

Final Environmental Assessment

**for Authorization for Incidental Take and Implementation of
Port Blakely's Habitat Conservation Plan for the John Franklin Eddy Forestlands**

Clackamas County, Oregon

June 2023



Lead Agency

National Oceanic and Atmospheric Administration National Marine Fisheries Service

Cooperating Agency

U.S. Fish and Wildlife Service

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ACRONYMS, ABBREVIATIONS, AND DEFINED TERMS

◦	degree
2022 Influenced Area	areas within 0.5 mile (mi) from parcels owned by Port Blakely that could be impacted by the Covered Activities and conservation measures
2022 Ownership	Port Blakely's John Franklin Eddy Forestland or parcels owned by Port Blakely where Covered Activities would initially occur and where the proposed HCP (conservation measures) would be implemented
ac	acre
Applicant	Port Blakely
BLM	Bureau of Land Management
Boundary for Potential Acquisition Lands	the area in which Port Blakely may acquire additional lands to be included in the HCP Area. It is bounded by the I-5 to the west, the Columbia River to the north, the Douglas-fir zone to the east (ODF 1996), and the southern extent of the Upper Willamette River Steelhead DPS to the south.
CEQ	Council on Environmental Quality
CFR	Code of Federal Regulations
Covered Activities	activities within the John Franklin Eddy Forestlands that may result in take of listed species (i.e., timber harvest, silviculture, and road management) for which Port Blakely has requested Incidental Take Permits
Covered Species	22 species that would be covered by the Incidental Take Permits
CTGR	Confederated Tribes of the Grand Ronde
DBH	diameter at breast height
EA	Environmental Assessment
ESA	Endangered Species Act of 1973
ESU	evolutionarily significant unit
ft	foot
FR	Federal Register
HCP	Habitat Conservation Plan
HCP Area	All areas that may be influenced by the implementation of the HCP, which includes the acres in the 2022 Ownership, 2022 Influenced Area, Potential Acquisition Area, and Potential Acquisition Influenced Area; same as Plan Area
I-5	Interstate 5
ITP	Incidental Take Permit
LCR	Lower Columbia River
LWD	large woody debris
mi	mile
mi ²	square mile

NEPA	National Environmental Policy Act of 1969
NI	Present, but resource is not effected to the degree that an analysis is required (low effects)
NMFS	National Marine Fisheries Service
NOAA	National Oceanic and Atmospheric Administration
NP	Not Present in the 2022 Ownership Area
OAR	Oregon Administrative Rules
ODF	Oregon Department of Forestry
ODFW	Oregon Department of Fish and Wildlife
OFP Rules	Forest Practice Administrative Rules and Forest Practices Act, collectively, Oregon Forest Practice Rules
ORS	Oregon Revised Statutes
PI	Present with potential for impact and therefore analyzed in the EA
Plan Area	Includes the 2022 Ownership, 2022 Influenced Area, Potential Acquisition Area, and Potential Acquisition Influenced Area; same as HCP Area
Potential Acquisition Area	area that may increase Port Blakely's land ownership by as much as 25%
Potential Acquisition Influenced Area	areas within 0.5 mile (mi) from the potential acquisition area.
Potential Additional Plan Area	the potential acquisition area and potential acquisition influenced area combined
Project	John Franklin Eddy Forestlands
Proposed Action	issuance of ITPs and implementation of the proposed HCP
RMA	Riparian Management Area
Services	National Marine Fisheries Service and U.S. Fish and Wildlife Service, collectively
SMA	Special Management Area
SSBT	salmon, steelhead, and bull trout
TPA	trees per acre
USC	United States Code
USEPA	U.S. Environmental Protection Agency
USFWS	U.S. Fish and Wildlife Service
UWR	Upper Willamette River

Chapter 1

Introduction

This Environmental Assessment (EA) is being prepared using the 1978 Council on Environmental Quality (CEQ) National Environmental Policy Act of 1969, as amended (NEPA), Regulations. NEPA reviews initiated prior to the effective date of the revised CEQ regulations may be conducted using the 1978 version of the regulations. The effective date of the 2020 CEQ NEPA Regulations was September 14, 2020. This environmental review began on June 10, 2020, and the agency was directed to proceed under the 1978 regulations. This chapter describes the Proposed Federal Action, the purpose and need, and the regulatory review process.

1.1 Action Requiring Review

The National Oceanic and Atmospheric Administration (NOAA) National Marine Fisheries Service (NMFS) and U.S. Fish and Wildlife Service (USFWS; collectively the “Services”) each received an application for an Incidental Take Permit (ITP), pursuant to the provisions of Section 10(a)(1)(B) and 10(a)(2)(A) of the Endangered Species Act of 1973, as amended (ESA; 16 United States Code [USC] 1531–1544 [1973]) for Port Blakely’s (or the Applicant’s) John Franklin Eddy Forestlands (Project) in Clackamas County, Oregon (Figure 1-1). Under Section 10 of the ESA, through issuance of ITPs, Applicants may be authorized to conduct otherwise lawful activities that may result in incidental take of listed species. Take is defined as “to harass, harm, pursue, hunt, shoot, wound, kill, trap, capture, or collect or attempt to engage in any such conduct” (16 USC 1532 [1973]). If the Services finds that Port Blakely’s application and related conservation plan meets the ITP issuance criteria under Section 10(a)(2)(B) of the ESA, the Services would issue ITPs. The ITPs would authorize incidental take associated with Port Blakely’s forest management activities (i.e., timber harvest, silviculture, and road management), i.e., Covered Activities, within 30,859 acres (ac) of Clackamas County and other potentially acquired commercial forestlands in Multnomah, Marion, and/or Linn counties in northwestern Oregon.

Port Blakely is requesting ITPs for eight federally listed endangered or threatened species as well as 14 proposed or non-listed species potentially affected by its forest management activities. (collectively, all these species are referred to as the Covered Species; Table 1-1). As indicated on Table 1-1, the NMFS is responsible for management of salmon and steelhead and their designated critical habitat (50 Code of Federal Regulations [CFR] Part 222 [1999]) and the USFWS is responsible for management of bull trout, Pacific lamprey, and terrestrial species; and their designated critical habitat (50 CFR Part 17 [2019]). Port Blakely’s objectives are to meet the conservation needs of Covered Species, provide a stable and predictable operating and regulatory environment, and to pursue forest management activities with assurances from the Services that authorizes incidental take of Covered Species.

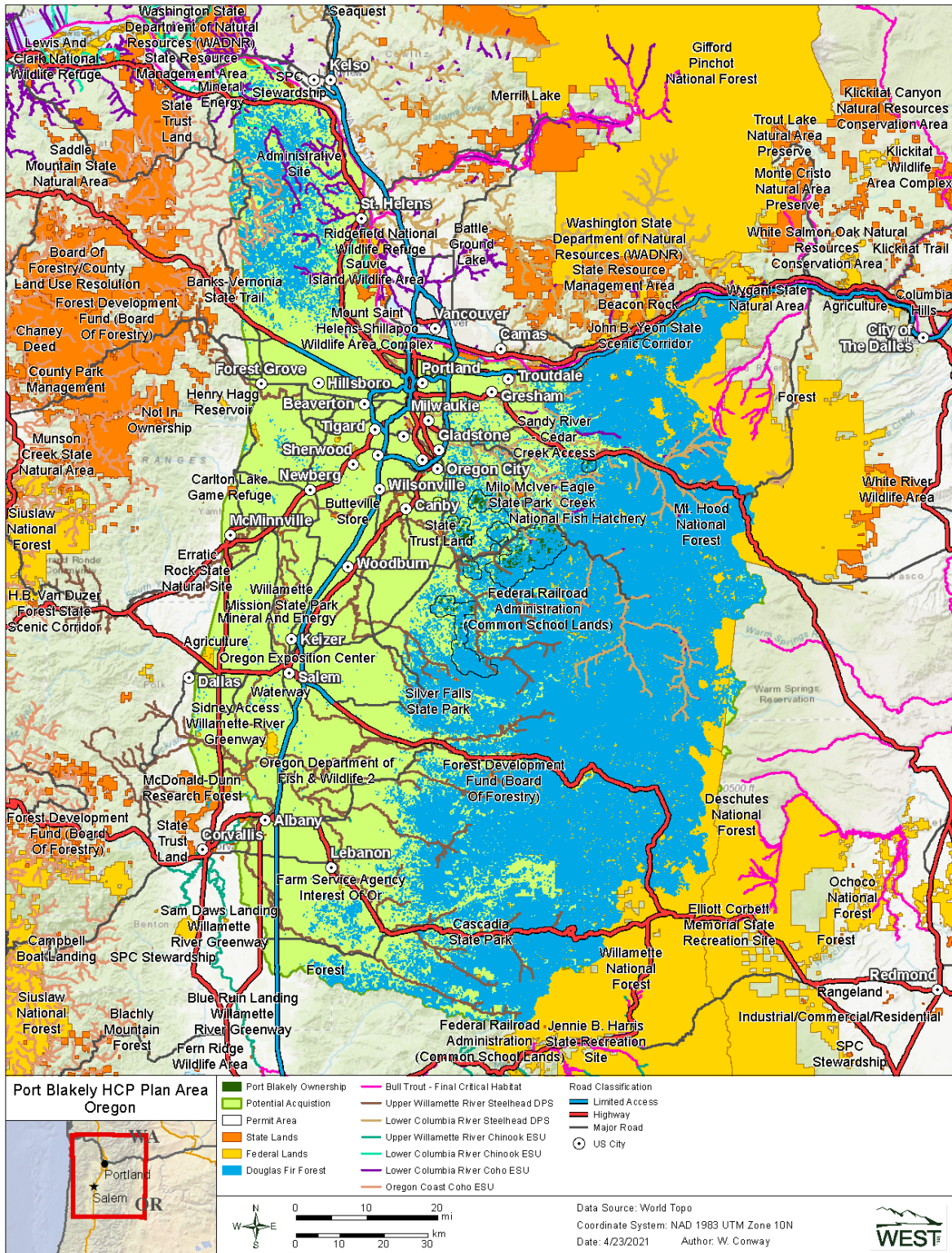


Figure 1-1. Vicinity Map of the Port Blakely John Franklin Eddy Forestlands

Table 1-1. Covered Species in the Port Blakely John Franklin Eddy Forestlands Habitat Conservation Plan

Common Name	Scientific Name	Federal Status (Federal Register [FR])	Federal Agency with Oversight
Fish – Anadromous			
1 Bull trout	<i>Salvelinus confluentus</i>	Threatened (64 FR 58910)	USFWS
2 Chinook salmon Lower Columbia River Fall Run	<i>Oncorhynchus tshawytscha</i>	Threatened (70 FR 37159)	NMFS
3 Chinook salmon Upper Willamette River Spring Run	<i>Oncorhynchus tshawytscha</i>	Threatened (70 FR 37159)	NMFS
4 Coho salmon Lower Columbia River	<i>Oncorhynchus kisutch</i>	Threatened (70 FR 37159)	NMFS
5 Pacific lamprey	<i>Lampetra tridentata</i>	Nonlisted	USFWS
6 Steelhead Lower Columbia River	<i>Oncorhynchus mykiss</i>	Threatened (71 FR 834)	NMFS
7 Steelhead Upper Willamette River	<i>Oncorhynchus mykiss</i>	Threatened (71 FR 834)	NMFS
Mammals			
8 Fringed myotis	<i>Myotis thysanodes</i>	Nonlisted	USFWS
9 Hoary bat	<i>Lasiurus cinereus</i>	Nonlisted	USFWS
10 Long-eared myotis	<i>Myotis evotis</i>	Nonlisted	USFWS
11 Long-legged myotis	<i>Myotis volans</i>	Nonlisted	USFWS
12 Silver-haired bat	<i>Lasionycteris noctivagans</i>	Nonlisted	USFWS
13 Townsend's big-eared bat	<i>Corynorhinus townsendii</i>	Nonlisted	USFWS
14 Pacific Fisher	<i>Pekania pennanti</i>	Proposed Threatened (84 FR 69712)	USFWS
15 Gray wolf	<i>Canis lupus</i>	Endangered (43 FR 9607) Delisted (85 FR 69778)	USFWS
Birds			
16 Northern goshawk	<i>Accipiter gentilis</i>	Nonlisted	USFWS
17 Northern spotted owl	<i>Strix occidentalis caurina</i>	Threatened (55 FR 26114)	USFWS
Amphibians and Reptiles			
18 Cascades frog	<i>Rana cascadae</i>	Nonlisted ¹	USFWS
19 Cascade torrent salamander	<i>Rhyacotriton cascadae</i>	Nonlisted ²	USFWS
20 Coastal tailed frog	<i>Ascaphus truei</i>	Nonlisted	USFWS
21 Oregon slender salamander	<i>Batrachoseps wrighti</i>	Nonlisted	USFWS
22 Western/North Pacific pond turtle	<i>Actinemys marmorata</i>	Nonlisted	USFWS

Table 1-1. Covered Species in the Port Blakely John Franklin Eddy Forestlands Habitat Conservation Plan

Common Name	Scientific Name	Federal Status (Federal Register [FR])	Federal Agency with Oversight
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¹ Status of species is currently under review by the USFWS (80 FR 37568–37579).

² Status of species is currently under review by the USFWS (80 FR 56423–56432).

NMFS = National Marine Fisheries Service; USFWS = U.S. Fish and Wildlife Service.

Under ESA Section 10(a)(2)(A), any application for an ITP must include a “conservation plan” detailing, among other things, the impacts of the incidental take authorized by the ITP on affected covered species and how the impacts will be minimized and mitigated. Port Blakely has prepared a Habitat Conservation Plan (HCP) for the Project, the *Habitat Conservation Plan for the John Franklin Eddy Forestlands* (available online:

<https://www.fisheries.noaa.gov/action/port-blakely-habitat-conservation-plan-john-franklin-eddy-forestlands>). The Applicant is applying for ITPs that would authorize incidental take of the Covered Species caused by the Covered Activities described in the proposed HCP for the duration of the 50-year permit term. The Proposed Action being evaluated by this EA is the issuance of ESA ITPs by the Services that would authorize incidental take of the Covered Species (Table 1-1), while carrying out the Covered Activities (Section 2.1.1), and implementation of the conservation measures to mitigate that take, as contained in the HCP, and in accordance with the statutory and regulatory requirements of the ESA.

The NMFS is the lead federal agency on this review and the USFWS is a cooperating agency; together, the Services are fulfilling obligations to evaluate the impacts of, and alternatives to, the Proposed Action.

1.2 Project Overview

Port Blakely’s John Franklin Eddy Forestland occupies 30,859 ac of land in Clackamas County, Oregon; of the total acreage within the Project, approximately 29,553 ac are commercial forestlands (primarily composed of Douglas fir) and 1,306 ac are non-forestland (i.e., buildings, power lines, roads, and rock pits). Port Blakely currently implements forestry management practices, including timber harvest, silviculture, and road management (described in additional detail in Chapter 2 and in Section 2.2 of the HCP), in accordance with Forest Practice Administrative Rules and Forest Practices Act, collectively, or Oregon Forest Practices (OFP) Rules (OFP Rules; Oregon Administrative Rules [OAR] 629–600 through 629-680) (Oregon Department of Forestry [ODF] 2018a).

Port Blakely proposes to conduct forestry management practices (Covered Activities) that provide predictable revenue over the long-term while also maintaining or restoring degraded habitat elements for Covered Species, resulting in better habitat quality than what would otherwise occur under the OFP Rules. Port Blakely will implement conservation measures that are consistent with and exceed OFP Rules, resulting in retention of more woody features, preservation of vegetation within wider riparian buffers, acceleration of habitat development based on silvicultural practices, reduction of sediment input to streams from roads, and increased protections for proposed Covered Species.

1.3 Plan Area

The HCP describes several areas within the HCP Area (or Plan Area), which includes all the areas that may be influenced by the implementation of the HCP. These different areas total 115,662 ac and include (Table 1-2):

- **2022 Ownership** - Port Blakely’s John Franklin Eddy Forestland or parcels owned by Port Blakely where Covered Activities would initially occur and where the proposed

HCP (conservation measures) would be implemented (30,859 ac; Figure 1-1). These acres are part of the Initial Plan Area as described in the HCP.

- **2022 Influenced Area** – areas within 0.5 mile (mi) from parcels owned by Port Blakely that could be impacted by the Covered Activities and conservation measures (61,717 ac). This constitutes part of the Initial Plan Area as described in the HCP.
- **Potential Acquisition Area** – Port Blakely may acquire additional lands that could result in as much as a 25% increase in acreage as compared to the acreage of its 2022 Ownership (7,714 ac). The acquisition and analyses extent are described at the end of this list. These acres are part of the Potential Additional Plan Area.
- **Potential Acquisition Influenced Area** - areas within 0.5 mi from the potential acquisition area (15,419 ac). These acres are part of the Potential Additional Plan Area.

The HCP identifies a large area within which the Potential Acquisitions would occur. This area is defined as the:

- **Boundary for Potential Acquisition Lands** – the area in which Port Blakely may acquire additional lands to be included in the HCP Area. It is bounded by the Interstate 5 (I-5) to the west, the Columbia River to the north, the Douglas-fir zone to the east (ODF 1996), and the southern extent of the Upper Willamette River Steelhead DPS to the south. This area is shown in Figure 1-1 (Potential Acquisition).

While the Boundary of Potential Acquisition Lands is large, acquisitions will only occur on a smaller subset of acres – those acres that are nonfederal and non-state forestlands that have similar vegetative species and characteristics as the HCP Area, i.e., Douglas-fir stands of western Oregon and have the potential to be occupied by Covered Species. These criteria reduce the area for potential acquisition from 4,391,700 ac to approximately 351,593 ac.

Table 1-2. HCP Area Definitions and Acreages

Acres	Acres	Initial Plan Area	Potential Additional Plan Area	HCP Area	Description
2022 Ownership	30,859	✓		✓	Port Blakely's John Franklin Eddy Forestland in Oregon
2022 Influenced Area	61,717	✓		✓	Areas within 0.5 miles from 2022 Ownership
Potential Acquisition Area	7,714		✓	✓	Maximum 25% of 2022 Ownership
Potential Acquisition Influenced Area	15,419		✓	✓	Areas within 0.5 miles from potential acquisition area
Total Acres	115,662	92,530	23,133	115,662	

As described in the HCP (Section 10.4), if Port Blakely wishes to include any nonfederal, nonstate forestland within the Boundary of Potential Acquisition Lands as Covered Lands under the HCP, Port Blakely shall provide notice to the Services of the proposed inclusion of additional lands, along with a legal description, specific description of the location, baseline conditions of the additional property, and any known Covered Species and Critical Habitat occurrences. The

Services will review the application for compliance with all applicable laws and executive orders. Lands to be proposed for HCP coverage must meet the following criteria:

- Nonfederal and non-state (small landowner or industrial) forestlands;
- Similar characteristics as the Initial Plan Area:
 - Similar vegetative and aquatic features;
 - No areas in Critical Habitat of species not analyzed in this EA;
 - Similar ratios of critical habitat as the 2022 Ownership;
 - Age-class distribution of forested lands to be added;
 - Within the western Oregon Douglas-fir Zone;
 - Similar forest stand conditions (mostly lower-quality and degraded habitat; previously harvested, etc.) as the 2022 Ownership;
 - Similar ratio of stream types and length as the 2022 Ownership;
 - Similar ratio of roads and road crossings as in the 2022 Ownership; and
 - Similar characteristics in terms of recreational use, viewsheds, and historical or cultural resources;
- Within the Upper Willamette River (UWR) and Lower Columbia River (LCR) Evolutionarily Significant Units (ESU).
- Within the 25% acreage limit analyzed; and
- Not increase the authorized level of take permitted.

While this EA analyzes the effects of the alternatives within the Initial Plan Area, due to the criteria for potential acquisition areas, the Services may infer that potential effects may be similar on future acquisitions. However, some characteristics will only be known when the Applicant proposes an inclusion of additional lands.

1.4 Purpose and Need

The purpose of the Federal action considered in this EA is to fulfill the Services' ESA Section 10(a) (1)(B) conservation authorities and obligations and to render decisions on the ITP applications, accompanied by an HCP, requesting authorization of incidental take of the Covered Species.

The need for the Proposed Action is to provide broad protection and conservation for Covered Species, while responding to the Applicant's request for ITPs to determine if they meet permit issuance criteria.

The Services must decide whether to issue or deny the ITPs. If the Services determine that the permit issuance criteria contained in Section 10(a)(1)(B) of the ESA are satisfied, they must issue ITPs to the Applicant. The Services may decide to issue permits conditioned on either the implementation of the HCP as submitted by the Applicant, or on the implementation of the HCP

as submitted by the Applicant with additional measures specified by the Services. If the ESA's issuance criteria are not satisfied, the Services will deny the permit requests.

In this EA, the Services analyze the impacts of the Covered Activities on all potentially affected elements of the natural and human environment within the Initial Plan Area. At the end of the review process, the determination of whether the issuance criteria have been met will be presented in 1) findings and recommendations memorandums that document the Services' conclusions on permit issuance under Section 10(a)(1)(B) of the ESA, and 2) ESA Section 7 biological opinions.

1.5 Cultural Resources Consultation and Tribal Coordination

In accordance with the National Historic Preservation Act of 1966 (54 USC 300101 et seq. [2014]), the Services consider the effects of a proposed undertaking on cultural resources listed or eligible for listing on the National Register of Historic Places. The purpose of Section 106 is to ensure federal agencies consult with state and local groups before cultural resources, such as archaeological sites and historic structures, are affected. This coordination process is also intended to ensure compliance with the American Indian Religious Freedom Act (1978) and Consultation and Coordination with Indian Tribal Governments (Executive Order 13175 [2000]).

The Services have determined that the issuance of the ITPs and implementation of the associated HCP by Port Blakely is an undertaking that is of the type that has no potential to cause effects on historic properties (36 CFR 800.3.a.1) (USFWS 2021). As such, no historic properties will be affected as a result of the issuance of ITPs and historic properties will not be discussed further in this EA.

On January 29, 2021, the Services sent a letter through email to the Confederated Tribes of the Grand Ronde (CTGR) Community of Oregon, whose historic lands include portions of the Clackamas and Molalla Basins. Following this January 29, 2021 letter, the Services and the CTGR met on March 17, 2021 to provide information and gain tribal expertise on the Port Blakely HCP. On June 14, 2022, the Services sent a letter through email to the CTGR notifying them of the posting and public comment period associated with the draft EA and draft HCP. No comments from the CTGR were received on the draft EA or draft HCP. The Services will coordinate with CTGR as the final EA and HCP are posted.

1.6 Public Involvement

The draft EA was released on June 14, 2022 with a Notice of Availability published in the Federal Register Notices (87 FR 35970 [June 14, 2022]). The public comment period closed on July 14, 2022. The NMFS received two comment letters. One of the letters expressed support for the Services' approval of the HCP and the proposed issuances of the ITPs to Port Blakely. The other letter was submitted by the U.S. Environmental Protection Agency (USEPA). The substantive comments from the USEPA's comment letter are addressed in this Final EA, as summarized in Section 1.7.

1.7 Changes to the Draft EA

A number of minor changes were made since the release of the Draft EA for public comment, as summarized below.

The USEPA's comment letter recommended that additional assessment on air quality be included, particularly in regards to prescribed burning activities covered in the HCP. Section 3.1 of this EA has been updated to provide more information on potential air quality effects due to burning. The USEPA also noted the importance of monitoring over the 50-year permit term. The proposed HCP monitoring program was incorporated into the Proposed Action as presented and analyzed in the draft EA. As stated in Section 2.1.4 of the EA (and detailed in Section 6.4.1 of the draft and final HCP), Port Blakely is proposing multiple compliance monitoring activities associated with implementation of the HCP. Additionally, a biological/effectiveness monitoring program would be followed for the first 10 years of the ITP term, at which point Port Blakely and the Services would coordinate to determine whether this monitoring program should be extended and/or adjusted, as detailed in Section 6.4.2 of the HCP. The ITPs, if granted by the Services, would require Port Blakely to follow this monitoring program.

Additionally, on January 31, 2023, Port Blakely provided an updated HCP to the NMFS (available online at <https://www.fisheries.noaa.gov/action/port-blakely-habitat-conservation-plan-john-franklin-eddy-forestlands>). The updates consisted of revised acreages, as assessed after the recent wildfires, including updated overall and forested acres of the HCP Plan Area (including the Initial Plan Area and the Potential Additional Plan Area), timber age stands, and projected harvests in 5 and 10 year periods. The updated HCP also provided a revised annual average road construction mileage. These updated numbers are provided in the 2023 HCP and are reflected in this EA, primarily in Sections 1.3 and 3.2.1.

Chapter 2

Alternatives

This chapter describes the No-action and Proposed Action Alternatives the Services considered in this analysis. This chapter describes conservation measures common to both alternatives and compares components unique to the alternatives.

2.1 Alternatives Retained for Detailed Analysis

The alternatives retained for detailed analysis vary by the avoidance, minimization, and mitigation measures that would be implemented that affect woody features, habitat development, riparian buffers, risk of road-related sediment input to streams, and species-specific protections. Because of expectations for avoidance, minimization, and mitigation measures to affect the level of take, the amount of mitigation needed to compensate for the impact of the taking varies by alternative.

2.1.1 Activities Common to Both Alternatives

Under both alternatives, the Applicant would continue to conduct forest management activities (i.e., Covered Activities) in the 2022 Ownership in accordance with existing state and federal regulations, as well as the operational and policy management actions currently implemented. Specifically, all forest management activities will be conducted in accordance with the ODF OFP Rules (Oregon Forest Practice Rules; OAR 629–600 through 629–680) (ODF 2018a). The Oregon Forest Practices Act identifies forest practices as any operation conducted on or pertaining to forestland, including but not limited to (a) reforestation of forestland, (b) road construction and maintenance, (c) harvesting of forest tree species, (d) application of chemicals, (e) disposal of slash, and (f) removal of woody biomass. However, OFP Rules do not substitute for, or ensure compliance with, the ESA, and nothing in the rules imposes any state requirement to comply with the ESA (ODF 2018a).

Under OFP Rules, forest managers conducting forest management operations requiring notification under OAR 629-605-0140 must submit a written plan, as required by the Oregon Revised Statute (ORS) 527.670(3), to the State Forester to allow the State Forester to evaluate and comment on the likelihood the operation will comply with the OFP Rules, including operations within:

- 300 feet (ft) of a specific site involving threatened or endangered wildlife species, or sensitive bird nesting, roosting, or watering sites as listed in a document published by the ODF titled “Cooperative Agreement between the Board of Forestry and the Fish and Wildlife Commission, March 28, 1984”
- 300 ft of any resource site identified in OAR 629-665-0100 (Sensitive Bird Nesting, Roosting and Watering Resource Sites on Forest Lands), OAR 629-665-0200 (Threatened and Endangered Species that use Resource Sites on Forest Lands), or OAR 629-645-0000 (Significant Wetlands)

- 300 ft of any nesting or roosting site of threatened or endangered species listed by the USFWS or by the Oregon Fish and Wildlife Commission by administrative rule.

The following Covered Activities are included in the OFP Rules, and implementation will continue under both alternatives.

- Timber harvest
 - Regeneration (even-age) harvest
 - Pre-commercial thinning
 - Stand recovery and natural disturbances harvest (salvage)
- Silviculture
 - Site preparation (debris clearing, piling and burning)
 - Reforestation (planting)
 - Fertilization
 - Disease, insect, and animal damage control
 - Mechanical vegetation control
- Road management
 - Road construction and maintenance
 - Abandonment and deactivation
 - Quarrying (rock pits)

Section 2.2 of the HCP describes in detail these Covered Activities. Section 2.1.4 below compares avoidance, minimization, and mitigation measures associated with each of the Covered Activities listed above under the No-action and Proposed Action Alternatives, and Section 6.3 of the HCP describes the measures in greater detail.

2.1.2 Alternative 1: No-action (Oregon Forest Practice Rules)

No action means “the proposed permit would not be issued, the proposed activity would not take place, and the resulting environmental effects from taking no action would be compared with the effects of permitting the proposed activity or an alternative activity to go forward” (46 FR 18026). Further guidance on the No-action Alternative offers that a No-action Alternative can include predictable actions by persons or entities other than the federal agencies involved in a project action acting in accordance with current management direction or level of management intensity. When a Proposed Action involves updating an adopted management plan or program, the No-action Alternative assumes the continuation of the existing management plan or program, or a scenario in which there is “no change” from a current management direction or level of management intensity (43 CFR 46.30).

The No-action Alternative is defined as the conditions that can be expected if the Services do not issue ITPs to the Applicant. Under the No-action Alternative, the Applicant would continue to conduct the Covered Activities that are included in the OFP rules in the 2022 Ownership. The Services would not issue ITPs and, therefore, the Applicant would remain subject to the prohibition of unauthorized taking of state- and federally listed species. Further, the Applicant would remain subject to state requirements to avoid or mitigate significant adverse impacts of forest management activities on all wildlife, including species listed or proposed for listing under the ESA. In addition, the Applicant would remain subject to state and federal laws. Section 1.7 of the HCP summarizes the applicable regulations that provide the framework for implementing the No-action Alternative.

The No-action Alternative would be the alternative implemented if the Services deny the Applicant the ITP; however, the No-action Alternative does not meet the Applicant's commitment to stewardship forestry while maintaining compliance with the ESA, as some forest management activities have the potential to result in take of listed species that currently inhabit or may inhabit the Plan Area in the future. Furthermore, the No-action Alternative does not meet the Services' purpose and need to provide broad protection and conservation for Covered Species.

2.1.3 Alternative 2: Proposed Action (Issue the Incidental Take Permits)

Under the Proposed Action, the Services would issue the ITPs with a 50-year term and Port Blakey would conduct the Covered Activities using the same forest management techniques as approved and regulated by OFP Rules (same as the No-action Alternative), with the inclusion of additional commitments to implement Conservation Measures. The Conservation Measures identified in the HCP were designed to produce more woody features that provide wildlife habitat, implement silviculture techniques that accelerate habitat development, adhere to wider riparian buffers to protect aquatic habitat, reduce the risk of road-related sediment input to streams, and provide species-specific protections. These Conservation Measures are summarized in Table 2-1.

The 50-year permit term requested by the Applicant is sufficient to capture one complete 50-year harvest rotation regime. A 50-year rotation regime is expected to improve riparian and stream function (as compared to current conditions and to most conditions anticipated under the No-action Alternative) by increasing the amount of shade and large woody debris (LWD) recruitment, which allow fish to utilize habitat for some or all of their life-stages. The Applicant would remain subject to the same state and federal laws as the No-action Alternative, but the issuance of ITPs would address ESA compliance for Covered Species that are federally listed (and for species listed during the permit term, as described in Section 10.3 of the HCP).

In 2016, when the Applicant and the Services began discussing the HCP, the Applicant intended to simultaneously develop a voluntary Stewardship Agreement with the ODF. On February 21, 2020, the Applicant entered into a voluntary Stewardship Agreement with the ODF under the authority of ORS 541.973, ORS 527.736, and OAR 629-021. By entering into the Stewardship Agreement, the Applicant has agreed to implement conservation measures that exceed ODF regulatory requirements, which are designed to protect natural resources and are

nearly identical to those described in the HCP (see Appendix 1 of the Stewardship Agreement, Port Blakely and ODF 2020).

Although the Applicant finalized its Stewardship Agreement with the State of Oregon in February 2020, this EA considers the Stewardship Agreement as part of the Proposed Action Alternative because the Applicant developed the Stewardship Agreement concurrently with the HCP and indicated that its signing of the Stewardship Agreement was based on the expectation of receiving ITPs and implementing the HCP Conservation Measures. Additionally, the components of the Stewardship Agreement overlap with the HCP Conservation Measures and are intended to work together. If the Applicant does not receive ITPs the Stewardship Agreement components would have very similar effects on Covered Species as the HCP Conservation Measures. However, the Stewardship Agreement is a voluntary, nonbinding agreement so the Applicant could terminate its participation in the Stewardship Agreement at any time.

Table 2-1. Summary of Proposed Conservation Measures by Species

Species	Proposed Conservation Measures
Fish – Anadromous	
Salmonids, bull trout, and lamprey	<ul style="list-style-type: none"> ● Create buffers composed of live trees, snags, downed wood, and understory vegetation around streams and around stream-associated habitats, such as wetlands (Habitat Conservation Plan [HCP] Sections 6.3.1 and 6.3.3) ● Place woody debris into streams to aid in creating additional habitat, spawning, and foraging opportunities (HCP Section 6.3.1) ● Retain old growth trees, snags, and downed logs (HCP Sections 6.3.2 and 6.3.3) to provide future woody debris ● Recruit and retain coarse woody debris in riparian buffers (HCP Sections 6.3.2 and 6.3.3) to provide future woody debris in streams ● Size road crossings at fish-bearing streams to allow for 100-year floods and to enable native fish species at all life stages to pass through (HCP Sections 6.3.1 and 6.3.4) ● Repair or remove impaired manmade fish passage barriers and complete periodic inspections (HCP Section 6.3.1) ● Conduct fish distribution surveys and design structure for permanent fish-crossing installations (HCP Section 6.3.1) ● Reduce/eliminate stream sediment input by (HCP Sections 6.3.1 and 6.3.4): <ul style="list-style-type: none"> ○ Locating roads away from streams outside riparian management areas (RMAs) and removing stream-adjacent roads where possible ○ Adding water bars and cross-drains to divert road run-off and sediment onto forest floor well above streams ○ Creating and maintaining ditches to ensure proper drainage for road run-off and disconnecting ditchlines from streams ○ Replacing poorly functioning culverts and using alternatives to culverts when possible ○ Installing larger than required culverts and bridges able to accommodate 100-year flood events; ○ Applying no-harvest stream riparian buffers to block and/or filter sediment. ● Create no-harvest buffers on fish-bearing streams to reduce the potential for stream temperature increases (HCP Section 6.3.1) ● Only construct new roads when essential and deactivate or abandon existing non-essential roads (HCP Section 6.3.4)

Table 2-1. Summary of Proposed Conservation Measures by Species

Species	Proposed Conservation Measures
Mammals	
Bats (fringed myotis, hoary bat, long-eared myotis, long-legged myotis, silver-haired bat, Townsend's big-eared bat)	<ul style="list-style-type: none"> ● Retain old growth trees, snags, and logs (HCP Sections 6.3.2 and 6.3.3) ● Strategically place leave trees, and create snags (HCP Section 6.3.2) ● Create understory with two canopy layers through pre-commercial thinning by hand-cutting, increasing habitat complexity (HCP Section 6.3.3) ● Commercially thin conifer dominant stands to increase forest habitat complexity and foraging and dispersal suitability (HCP Section 6.3.3) ● Delay regeneration harvest stands for stands 50 years of age or older, resulting in forest stands older than typical commercial forest landscapes (HCP Section 6.3.3) ● Establish special management areas around sensitive habitat types within commercial harvest areas and protect these areas for the entire HCP term (HCP Section 6.3.3) ● Only construct new roads when essential and deactivate or abandon existing non-essential roads (HCP Section 6.3.4) ● Create no-harvest buffers in riparian management areas (RMAs) (HCP Section 6.3.1)
Gray wolf	<ul style="list-style-type: none"> ● Protect den sites and restrict disturbance (HCP Section 6.3.5) ● Create understory with two canopy layers through pre-commercial thinning by hand-cutting, increasing habitat complexity and prey base (HCP Section 6.3.3) ● Regeneration harvest age for stands 50 years of age or older, resulting in forest stands older than typical for commercial forest landscapes (HCP Section 6.3.3) ● Establish special management areas around sensitive habitat types within commercial harvest areas and protecting these areas for the entire HCP term (HCP Section 6.3.3) ● Only construct new roads when essential and deactivate or abandon existing non-essential roads (HCP Section 6.3.4) ● Restrict motorized access to HCP Area roads through locked gates (HCP Section 6.3.5) ● Commercially thin conifer dominant stands to increase habitat complexity, foraging and dispersal suitability, and potential prey base (HCP Section 6.3.3) ● Create no-harvest buffers in RMAs (HCP Section 6.3.1)

Table 2-1. Summary of Proposed Conservation Measures by Species

Species	Proposed Conservation Measures
<p>Pacific fisher</p>	<ul style="list-style-type: none"> ● Protect den sites, create understory, regeneration harvest age, and establish special management areas; new road construction measures would be the same as those described for gray wolf (HCP Section 6.3.5) ● Restrict trapping/nuisance animal control near dens (HCP Section 6.3.5) ● U.S. Fish and Wildlife service (USFWS) or its agents may monitor if females are occupying dens, raising kits, and determining presence (HCP Section 6.3.5) ● Create coarse woody debris bio-dens for fishers and/or prey species (HCP Section 6.3.5) ● Report to USFWS any occupied den sites or any dead, sick, or captured fishers (HCP Section 6.3.5) ● Where suitable habitat exists and where agreed upon by Port Blakely and USFWS, allow the release of translocated fishers (HCP Section 6.3.5) ● Cover man-made structures on the HCP lands that may entrap fishers (e.g., water troughs), or place a device inside the structure to enable the fisher to climb out (HCP Section 6.3.5) ● Create no-harvest buffers in RMAs (HCP Section 6.3.1)
<p>Birds</p>	
<p>Northern goshawk</p>	<ul style="list-style-type: none"> ● Habitat protection in the form of 30 acres (ac) of forested habitat untouched around two active nest sites (HCP Section 6.3.5) ● Operational disturbance restriction by staying 0.50 mile (mi) or greater away from active nests from March 1 – August 31 ● Provide forest landscape-wide habitat mosaic (HCP Section 6.3.5) ● Create understory with two canopy layers through pre-commercial thinning by hand-cutting, increasing habitat complexity and prey base (HCP Section 6.3.3) ● Commercially thin conifer dominant stands to increase habitat complexity, foraging and dispersal suitability, and potential prey base (HCP Section 6.3.3) ● Regeneration harvest age for stands 50 years of age or older, resulting in forest stands older than typical for commercial forest landscapes (HCP Section 6.3.3) ● Establish special management areas around sensitive habitat types within commercial harvest areas and protecting these areas for the entire HCP term (HCP Section 6.3.3) ● Only construct new roads when essential and deactivate or abandon existing non-essential roads (HCP Section 6.3.4) ● Create no-harvest buffers in RMAs (HCP Section 6.3.1)

Table 2-1. Summary of Proposed Conservation Measures by Species

Species	Proposed Conservation Measures
<p>Northern spotted owl</p>	<ul style="list-style-type: none"> ● Nest protection and implement 0.25 mi noise disturbance restrictions for spotted owl nest/pair sites from March 1 through September 30 (HCP Section 6.3.5) ● Avoid harvest of high quality habitat around nest/pairs for up to three occupied spotted owl nest sites (HCP Section 6.3.5) ● Retain legacy trees and snags, leaving a minimum of about 7,500 ac for foraging and dispersal habitat (HCP Section 6.3.5) ● Recovery planning as needed with USFWS (HCP Section 6.3.5) ● Create upland habitat, strategically leave trees unharvested, retain legacy trees, and create snags (HCP Section 6.3.2) ● Retain understory trees in riparian areas and uplands ● Creation and retention of coarse woody debris (bio-dens) (HCP Sections 6.3.2 and 6.3.3) ● Create understory with two canopy layers through pre-commercial thinning by hand-cutting, increase habitat complexity and prey base (HCP Section 6.3.3) ● Commercially thin conifer dominant stands to increase habitat complexity, foraging and dispersal suitability, and potential prey base (HCP Section 6.3.3) ● Regeneration harvest age for stands 50 years of age or older, resulting in forest stands older than typical for commercial forest landscapes (HCP Section 6.3.3) ● Establish special management areas around sensitive habitat types within commercial harvest areas and protecting these areas for the entire HCP term (HCP Section 6.3.3) ● Only construct new roads when essential and deactivate or abandon existing non-essential roads (HCP Section 6.3.4)
<p>Amphibians and Reptiles</p>	
<p>Cascades frog, coastal tailed frog, western pond turtle</p>	<ul style="list-style-type: none"> ● Create buffers around stream-associated habitats (e.g., wetlands) composed of live trees, snags, downed wood, and understory vegetation (HCP Section 6.3.1) ● Retain old growth trees, snags, and downed logs (HCP Sections 6.3.2 and 6.3.3) ● Maintain the understory vegetation within 30–50 feet (ft) of nonfish streams and aquatic habitats (HCP Sections 6.3.2 and 6.3.3) ● Recruit and retain coarse woody debris (HCP Sections 6.3.2 and 6.3.3) ● Locate roads away from streams outside RMAs and remove stream-adjacent roads where possible (HCP Section 6.3.1) ● Trees cut during pre-commercial thinning will not be removed, providing short-term woody debris input to the forest floor (HCP Section 6.3.3). ● Create an understory with two canopy layers through pre-commercial thinning by hand-cutting, increasing habitat complexity (HCP Section 6.3.3) ● Establish special management areas around sensitive habitat types within commercial harvest areas and protect these areas for the entire HCP term (HCP Section 6.3.3) ● Only construct new roads when essential and deactivate or abandon existing non-essential roads (HCP Section 6.3.4)

Table 2-1. Summary of Proposed Conservation Measures by Species

Species	Proposed Conservation Measures
Salamanders (Oregon slender salamander, cascade torrent salamander)	<ul style="list-style-type: none"> ● Create buffers around stream-associated habitats composed of live trees, snags, downed wood, and understory vegetation. ● Retain old growth trees, snags, and downed logs (HCP Sections 6.3.2 and 6.3.3) ● Maintain the understory vegetation within 30–50 ft of nonfish streams and aquatic habitats (HCP Sections 6.3.2 and 6.3.3) ● Recruit and retain coarse woody debris (HCP Sections 6.3.2 and 6.3.3) ● Trees cut during pre-commercial thinning will not be removed, providing short-term woody debris input to the forest floor (HCP Section 6.3.3). ● Create an understory with two canopy layers through pre-commercial thinning by hand-cutting, increasing habitat complexity (HCP Section 6.3.3) ● Establish Sensitive Management Areas around sensitive habitat types within commercial harvest areas and protect these areas for the entire HCP term (HCP Section 6.3.3) ● Only construct new roads when essential and deactivate or abandon existing non-essential roads (HCP Section 6.3.4) ● Retain or create at least 30 cubic ft per acre of coarse woody debris, with no pieces less than 10 cubic ft, and/or piles five to 10 ft in diameter with average piece size of 10 ft in diameter and one to three ft long at regeneration harvest (HCP Section 6.3.2)

2.1.4 Comparison of the Alternatives

The following table describes the key differences between the No-action and the Proposed Action Alternatives. Section 6.3 of the HCP contains detailed descriptions of the conservation actions summarized in Table 2-2 for the Proposed Action.

Table 2-2. Key Differences between the No-action Alternative and the Proposed Action

	No-action Alternative	Proposed Action
Timber Harvest		
Regeneration harvest	<ul style="list-style-type: none"> ● Harvest age approximately 39 years 	<ul style="list-style-type: none"> ● Harvest age approximately 50 years
Pre-commercial thinning	<ul style="list-style-type: none"> ● No requirement 	<ul style="list-style-type: none"> ● Occur between 10 and 20 years of age for stands with stocking levels over 400 trees per acre (TPA), or on steep slopes over 350 TPA ● leave cut trees to provide short-term woody debris
Commercial thinning	<ul style="list-style-type: none"> ● No requirement 	<ul style="list-style-type: none"> ● At least 25% of operable land thinned to a target stocking level of 180–235 TPA
Upland Habitat Ecosystem Functions		

Table 2-2. Key Differences between the No-action Alternative and the Proposed Action

	No-action Alternative	Proposed Action
Coarse woody debris	<ul style="list-style-type: none"> Two downed logs or downed trees per acre (ac) harvested, one of which is a conifer, that each comprise at least 10 cubic feet (ft) gross volume and are no less than six ft long or one downed conifer or suitable hardwood log of at least 20 cubic ft gross volume and no less than six ft long may count as two logs. 	<ul style="list-style-type: none"> Retain or create at least 30 cubic ft per ac of coarse woody debris, with no pieces less than 10 cubic ft, and/or piles five to 10 ft in diameter with average piece size of 10 ft in diameter and one to three ft long at regeneration harvest Retain or create two trees (defective or of the largest class) per ac on the forest floor at commercial thinning
Retain understory trees	<ul style="list-style-type: none"> No requirement 	<ul style="list-style-type: none"> Retain understory trees less than 10 inches in diameter at breast height (DBH) where they exist in upland patches or along the edge of the unit at regeneration harvest Retain understory western red cedar where they exist throughout the harvest unit
Retain logging slash	<ul style="list-style-type: none"> No requirement 	<ul style="list-style-type: none"> Retain logging slash distributed throughout the harvest unit
Snag and leave trees	<ul style="list-style-type: none"> Two snags or green trees at least 30 ft in height and 11 inches DBH, at least 50% of which are conifers 	<ul style="list-style-type: none"> Retain all safe snags and create additional snags at the rate of one snag for every 10 ac at regeneration harvest, mechanically topped trees will be ≥ 15 inches DBH and ≥ 12 ft tall and girdled trees will be ≥ 15 inches DBH and ≥ 30 ft tall Retain four wildlife trees per ac at regeneration harvest Retain two defective trees or create two snags from the largest size class per ac at commercial thinning Retain a minimum of 25% of the leave trees in the uplands as reserves around special management areas where they exist or, if special management areas not present, in 0.25–1.0 ac sized patches distributed across the harvest unit
Stream and Riparian Ecosystem Functions		
Fish-bearing stream riparian management area (RMA)	Large streams	<p>Large streams</p> <ul style="list-style-type: none"> 100-ft buffer unmanaged, includes all native fish <p>Medium streams</p>

Table 2-2. Key Differences between the No-action Alternative and the Proposed Action

	No-action Alternative	Proposed Action
	<ul style="list-style-type: none"> 100-ft buffer with 80-ft managed¹ zone, includes anadromous, game, and Endangered Species Act- (ESA-) listed fish <p>Medium streams</p> <ul style="list-style-type: none"> 70-ft to 80-ft buffer with 50- or 60-ft managed zone (dependent on steelhead and bull trout use) <p>Small streams</p> <ul style="list-style-type: none"> 50-ft to 60-ft buffer with 30 or 40-ft managed zone (dependent on steelhead and bull trout use) <p>Stream-associated special habitat types and/or features (e.g., all sizes of wetlands, seeps, and unstable slopes)</p> <ul style="list-style-type: none"> No requirement 	<ul style="list-style-type: none"> 90-ft buffer unmanaged, includes all native fish <p>Small streams</p> <ul style="list-style-type: none"> 75-ft buffer unmanaged², includes all native fish <p>Stream-associated special habitat types and/or features</p> <ul style="list-style-type: none"> 50-ft buffer
Nonfish-bearing stream RMA	<p>Large streams</p> <ul style="list-style-type: none"> 70-ft buffer with 50-ft managed zone <p>Medium streams</p> <ul style="list-style-type: none"> 50-ft buffer with 30-ft managed zone <p>Small streams</p> <ul style="list-style-type: none"> No requirement <p>Stream-associated special habitat types and/or features</p> <ul style="list-style-type: none"> No requirement 	<p>Large streams</p> <ul style="list-style-type: none"> 80-ft buffer with 25-ft managed zone <p>Medium streams</p> <ul style="list-style-type: none"> 80-ft buffer with 25-ft managed zone <p>Small streams (perennial only)</p> <ul style="list-style-type: none"> 50-ft buffer with 25-ft managed zone <p>Stream-associated special habitat types and/or features (large and medium streams)</p> <ul style="list-style-type: none"> 50-ft buffer <p>Stream-associated special habitat types and/or features (small streams)</p> <ul style="list-style-type: none"> no disturbance of feature 30-ft equipment limitation zone from edge of feature
Lake, wetland, and bog RMA	<p>Lakes, wetlands and bogs (over eight ac)</p> <ul style="list-style-type: none"> Written management plan for activities within 100 ft 	<p>Stream-associated lakes and fish-bearing lakes (over eight ac), wetlands (over eight ac), and bogs (any size)</p> <ul style="list-style-type: none"> 100-ft buffer to include: <ol style="list-style-type: none"> 50-ft no-harvest buffer zone measured from edge of water, and 50-ft managed buffer composed

¹ Managed refers to areas with a formal or informal plan applied regularly over a term usually five years or more

² Unmanaged refers to areas without a formal or informal plan

Table 2-2. Key Differences between the No-action Alternative and the Proposed Action

	No-action Alternative	Proposed Action
		<p>of 50% relative retention of original live trees by DBH class well distributed, and retention of snags, downed wood and understory trees/shrubs less 10 inches or less DBH, measured from wetland edge.</p> <p>Fish-bearing lakes and wetlands (less than eight acres)</p> <ul style="list-style-type: none"> 50-ft no-harvest buffer zone measured from edge of water <p>Nonfish-bearing lakes (0.5–8.0 ac)</p> <ul style="list-style-type: none"> 50-ft buffer with 25-ft no-harvest buffer zone measured from edge of water <p>Nonfish-bearing lakes (0.25-0.5 ac), seeps and wetlands <8 ac</p> <ul style="list-style-type: none"> no disturbance of feature 30-ft equipment limitation zone from edge of feature
Retain understory trees	<ul style="list-style-type: none"> No requirement 	<ul style="list-style-type: none"> Retain understory trees less than 10 inches DBH where they exist along stream buffers
Large woody debris	<ul style="list-style-type: none"> No requirement 	<ul style="list-style-type: none"> Contribute large woody debris (LWD) to small and medium fish-bearing streams where LWD is minimal or does not exist in the stream at the rate of one tree, on average, per 300 ft on each side of the stream, rounding up to four trees per 1,000 ft (or eight trees if both sides of the stream are included in the harvest unit) at regeneration harvest
Road crossings at fish-bearing streams	<ul style="list-style-type: none"> Designed to accommodate all life stages of anadromous, game, and ESA-listed species Designed to accommodate 50-year flood events 	<ul style="list-style-type: none"> Designed to accommodate all life stages of all native fish species Designed to accommodate 100-year flood events
Fix or remove impaired manmade fish passage barriers	<ul style="list-style-type: none"> Required for roads constructed or reconstructed after September 1994 No time limit to identify or repair structures 	<ul style="list-style-type: none"> Required for all known existing barriers All repairs completed within five years of incidental take permit (ITP) issuance Apply a priority scheme to address worst first for repair or replacement

Table 2-2. Key Differences between the No-action Alternative and the Proposed Action

	No-action Alternative	Proposed Action
		<p>in coordination with the Oregon Department of Fish and Wildlife</p> <ul style="list-style-type: none"> • Newly discovered or acquired barriers will be repaired within the first year of the ITP, if operationally possible, but no later than within three years of discovery or acquisition • Periodic inspection of barrier structures as forest management activities occur or in response to high precipitation events • Require fish-distribution surveys and design structure for all permanent fish crossing installations
General sediment reduction measures	<ul style="list-style-type: none"> • General practices to reduce sedimentation 	<ul style="list-style-type: none"> • Locate new roads away from streams and remove stream-adjacent roads, where practicable • Create additional water bars and cross-drains to divert road run-off • Disconnect ditch lines from streams • Replace poorly functioning culverts within five years of ITP issuance
Road Management		
Road decommissioning	<ul style="list-style-type: none"> • Not required 	<ul style="list-style-type: none"> • Implement where the road is not expected to be needed for 20–25 years • Implement, where practical, for stream adjacent roads; estimate 1.9 miles will be removed within five years of ITP issuance
Road maintenance and abatement plan	<ul style="list-style-type: none"> • Not required 	<ul style="list-style-type: none"> • Developed to address ditches, cross drains, energy dissipaters, water bars, out-sloped drivable dips, shallow road surface bars, berms, ditch-outs, and erosion control
Access restrictions	<ul style="list-style-type: none"> • Not Required 	<ul style="list-style-type: none"> • All roads closed to the public via locked gates • No non-permitted uses of the 2022 Ownership and Potential Acquisition Area • Authorized road use regulated to primary access roads only

Table 2-2. Key Differences between the No-action Alternative and the Proposed Action

	No-action Alternative	Proposed Action
		<ul style="list-style-type: none"> Secondary roads only for access to current forest management activities
Additional Measures		
Collaborative fish and wildlife habitat restoration project(s)	<ul style="list-style-type: none"> Not required 	<ul style="list-style-type: none"> Contribute a minimum of \$10,000–\$25,000 per year (monetary, in-kind staff time, or forest products) to agency-approved project(s) Increasing threshold of funding contributions based on ownership acres
Monitoring	<ul style="list-style-type: none"> General monitoring of the direct effects of proposed practices 	<ul style="list-style-type: none"> Compliance and biological effectiveness monitoring

2.2 Alternatives Dismissed from Further Consideration

During early coordination, the Services and Applicant discussed other alternatives that were ultimately dismissed from further consideration. These included:

- Shorter permit term.** Dismissed because the conservation strategy (including growth of areas currently in early seral stages) could not biologically support the effects of the proposed harvest. A 50-year harvest rotation is expected to improve riparian and stream function by increasing the amount of shade and LWD recruitment, which allow fish to utilize habitat for some or all of their life-stages.
- Fewer Covered Species.** Dismissed because the Applicant considers each of the proposed Covered Species to be at risk at the federal or state level, as described in Sections 3.1 and 3.2 of the HCP.

Chapter 3

Affected Environment and Environmental Consequences

3.1 Overview of Approach and Analysis

The affected environment is the area and its resources (e.g., biological, physical, socioeconomic) potentially impacted by the No-action and Proposed Action Alternatives. Relative to the Applicants' proposal, the affected environment includes those settings where any of the proposed Covered Activities (i.e., timber harvest, silviculture, and road management) would occur. For this EA, the analysis area is focused on the Initial Plan Area with inferences to the remainder of the HCP Area (refer to Section 1.3).

3.1.1 Scope and Scale of the Analysis

The intent of an EA analysis under NEPA is to determine if a Proposed Action would result in significant impacts on the environment. Thus, the scope of the analysis encompasses those resources that could be significantly affected by implementation of the Proposed Action. The focus of the Proposed Action is the potential impact on Covered Species from the Covered Activities within the Initial Plan Area. Covered Species are the primary resources evaluated in this EA; other resources were considered and are either not present in the Initial Plan Area, do not warrant detailed analysis due to the low likelihood of impacts, or were brought forward for analysis (Table 3-1). Resources were considered in light of the OFP Rules and the implemented conservation measures included in the Proposed Action, which result in more woody features that provide wildlife habitat, silviculture techniques that accelerate habitat development, wider riparian buffers to protect aquatic habitat, reduction of risk of road-related sediment input to streams, and species-specific protections.

Table 3-1. Resources Considered for Evaluation

Resource/Issue	Determination*	Rationale
Soils	PI	Both alternatives would comply with all Oregon Forest Practice soil protection measures, which would result in low level direct impacts on soil resources from timber harvest activities. However, the potential for sediment runoff to water bodies would exist and could potentially impact Covered Species. Therefore, sediment runoff impacts are evaluated under individual aquatic Covered Species in this Environmental Assessment (EA).
Surface Water	PI	Both alternatives would affect surface water, which is evaluated as a function of habitat for individual aquatic Covered Species. See each aquatic Covered Species for surface water analyses.
Timber	PI	Timber is present in the Initial Plan Area and would be affected by both alternatives
Vegetation	PI	Both alternatives would affect vegetation, which is evaluated through the changes in the timber harvest as well as a function of habitat for individual Covered Species. See each Covered Species for vegetation analyses.

Table 3-1. Resources Considered for Evaluation

Resource/Issue	Determination*	Rationale
Coexisting Wildlife** and Fish—not addressed in the Habitat Conservation Plan (HCP)	PI	Coexisting wildlife and fish species in the Initial Plan Area would be affected by both alternatives in a similar manner as the Covered Species.
Covered Species	PI	These species may be present in the Initial Plan Area and are affected by both alternatives.
Recreation	NI	The 2022 Ownership Area is private with limited public recreation. Therefore, the alternatives would have a low level of impact on recreation.
Socioeconomics	NI	Neither alternative yields social or economic impacts beyond the marginal cost of running a private forest products business; therefore, social or economic impacts from either alternative is low.
Visual	NI	Activities under both alternatives would have similar low level visual impacts beyond the individual parcels selected for harvest, silviculture, or road management. The changes due to conservation measures would not likely be discernable from public vantage points.
Air Quality and Greenhouse Gas Emissions	NI	Both alternatives would create similar, intermittent, and short-term emissions from soil disruption and combustion emissions from the construction equipment. These emissions could result in low levels of temporary impacts on air quality in the vicinity. Both alternatives would follow OFP Smoke Management Rules 629-048-0001 through 629-048-0500, in order to comply with the “Oregon Smoke Management Plan” (revision approved May 2021 and effective June 2021) with regards to prescribed burning (see Section 2.2.2.1 of the HCP for details). The potential air quality effects of the revised Oregon Smoke Management Plan were assessed as part of the Environmental Protection Agency’s review and approval of the revisions. ³ That analysis is incorporated by reference in this EA, and because Port Blakely would follow the Smoke Management Plan under either alternative, air quality is not evaluated further in this EA.
Cultural	NI	The issuance of the ITPs and implementation of the associated HCP by Port Blakely is an undertaking that is of the type that has no potential to cause effects on historic properties (Refer to Section 1.5)
Environmental Justice	NP	No communities are present in the private forest land covered in the 2022 Ownership Area; therefore, no Environmental Justice implications are anticipated as result of the Proposed Action.

³ Available online at <https://www.regulations.gov/document/EPA-R10-OAR-2019-0599-0042>

Table 3-1. Resources Considered for Evaluation

Resource/Issue	Determination*	Rationale
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* NP = Not Present in the 2022 Ownership Area; NI = Present, but resource is not affected to the degree that an analysis is required (low effects); PI = Present with potential for impact and therefore analyzed in the EA.

** The Applicant selected the Covered Species for the issuance of an ITP. Other species, such as the bald or golden eagles or other migratory birds, were not included and would not be affected by the issuance of an ITP.

3.1.2 Uncertainty and Data Adequacy

The exact location where Covered Activities and conservation measures may occur under the Proposed Action within the HCP Area is unpredictable in areas beyond the Initial Plan Area. There is also uncertainty about actual occupancy and use by Covered Species in portions of the potential additional plan area, and about forest or habitat conditions on portions of the area outside of the 2022 Ownership. Therefore, it is difficult to predict the potential effects for many of the Covered Species. In the absence of such information and data related to current conditions for the Potential Additional Plan Area, generalized information for the West Cascades Ecoregion within which the HCP Area is located was utilized and it was assumed, as dictated by provisions of the proposed HCP, that the potential acquisition area in Covered Lands includes only lands that are in the same condition (mostly lower-quality and degraded habitat; previously harvested, etc.) as the 2022 Ownership.

3.1.3 Climate Change

One factor affecting the forestland habitat and its natural terrestrial and aquatic resources at large is climate change. During the last century, average regional air temperatures in the Pacific Northwest increased by 1 degree (°) to 1.4° Fahrenheit (F) as an annual average, and up to 2°F in some seasons (based on average linear increase per decade; Abatzoglou et al. 2014, Kunkel et al. 2013). Warming is likely to continue during the next century as average temperatures are projected to increase another 3° to 10°F, with the largest increases predicted to occur in the summer (Mote et al. 2014).

Decreases in summer precipitation of as much as 30% by the end of the century are consistently predicted across climate models (Mote et al. 2014). Precipitation is more likely to occur during October through March, less during summer months, and more winter precipitation will be rain than snow (ISAB 2007, Mote et al. 2013). Earlier snowmelt will cause lower stream flows in late spring, summer, and fall, and water temperatures will be warmer (ISAB 2007, Mote et al. 2013). Models consistently predict increases in the frequency of severe winter precipitation events (i.e., 20-year and 50-year events), in the western United States (Dominguez et al. 2012). The largest increases in winter flood frequency and magnitude are predicted in mixed rain-snow watersheds (Mote et al. 2014).

Overall, about one-third of the current cold-water salmonid habitat in the Pacific Northwest is likely to exceed key water temperature thresholds by the end of this century (Mantua et al. 2009). Higher temperatures will reduce the quality of available salmonid habitat for most freshwater life

stages (ISAB 2007). Reduced flows will make it more difficult for migrating fish to pass physical and thermal obstructions, limiting their access to available habitat (Mantua et al. 2010, Isaak et al. 2012).

The NOAA NEPA Companion Manual (NOAA 2017) requires that, “decision makers should consider (1) the potential effects of proposed actions on climate change as indicated by assessing the estimated greenhouse gas (GHG) emissions of the proposed action, and (2) the effects of climate change on proposed actions and their environmental impacts.”

This section discusses effects of the Proposed Action on climate change. The effects of climate change on the Proposed Action is presented in Chapter 4, Cumulative Impacts, because those effects have to be added, incrementally, to the effects of the Proposed Action and all other past, present, and reasonably foreseeable future actions.

Vehicles and other equipment with internal combustion engines and burning of forest slash will release carbon dioxide emissions. On the other hand, retained trees and new growth would temporarily store carbon. The effect of the covered activities on climate change is negligible when considering the small area, relative to the state’s forestlands. Under the Proposed Action Alternative, Port Blakely anticipates harvesting 500 ac annually (HCP) and thinning 300-600 ac annually over the 50-year permit term. This alternative would result in fewer emissions and more sequestration over the permit term because this alternative would harvest or thin approximately half of the number of acres than the No-action Alternative.

3.1.4 Critical Habitat

Critical Habitat designations within the 2022 Ownership are primarily limited to mainstem rivers, such as the Molalla and Clackamas Rivers. Very little Critical Habitat occurs on the 2022 Ownership (Table 3-2). There is no critical habitat for bull trout or terrestrial species within the 2022 Ownership. Based on the criteria established in Section 1.3 for additional land acquisitions it is assumed that the ratio of critical habitat would be consistent with Table 3-2.

Table 3-2. Stream Miles of Critical Habitat by Species and Evolutionarily Significant Units within the 2022 Ownership and as a Percent of the 2022 Ownership

Species	Critical Habitat Stream Miles in ESU	Critical Habitat Miles on the 2022 Ownership	Critical Habitat in ESU as a Percentage of the 2022 Ownership
Chinook Salmon LCR	370.4	0	0
Coho Salmon LCR	762.9	5.6	0.7
Steelhead LCR	694.6	5.3	0.8
Chinook Salmon UWR	66.1	0	0
Steelhead UWR	1,135.5	3.3	0.3

ESU = Evolutionarily Significant Unit

LCR = Lower Columbia River

UWR = Upper Willamette River

3.2 Resources Affected by the Project

3.2.1 Timber

3.2.1.1 Affected Environment

Port Blakely's 2022 Ownership within the Plan Area encompasses 30,859 ac in Clackamas County, Oregon, and comprises disconnected parcels of commercial forestland (29,553 ac) and some non-forest land (1,306 ac) at the western edge of the Cascade Mountain Range (Figure 1-1). The forestlands comprise primarily Douglas fir and a mix of white wood (other firs, western hemlock, Sitka spruce, and several pines), hardwoods (alder, cottonwood, maple, oak, and ash), and a small amount of western red cedar. Some of Port Blakely's forestlands were previously managed for agricultural purposes, or have sustained at least two harvest rotations. The result of this is there are very few legacy structures to provide diversity and complexity across the landscape, which is valuable for some wildlife species. This is true for both terrestrial forest habitat in the uplands and riparian habitat along streams and wetlands. Structural features such as standing snags, older trees, forest-floor coarse woody debris, and large wood in streams are uncommon across much of Port Blakely's 2022 Ownership. What remains are stands that have matured from previous agricultural conditions with few legacy features and stands harvested under current OFP Rules that require only minimum woody features be retained. Table 3-3 shows the breakdown of different age-classes in the HCP Area in Year 2022 (post-wildfire), per the 2023 HCP.

There are areas within the 2022 Ownership of higher quality habitat (i.e., areas with older trees and some structural features), primarily located in the no harvest stream buffer areas associated with the OFP Rule. These stands are 51 to 70+ years of age and developed over the past several decades. The existing stream buffers combined with the older age class of the managed landscape compose 20% of the forested stands in the HCP Area, nearly all of which are less than 70 years of age (Table 3-3). These riparian and older stands contain some snags and older conifer and hardwood trees that have attained the size and/or defect that provides habitat characteristics, such as broken tops, cavities, etc. These age-classes and stand distribution across the landscape are a result of implementation of basic OFP Rules and voluntary activities by Port Blakely to extend the harvest rotation age and conduct commercial thinning. Younger age-classes (i.e., the 1- through 10-year old age-class) closely resembles the early seral stages of a natural forest that has undergone natural disturbance. During this stage, a variety of forbs and grasses are dominant, while in the 11- to 20-year old age-class, young trees experience rapid growth evolving into a stand representative of a young sapling/shrub dominated forest. The 1- to 10-year old young forests are very diverse and comprise a large variety of native hardwoods, shrubs, and understory vegetation.

As the Douglas fir plantation ages, in the 11- to 20-year old age-class, the canopy begins to close, with trees outcompeting understory vegetation. This 'stem exclusion' period triggers a pre-commercial thin management entry where greater than 25% of trees are cut. All the cut trees are retained on site, contributing to an abundance of short-term woody debris. Sunlight is again able to penetrate to the forest floor and the understory responds. The cycle continues and as the Douglas fir canopy in the 21- to 30-year old age-class again begins to close, a commercial-thin management entry is triggered. The trees are removed from the stand during this management

entry, which increases sunlight penetration to the forest floor causing understory vegetation to develop. These older age-classes, with some wildlife habitat structural elements as a result of weather events, are left to mature to maximum timber value in the 41- to 50- and 50+ year old age-classes. Stands in these age-classes are candidates for regeneration harvest, and the cycle begins anew. These forest-age classes are distributed across the 2022 Ownership in proportions ranging from 8% (21–30 age-class) to 20% (51+ age-class) (see Table 3-3).

Table 3-3. Acreage of Port Blakely 2022 Ownership Relative to Age-classes in Year 2022 (Post-Fire) and General Characteristics and Management

Age Class	General Characteristics	General Oregon Forest Practice Rule Timber Management	2022 (Post-Fire)*	
			Gross Acres	Percent
0–10	Closely resembles early seral stages; dominated by grasses and other non-shrub plants (forbs);	None	9,701	33
11–20	Rapid growth of young trees; evolving into a state of young sapling/shrub dominated forests; diverse vegetation structure; tree canopy begins to close and understory vegetation begins to be outcompeted	Cut 25% of trees to open canopy for sunlight to reach understory and leave cut trees in place	3,214	11
21–30	Stand closes and understory vegetation begins to be outcompeted	Commercial-thin management triggered; remove cut trees	2,452	8
31–40	Provide some wildlife habitat structural elements and left to mature to maximum timber value	Typically harvested at 39 years under Oregon Forest Practice Rules	3,284	11
41–50	Structural diversity of tree canopy increases, natural disturbance promotes understory growth	Candidates for regeneration harvests under Proposed Action	5,085	17
51+	Provide stream buffers, snags, older trees with defect providing habitat such as broken tops and cavities	Candidates for regeneration harvests under Proposed Action	5,818	20
Total			29,553*	100

* Total forested acreage differs from total Habitat Conservation Plan plans by 1,306 acres comprising non-forest (e.g., buildings, power lines, rail lines, and rock pits).

3.2.1.2 Environmental Consequences

No-action Alternative

Under the No-action Alternative, timber is typically harvested at 39 years of age or less, except where trees are required to remain in riparian buffers and leave trees. Based on the ages of the 2022 Ownership and the OFP rules, there would be a noted shift in the age-class composition of the forestlands over the next 50 years as evaluated in 10-year periods (Figure 3-1). In the first period, 41 to 50 and 51+ age-classes would be harvested while younger age-classes would compose most of the forestland for the subsequent 40 years. The 51+ age-class also would

remain relatively constant from 1,366 ac in the first decade increasing on a decadal basis to 1,595 acres in the fifth decade and be composed of riparian buffers and leave trees as required by OFP Rules. The 41 to 50 age-class would vary from approximately 131 ac in the first period to 98 ac in the second period to zero ac in the third period when it would be completely harvested. In Periods 4 and 5, the largest amount of forest stands that might function as spotted owl habitat, as well as habitat for other terrestrial species, based solely on tree size, and stand age, would comprise about 5% of the forested landscape. Most of this potential habitat would be in dense, unmanaged stands with few of the structural features utilized by terrestrial species distributed throughout the 30,859-ac 2022 Ownership.

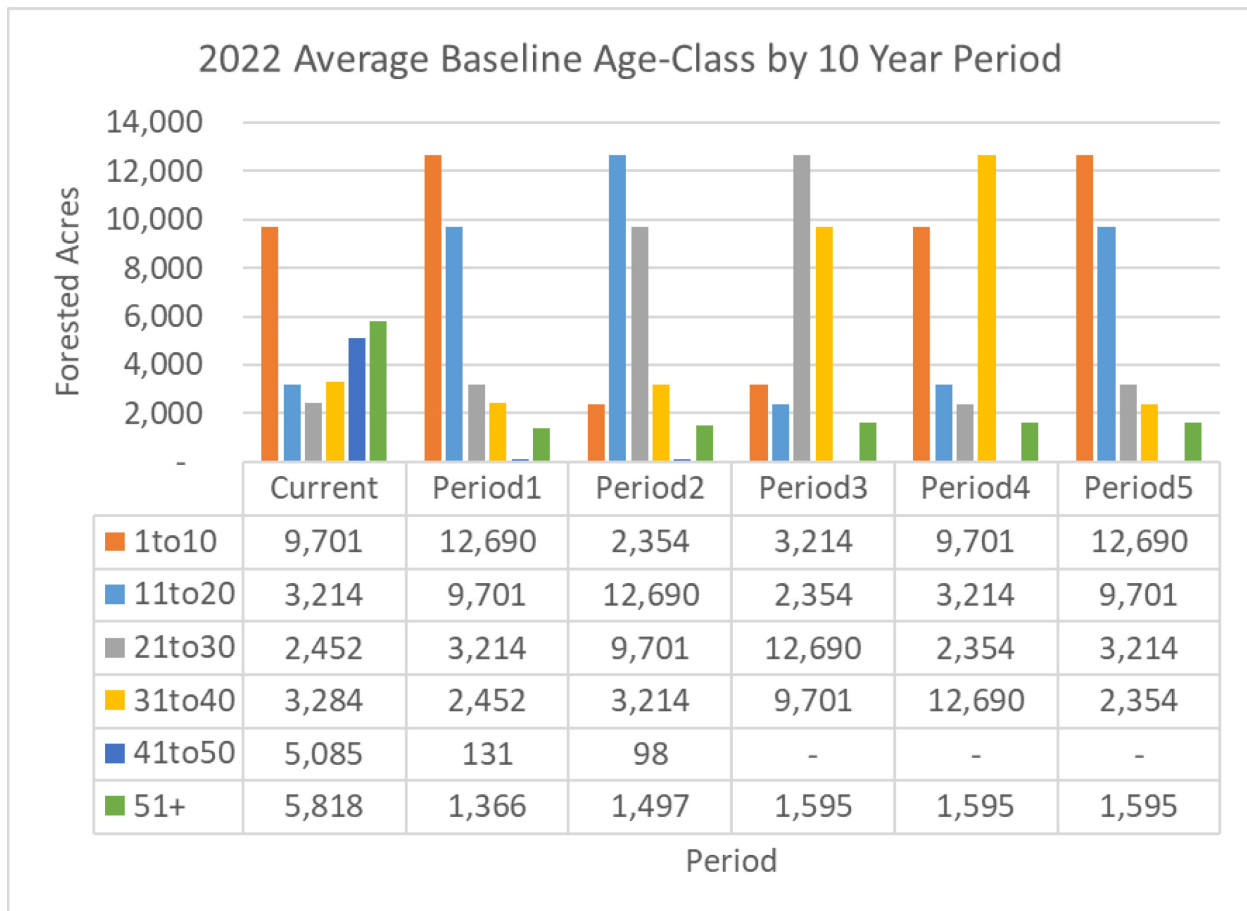


Figure 3-1. Acreage of Port Blakely 2022 Ownership Age-classes Projected by Decade for the Permit Term under Current Oregon Forest Practices Rules

Proposed Action Alternative

Under the Proposed Action Alternative, Port Blakely would conduct regeneration harvests on a small fraction of the land base on an annual basis and typically would be applied to stands 50 years of age and older. A description of the harvest decision-making process and approach is

provided in Section 2.2 of the HCP. The regeneration harvest practices would be conducted under the No-action Alternative and the Proposed Action, however under the Proposed Action there are commitments to grow stands older than the economic rotation age, manage stands for structural diversity, retention of more leave trees and wider riparian buffers, and implementing road construction and maintenance measures which would be beneficial to Covered Species.

Age-classes 50 years old and older would shift from approximately 20% of the 2022 Ownership at the start of the Permit term and remaining relatively constant at 11-15% (3,246-4,308 ac) over the Permit term (Figure 3-2). Stands would be managed over time, some harvested and some retained in riparian area buffers and other leave tree areas, while at the same time additional stands would become part of the 51+ age-class. By the end of the HCP term, the older age class would have shifted across the landscape, and retention of age-classes 60–69 and 70+ would, for the most part, be in riparian and upland reserve areas.

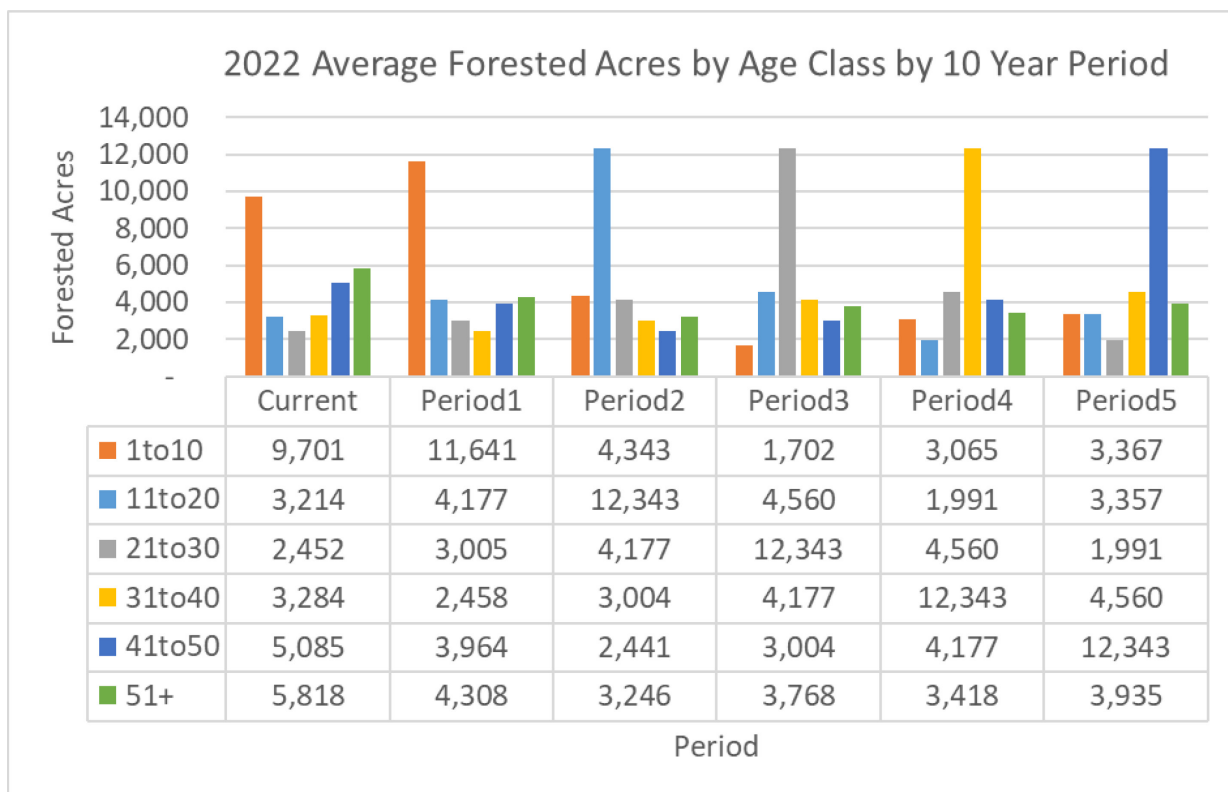


Figure 3-2. Acreage of Port Blakely Currently Owned Forest Age-classes Projected by Decade for the Permit Term under the Proposed Action

The current riparian leave tree areas are composed of buffers retained under OFP Rules and are estimated to be 4% (about 1,200 ac) of the 2022 Ownership (Port Blakely 2018a, 2018c). These are typically stream buffers that are associated with regeneration harvest units that have occurred over the past two decades (beginning when OFP stream protection rules were enacted). Stream buffers and upland habitat reserves in the Initial Plan Area are anticipated to encompass two to three times the retention area (2400-3600 acres) that would occur under OFP Rules by the end of

the Permit term (Port Blakely 2018a, 2018c). The 51+ age-class comprise the reserves along with the harvestable acres shown by decade in Figure 3-2. The upland habitat reserves would be 0.25 to 1.00 ac in size and would be located within the harvest unit, preferably around sensitive or unique habitats, when available. They are expected to contribute substantially to terrestrial habitat complexity.

During regeneration harvest, legacy trees would be retained, provided the legacy tree does not pose a risk to human safety and does not create an operational hardship. Wildlife trees may be clumped, or randomly distributed as is logistically practicable. Where snags are retained, small clumps of live trees surrounding these snags may be retained for safety considerations and to provide more complex habitat.

3.2.2 Fish Species

The fish Covered Species addressed in the HCP are bull trout, Chinook salmon LCR, Chinook salmon UWR, coho salmon LCR, steelhead LCR, steelhead UWR, and Pacific lamprey. These species are listed as threatened under the ESA with the exception of Pacific lamprey, which was evaluated for listing under the ESA in 2004, but the USFWS determined listing was not warranted. However, the State of Oregon listed the Pacific lamprey as a sensitive species and gave the species protected status in 1996. Detailed information on the status and distribution, habitat characteristics and use, and occurrence within the Plan Area for each fish Covered Species can be found in Sections 3.1.1 through 3.1.6 and 3.2.1 of the HCP.

Existing threats to the fish Covered Species are discussed in Section 5.1 of the HCP. The ESA Recovery Plan for Lower Columbia River Salmonids (LCR Recovery Plan) and the Upper Willamette River Conservation and Recovery Plan for Chinook Salmon and Steelhead (UWR Recovery Plan) provide comprehensive discussions of the limiting factors and threats responsible for salmon species declines in Oregon (ODFW and NMFS 2011, NMFS 2013). Limiting factors are the physical, biological, or chemical conditions (e.g., inadequate spawning habitat, habitat connectivity, high water temperature) and associated ecological processes and interactions experienced by the fish that result in reductions in viable salmonid population parameters (abundance, productivity, spatial structure, and genetic diversity). Threats are the human activities or natural events (e.g., road building, floodplain development, fish harvest, hatchery influences) that cause or contribute to limiting factors (ODFW and NMFS 2011).

In general, development and land use practices have been identified as contributors to limiting factors affecting fish species in the stream ecosystem within the Plan Area (refer to Section 5.1.1 of the HCP). These practices have adversely affected stream and side-channel structure, riparian conditions, floodplain function, sediment conditions, and water quality and diminished habitat quantity, quality, and complexity. Improperly located, constructed, or maintained forest roads have disrupted stream flow patterns and sediment supply processes, disconnected streams from floodplains, and, in riparian areas, reduced wood recruitment to streams.

3.2.2.1 Affected Environment

Most of Port Blakely's 2022 Ownership and Influenced Area include tributary habitat of two main river systems, Molalla and Clackamas Rivers. A summary of the stream types on the 2022

Ownership is provided below. For larger fish-bearing streams and rivers that flow through or adjacent to the Plan Area, it is assumed that a variety of fish species, representing all fresh-water life-stages, are present. The fish utilizing the tributary streams that flow through the 2022 Ownership include resident cutthroat trout, steelhead, and sculpin species. Occasionally coho and lamprey are detected. Salmonids that are detected within these headwater streams are typically rearing juveniles, while sculpin and lamprey have been detected at all life-stages.

Streams on 2022 Ownership

Streams within the 2022 Ownership are classified as small and medium size according to the stream types described in the OFP Rules. These streams are part of the Clackamas and Molalla River systems. The 2022 Ownership comprises roughly 190 mi of stream channels and approximately 22% of those streams are small fish-bearing streams, while more than half the streams (55%) are small perennial and seasonal nonfish streams (Table 3-4). Under OFP Rules, fish-bearing streams are defined by fish use. “Fish use” means inhabited at any time of the year by anadromous or game fish species or fish listed as threatened or endangered species under the federal or state ESAs (ODF 2018a). For the HCP and associated protections, Port Blakely broadened the definition to include all native fish when determining fish-bearing streams. The OFP Rules define buffer areas around streams based on stream type and refer to these as Riparian Management Areas (RMAs). Vegetation management within the RMAs require the following vegetation remain: all understory within 10 ft of the high-water level, all trees within 20 ft of the high-water level (no-harvest), all trees leaning over the channel, all downed wood, all snags that are safe or do not pose a fire hazard threat, and snags felled for safety or fire hazard reasons retained where felled. The area within the RMA that extends from the 20 ft where no-harvest can occur to the end of the buffer is referred to as the managed portion of the RMA and the level of management varies based on the stream type, management zone width and harvest type. Refer to *Stream Riparian Management Areas* under 2.2.1.1 of the HCP for more details.

Table 3-4. Miles of Known Fish- and Nonfish-Bearing Streams by Stream Type and Percent of Total Stream Miles on Port Blakely's 2022 Ownership

Stream Type	Miles	Percent
Fish-bearing		
Large	17.7	9.3
Medium – non SSBT	18.0	9.5
Medium – SSBT	6.9	3.6
Small – non SSBT	42.3	22.3
Small – SSBT	0.3	0.2
Nonfish-bearing		
Large	0	0
Medium	0.2	0.1
Small	104.5	55.0
Domestic	0.1	0
Total Miles	190.0	100

SSBT = salmon, steelhead, and bull trout

Evolutionarily Significant Units

Under the ESA, an ESU is defined as a population that is substantially reproductively isolated from conspecific populations and represents an important component in the evolutionary legacy of the species.

To further understand the potential impacts to listed fish species populations, the number of stream miles by type where the LCR ESU for Chinook salmon, coho salmon and steelhead were considered. There are 38.9 fish stream miles in the 2022 Ownership where the Chinook salmon, coho salmon or steelhead may be present (Table 3-5). The large and medium fish stream total miles in the 2022 Ownership as a proportion of all known large and medium fish streams in the LCR (Oregon portion) ESU is 0.9 and 2.2%, respectively. While the proportion of small fish streams in the 2022 Ownership within the Oregon LCR ESU is 3.3% (ODF 2018b, Port Blakely 2018c). The proportion of small nonfish streams in the 2022 Ownership within the Oregon LCR ESU is 4.3%. For future land acquisitions within the Potential Acquisition Area, it was assumed that these acres would have the same ratio of stream types and length as the 2022 Ownership. Given that the acquisitions in the Potential Acquisition Area could increase Port Blakely's land ownership by 25%, it was assumed that the miles of each stream type (fish and nonfish streams) would 2022 Ownership also increase by 25%. For example, small fish streams within the 2022 Ownership and within the LCR ESU (17.0 mi) are anticipated to increase in the future acquisitions by 4.3 mi for a total of 21.3 mi of small fish streams. This would compose 4.1% of the total small fish streams miles within the LCR ESU.

Table 3-5. Miles of Streams by Stream Type within the Lower Columbia River Evolutionarily Significant Unit (Oregon Portion) and the Percent of each under Ownership by Port Blakely

Stream Type	LCR ESU	2022 Ownership within the LCR ESU	Percentage of Total Miles in LCR ESU under 2022 Ownership by Port Blakely
Fish			
Large	1,001.2	9.5	0.9
Medium	554.6	12.4	2.2
Small	516.5	17.0	3.3
Total Miles	2,072.3	38.9	6.4
Nonfish			
Large	0	0	0
Medium	9.5	0	0
Small	843.2	36.4	4.3
Total Miles	852.7	36.4	4.3

LCR = Lower Columbia River

ESU = Evolutionarily Significant Unit

There are 46.4 fish stream miles in the 2022 Ownership where the UWR Chinook salmon and steelhead may be present (Table 3-6). The large and medium fish stream total miles in the 2022 Ownership as a proportion of all known large and medium fish streams in the UWR ESU is 0.4 and 0.8%, respectively. While the proportion of small fish streams in the 2022 Ownership within the UWR ESU is 0.9% (ODF 2018b, Port Blakely 2018c). The proportion of small nonfish streams in the 2022 Ownership within the UWR ESU is 0.81% and medium nonfish streams 0.12%. For future land acquisitions within the Potential Acquisition Area, it was assumed that these acres would have the same ratio of stream types and length as the 2022 Ownership. Given that the acquisitions in the Potential Acquisition Area could increase Port Blakely's land ownership by 25%, it was assumed that the miles of each stream type (fish and nonfish streams) would also increase by 25%. 2022 Ownership. For example, small fish streams within the 2022 Ownership and within the UWR ESU (25.5 mi) are anticipated to increase in the future acquisitions by 6.4 mi for a total of 31.9 mi of small fish streams. This would compose 1.17% of the total small fish streams within the UWR ESU.

Table 3-6. Miles of Streams by Stream Type within the Upper Willamette River Evolutionarily Significant Unit and the Percent within the 2022 Ownership

Stream Type	UWR ESU	2022 Ownership within the UWR ESU	Total Miles in UWR ESU as a Percentage of the 2022 Ownership
Fish			
Large	2,317.8	8.3	0.4
Medium	1,625.5	12.6	0.8
Small	2,726.4	25.5	0.9
Total Miles	6,669.7	46.4	2.1
Nonfish			
Large	7.9	0	0
Medium	172.2	0.2	0.1
Small	8,356.9	68.0	0.8
Total Miles	8,537.0	68.2	0.9

ESU = Evolutionarily Significant Unit

UWR = Upper Willamette River

Critical Habitat

Critical habitat designations within the 2022 Ownership are primarily limited to mainstem rivers, such as the Molalla and Clackamas Rivers. Very little critical habitat occurs within the 2022 Ownership (Table 3-7).

Table 3-7. Stream Miles of Critical Habitat by Species and Evolutionarily Significant Units within the 2022 Ownership and as a Percent of the 2022 Ownership

Species	Critical Habitat Stream Miles designated for the ESU	Critical Habitat Miles on the 2022 Ownership	Percentage of Critical Habitat in ESU within the 2022 Ownership
Chinook Salmon LCR	370.4	0	0
Coho Salmon LCR	762.9	5.6	0.7
Steelhead LCR	694.6	5.3	0.8
Chinook Salmon UWR	66.1	0	0
Steelhead UWR	1,135.5	3.3	0.3

ESU = Evolutionarily Significant Unit

LCR = Lower Columbia River

UWR = Upper Willamette River

Roads on 2022 Ownership and acres acquired in the future

The total amount of active roads on the 2022 Ownership is 251 mi, resulting in a road density of approximately 5.2 mi/square mi (mi²). Annual road construction, maintenance activities involving rocking, and deactivation and abandonment currently averages 4.2 mi, 8.5 mi, and 1.1 mi, respectively. There are approximately 32 mi of deactivated or abandoned roads on the 2022 Ownership, i.e., 13% of the existing road system. Additionally, there are nine permanent steel bridges on the 2022 Ownership that would need to be replaced at some point during the next 50 years as part of the road management plan.

The length of roads that occur within 200 ft from fish-bearing streams in the 2022 Ownership totals 24.6 mi (Port Blakely 2018b). By ESU (see Figure 3-1 in the HCP), there are 12.3 mi of road in the LCR ESU, and 12.3 mi of road in the UWR ESU that are within 200 ft of fish-bearing streams. Port Blakely has virtually no control of the effects of roads to fish-bearing streams located beyond the 2022 Ownership. With consideration of future acquisitions, we assume the acquired acres would have a similar ratio of roads as the acres in the 2022 Ownership.

Additionally, within the 2022 Ownership, the LCR ESU contains 50 active road crossings of fish-bearing streams while there are 60 active crossings of fish-bearing streams in the UWR ESU. With consideration of future acquisitions, we assume the acquired acres would have a similar ratio of road crossings as the acres in the 2022 Ownership. Given that the acquired acres in Potential Acquisition Area could increase Port Blakely's acreage by as much as 25%, we assume a 25% increase in road crossings.

Other Factors

In general, development and land use practices have been identified as contributors to limiting factors affecting fish species in the stream ecosystem within the Plan Area (refer to Section 5.1.1 of the HCP). These practices have adversely affected stream and side-channel structure, riparian conditions, floodplain function, sediment conditions, and water quality and diminished habitat quantity, quality, and complexity. Improperly located, constructed, or maintained forest roads have disrupted stream flow patterns and sediment supply processes, disconnected streams from floodplains, and, in riparian areas, reduced wood recruitment to streams.

General characteristics for each fish Covered Species are provided below:

- **Bull Trout** – An experimental population was introduced in the Clackamas River drainage and could inhabit large streams in the Plan Area; no Critical Habitat occurs within the 2022 Ownership or the Potential Acquisition Area
- **Chinook Salmon LCR Fall Run** – Occurs in the Clackamas River drainage and could inhabit streams over 10-ft wide in the Plan Area; no Critical Habitat occurs within the 2022 Ownership
- **Chinook Salmon UWR Spring Run** – Occurs in the Molalla and Clackamas River drainages and could inhabit streams over 10-ft wide in the Plan area; no Critical Habitat occurs within the 2022 Ownership

- **Coho Salmon LCR** – Occurs in the Clackamas River drainage including Clear Creek and is known to inhabit many small and medium streams in the Plan Area; 5.6 mi of Critical Habitat occur within the 2022 Ownership
- **Steelhead LCR** – Occurs in the Clackamas River drainage and is known to inhabit many small and medium streams in the Plan Area; 5.3 mi of Critical Habitat occur within the 2022 Ownership
- **Steelhead UWR** – Occurs in the Molalla River drainage and is known to inhabit many small and medium streams in the Plan Area; 3.3 mi of Critical Habitat occur within the 2022 Ownership
- **Pacific Lamprey** – Occurs in the Molalla-Pudding and Clackamas River watersheds and has been observed in the Molalla River system within the Plan Area

3.2.2.2 Environmental Consequences

No-action Alternative

Forest management activities would potentially result in impacts to fish Covered Species in the form of sedimentation, increased water temperatures, habitat degradation and impediments to migration. These direct effects are exacerbated by cumulative impacts and climate change. Impacts from each forest management activity under the No-action Alternative are described below.

Timber Harvest Impacts: Timber harvest can lead to reduced vegetative cover, increased stream temperatures, bank erosion, altered drainage systems, and decreased stream productivity. These impacts are documented in the HCP (Section 5.1.1), as well as the recovery plans for the fish Covered Species.

Under the No-action Alternative, timber harvest would occur according to the OFP Rules that include stream and wetland buffer requirements as described in the Water Protection Rules (OAR 629–635 through OAR 629–660). Under OFP Rules, large and medium streams receive buffers with 20-ft, no-harvest zones and 50–80 ft of managed zone. The OFP Rules allows some management in the outer RMA zones, and do not require a riparian buffer on perennial small, nonfish-bearing streams (i.e., 55% of the total length of streams). Table 3-4 lists the amount and percentage of large, medium, and small, nonfish-bearing streams.

These No-action Alternative buffers are substantially narrower than needed to provide for fully functional riparian zones (U.S. Department of Agriculture and U.S. Department of Interior 1993). Furthermore, the lack of a requirement to provide a riparian buffer on perennial nonfish-bearing streams, which compose most of the streams within the 2022 Ownership would result in stream temperature increases after harvest (Beechie 2015).

Fish productivity has been impacted by timber harvest practices that degrade riparian conditions by decreasing large wood recruitment and increasing delivery of fine sediments to downstream areas (Oregon Department of Fish and Wildlife [ODFW] 2010). The lack of LWD results in a reduction in spawning and rearing habitats, as well as general habitat complexity. Placement of LWD to improve fish habitat is not required under OFP Rules. Restrictions on the amount and

location of regeneration harvest within a watershed are based on OFP Rule requirements and include harvest unit size limitations (up to 120 ac), annual harvest range from 1,000–1,100 ac. The OFP Rules standards for regeneration timber harvests were established to minimize soil and debris from entering waters of the state, and to protect wildlife and fish habitat. These requirements would be followed under the No-action and Proposed Action Alternatives.

Additionally, timber harvest practices have contributed to the straightening and restricting of stream channels and have decreased channel complexity and connectivity to side channels and other off-channel areas that historically provided important overwintering habitat for juvenile salmonids. Additional degraded channel structure and form are not likely to occur under OFP Rules as there are prohibitions on changes to stream channel integrity, which keeps the structural integrity of fish streams intact.

Silviculture Impacts: Site preparation has the potential to deliver sediment to fish-bearing streams.

Under OFP Rules, mechanical site preparation in RMAs is allowed, but only if the activity is conducted in a manner such that sediment or debris does not enter waters of the state. Adequate distance between disturbed soils and waters of the state to filter sediment from run-off water must be maintained and no debris or soil shall be placed where it may enter waters of the state. For impact assessment purposes, an average annual regeneration harvest of 1,000–1,100 ac across the 2022 Ownership was considered. Approximately 80% of the 2022 Ownership is tractor-logging ground with the associated site preparation. Extrapolating the annual acreage of harvest units receiving site preparation is approximately 400 ac, or 1.3% of the 2022 Ownership.

Treatment of diseased or insect-damaged trees, if warranted, includes thinning or regeneration harvest although typically on a much smaller scale than the average size of regeneration harvest. Potential impacts to Covered Species habitat from this activity conducted under OFP Rules would be similar to impacts from regeneration harvest, albeit substantially less because diseased and/or insect-damaged trees typically occur in small pockets of a few acres. In the past 15 years, no diseased or insect-damaged trees have warranted special entry to forested stands within the 2022 Ownership. Rather, they have been removed/harvested at the time of regeneration harvest.

The remaining silviculture activities, i.e., reforestation, fertilization, and mechanical vegetation control, are unlikely to have an impact on fish Covered Species habitat because they involve small crews walking through the harvest unit over a span of several days, and do not result in significant substantial ground/soil disturbance or operations in RMAs. Fertilizer is only applied to areas targeted for eventual harvest. All stream and wetland buffers and permanent leave areas around special sites in the uplands are avoided as required by OFP Rules.

Road Management Impacts: Generally, improperly located, constructed, or maintained roads have degraded stream flow and increased movement of fine sediment to stream channels (ODFW 2010). Road development that restricted stream channels and impinged on channel dynamics has had a major impact on fish habitat quality. Forest and rural roads have altered sediment routing and led to an overabundance of fine-grained sediments, excess of coarse-grained sediments, inadequate coarse-grained sediments, and/or contaminated sediment in stream channels. Excessive fine sediment reduces egg development and survival during the incubation

life stage. The high density of forest and rural roads throughout the area, as well as timber harvest practices on unstable slopes adjacent to riparian habitat, contributes to an abundance of fine sediment in tributary streams that covers spawning gravel, limiting egg development and incubation, and increases turbidity. During the road building process, destabilized stream banks can release excess sediment, causing turbid water and silt deposits that harm aquatic life and violate water quality standards.

Small dams, irrigation diversions, road crossings and other passage impediments restrict juvenile and adult fish access to habitat on tributaries. Forest managers are required to design and construct stream crossings (culverts, bridges, and fords) consistent with Forest Practices (ODF 2018a) and Oregon Fish Passage laws (OAR 635-412-0005 through 635-412-0040) that pass peak flows that at least correspond to the 50-year return interval, and allow migration of adult and juvenile fish upstream and downstream during conditions when fish movement in that stream normally occurs (OAR 629-625-0600). Maintenance of fish passage through water crossing structures includes a requirement to keep structures cleared of woody debris and deposits of sediment that would impair fish passage, as is reasonably practicable.

Port Blakely follows the OFP recommendations (OAR 629-625-0650) when deactivating or abandoning forest roads. These recommendations focus on preventing road-related damage to waters of the state. Road deactivation involves blocking access to the road to prevent any use when forest management activities are not anticipated to occur for ten or more years. Drainage structures (cross drains, culverts, and other drainage features) are typically left in place and maintained when needed. Port Blakely abandons roads when current and acquired lands have stream-adjacent roads or are located near sensitive habitats such as wetlands or unstable slopes, and where other options exist for road placement. Abandonment activities include bed and drainage structure removal and restoring to a condition capable of growing trees. Road deactivation and abandonment currently averages 1.1 mi, annually. There are approximately 32.0 mi of deactivated or abandoned roads on the 2022 Ownership, i.e., 13% of the existing road system. Deactivation and abandonment activities reduce the potential impacts to fish habitat by eliminating future sources of sediment input.

Stream-adjacent roads can restrict stream channels and impinge on channel dynamics that create off channel areas important as overwintering habitat for juvenile fish. High road densities, coupled with other forest management activities on over-steepened slopes adjacent to riparian habitat, contributes to an abundance of fine sediment in tributary streams that covers spawning gravel, limiting egg development and incubation, and increases turbidity. In addition to the requirements of the water protection rules, operators must submit a written plan to the State Forester before constructing roads in RMAs. This does not prevent roads in RMAs from occurring, but suggests if options for road placement outside RMAs are available, they may be required. There are no OFP Rules addressing road density. Thus, existing or newly constructed roads close to streams and road densities would likely have negative impacts to fish habitat quality under the No-action Alternative.

The development, use, and abandonment of rock pits or quarries located on forestland and used for road management activities are addressed in the OFP Rules (ODF 2018a). Currently, there are 18 rock pits covering approximately 40 ac. Two of these rock pits, totaling approximately four ac, are approximately 150 ft from a stream. Future quarries will be sited away from streams

to be compliant with OFP Rules requiring landowners to protect water quality, i.e., prevent sediment delivery to streams, which are expected to result in minimal impacts to fish habitat. When no more material can be safely extracted, i.e., without risk of material input to streams, it is abandoned. When abandoned, rock pits are reclaimed to return the pits to forest production. Port Blakely anticipates abandoning eight rock pits over the next 50 years and replacing them with eight new rock pits approximately 1.5 ac in size, on average. New rock pits will be located near existing roads and away from streams outside of riparian areas on stable slopes. Quarrying activities conducted under OFP Rules are not expected to significantly impact aquatic species because of their site location relative to streams, and the small acreage affected within the Plan Area.

These potential impacts are documented in Section 5.1.1 and 7.1.1 of the HCP. The OFP Rules include an entire section with requirements for forest road design, construction, and maintenance (OAR 629-625-0100 through OAR 629-625-0800) (ODF 2018a), which are designed to protect water quality while providing safe travel.

Proposed Action Alternative

Covered Activities without the conservation measures would potentially result in similar impacts to fish Covered Species as described for the No-action Alternative. However, under the Proposed Action, the buffers widths would be modified to provide more protection for riparian wildlife species, reduction of potential sedimentation into the streams, and provide vegetation cover along streams to reduce water temperatures. Under the Proposed Action, all fish-bearing streams on Port Blakely's 2022 Ownership land would have increased no harvest buffer requirements (Table 3-8) compared to the No-action Alternative. Approximately half of the stream miles in the 2022 Ownership are small nonbearing fish streams that currently require no buffers (Table 3-8). Under the Proposed Action a 50 foot (25 ft no harvest, 25 ft managed) buffer would be applied on these stream types.

Table 3-8. Miles of Known Fish- and Nonfish-bearing Streams by Stream Type and Percent of Total Stream Miles on Port Blakely’s 2022 Ownership Associated Riparian Management Areas (RMA)

Stream Type	Miles	Percent	RMA Width Oregon Forest Practice Rules (feet)	
			No-action Alternative	RMA Width HCP (feet) Proposed Action Alternative
Fish-bearing				
Large	17.7	9.3	100 = 20 no harvest; 80 managed	100 no harvest
Medium – non SSBT	18.0	9.5	70 = 20 no harvest; 50 managed	90 no harvest
Medium – SSBT	6.9	3.6	80 = 20 no harvest; 60 managed	90 no harvest
Small – non SSBT	42.3	22.3	50 = 20 no harvest; 30 managed	75 no harvest
Small – SSBT	0.3	0.2	60 = 20 no harvest; 40 managed	75 no harvest
Nonfish-bearing				
Large	0	0	70 = 20 no harvest; 50 managed	80 = 55 no harvest; 25 managed
Medium	0.2	0.1	50 = 20 no harvest; 80 managed	80 = 55 no harvest; 25 managed
Small	104.5	55.0	No requirement	50 = 25 no harvest; 25 managed
Domestic	0.1	0	-	-
Total Miles	190.0	100		

HCP = Habitat Conservation Plan

SSBT = salmon, steelhead, and bull trout

RMA = Riparian Management Areas

Under the Proposed Action, without the application of the conservation measures for fish (Table 2-1) would potentially reduce the adverse impacts. The overall impacts from the conservation measures compared to the No-action Alternative for fish Covered Species are beneficial and summarized in Table 3-9.

Table 3-9. Impacts to Fish – Proposed Action

Type of Impact	Conservation Measures	Potential Impacts of the Proposed Action Compared to the No-action Alternative
Harm/Habitat Degradation – Sedimentation	<ul style="list-style-type: none"> ● Create buffers around streams and around stream-associated habitats, such as wetlands (Table 2-1) ● Reduce/eliminate stream sediment input by (Habitat Conservation Plan [HCP] Sections 6.3.1 and 6.3.4): <ul style="list-style-type: none"> ○ Locating roads away from streams outside Riparian Management Areas (RMAs) and removing stream-adjacent roads where possible ○ Adding water bars and cross-drains to divert road run-off and sediment onto forest floor well above streams ○ Creating and maintaining ditches to ensure proper drainage for road run-off and disconnecting ditchlines from streams ○ Replacing poorly functioning culverts and using alternatives to culverts when possible 	<p>Chronic sediment inputs could occur at low levels where roads cross streams and less so for roads adjacent to streams. Sediment inputs could also occur from the continuing use of these roads throughout the term of the HCP. Chronic input is expected to decline over the life of the Permit as HCP measures such as construction of roads away from RMAs, abandoning roads in the uplands and adjacent to streams when practicable, implementing enhanced road management measures that focus on sediment reduction, and making stream-crossing improvements.</p> <p>These conservation measures would benefit fish Covered Species by reducing sediment from entering the stream, improving water quality and stream function for fish and wildlife that rely on stream ecosystem habitats in the Plan Area.</p>

Table 3-9. Impacts to Fish – Proposed Action

Type of Impact	Conservation Measures	Potential Impacts of the Proposed Action Compared to the No-action Alternative
Harm/Habitat Degradation – Sedimentation <i>(continued)</i>	<ul style="list-style-type: none"> ○ Installing larger than required culverts and bridges able to accommodate 100-year flood events ○ Applying no-harvest stream riparian buffers to block and/or filter sediment. ● Only construct new roads when essential and deactivate or abandon existing non-essential roads (HCP Section 6.3.4) 	<p>The application of a 75-foot (ft), no-harvest buffer in the RMA for small fish-bearing streams would reduce potential impacts from sedimentation resulting from timber harvest due to the typically low gradient and narrow stream width. The application of larger no-harvest buffers on the large and medium fish-bearing streams, 100 ft and 90 ft respectively, would function similarly. Thus, the potential for sediment delivery from timber harvest activities to fish-bearing streams would likely be low compared to the No-action Alternative throughout the Plan Area.</p> <p>Small, nonfish-bearing streams would receive a 50-ft buffer, the inner-most 25 ft of which would be a no-harvest zone. Medium and large, nonfish-bearing streams would receive 80-ft buffers with an inner 55-ft no-harvest zone. Given the predominately low gradient and narrow widths of these streams, the potential for sediment delivery to fish-bearing streams from Covered Activities occurring on the 2022 Ownership land is likely low and negligible in streams within the Influenced Area. Based on the limited proportion of total fish- and nonfish-bearing stream miles of the Lower Columbia River Ecologically Significant Unit (ESU) and Upper Willamette River ESU (refer to Section 3.2.2.1) throughout the HCP Area, the potential impact on listed salmonids would be negligible. Therefore, there would be limited benefit compared to the No-action Alternative.</p>
Harm/Increased water temperature	<ul style="list-style-type: none"> ● Create no-harvest buffers (Table 2-2) on fish-bearing streams to reduce the potential for stream temperature increases (HCP Section 6.3.1) 	No-harvest buffers would provide shade to reduce the potential impact of increasing the stream water temperature. This would be an improvement to the No-action Alternative, which lacks a requirement for riparian buffers on perennial nonfish-bearing streams.
Harm/Habitat degradation – loss of large woody debris	<ul style="list-style-type: none"> ● Add woody debris near streams to aid in creating additional habitat, spawning, and foraging opportunities (Table 2-1) ● Create buffers composed of live trees, snags, downed wood, and understory vegetation 	These conservation measures benefit fish Covered Species by altering water flow, changing water velocity to trap sediment or create pools, providing a source for fish prey production, and providing cover for juvenile fish. This would be an improvement to the No-action Alternative which does not require large wood debris to be placed in stream to improve fish habitat.

Table 3-9. Impacts to Fish – Proposed Action

Type of Impact	Conservation Measures	Potential Impacts of the Proposed Action Compared to the No-action Alternative
Harm/Impediments to migration	<ul style="list-style-type: none"> ● Size road crossings at fish-bearing streams to allow for 100-year floods and to enable native fish species at all life stages to pass through (Table 2-1 and HCP Sections 6.3.1 and 6.3.4) ● Repair or remove impaired manmade fish passage barriers and complete periodic inspections (Table 2-1) ● Conduct fish distribution surveys and design structures for permanent fish-crossing installations (Table 2-1) 	Removal of impediments would allow fish to access habitats for all life stages. A stream survey and a designed structure will be conducted for permanent fish crossing installations. Streams are not re-directed out of natural drainages, rather culverts or bridges will be installed. All streams will have a structure that will pass 100-year flow events. Designing crossings to allow the movement of 100-year flow events exceeds OFP Rules. The removal of impediments and design for a 100-year flow event would result in a benefit to fish movement compared to the No-action Alternative which does not require for a 100-year flow event.

3.2.3 Bats

The bat Covered Species addressed in the HCP, fringed myotis, long-eared myotis, long-legged myotis, hoary bat, silver-haired bat, and Townsend’s big-eared bat, are not listed under the ESA, but are species of concern according to the HCP (Table 1-1). Detailed information on their status and distribution, habitat characteristics and use, and occurrence within the Plan Area can be found in Section 3.2.10, 3.2.11, and 3.2.12 of the HCP, which is summarized below.

3.2.3.1 Affected Environment

These six bat species are Covered Species because they are known to occur in Clackamas County (NatureServe 2018a, Oregon Biodiversity Information Center 2016), the HCP Area currently has or will contain habitat features commonly utilized by these bats, and the likelihood that existing or anticipated threats will increase (International Union of the Conservation of Nature 2018), thus, increasing the potential for listing under the ESA. Specific threats to each species or groups of species are discussed in Sections 3.2.10 (Townsend’s big-eared bat), 3.2.11 (hoary bat and silver-haired bat), and 3.2.12 (fringed myotis, long-eared myotis, and long-legged myotis) of the HCP.

No specific records are known that suggest these bat species occur in the Initial Plan Area, but they could occur where suitable roost and foraging habitat occurs. For the myotis bat species, suitable night and maternity roosting, and hibernaculum habitat in the form of tree foliage, cavities and loose bark of coniferous and hardwood forests adjacent to lakes, ponds, and streams, occurs throughout the Plan Area. Rocky features are also available for the occasional roost site. These features and characteristics are likely more abundant in the form of substantially older trees on nearby Federal lands. Foraging habitat includes various open areas, including spaces over open water, streams, and along riparian corridors, which is present across the entire Plan Area and adjacent Federal lands. Hoary bat and silver-haired bat are both tree-roosting species. Hoary bat habitat includes primarily deciduous and coniferous forests and woodlands, including

areas altered by humans. These bats are thought to prefer trees at the edge of clearings, but have also been found in trees in heavy forests, open wooded glades, and shade trees along urban streets and in city parks (Anderson 2002). Their foraging habitat includes various open areas, including spaces over water and along riparian corridors. Individuals may forage around lights in non-urban situations (Furlonger et al. 1987). Silver-haired bat habitat is primarily forested (frequently coniferous) areas adjacent to lakes, ponds, or streams, including areas that have been altered by humans. Summer roosts and nursery sites are in coniferous or deciduous tree foliage, cavities, or under loose bark, and sometimes in buildings. During the winter months, silver-haired bats that hibernate, find shelter in northern areas inside trees, buildings, rock crevices, and similar protected structures (Bentley 2017). In the Pacific Northwest, these bats show an affinity for forests that contain large numbers of snags (Campbell et al. 1996, Mattson et al. 1996, Betts 1998). In Oregon, maternity roosts have been documented in cavities high in tall, declining or newly dead trees (Betts 1998). Silver-haired bats appear to be particularly fond of willow, maple, and ash trees, most likely due to the deeply fissured bark; hardwoods including maple, ash, and cottonwood, a relative of willow, occur on Plan Area forests (Section 4.1 of the HCP). Silver-haired bats are insectivorous, and they feed opportunistically on any concentration of insects they come across. They have a short-range foraging strategy, traveling over woodland ponds and streams. Townsend's big-eared bats are classic cave-dwelling bat species; however, they are also known to use other types of habitat. In Oregon and Washington, records indicate that there is significant use of buildings, bridges, tunnels, and mines for roosting by this species, as caves are limited throughout much of these states, particularly west of the Cascades (Culver et al. 1999). Foraging behavior of the Townsend's big-eared bat is typical of insectivorous bats.

3.2.3.2 Environmental Consequences

No-action Alternative

Forest management activities would potentially result in impacts to bat Covered Species in the form of loss of roosting and foraging habitat. These direct effects are exacerbated by cumulative impacts and climate change. Impacts from each forest management activity under the No-action Alternative are described below.

Timber Harvest Impacts: Regeneration timber harvest removes deciduous and conifer trees that are preferred habitat of hoary bats and silver-haired bats both for roosting and foraging, and results in removal of snags in various stages of deterioration, hollow trees, and the green and dying trees that can provide future snags that could be used by myotis bats (Taylor 2006). However, some snags would be available post-harvest under the wildlife tree and snag retention requirements of OFP Rules, but their use may depend on where they are located relative to other standing trees. If there is a source of suitable roosting and resting structures in nearby forests, the forest edge created by rotation harvesting over time may provide foraging opportunities for tree-roosting bats.

Forest management in and adjacent to streams and wetlands results in removal of some trees that may function as roost sites, but also may affect the integrity of foraging habitat. These habitat effects are ameliorated to some extent by OFP Rules that require protection of streams and wetlands with buffers. However, a large portion (60–80%) of the stream buffers and the entirety of wetland buffers comprises a managed zone that likely reduces the effectiveness of the buffers

in maintaining the integrity of the aquatic features and, thus, reduces the foraging quality of wetlands and streams.

Silviculture Impacts: Silviculture activities are conducted by small crews for short durations during daylight hours. These activities would not have an impact on night-foraging myotis bats or on night-foraging migratory tree-roosting bats. Most silviculture activities do not result in the removal of potential roosting structures as any removal or degradation of roosting structures would have already occurred during regeneration harvest activities. However, insect control activities may result in removal of small pockets of insect-infested trees. Insect control activities are uncommon, but when conducted they would be part of a regeneration timber harvest or function as a small scale timber harvest with similar effects to bats as described above, i.e., potential removal of roost sites and, possibly, removal of an insect foraging source. If debris-piling occurs and piles are retained, i.e., not burned, it is possible the debris piles could function as day roosts for individual bats after adjacent vegetation develops because they are known to use stumps as day roosts. Fertilization activities are typically a one-time application that enhances tree growth and has little or no impact on bat forage species.

Road Management Impacts: Road construction activities that involve the removal of trees would have similar effects to the myotis bats, hoary bat, and silver-haired bat as timber harvest activities, though to a lesser extent, because entire forest stands would not be removed. Maintenance activities are unlikely to have much of an effect on these bats relative to potential for disturbance because most bat activity occurs during non-daylight hours when road activity is minimal or non-existent. The exception would be if there is a suitable older tree or snag functioning as a roost located adjacent to a forest road where activity is occurring. This would likely present a temporary negative effect to roosting bats depending on the proximity of the roost structure to the active road.

There are nine permanent steel bridges in the 2022 Ownership, four of which are anticipated to need replacement at some point in the next 40 years as part of the long-term road maintenance plan. Bridge replacements could result in permanent removal of Townsend's big-eared bat roosts, depending on when the replacement occurs. However, bridge planned replacements are more likely to result in only temporary removal of roost sites, if occupied. Steel bridges are not cited as the type of bridge frequently used by bats, including Townsend's big-eared bat. Under OFP Rules, there are no requirements to survey for bats prior to conducting bridge work, so, unless it is obvious at the time of replacement activity, no remedial action would be taken to minimize potential impacts to Townsend's big-eared bat.

Proposed Action Alternative

Covered Activities without the conservation measures would potentially result in largely similar types of impacts to bat Covered Species as No-action Alternative in the form of loss of roost habitat and disturbance to occupied and foraging habitat. Under the Proposed Action, the application of the conservation measures for bats (Table 2-1) would potentially reduce adverse impacts and provide some benefit as summarized in Table 3-10. Overall, potential impacts to roosting habitat under the Proposed Action Alternative would be less than those under the No-action Alternative for tree-roosting bats and myotis bats, and the same as the No-action Alternative for Townsend's big-eared bat. Potential impacts associated with human disturbance

in occupied habitat to bat Covered Species are neutral under the Proposed Action Alternative as compared to the No-action Alternative. Potential impacts to foraging habitat for bat Covered Species under the Proposed Action Alternative would be less than those under the No-action Alternative.

Table 3-10. Impacts to Bats – Proposed Action

Type of Impact	Conservation Measures	Potential Impacts of the Proposed Action Compared to the No-action Alternative
<p>Loss of roost habitat (bridges for Townsend’s big-eared bat; older trees, rocky features for tree-roosting bats and myotis)</p>	<ul style="list-style-type: none"> ● Retain old growth trees, snags, and logs (Habitat Conservation Plan [HCP] Sections 6.3.2 and 6.3.3) ● Strategically place leave trees and create snags (HCP Section 6.3.2) ● Regeneration harvest age for stands 50 years of age or older, resulting in forest stands older than typical commercial forest landscapes (HCP Section 6.3.3) ● Create no-harvest buffers in Riparian Management Areas (HCP Section 6.3.1) 	<p>Tree-roosting bats and myotis bats would benefit from these conservation measures because they would protect defective trees and snags, create snags, provide upland leave tree patches that provide roost habitat, provide bigger riparian buffers, unmanaged zones in riparian areas, and provide for older commercial forest age-classes, all of which have the potential to provide roost sites. These measures ameliorate some of the potential adverse impacts due to loss of roost habitat. The amount of adverse impact in the form of harm associated with degradation of roost sites in the HCP Area is considered to be lower than the No-action Alternative with these conservation measures.</p> <p>Steel bridges are not cited as the type of bridge frequently used by bats including Townsend’s big-eared bat, but bridge replacements could result in removal of Townsend’s big-eared bat roosts, depending on when the replacement occurs. Under the HCP, bridges that are replaced would be equipped with structures suitable for roosting bats, based on best available science.</p>
<p>Disturbance to occupied and foraging habitat</p>	<ul style="list-style-type: none"> ● Create understory with two canopy layers through pre-commercial thinning by hand-cutting, increase habitat complexity ● Commercial thinning of conifer dominant stands to increase forest habitat complexity and foraging and dispersal suitability ● Establish Special Management Areas around sensitive habitat types within commercial harvest areas and protecting these areas for the entire HCP term ● Only construct new roads when essential and deactivate or abandon existing non-essential roads 	<p>Any human activity associated with forest management activities, especially timber harvest, would likely cause disturbance to Covered bats that may occur near the activities. Some activities, such as pre-commercial thinning by hand, would likely only disturb bats occupying roosts during day light hours. Although foraging habitat and opportunities are likely more abundant than roosting habitat, i.e., over open wetlands and along streams and riparian habitat, this type of habitat is protected under the conservation measures and foraging bats are unlikely to be disturbed since foraging occurs at night.</p>

3.2.4 Gray Wolf

A final rule announcing the delisting of the gray wolf was published on November 3, 2020; the delisting went into effect on January 4, 2021 (85 FR 69778). (Table 1-1). No critical habitat for gray wolf has been designated in Oregon. Detailed information on the status and distribution, habitat characteristics and use, and occurrence of gray wolf within the Plan Area can be found in Section 3.1.7 of the HCP, which is summarized below.

3.2.4.1 Affected Environment

Wolves do not yet occupy all their estimated potential range in Oregon; however, wolves occur throughout much of the state, including the White River estimated wolf use area in the north Cascades near Mount Hood. This wolf use area is approximately 30 mi east of the 2022 Ownership near Estacada, Oregon. This wolf use area occurs within the Potential Acquisition Lands Boundary, although most of the area at the eastern edge of the boundary is higher elevation Federal land that would not be acquired by Port Blakely and therefore would not be added to the HCP. Wolf collar data show that wolves traverse the entirety of the Cascades and have proven capable of crossing all types of potential barriers (e.g., rivers, highways). There are no known conditions that prevent wolves from occupying much of the currently unoccupied areas of range. As habitat generalists that rely on large areas of land without barriers, containing adequate hiding cover and ungulate populations, wolves are likely to continue expanding their range in the western Cascade Mountains of Oregon. The Plan Area contains a variety of forest age-classes that provide cover, vegetation for ungulate browsing, and upper watersheds that are miles from human habitation. Thus, the Plan Area contains essential habitat elements conducive for wolf occupation and it is likely wolves could occur in the HCP Area in the future.

3.2.4.2 Environmental Consequences

No-action Alternative

Forest management activities would potentially result in impacts to the gray wolf in the form of disturbance from human activity and destruction of dens. These direct effects are exacerbated by cumulative impacts and climate change. Impacts from each forest management activity under the No-action Alternative are described below.

Timber Harvest Impacts: There are no specific OFP Rules that address resource site protection for wolves. Conducting timber harvest activities under OFP Rules could result in destruction of wolf den sites, although this would likely be uncommon given the low density of wolf dens and consequent low likelihood of occurrence in the area. Gray wolf habitat changes from harvest activities results in a matrix of age-classes, riparian and road corridors that is not likely to negatively affect wolves in the long term, provided landscape conditions also result in suitable prey species habitat conditions. Regeneration harvest and subsequent silvicultural activities, such as planting, result in a variety of forest age-classes across the landscape with numerous openings that provide foraging habitat for prey species. Forested landscapes with a variety of forest age-class stands can also provide hiding and denning habitat for wolves, although forest age classes greater than 41 years of age that are more likely to allow wolf movements through the forest and include habitat conditions for denning will be greatly reduced over the next decade, i.e., over

8,000 ac will be reduced by approximately 6,000 ac. Riparian zones along medium and large, low-gradient streams likely provide sufficient hiding cover to function as travel corridors. In upper watersheds containing small streams, the OFP Rule requirements for small fish streams and nonfish streams may not be capable of being used by wolves for travel or hiding because of the narrow buffer width and/or dense understory vegetation typical of forested stands in the Plan Area. In the short term, human activity associated with timber harvest could disturb wolves to the extent they are temporarily displaced from areas used for denning or hunting prey. However, once human activity is absent, wolves could occupy commercial forest landscapes where denning habitat is located and/or adequate numbers of prey species are present. This is especially true in remote upper watersheds, away from the agriculture, urban development, and transportation corridors in the valleys.

Silviculture Impacts: Wolves may be disturbed by the human presence associated with silviculture activities. If these activities are isolated, i.e., not in proximity to numerous other forest management activities, wolves can readily move back into previously occupied areas if habitat conditions are suitable. Conducting silvicultural activities would not likely result in a long-term disturbance to wolves.

Road Management Impacts: Low road densities are one of the five main predictors of wolf habitat (ODFW 2015). An ODFW analysis suggested wolves did not currently occur in areas where road densities exceeded 5.6 mi/mi² (ODFW 2015). An approximate estimate of active road density throughout the HCP Area is 5.2 mi/mi², which is near this threshold. There are no OFP Rules that limit road densities on an industrial forest landscape. Currently, Port Blakely in total constructs an average of approximately 4.2 mi of road annually while road abandonment and deactivation averages 1.1 mi. These rates are expected to occur over the next several decades. Thus, the road density may remain at or near the level in which wolves would still inhabit the forested landscape mosaic that currently exists given that road density is only one of several predictors of viable wolf habitat.

Roads alone should not have an impact on wolves; only the human activity associated with roads, such as haul trucks and staff vehicles used to conduct road management and other forest management activities. Fritts and Mech (1981) observed that some wolves use secondary roads in winter (if plowed) even though the probability of harmful contact with humans is increased considerably. Disturbances from roads are expected to be brief and temporary in nature, lasting only as long as the specific road use, construction, and maintenance activity occurs. Thus, there would likely be short-term impacts from human activity associated with roads, which could temporarily displace wolves. However, once human activity is absent, the roads and adjacent habitat are likely to be used by wolves should they expand their range to include the Plan Area because wolves will occupy a variety of land cover types provided adequate prey exists (Keith 1983, Fuller 1989, Haight et al. 1998) and human activity is minimal (Oakleaf et al. 2006, Belongie 2008).

Proposed Action Alternative

Covered Activities without the conservation measures would potentially result in adverse impacts largely similar to the No-action Alternative to gray wolf in the form of disturbance from human activity and direct impact (injury or mortality). Under the Proposed Action, however, the

application of the conservation measures for gray wolf (Table 2-1) would potentially reduce adverse impacts compared to the No-action Alternative and provide some benefit (Table 3-11). Overall, potential impacts to den sites under the Proposed Action Alternative would be positive compared to the No-action Alternative, as there would be added protections that do not currently exist. The increased complexity in the understory conifer stands would benefit habitat for prey base species and provide travel corridors for gray wolves, which would be positive compared to the No-action Alternative. Additional information for gray wolf with the application of conservation measures is discussed in the HCP (Section 6 and 7).

Table 3-11. Impacts to Gray Wolf – Proposed Action

Type of Impact	Conservation Measures	Potential Impacts of the Proposed Action Compared to the No-action Alternative
Disturbance from human activity	<ul style="list-style-type: none"> ● Creating understory with two canopy layers through pre-commercial thinning by hand-cutting, increasing habitat complexity and prey base (Habitat Conservation Plan [HCP] Section 6.3.3) ● Regeneration harvest age for stands 50 years of age or older, resulting in forest stands older than typical for commercial forest landscapes (HCP Section 6.3.3) ● Establishing Special Management Areas (SMAs) around sensitive habitat types within commercial harvest areas and protecting these areas for the entire HCP term (HCP Section 6.3.3) ● New roads only constructed when essential and existing non-essential roads deactivated or abandoned (HCP Section 6.3.4) ● Restrict motorized access to HCP roads through locked gates (HCP Section 6.3.5) ● Commercial thinning of conifer dominant stands to increase habitat complexity, foraging and dispersal suitability, and potential prey base (HCP Section 6.3.3) ● Create no-harvest buffers in Riparian Management Areas (HCP Section 6.3.1) 	<p>Potential adverse impacts from disturbance under either alternative may displace wolves or cause them to move away from hunting areas, rendezvous sites, or travel corridors. However, the potential impact is expected to be temporary, lasting only as long as humans are near wolf occupancy, which could range from only minutes (road travel) to several weeks (timber harvest unit activity). Given that wolves are such habitat generalists, opportunistic, and highly transitory with the ability to freely move away from disturbance, the small amount of adverse impact anticipated from disturbance is unlikely to diminish the ability of gray wolves to hunt, hide, or den within the Plan Area, i.e., management activities would not negatively affect wolf behavior and reproduction.</p> <p>Conservation measures under the Proposed Action would reduce the potential adverse impacts to gray wolves. Minimizing roads and restricting access would reduce disturbance from motorized access. Increasing habitat complexity, establishing SMAs, and older forest stands would result in a forest landscape mosaic that might facilitate use by wolves by providing cover for hiding and travel, habitat for prey species, and potential den site habitat.</p>
Direct impact	<ul style="list-style-type: none"> ● Den site protection and restricted disturbance (HCP Section 6.3.5) 	<p>Although the HCP notes that no take is anticipated as a direct result of habitat manipulations, den site protections offer assurances that direct take of individual wolves is highly unlikely.</p>

3.2.5 Pacific Fisher

The Pacific fisher is proposed for listing as threatened under the ESA (Table 1-1). Detailed information on the status and distribution, habitat characteristics and use, and occurrence of Pacific fisher within the Plan Area can be found in Section 3.2.9 of the HCP, which is summarized below.

3.2.5.1 Affected Environment

The fisher is a small, carnivorous mammal native to the coniferous and mixed forests of Canada and the northern U.S. They are solitary, forest-dwelling predators that are rarely seen. Conservation and protection measures to reduce trapping and re-introduce fisher back into their historic range have allowed them to rebound and continued efforts will facilitate recovery success (USFWS 2016).

Fishers use forested habitats across their range, and in western North America, the forested habitats are commonly conifer-dominated (Raley et al. 2012). The fisher is considered a secretive carnivore because they occur at low population densities, they use dense forests where they are difficult to see, and they avoid humans and developed areas. Fisher home ranges are commonly found at low and mid-elevations and are frequently dominated by forests with 1) a moderate to dense forest canopy, 2) a mosaic of successional stages, 3) few large openings, 4) complex forest structure, and 5) large woody structures (Raley et al. 2012). Fishers are prey generalists and hunt for prey in a variety of stand types including early, mid, and late successional stands in managed or unmanaged forest landscapes. Conversely, fishers are selective when it comes to den site and rest site habitats; they opt for areas with large, woody structures (Raley et al. 2012).

Fisher populations are presumed to not currently exist throughout the northern and central Cascade Range of Oregon, including the Plan Area, although an individual fisher was detected at the southern edge of Lane County in the Cascades. Habitat modeling suggests these areas contain habitat sufficient to support fishers in the Cascades (Aubry and Lewis 2003). The Initial Plan Area currently contains a forest habitat mosaic composed of primarily second and third growth forests with limited structural features, i.e., snags and downed wood that may be used as fisher den sites and as prey species habitat. However, given their historical occurrence, the potential for future introduction efforts on adjacent Federal lands or in the HCP Area, and structural features retention efforts implemented under the Proposed Action, it is possible that fishers could occur in the area during the life of the permit.

3.2.5.2 Environmental Consequences

No-action Alternative

Forest management activities would potentially result in impacts to the Pacific fisher in the form of removal of den and resting structures, prey habitat, and disturbance from human activity. These direct effects are exacerbated by cumulative impacts and climate change. Impacts from each forest management activity under the No-action Alternative are described below.

Timber Harvest Impacts: There are no specific OFP Rules that address resource site protection for fisher. However, some fisher habitat may be retained during OFP Rule regeneration harvests, e.g., snags, logs, stumps, and large down trees, on steep ground where cable yarding is the preferred method, on level ground where it is safe to retain snags. These structures could function as potential resting or den sites given suitable habitat conditions surrounding the structures. Defect that occurs in stands over 30 years of age, as a result of wind and ice storms, could also contribute to the overall stand functioning as fisher habitat. Resting and den structures retained in stream buffers, may also result in use by fishers in the future as the stand regenerates, but this may take decades to occur if not located near mature stands. Regeneration timber harvest, therefore, would generally result in long-term adverse effects to fishers because of the removal of trees and snags that function as den and resting structures, as well as prey habitat, even though these structures are required to be retained in small amounts on a per acre basis (ORS 527.676).

Silviculture Impacts: Fishers may be disturbed by the human presence associated with conducting silviculture activities. If these activities are isolated, i.e., not in proximity to numerous other forest management activities, fishers may continue to use occupied areas if habitat conditions are suitable. Alternatively, they may be disturbed to an extent where they move to areas of suitable habitat in the Plan Area or other ownerships. Conducting site preparation, i.e., debris-clearing, piling and mechanical site preparation, can result in elimination of potential fisher resting and denning sites or habitat for prey species, especially if the debris piles are subsequently burned. Over the long term, a lack of these structures in stands that would normally provide suitable habitat conditions, i.e., older stands with closed canopies, would likely preclude fishers from occupying the 2022 Ownership.

Road Management Impacts: Road construction removes habitat and creates openings in continuous canopy forest. In addition to their disruption of habitat continuity, roads are sources of vehicle-collision mortality of fishers (USFWS 2016). Secondary forest roads, used for ongoing timber harvest operations, but for little or no other activities, likely don't pose a serious risk to fishers. Port Blakely currently restricts motorized public access to its 2022 Ownership in Clackamas County, and has proposed continued restrictions on access as part of their HCP conservation strategy.

Proposed Action Alternative

Covered Activities without the conservation measures would potentially result in adverse impact to Pacific fisher in the form of harm/destruction of den sites, habitat degradation, and harassment/disturbance as described for the No-action Alternative. However, under the Proposed Action, the application of the conservation measures for Pacific fisher (Table 2-1) would potentially reduce adverse impacts. Impacts from the conservation measures for the fisher are summarized in Table 3-12. Overall, potential impacts to den sites and habitat in general under the Proposed Action Alternative would be positive compared to the No-action Alternative, primarily due to den site protections. Potential impacts related to harassment or disturbance under the Proposed Action Alternative would be positive compared to the No-action Alternative.

Table 3-12. Impacts to Pacific Fisher – Proposed Action

Type of Impact	Conservation Measures	Potential Impacts of the Proposed Action Compared to the No-action Alternative
Harm/Destruction of den sites	<ul style="list-style-type: none"> ● Den site protection, creation of understory, regeneration harvest age, establishment of Special Management Areas (SMAs), and new road construction measures would be the same as those described above (see <i>Gray Wolf</i>) ● U.S. Fish and Wildlife Service (USFWS), or its agents, may monitor if females are occupying dens, raising kits, and determining presence (Habitat Conservation Plan [HCP] Section 6.3.5) ● Creating coarse woody debris bio-dens for fishers and/or prey species (HCP Section 6.3.5) ● Report to USFWS any occupied den sites or any dead, sick, or captured fishers (HCP Section 6.3.5) ● Where suitable habitat exists and where agreed upon by Port Blakely and USFWS, allow the release of translocated fishers (HCP Section 6.3.5) ● Create no-harvest buffers in Riparian Management Areas (HCP Section 6.3.1) 	<p>Potential fisher dens may be created during regeneration harvest and retained, which could benefit fishers. Some of these structures could take decades to occur but those created would be available for decades. Timber harvest, whether it is regeneration or a commercial thin, would generally result in long-term adverse effects because of the removal of trees and snags that function as den and maternal structures, even though some of these structures would be retained. The creation of slash or brush piles, while having the potential to function as fisher habitat, require the correct complex of habitat features to be effective. Creation of such structures would become more beneficial as the surrounding stands mature. Destruction of known den sites would be prohibited, and den site disturbance restrictions would be applied to an area comprising 0.25 mile (mi) around occupied sites. Trapping and nuisance animal control activities would be restricted within 2.50 mi of known occupied dens. Coarse woody debris piles would be created to facilitate use by fishers as denning, resting or hiding habitat.</p>
Habitat degradation	<ul style="list-style-type: none"> ● Den site protection, creation of understory, regeneration harvest age, establishment of SMAs, and new road construction measures would be the same as those described above (see <i>Gray Wolf</i>) 	<p>Similar habitat degradation from road construction and timber harvest could occur as described for the No-action Alternative, but impacts to fishers are expected to be minimal because they utilize and hunt in a variety of stand types including early, mid, and late successional stands in managed or unmanaged forest landscapes.</p>

Table 3-12. Impacts to Pacific Fisher – Proposed Action

Type of Impact	Conservation Measures	Potential Impacts of the Proposed Action Compared to the No-action Alternative
Harassment/disturbance	<ul style="list-style-type: none"> ● Trapping/nuisance animal control restricted near dens (HCP Section 6.3.5) ● Man-made structures on the HCP lands that may entrap fishers (e.g., water troughs) would be covered, or a device would be placed inside the structure to enable the fisher to climb out (Table 2-1 and HCP Section 6.3.5) 	Potential impacts in the form of harassment/disturbance or entrapment of fishers in man-made structures could occur. The potential impact from disturbance may displace fishers or cause them to move away from hunting areas or den sites even though there would be species-specific disturbance restrictions implemented. Thus, the potential impact is expected to be temporary, lasting only as long as humans are near fisher occupancy, but may occur over the entire Permit term. Trapping and unintentional entrapment in man-made structures would be restricted, benefitting fishers.

3.2.6 Northern Goshawk

The northern goshawk is not listed under the ESA, but is a species of concern, see HCP (Table 1-1). Detailed information on the status and distribution, habitat characteristics and use, and occurrence of northern goshawk within the Plan Area can be found in Section 3.2.7 of the HCP, which is summarized below.

3.2.6.1 Affected Environment

Northern goshawks occupy a wide variety of forest habitats (U.S. Department of the Interior 1998). Typical territories often contain several alternate nests that are used by pairs over several years. Goshawks are typically found in large, forested areas with a mosaic of tree stages, forest characteristics, openings, and habitat components (e.g., snags and downed logs). They prefer an open forest floor for access to ground-dwelling prey. Nest areas range from those with a few mature trees, but with dense understory trees, to those with closed mature canopies and sparse understory trees. However, they can be generalists in terms of the types and ages of forests they can utilize and can also be found nesting in managed younger forests intermingled with mature trees with high canopies. Goshawks nest in either conifer or deciduous trees, often in one of the largest trees in the stand (Reynolds et al. 1982). The height and diameter of the nest trees are highly variable depending on forest type and geographic location. Typically, goshawk nest habitat is characterized as mature to old-growth forests composed primarily of relatively large trees with relatively high canopy closure (60–80%), near the bottom of moderate slopes, on north exposures and in areas with sparse ground cover, but nesting can occur in younger stands if conditions are right (Andersen et al. 2003, Bosakowski et al. 1999).

Goshawks can occur in all forested regions of Oregon. The exact number of adults or breeding pairs is not known, but they are expected to occur throughout the western Cascades including across the Plan Area (USFWS 1998). The goshawk is identified as occurring in Clackamas

County and is known to occur in the Clackamas watershed (NatureServe 2018b, Oregon Biodiversity Information Center 2016). The Initial Plan Area currently contains a mosaic of conifer stands with a range of age-classes that includes some mature stands, thinned stands with openings, and legacy snags and older trees scattered throughout the landscape, especially in riparian areas. These stands and structural features have the potential to provide nest sites and prey foraging opportunities. Thus, although nesting and prey habitat features may not be abundant, their presence in the Plan Area likely facilitates some use by goshawks.

3.2.6.2 Environmental Consequences

No-action Alternative

Forest management activities would potentially result in impacts to the Northern goshawk in the form of removal of nest trees, habitat degradation, nest failure or abandonment, and disturbance from human activity. These direct effects are exacerbated by cumulative impacts and climate change. Impacts from each forest management activity under the No-action Alternative are described below.

Timber Harvest Impacts: Timber harvest is the principal threat to breeding populations (Squires and Reynolds 1997). In addition to the relatively long-term impacts of removing nest trees and degrading habitat by reducing stand density and canopy cover, logging activities conducted near nests during the incubation and nestling periods can have an immediate impact, i.e., nest failure due to abandonment (Boal and Mannan 1994, Squires and Reynolds 1997). There are no specific OFP Rules that address resource site protection for northern goshawks. Goshawks are not known to occur in the Plan Area, but even though forested stands are predominately second and third growth, it is possible that goshawks could nest where remnant older trees or snags exist in younger stands. However, this potential is reduced by regeneration timber harvest that occurs by the time stands reach age 40 (Table 3-1), which is likely to eliminate any potentially suitable nesting structures, notwithstanding OFP Rule requirements to retain some snags and wildlife trees (ORS 527.676). RMAs may also provide potential nesting structures provided other breeding area characteristics such as older trees, continuous canopy forest, and reduced stand initiation cover are available (Finn et al. 2002). Should a goshawk nest be established, there are no OFP Rule requirements to protect nest sites or prevent disturbance to nesting goshawks. The overall impact of managing the industrial forest landscape on short rotations with age classes less than 40 years of age would likely preclude some use of the Plan Area by nesting goshawks; nesting habitat is typically characterized as mature to old-growth forests composed primarily of relatively large trees with relatively high canopy closure.

Silviculture Impacts: Goshawks may be disturbed by the human presence associated with conducting silviculture activities. There are no OFP Rules restricting disturbance to goshawks from forest management activities. Silviculture activities are typically conducted in harvest units for post-regeneration harvest, so, unless these units are adjacent to an older occupied stand, which, for the most part, would be harvested in the next decade, they are unlikely to result in disturbance to goshawk nest sites.

Road Management Impacts: Potential impacts to goshawks from new road construction would have similar impacts as timber harvest when this activity involves the removal of trees.

Disturbances associated with timber harvest such as road construction, maintenance, and use may negatively affect goshawks. McLaughlin (2002) observed a coastal goshawk nest that was immediately adjacent to a newly constructed road (i.e., construction began after nest initiation) and exposed to forestry activities (blasting, hauling, falling) throughout one breeding season. Although the female goshawk never habituated to the disturbance, three young successfully fledged from this nest. Goshawks may habituate to some types of noise disturbance, such as weaker noises farther from nests and those of a constant, predictable nature, compared to unpredictable and erratic louder noises closer to nests (McLaughlin 2002). There are no OFP Rules that address protection of goshawks nest sites or provide disturbance restrictions. Thus, direct disturbance from commercial forest management activities conducted under OFP Rules is likely to occur that can disrupt goshawk breeding including nest abandonment.

Proposed Action Alternative

Covered Activities without conservation measures would potentially result in largely similar adverse impacts to northern goshawk as those described for the No-action Alternative in the form of habitat degradation and harassment/disturbance. Under the Proposed Action, however, the application of the conservation measures for northern goshawk (Table 2-1) would potentially reduce adverse impacts and provide some benefit (Table 3-13). Overall, potential impacts to Northern goshawk under the Proposed Action Alternative would be less than those under the No-action Alternative. Nests would be protected, timing restrictions would be in place to minimize disturbance to active nests, habitat complexity would be increased, and older trees would be more available.

Table 3-13. Impacts to Northern Goshawk – Proposed Action

Type of Impact	Conservation Measures	Potential Impacts of the Proposed Action Compared to the No-action Alternative
Habitat degradation	<ul style="list-style-type: none"> ● Habitat protection in the form of 30 acres (ac) of forested habitat untouched around two active nest sites (Habitat Conservation Plan [HCP] Section 6.3.5) ● Provide forest landscape-wide habitat mosaic (HCP Section 6.3.5) ● Create understory with two canopy layers through pre-commercial thinning by hand-cutting, increasing habitat complexity and prey base (HCP Section 6.3.3) 	Harm due to habitat degradation is likely to occur when timber stands that are at least 50 years of age are harvested under either alternative. The acreage of these stands on a decadal basis ranges from lows of approximately 3,200 and 3,400 ac in the second and fourth decades of the Permit term, respectively, to 3,900 ac in the fifth decade of the Permit period. This is a benefit compared to the No-action Alternative.

Table 3-13. Impacts to Northern Goshawk – Proposed Action

Type of Impact	Conservation Measures	Potential Impacts of the Proposed Action Compared to the No-action Alternative
Habitat degradation <i>(continued)</i>	<ul style="list-style-type: none"> ● Commercial thinning of conifer dominant stands to increase habitat complexity, foraging and dispersal suitability, and potential prey base (HCP Section 6.3.3) ● Regeneration harvest age for stands 50 years of age or older, resulting in forest stands older than typical for commercial forest landscapes (HCP Section 6.3.3) ● Create no-harvest buffers in Riparian Management Areas (HCP Section 6.3.1) 	<p>Conservation measures that protect defective trees and snags, create snags, and provide upland leave tree patches allowed to mature would ameliorate some of the potential impact. Riparian and wetland buffers would also result in retention of existing older trees, defective trees, and understory vegetation that provide prey species habitat. Although older forest habitat, i.e., 50+ years of age, would decrease by a few hundred acres in the first period, it remains constant or several hundred acres more than the starting condition throughout the permit term (see Figure 3-2).</p> <p>The HCP focuses on protecting trees that are more likely to function as nest trees for goshawks. Although adverse impacts are expected to occur, it is difficult to determine the amount of potential impact from timber harvest that eliminates nest trees in these stands because of the uncertainty associated with actual occupancy and the positive effects of conservation measures that result in retention and replacement of potential nest trees.</p>
Harassment/disturbance	<ul style="list-style-type: none"> ● Disturbance restriction by staying 0.50 mile or greater away from active nests from March 1 – August 31 (HCP 6.3.5) ● Establishing Special Management Areas around sensitive habitat types within commercial harvest areas and protecting these areas for the entire HCP term (HCP Section 6.3.3) ● New roads only constructed when essential and existing non-essential roads are deactivated or abandoned (HCP Section 6.3.4) 	<p>Impacts related to harassment and disturbance would be similar to those described under the No-action Alternative. Pre-commercial and commercial thinning, as well as regeneration harvest, would occur in every decade of the Permit term. Harassment could occur when these activities are conducted. Incidental take in the form of harassment by disturbance could occur anywhere in the covered area although it is most likely to occur in or near suitable habitat and on roads near the northern goshawk nest sites in older stands in the HCP Area. Port Blakely would also conduct routine road management activities that may disturb northern goshawks, Establishing Special Management Areas, nest site disturbance restrictions, and limiting new road construction would likely limit this type of disturbance.</p>

3.2.7 Northern Spotted Owl

The northern spotted owl is listed as threatened under the ESA (Table 1-1). Critical habitat for northern spotted owl has been designated in Oregon, including parts of Clackamas County. Detailed information on the status and distribution, habitat characteristics and use, and occurrence of northern spotted owl within the Plan Area can be found in Section 3.1.8 of the HCP, which is summarized below.

3.2.7.1 Affected Environment

The northern spotted owl historically occupied forests from southwestern British Columbia through western Washington and Oregon to northwestern California (USFWS 2018). In Oregon, spotted owls occur in the Coast Range, Klamath Mountains, Willamette Valley, West Cascades and East Cascade regions, where they are found year-round in forested habitats except for low elevation valleys (Oregon Forest Resources Institute 2017). In the last 190 years, the loss, degradation, and fragmentation of spotted owl nesting, roosting, and foraging habitat has led to a decline throughout much of the species' historical range.

Spotted owl habitat is characterized by dense canopy closure typical of mature and old-growth forests that include structure heterogeneity including, abundant logs, snags, and live trees with broken tops. Although they are known to nest, roost, and feed in a wide variety of habitat types, spotted owls prefer older forest stands with variety, i.e., multi-layered canopies of several tree species of varying size and age, both standing and fallen dead trees, and open space among the lower branches to allow flight under the canopy (USFWS 2018). Spotted owls are territorial raptors that range widely in search of prey, but are 'anchored' during the breeding season to a nest site (central-place forager) (USFWS 2017). Their territories are usually described as a spatial metric (core area around a nesting site enclosed within a wider home range) and a usage metric (nesting, roosting, foraging, and dispersal).

Spotted owl nest sites or activity centers are not known to occur in the 2022 Ownership, based on limited surveys that determined no spotted owl occupancy (Coe 2019). Although the majority of the 2022 Ownership has not been directly surveyed for suitable habitat, habitat typically assumed to be minimally suitable for spotted owl nesting does not occur in the 2022 Ownership. The highest quality spotted owl habitat that does occur in the 2022 Ownership is generally suitable only for foraging and roosting by spotted owl, primarily represented by stands that are over 50 years old. This is because these older stands contain woody structural features such as snags, defective trees, and downed wood that may be habitat for prey species. Approximately 5,818 ac of this habitat occurs in the 2022 Ownership (20% of the 2022 Ownership forested land), and generally occurs in relatively small blocks distributed within a matrix of younger, less structurally complex stands (age classes 26–40 year old that have been thinned) that allow spotted owls to move and disperse through or are unsuitable for spotted owl use.

No spotted owls or activity centers are currently known to occur on the 2022 Ownership (Coe 2019). Two spotted owl sites have been identified within the 2022 Influenced Area; one on Federal land about 0.40 mi to the east of the easternmost parcel, and one on State land (Gawley Creek Site) located about 0.50 mi south of the southeastern-most parcel of the 2022 Ownership. The Federal land owl site to the east is believed to be nonexistent due to the large wildfire,

known as the 36 Pit Fire that occurred in the Clackamas River basin in 2014, and the wildfires that again burned through the area in 2020. The Gawley Creek Site on State lands to the south is considered an existing site center. Annual surveys have been conducted at the Gawley Creek Site since 1988 (Coe 2019). This area also sustained severe fire damage as a result of the 2020 wildfires, although the impact on the actual site center is unknown. The site center was moved about 0.75 mi to the east in 2014 when nesting was confirmed (both owls were banded in 2016 by the Bureau of Land Management [BLM], so identification was confirmed). This move did not equate to a change in distance from the 2022 Ownership as it is located to the north of both the old and new site center. However, no nesting has been confirmed since 2014 and there were no detections in 2019 (Coe 2019). The distance and geographic and ecological conditions between these areas and the 2022 Ownership probably mean demographic and habitat connectivity are limited, but not precluded as the land is contiguous managed forestland. The new site center is located on state forestland, which was partially impacted by wildfires in 2020. The impact of the fire and the state's management plans are unknown (email from Port Blakely, May 11, 2021).

However, the State-owned site is close enough and contains nesting habitat such that some periodic use of the 2022 Ownership by those spotted owls and/or their progeny could occur. Based on this information, the 2022 Ownership likely could minimally support regional spotted owl conservation as follows: 1) provide a small and localized movement and foraging landscape for spotted owls that periodically and quickly pass through the area while dispersing, 2) provide ongoing supplemental roosting and foraging opportunities for single spotted owls or spotted owl pairs that occasionally occupy territories located primarily on adjacent/nearby Federal or State lands, and 3) provide foraging opportunities and other habitat attributes for occasional non-territorial owls to survive in the 2022 Ownership for an unknown amount of time.

3.2.7.2 Environmental Consequences

No-action Alternative

Forest management activities would potentially result in impacts to the northern spotted owl in the form of degradation or elimination of potentially suitable habitat and disturbance. These direct effects are exacerbated by cumulative impacts and climate change. Impacts from each forest management activity under the No-action Alternative are described below.

Timber Harvest Impacts: Timber harvest on intensively managed commercial forestlands under OFP Rules results in depletion of older forested stands that, in the past, may have functioned as nesting, roosting and foraging habitat that spotted owls rely on (USFWS 2011). Typically, when managed private forestlands are commercially thinned, nearly all defective trees and snags are removed to enhance growth of remaining trees or for safety reasons, although thinning can open a stand resulting in tree spacing and canopy lift that allows spotted owls to move through the stand. There are no OFP Rules that explicitly apply to commercial thinning and, under baseline forest management projections, Port Blakely would not conduct commercial thinning. Regeneration harvest of Douglas fir stands in the western Oregon Cascades results in clearcuts that remove all the trees. Managing stands on a short rotation basis results in clearcuts distributed across the landscape resulting in habitat fragmentation that also contributes to degradation of

suitable spotted owl habitat at the landscape scale, i.e., a mix of young stands less than 40 years old distributed across the ownership.

Unless a forested stand is occupied by spotted owls (known nest tree or activity center of an adult pair), removal of suitable habitat, and woody structures that serve as habitat for prey species, is permitted under OFP Rules (OAR 629-665-0210) and could result in degradation or elimination of potentially suitable spotted owl habitat on a large scale. However, Federal law prohibits a person from taking spotted owls that, as cited in OFP Rules, may include significant alteration of owl habitat on any class of land ownership. If a spotted owl nest site is identified in the 2022 Ownership, it would be protected under OFP Rules, which requires protection of all spotted owl nest sites by retention of a 70-ac area of suitable spotted owl habitat encompassing the nest site maintained as suitable spotted owl habitat.

The HCP defines age-classes greater than 50 years of age as having characteristics for “foraging/dispersal and sometimes roosting and/or nesting” (Section 5.1.2.2 of the HCP). Under the No-action Alternative, age-classes greater than 50 years make up about 20% of the 2022 Ownership in the current period, and would drop to approximately 5% for the remaining periods (Figure 3-1). Since there would be no commercial thinning and no focus on retention of trees with defect and/or legacy structures, except for basic OFP Rules for retention of wildlife tree (two per acre) and downed woody debris (at least 20 cubic ft gross volume), spotted owl foraging/dispersal and prey habitat would be minimal across the landscape (ORS 527.676). It is unlikely that, under these circumstances, spotted owl nest sites would be established in the 2022 Ownership, or that foraging/dispersal habitat would be available in adequate amounts that facilitate spotted owl use.

Some suitable spotted owl habitat may remain in riparian areas; however, these corridors of standing timber provide very little interior forest conditions conducive for spotted owl use until such time as the adjacent stands reach a height that buffers the riparian trees (approximately 35–40 years of age). Replanted stands allowed to mature naturally, as well as commercially thinned stands, have the potential to become functional roosting, foraging, and dispersal habitat given the right conditions. Naturally maturing stands achieve this condition later than commercially thinned stands, which, with proper spacing and retention of some defective trees, could provide habitat for use by spotted owls for these activities. However, under baseline OFP Rules, Port Blakely is not required, nor are they committed, to conducting commercial thinning. Thus, implementation of forest management activities on Port Blakely’s industrial forest landscape would likely preclude these functions from occurring because of the focus on growth of vigorous, “clean”, defect-free trees planned for harvest as early as 35–40 years of age.

The effects of noise on spotted owls are largely unknown (USFWS 2017). The effect of noise on birds is extremely difficult to determine due to the inability of most studies to quantify one or more variables such as 1) timing of the disturbance in relation to nesting chronology, 2) type, frequency, and proximity of human disturbance, 3) clutch size, 4) health of individual birds, 5) food supply, and 6) outcome of previous interactions between birds and humans (Knight and Skagan 1988). Additional factors that confound the issue of disturbance include the individual bird’s tolerance level, ambient sound levels, physical parameters of sound, and how it reacts with topographic characteristics and vegetation, and differences in how species perceive noise (USFWS 2017). It is assumed that human activities associated with timber harvest, including use

of heavy equipment and helicopters, cause some disturbance to owls as evidenced by the disturbance and disruption distances established by USFWS (2003, 2013). Disturbance of spotted owls is also addressed in the OFP Rules (OAR 629-665-0210). Prevention of disturbances resulting from forest management activities “which cause owls to flush from the nesting site” during the critical period of nest use each year, i.e., between March 1 and September 30, is not authorized without a written plan approved by the State Forester. Should a spotted owl nesting site be discovered, this disturbance restriction would be applicable, minimizing the potential for disturbance to spotted owls.

Silviculture Impacts: Spotted owls may be disturbed by the human presence associated with conducting silviculture activities. If these activities are conducted according to the OFP Rules, i.e., do not cause spotted owls to flush from the nesting site, they should result in no disturbance to spotted owls. Silviculture activities are typically conducted in harvest units for post-regeneration harvest so unless these units are adjacent to an older occupied stand, they are unlikely to result in disturbance to spotted owl nest sites. There is some flexibility associated with the timing of conducting silvicultural activities, so adherence to the OFP Rules relative to spotted owl disturbance can, for the most part, be implemented without impacts to spotted owls.

Road Management Impacts: New road construction results in removal of trees and creates openings in forested stands adding to the habitat depletion and fragmentation that occurs from regeneration timber harvest. Potential impacts to spotted owls from new road construction would have similar impacts as timber harvest when this activity involves the removal of trees.

Road management activities also can cause disturbance of spotted owls that may be occupying an older forest stand functioning as dispersal habitat with roosting and foraging opportunities, or younger stands that qualify simply as dispersal habitat. Disturbance of spotted owls may cause them to move out of an area to less suitable areas and/or disrupt their behavior such that they are exposed to predation. If the road management activities have the potential to cause disturbance to nesting spotted owls, they are subject to the same OFP Rules as silviculture activities described above, i.e., no disturbance that causes spotted owls to flush from the nesting site during the critical period of March 1 through September 30, each year.

Once roads are in place, impacts on spotted owls would be limited to the disturbance associated with haul trucks and staff vehicles used to conduct road management (including quarrying activities) and other forest management activities. This disturbance is expected to be temporary in nature, lasting only as long as the specific road use, construction, and maintenance activity occurs. Thus, there would likely be short term impacts from human activity associated with roads, which could temporarily displace spotted owls that may be using nearby habitat.

Proposed Action Alternative

Covered Activities without conservation measures would potentially result in largely similar adverse impacts to northern spotted owl as described for the No-action Alternative in the form of habitat degradation and harassment/disturbance. Under the Proposed Action, however, the application of the conservation measures for northern spotted owl (Table 2-1) would potentially reduce adverse impacts and provide some benefit (Table 3-14). Overall, potential impacts to northern spotted owls under the Proposed Action Alternative would be less than those under the

No-action Alternative. Nests would be protected, timing restrictions would be in place to minimize disturbance to active nests, habitat complexity would be increased, and older trees would be more available.

Additional information for northern spotted owl with the application of Conservation Measures is discussed in the HCP (Sections 6 and 7).

Table 3-14. Impacts to Northern Spotted Owl – Proposed Action

Type of Impact	Conservation Measures	Potential Impacts of the Proposed Action Compared to the No-action Alternative
Habitat degradation	<ul style="list-style-type: none"> ● Avoiding harvest of high quality habitat around nest/pairs for up to three occupied spotted owl nest sites (Habitat Conservation Plan [HCP] Section 6.3.5) ● Retaining legacy trees and snags, leaving a minimum of about 7,550 acres (ac) for foraging and dispersal habitat (HCP Section 6.3.5) ● Recovery planning as needed with U.S. Fish and Wildlife Service (HCP Section 6.3.5) ● Creating upland areas, placing leave trees, retaining legacy trees, and creating snags (HCP Section 6.3.2) ● Retaining understory trees in riparian areas and uplands (Table 2-1) ● Creation and retention of coarse woody debris (bio-dens; Table 2-1; HCP Sections 6.3.2 and 6.3.3) ● Strategically placing leave trees and snags (HCP Sections 6.3.2 and 6.3.3) ● Creating understory with two canopy layers through pre-commercial thinning by hand-cutting, increasing habitat complexity and prey base (HCP Section 6.3.3) ● Commercial thinning of conifer dominant stands to increase habitat complexity, foraging, and dispersal suitability, and potential prey base (HCP Section 6.3.3) ● Regeneration harvest age for stands 50 years of age or older, resulting in forest stands older than typical for commercial forest landscapes (HCP Section 6.3.3) 	<p>Through Port Blakely’s forest management efforts, functional spotted owl foraging habitat (i.e., age-classes greater than 50 years) in the HCP area would remain relatively constant at 20% throughout the start of the Permit term to 11% to 15% throughout the Permit term (Figure 3-2). These percentages of foraging habitat are the same for the first term, and higher for the remainder of the term, than the No-Action alternative, thus benefitting spotted owl.</p> <p>An objective of the HCP (Objective 5 in Section 6.2) is to create owl foraging and dispersal habitat through commercial thinning of 25- to 40-year age classes, or 12% of the HCP Area. The amount of foraging habitat in these age classes would be maximized in the 4th and 5th decade of the Permit term at 16.4% and 19.8% respectively. Stands older than 35 years of age that have been commercially thinned provide functional dispersal habitat. The amount of /dispersal habitat would substantially increase in the fourth and fifth decades of the Permit term, from an average of 10.4% in the first three decades to 22.6% and 30.9%, respectively. Foraging and dispersal habitat would benefit under the Proposed Action compared to the No-action Alternative. No commercial thinning is done under the No-Action Alternative, so no foraging or dispersal habitat in the 25- to 40-year age classes is being created.</p>
Habitat degradation (continued)		Other impacts would be the same as described for the No-action Alternative, include nest protection if found in the HCP

Table 3-14. Impacts to Northern Spotted Owl – Proposed Action

Type of Impact	Conservation Measures	Potential Impacts of the Proposed Action Compared to the No-action Alternative
		<p>Area. Because of the proximity of HCP lands to existing spotted owl sites, some use of the HCP Area is likely to occur for dispersal and foraging. The probability of an owl pair nesting on the property is possible, although the likelihood is low, because nearby Federal lands contain larger patches of higher quality nesting, roosting, and foraging habitat. The HCP Area would contribute to spotted owl conservation for the entire Permit term by improving habitat quality and quantity over that expected under the No-action Alternative, which could slightly benefit their populations in the western Oregon Cascade Region. The impact of any take that may occur in the future would be very small because it would be to spotted owls that would likely not have inhabited the HCP Area were it not for the HCP conservation measures that provided suitable habitat features and species-specific protection measures. Thus, the impacts of the take to spotted owl populations would likely be negligible.</p>
Harassment/disturbance	<ul style="list-style-type: none"> ● Implement 0.25-mile noise disturbance restriction for nest/pair sites from March 1 – September 30 (HCP 6.3.5) ● Establish Sensitive Management Areas around sensitive habitat types within commercial harvest areas and protect these areas for the entire HCP term (HCP Section 6.3.3) ● New roads only constructed when essential and existing non-essential roads deactivated or abandoned (HCP Section 6.3.4) 	<p>Under either alternative, potential adverse impact in the form of harassment by disturbance could occur anywhere in the covered area, although it is most likely to occur in habitat and on roads near the spotted owl nest sites on adjacent ownerships due to disturbance restrictions of known nest sites. Pre-commercial and commercial thinning, as well as regeneration harvest, would occur in every decade of the Permit term. Harm and harassment could occur when these activities are conducted. Under either alternative, Port Blakely would conduct routine road management activities, including rock pit development that may disturb spotted owls.</p>

3.2.8 Amphibians and Reptiles

The amphibian and reptile Covered Species addressed in the HCP, Cascade frog, coastal tailed frog, Cascade torrent salamander, Western/Pacific pond turtle, and Oregon slender salamander are not listed under the ESA, but are species of concern according to the HCP (Table 1-1). Detailed information on their status and distribution, habitat characteristics and use, and occurrence within the Plan Area can be found in Sections 3.2.2 through 3.2.6 of the HCP, which is summarized below.

3.2.8.1 Affected Environment

Within the Plan Area, there is suitable habitat for Cascades frogs, coastal tailed frogs, Cascade torrent salamander, western pond turtle, and Oregon slender salamander, and there are documented occurrences for these species within the Plan Area:

- Natural Heritage records that show Cascade frogs occurring in the Clackamas and Molalla-Pudding watersheds (NatureServe 2018b).
- The coastal tailed frog is known to occur in Clackamas County in Oregon, specifically in both the Clackamas and Molalla-Pudding Watersheds (NatureServe 2018b).
- Cascade Torrent Salamander population includes Clackamas County (NatureServe 2018b).
- Oregon slender salamander populations are documented in the Clackamas and Molalla-Pudding watersheds (NatureServe 2018b)
- The western pond turtle is known to occur in Clackamas and Marion counties in Oregon, and more specifically in both the Clackamas and Molalla-Pudding Watersheds (NatureServe 2018b)

3.2.8.2 Environmental Consequences

No-action Alternative

Forest management activities would potentially result in impacts to the Cascades frogs, coastal tailed frogs, Cascade torrent salamander, Western pond turtle, and Oregon slender salamander in the form of removal of den and resting structures, prey habitat, and disturbance from human activity. These direct effects are exacerbated by cumulative impacts and climate change. Impacts from each forest management activity under the No-action Alternative are described below.

Timber Harvest Impacts: Although some riparian habitat used by the reptile and amphibian covered species would be retained along small fish-bearing streams and stream-associated wetlands as a result of OFP Rule requirements, the timber harvest would reduce the amount of habitat available for reptiles and amphibians and, does not provide enough trees to completely prevent temperature increases. Reductions in stream-adjacent riparian habitat on small fish streams, as a result of low basal area retention requirements of OFP Rules, and the lack of a requirement to provide a riparian buffer on perennial nonfish-bearing headwater streams, increase water temperatures. Higher water temperatures would have would reduce the quality of available habitat for amphibians and result in higher rates of dehydration among wet-skinned amphibians as they attempt to keep themselves cool (ISAB 2007, Lertzman-Lepofsky et al. 2020). These impacts would be exacerbated by climate change. As described in Section 3.1.4,

about one-third of the current cold-water habitat in the Pacific Northwest is likely to exceed key water temperature thresholds by the end of this century (Mantua et al. 2009).

Regeneration timber harvest has the potential to remove trees in the outer margins of riparian habitat and around non-fish bearing streams, and result in substantial ground disturbance that can destroy coarse woody debris such as logs and bark. This activity can also reduce the quality of aquatic habitat by potentially removing future LWD or expose streams and wetlands to solar radiation that may warm waters beyond their suitability for turtles and amphibian Covered Species. Timber harvest also results in ground disturbance that may result in harm from destruction of turtle nests and/or overwintering sites, especially where these occur near aquatic habitat, as well as sedimentation and drying of habitat. Forest management activities could also cause disturbance to dispersing species, interrupting their movements and/or changing their direction to an extent that they become disoriented or expend excessive energy to avoid the disturbance.

Silviculture Impacts: Silviculture activities that disturb the substrate, and degrade and collect down wood negatively impact western pond turtles, Cascade torrent salamander, and Oregon Slender salamanders, especially site preparation activities such as debris-clearing, piling, and burning, particularly if they are upland at the time of these activities. Although there are OFP Rules that address avoidance of sediment delivery to streams by minimizing soil disturbance, they are not likely adequate to protect overwintering western pond turtles, Cascade torrent salamander, or Coastal tailed frog or prevent soil disturbance that alter microclimates important to the Oregon slender salamander.

If debris piles remain unburned, they may ultimately function as a refuge and retain microclimate functions suitable for the Oregon slender salamander. Current OFP Rules require a minimum volume of 20 cubic ft be retained per acre in regeneration harvest units. Although this would benefit the Oregon slender salamander as the harvest unit matures, the immediate effect is likely not very beneficial because of the soil compaction and down wood degradation that would have occurred throughout the harvest unit.

Road Management Impacts: Road maintenance activities are unlikely to affect the amphibian and reptile Covered Species, but road construction activities, road placement, and culverts have the potential to introduce sediment to streams, fragment habitat, and disrupt amphibian movement, respectively. Road construction involves vegetation clearing and soil disturbance (terrestrial habitat loss), and instream works for culvert and bridge replacements/installations (aquatic habitat loss).

Road construction activities impacts are expected to be minor because the majority of roads occur in upslope habitats infrequently occupied by amphibians and reptiles (i.e., not near and parallel to watercourses) and most culverts with flow issues are repaired when forest management activities occur in the vicinity. OFP Rules relative to road management focus on avoiding or minimizing the potential for delivery of sediment to streams. Roads are required to be constructed as far away from streams as economically and practically possible.

Proposed Action Alternative

Covered Activities without the conservation measures would potentially result in largely similar adverse impacts to amphibian and reptile Covered Species as described for the No-action

Alternative in the form of sedimentation, increased water temperatures, habitat degradation and impediments to migration. Under the Proposed Action, however, the application of the conservation measures (Table 2-1) would potentially reduce the adverse impacts and provide some benefit. The impacts from the conservation measures for amphibian and reptile Covered Species are summarized in Table 3-15. Overall, potential impacts to amphibians and reptiles under the Proposed Action Alternative would be less than those under the No-action Alternative. No-harvest buffers and retention areas would retain the integrity and ecological function of aquatic habitats upon which the reptile and amphibians depend. Road management conservation measures would reduce or eliminate the potential to disturb and/or degrade reptile and amphibian Covered Species habitat. Conservation measures that protect and create snags (and stumps) that could become future coarse woody debris, retention of upland leave tree patches, and the commitment to protect and/or provide coarse woody debris and slash on the forest floor during regeneration harvest activities would also likely serve as suitable habitat structures for some amphibians and reptiles.

Table 3-15. Impacts to Amphibians and Reptiles – Proposed Action

Type of Impact	Conservation Measures	Potential Impacts of the Proposed Action Compared to the No-action Alternative
Harm/Habitat Degradation – Sedimentation and habitat modification	<ul style="list-style-type: none"> ● Buffers around stream-associated habitats (e.g., wetlands) composed of live trees, snags, downed wood, and understory vegetation (Table 2-1) ● 50-foot (ft) no-harvest zones around stream-associated lakes (over eight acres [ac]), wetlands (over eight ac, and bogs (any size) ● 50-ft managed buffer composed of 50% relative retention of original live trees ● Maintaining the understory vegetation within 25 feet of harvest unit boundaries and adjacent to buffers on streams and aquatic habitats (Habitat Conservation Plan [HCP] Sections 6.3.2 and 6.3.3) ● Locating roads away from streams outside Riparian Management Areas and removing stream-adjacent roads where possible (HCP Section 6.3.1) ● Establishing Special Management Areas around sensitive habitat types within commercial harvest areas and protecting these areas for the entire HCP term (HCP Section 6.3.3) ● New roads only constructed when essential and existing non-essential roads deactivated or abandoned (HCP Section 6.3.4) 	<p>Potential adverse impact on reptiles and amphibians may occur as a result of timber harvest through loss or modification of habitat as described for the No-action Alternative. The combination of no-harvest buffers and retention areas associated with stream-associated lakes and wetlands, as well as isolated lakes and wetlands, would retain the integrity and ecological function of these aquatic habitats upon which the reptile and amphibians depend, which would ameliorate the potential loss. Timber harvest results in ground disturbance that may result in harm from destruction of turtle nests and/or overwintering sites especially where these occur near aquatic habitat as described for the No-action Alternative. Forest road construction would have similar impacts, although at a more limited level. The buffers would protect the western pond turtle nesting and overwintering habitat and amphibian habitat, especially along nonfish-bearing streams. Implementation of road management conservation measures would result in minimal stream crossings, a reduction in road construction adjacent to streams and removal of some roads within 200 ft of streams. These measures serve to reduce or eliminate the potential to disturb and/or degrade reptile and amphibian Covered Species habitat.</p>
Harm/Habitat Degradation – Sedimentation and	<ul style="list-style-type: none"> ● Retain or create at least 30 cubic ft per acre of coarse woody debris, with no pieces less than 10 cubic feet, and/or piles five to 10 ft in diameter with 	<p>The HCP also contains measures that support connectivity of all in-stream habitat on Port Blakely’s ownership, focusing on fish passage blockages early in the HCP term.</p>

Table 3-15. Impacts to Amphibians and Reptiles – Proposed Action

Type of Impact	Conservation Measures	Potential Impacts of the Proposed Action Compared to the No-action Alternative
habitat modification <i>(continued)</i>	average piece size of 10 ft in diameter and one to three ft long at regeneration harvest	Road improvement activities such as the use of 100-year event culverts ensure that the potential for fish passage blockages and disconnected streams are eliminated. Given these conservation measures, the impact likely to occur in the Plan Area due to the Covered Activities would be considered negligible to reptiles and amphibian Covered Species.
Harm/Increased water temperature	<ul style="list-style-type: none"> ● Buffers around stream-associated habitats (e.g., wetlands) composed of live trees, snags, downed wood, and understory vegetation (HCP Section 6.3.1) ● Maintaining the understory vegetation within 25 ft of harvest unit boundaries and adjacent to buffers on streams and aquatic habitats (HCP Sections 6.3.2 and 6.3.3) 	Reptile and amphibian species would benefit from these conservation measures as described in detail for fish Covered Species (see Section 3.2.2.1). Potential impact in the form of harm could occur from minimally increased water temperatures, specifically for reptiles and amphibians, rising water temperatures would potentially result in poor annual survival for eggs and tadpoles. Increased vegetation cover resulting from the no-harvest buffers and maintaining the understory of vegetation would reduce the potential for water temperature from raising and reduce the potential for ponds, lakes, and wetlands to dry up.
Harm/Habitat Degradation – loss of woody debris on forest floor	<ul style="list-style-type: none"> ● Retaining old growth trees, snags, and downed logs (HCP Sections 6.3.2 and 6.3.3) ● Recruitment and retention of coarse woody debris (HCP Sections 6.3.2 and 6.3.3) ● Creation of an understory with two canopy layers through pre-commercial thinning by hand-cutting, increasing habitat complexity (HCP Section 6.3.3) ● Trees cut during pre-commercial thinning will not be removed, providing short-term woody debris input to the forest floor (HCP Section 6.3.3). 	Under either alternative, regeneration harvest typically results in substantial ground disturbance that can destroy coarse woody debris such as logs, stumps, and exfoliated bark. This is especially likely in low-gradient forest stands that are harvested with ground-based equipment. Ground disturbance also occurs in association with road construction when trees are removed, and the ground is prepared for road surfacing. The level of potential impact from harm would be minimized by conservation measures that protect and create snags (and stumps) that could become future coarse woody debris, retention of upland leave tree patches, and the commitment to protect and/or provide coarse woody debris and slash on the forest floor during regeneration harvest activities. No-harvest stream buffers and the associated snags and large woody debris that occurs would also likely serve as suitable habitat structures. Conservation measures that provide debris piles, retain slash and provide upland leave tree patches allowed to mature will ameliorate some of the potential adverse impact.

Chapter 4

Cumulative Impacts

Cumulative impacts are those that result from incremental impacts of a project when added to other past, present, and reasonably foreseeable actions within the Plan Area. Cumulative impacts can result from individually minor, but collectively significant actions that take place over a period of time. This chapter addresses the incremental cumulative impacts on each of the resources discussed in Chapter 3.

Other past, present, and reasonably foreseeable actions are considered in the general context of the Proposed Action. Port Blakely's 2022 Ownership in Clackamas County is inter-mixed with small town residential properties, private landowners that engage in forestry and agriculture activities, and state and federal forestlands. Port Blakely's 2022 Ownership is bordered on the north primarily by small private forest and agriculture landowners, on the east by federal lands, i.e., BLM and U.S. Forest Service, to the southeast by Weyerhaeuser (which is a large company that owns tracts of forestland), to the south by federal and state lands, and to the southwest and west by private forests, agriculture lands, and urban areas (cities and towns).

Actions in the adjacent areas to the areas defined in Section 1.3 and in the waterways that flow through these areas could all contribute to cumulative impacts. Following are some example projects or activities that contribute to the consideration of cumulative impacts.

- Hatchery Programs for spring Chinook salmon, steelhead, and rainbow trout in the UWR Basin – One purpose for the hatcheries is to conserve and recover ESA-listed salmon and steelhead, while providing hatchery-origin fish for recreation and commercial fisheries in the Willamette River, LCR, and ocean. Hatchery fish are released into the Molalla River (among others); much of the 2022 Ownership is in the upper watersheds of the Molalla River and Clackamas River, (hatchery fish are not released into the Clackamas River). The larger HCP Area includes other rivers where hatchery fish are released, namely the North Santiam River and South Santiam River.
- Actions to Reduce California Sea Lion Predation on Salmonid Fishes Listed as Threatened or Endangered under the ESA in the Willamette River – this ongoing project involves the lethal removal of California sea lions in the Willamette River. The target area for removal is the 2.5 mi reach of the river between the mouth of the Clackamas River and the base of Willamette Falls. This area is within the Potential Acquisition Area.
- Various NMFS projects in Clackamas County – NMFS is engaged in about 20 projects in Clackamas County, ranging from fish habitat improvement, to habitat restoration and enhancement, to dam removal. Collectively, these completed (past) and ongoing projects contribute incrementally to cumulative impacts. The Corral Creek Dam Removal Project is illustrative of these projects overall and is located near Port Blakely forestland. This project re-established 2.5 mi of stream habitat above an old concrete dam originally used to impound water for crop and pasture irrigation. Dam removal improved passage for coho, spring Chinook, and winter steelhead, and restored natural sediment transport and hydrologic functions of the stream.

- The ODF is preparing a multi-species Western Oregon State Forest HCP to support issuance of ITPs for Western Oregon State Forests that are managed by ODF. The HCP is currently in draft form. While most of the forestlands considered in this Western Oregon State Forest HCP are west of the Plan Area, some are located in the southwest corner of Clackamas County near Port Blakely forestland. ODF's vision for the HCP is to ensure species protection and conservation, as well as increased certainty that working state forestlands will continue to benefit all Oregonians.
- The Oregon Private Forest Accord is a compromise agreement between members of Oregon's private timber industry, conservation and fishing organizations to modify parts of the OFA. The Accord proposed state legislation in 2021, and it passed in 2022. The Oregon Board of Forestry approved changes to the OFA administrative rules on October 26, 2022. The revised rules expand stream buffer requirements for large private forestland owners (owning 5,000ac or more of forestland), which will take effect on July 1, 2023.
- Urban development – According to the Coordinated Population Forecast 2017 – 2067 (Population Research Center 2017), Clackamas County's total population grew steadily between 2000 and 2010, with an average annual growth rate of 1.1%. Some areas experienced more rapid population growth during the 2000s, including Sandy and Molalla at 5.6 and 3.8% respectively. Clackamas County's total population is forecast to increase by more than 107,000 between 2017 and 2035, and by more than 267,900 by 2067. Most of the growth is forecast to occur within Clackamas County's five Urban Growth Boundaries (Barlow, Canby, Estacada, Molalla, and Sandy), with the smallest percentage of average annual growth occurring in areas outside the urban growth boundaries. A growing population increases demand for land of all types. Lands designated for urban uses in Clackamas County and policies for these lands are described in the Clackamas County Comprehensive Plan, as well as other land use designations such as rural, agriculture, and forest.
- Climate Change – As discussed in Section 3.1.3, Climate change will continue to alter the existing environment over the duration of the HCP (air temperature, water temperature, water flows, and precipitation as discussed above, together with changes in wildfires and extreme weather events. However, the intensity and number of these changes and events, specific to the HCP forestlands, is unknown.
- Private forestry – Other private companies operate in the Boundary for Potential Acquisitions Lands (Section 1.3) and would likely target the 351,593 acres of Douglas fir forests as well.

Past land management actions have led to the present conditions in the Plan Area and the surrounding lands, including the listing of Covered Species considered in Port Blakely's HCP under the ESA. Future population growth in Clackamas County is likely to result in increases in demand for land of all types, including land for urban expansion, transportation, agriculture, and forest resources. Such demand is likely to continue to adversely affect Covered Species, especially when exacerbated by climate change effects.

However, a number of past, ongoing, and future mitigation projects by federal, state, and private entities which provide a degree of conservation benefit to Covered Species. A sampling of these

actions are listed above and range from projects to benefit covered fish species, such as operation of the hatchery programs for the conservation and recovery of ESA-listed salmon and steelhead, to those that would benefit covered terrestrial species, such as the Western Oregon State Forest HCP. It is not known how much these projects cumulatively offset adverse impacts, but they are unlikely to completely offset adverse impacts.

As discussed in Section 3.1.3, the NEPA analysis must consider the effects of climate change on the Proposed Action. Catastrophic wildfires, such as the 2020 Riverside and Beachie Creek wildfires that burned western Oregon, or multiple smaller fires will alter the existing landscape. For example, the 2020 wildfires affected approximately 8,100 acres of the 2022 Ownership. The catastrophic wildfires burned with mixed-severity and diminished the quality of fish and wildlife habitat in some areas while increasing the diversity of habitat features in other areas.

Wildfires and other unforeseen or changed circumstances as described in Chapter 8 of the HCP would not prevent the Applicant from achieving the objectives and commitments described in the HCP. Port Blakely has committed to adaptively managing the HCP Area in accordance with the HCP and the ITPs. As external forces, including climate-change induced forces alter the landscape, Port Blakely would adjust its harvest strategy accordingly. The overall intent, conservation measures, and commitments summarized in Table 2-1 and the age class forecast in Figure 3-2 would be maintained.

As discussed in Chapter 3, the Proposed Action would also provide a degree of conservation benefit for each of the Covered Species when compared to the No-action Alternative. However, given the adverse conditions that the Covered Species experience, and are likely to continue to experience in the Plan Area in the future, the cumulative impact on each of these covered species would remain adverse both with and without the Proposed Action. The incremental cumulative impact of the Proposed Action on each of the covered species would be negligible and perhaps only slightly incrementally discernable from the No-action Alternative.

Chapter 5

Agencies Consulted

Confederated Tribes of the Grand Ronde

NMFS

ODF

ODFW

USFWS

WEST, Inc.

Chapter 6

Literature Cited

- 16 United States Code (USC) §§ 1531-1544. 1973. Title 16 – Conservation; Chapter 35 – Endangered Species; Sections (§§) 1531-1544. 16 USC 1531-1544. Available online: <https://www.fws.gov/le/USStatutes/ESA.pdf>
- 16 United States Code (USC) § 1532. 1973. Title 16 – Conservation; Chapter 35 – Endangered Species; Section (§) 1532 – Definitions. 16 USC 1532. December 28, 1973. [Public Law (P.L.) 93-205, § 3, December 28, 1973, 87 Statute (Stat.) 885; P.L. 94-359, § 5, July 12, 1976, 90 Stat. 913; P.L. 95-632, § 2, November 10, 1978, 92 Stat. 3751; P.L. 96-159, § 2, December 28, 1979, 93 Stat. 1225; P.L. 97-304, § 4(b), October 13, 1982, 96 Stat. 1420; P.L. 100-478, Title I, § 1001, October 7, 1988, 102 Stat. 2306.]. Available online: <https://www.gpo.gov/fdsys/pkg/USCODE-2011-title16/pdf/USCODE-2011-title16-chap35-sec1532.pdf>
- 36 Code of Federal Regulations (CFR) 800.3. Protection of Historic Properties. Subpart B – The Section 106 Process; Section 800.3 – Initiation of the Section 106 Process. Available online: <https://www.achp.gov/sites/default/files/regulations/2017-02/regs-rev04.pdf>
- 43 Code of Federal Regulations (CFR) 46.3. 2014. Title 48 – Federal Acquisition Regulations System; Chapter 1 – Federal Acquisition Regulation; Subchapter G – Contract Management; Part 46 – Quality Assurance; Subpart 46.3 – Contract Clauses. October 1, 2014.
- 43 Federal Register (FR) 9607-9615. 1978. Endangered and Threatened Wildlife and Plants; Reclassification of the Gray Wolf in the United State and Mexico, with Determination of Critical Habitat in Michigan and Minnesota; Final Rule. Department of the Interior Fish and Wildlife Service. 43 FR 9607. March 9, 1978.
- 46 Federal Register (FR) 18026-18038. 1981. Forty Most Asked Questions Concerning CEQ’s National Environmental Policy Act Regulations. 46 FR 18026. March 23, 1981.
- 50 Code of Federal Regulations (CFR) Part 17. Department of the Interior Fish and Wildlife Service. 2019. Federal Register (FR) 84: 158 Endangered and Threatened Wildlife and Plants; 12-Month Findings on Petitions to List Eight Species as Endangered or Threatened Species. Department of the Interior Fish and Wildlife Service. August 15, 2019. Available online: <https://www.govinfo.gov/content/pkg/FR-2019-08-15/pdf/2019-17536.pdf#page=1>
- 50 Code of Federal Regulations (CFR) Part 222. 1999. Title 50 – Wildlife and Fisheries; Chapter I – United States Fish and Wildlife Service, Department of the Interior; Subchapter C – Marine Mammals; Part 222 – General Endangered and Threatened Marine Species. 50 CFR 222. [16 USC 742a et seq. 64 Federal Register 14054, March 23, 1999, unless otherwise noted.]. Available online: <https://www.govinfo.gov/content/pkg/CFR-2012-title50-vol10/pdf/CFR-2012-title50-vol10-part222.pdf>
- 54 United States Code (USC) 300101 et seq. 2014. Title 54 – National Park Service and Related Programs; National Park Service and Related Programs Sections 300101 – 320303. 54 USC 300101 et seq.
- 55 Federal Register (FR) 123: 26114-26194. 1990. Endangered and Threatened Wildlife and Plants; Determination of Threatened Status for the Northern Spotted Owl; Final Rule. Department of the Interior Fish and Wildlife Service. 55 FR 26114. June 26, 1990. Available online: https://archives.federalregister.gov/issue_slice/1990/6/26/26102-26194.pdf#page=13

- 64 Federal Register (FR) 210: 58910-58933. 1999. Endangered and Threatened Wildlife and Plants; Determination of Threatened Status for Bull Trout in the Conterminous United States; Final Rule. Department of the Interior Fish and Wildlife Service. 64 FR 58910. December 1, 1999.
- 70 Federal Register (FR) 123: 37159-37216. 2005. Endangered and Threatened Species: Final Listing Determinations for 16 ESUs of West Coast Salmon, and Final 4(d) Protective Regulations for Threatened Salmonid ESUs; Final Rule. Department of the Interior Fish and Wildlife Service. 70 FR 37159. June 28, 2005.
- 71 Federal Register (FR) 3: 834-862. 2006. Endangered and Threatened Species; Final Listing Determinations for 10 Distinct Population Segments of West Coast Steelhead. National Marine Fisheries Service (NMFS), National Oceanic and Atmospheric Administration (NOAA), Commerce. 71 FR 834. January 5, 2006. Available online: <https://www.govinfo.gov/content/pkg/FR-2006-01-05/pdf/06-47.pdf>
- 80 Federal Register (FR) 126: 37568-37579. 2015. Endangered and Threatened Wildlife and Plants; 90-Day Findings on 31 Petitions. Department of the Interior Fish and Wildlife Service. 80 FR 37568. July 1, 2015.
- 84 Federal Register (FR) 244: 69712-69713. 2019. Endangered and Threatened Wildlife and Plants; Threatened Species Status for West Coast Distinct Population Segment of Fisher With Section 4(d) Rule; Revised Proposed Rule; Reopening of Public Comment Period. Department of the Interior Fish and Wildlife Service. 84 FR 69712. December 19, 2019.
- 85 Federal Register (FR) 213: 69778-69895. 2020. Endangered and Threatened Wildlife and Plants; Removing the Gray Wolf (*Canis lupus*) From the List of Endangered and Threatened Wildlife; Final Rule and Notification of Petition Finding. Department of the Interior Fish and Wildlife Service. 85 FR 69778. November 3, 2020. Available online: <https://www.govinfo.gov/content/pkg/FR-2020-11-03/pdf/2020-24171.pdf>
- American Indian Religious Freedom Act. 1978. Title 42 – the Public Health and Welfare; Chapter 21 – Civil Rights; Subchapter I – Generally; Section 1996 – Protection and Preservation of Traditional Religions of Native Americans. 42 United States Code (USC) 1996. [Pub. L. 95-341, §1, Aug. 11, 1978, 92 Stat. 469.]. Available online: <http://www.gpo.gov/fdsys/pkg/USCODE-2010-title42/pdf/USCODE-2010-title42-chap21-subchapI-sec1996.pdf>
- Abatzoglou, J.T., D.E. Rupp, and P.W. Mote. 2014. Seasonal Climate Variability and Change in the Pacific Northwest of the United States. *Journal of Climate*. Volume 27: Issue 5, 2125-2142
- Andersen, D. E., S. DeStefano, M. I. Goldstein, K. Titus, C. Crocker-Bedford, J. J. Keane, R. G. Anthony, and R. N. Rosenfield. 2003. Technical Review of the Status of the Northern Goshawks in the Western United States. Final Report submitted to The Raptor Research Foundation Inc and The Wildlife Society by The Joint Raptor Research Foundation Inc. and The Wildlife Society Technical Committee on the Status of the Northern Goshawks in the Western United States.
- Anderson, S. K. 2002. *Lasiurus cinereus* (On-line). Animal Diversity Web. Accessed March 2018. Available online: https://animaldiversity.org/accounts/Lasiurus_cinereus/
- Aubry, K. B. and J. C. Lewis. 2003. Extirpation and Reintroduction of Fishers (*Martes pennanti*) in Oregon: Implications for Their Conservation in the Pacific States. *Biological Conservation* 114(1): 79-90.

- Beechi, T.J. 2015. Letter to Tom Imeson, Chairman, Oregon Board of Forestry, Oregon Department of Forestry providing additional perspective for consideration on the action titled “Developing Riparian Rule Prescriptions”, scheduled for the Board of Forestry (Board) review on July 23, 2015. NOAA Fisheries, Northwest Fisheries Science Center, Fish Ecology Division, Watershed Program. Seattle, Washington.
- Belongie, C. C. 2008. Using GIS to Create a Gray Wolf Habitat Suitability Model and to Assess Wolf Pack Ranges in the Western Upper Peninsula of Michigan. *Papers in Resource Analysis* 10: 1-15.
- Bentley, J. 2017. *Lasionycteris noctivagans* (On-line). Animal Diversity Web. Accessed March 2018. Available online: https://animaldiversity.org/accounts/Lasionycteris_noctivagans/
- Betts, B. J. 1998. Roosts Used by Maternity Colonies of Silver-Haired Bats in Northeastern Oregon. *Journal of Mammalogy* 79(2): 643-650.
- Boal, C. W. and R. W. Mannan. 1994. Northern Goshawk Diets in Ponderosa Pine Forests on the Kaibab Plateau. *Studies in Avian Biology* 16: 97-102.
- Bosakowski, T., B. McCullough, F. J. Lasansky, and M. E. Vaughn. 1999. Northern Goshawks Nesting on a Private Industrial Forest in Western Washington. *J. Raptor Res.* 33(3): 240-244.
- Campbell, L. A., J. G. Hallett, and M. A. O’Connell. 1996. Conservation of Bats in Managed Forests: Use of Roosts by *Lasionycteris noctivagans*. *Journal of Mammalogy* 77: 976-984.
- Coe, F. C. 2019. 2019 Northern Spotted Owl Survey Report – Gawley Creek. Port Blakely and Cafferata Consulting. 43 p.
- Culver, D. C., H. H. Hobbs, III, M. C. Christman, and L. L. Master. 1999. Distribution Map of Caves and Cave Animals in the United States. *Journal of Cave and Karst Studies* 61: 139-140.
- Dominguez, F., E. Rivera, D.P. Lettenmaier, C.L. Castro. 2012. Changes in winter precipitation extremes for the western United States under a warmer climate as simulated by regional climate models. *Geophysical Research Letters*, Vol. 39, L05805, doi:10.1029/2011GL050762, 2012.
- Endangered Species Act (ESA). 1973. 16 United States Code (USC) §§ 1531-1544, Public Law (PL) 93-205, December 28, 1973, as amended, PL 100-478 [16 USC 1531 *et seq.*]; 50 Code of Federal Regulations (CFR) 402.
- Executive Order 13175. 2000. Consultation and Coordination with Indian Tribal Governments. Washington, D.C. Available online: https://energy.gov/sites/prod/files/nepapub/nepa_documents/RedDont/Req-EO13175tribgovt.pdf
- Finn, S. P., D. E. Varland, and J. M. Marluff. 2002. Does Northern Goshawk Breeding Occupancy Vary with Nest-Stand Characteristics on the Olympic Peninsula, Washington? *Journal of Raptor Research* 36(4): 265-279.
- Fritts, S.H. and L.D. and Mech. 1981. Dynamic, Movements, and Feeding Ecology of a Newly Protected Wolf Population in Northwestern Minnesota. *Wildlife Monographs* 80:3-79.
- Fuller, T. K. 1989. Population Dynamics of Wolves in North-Central Minnesota. *Wildlife Monographs* 105: 1-41.
- Furlonger, C. L., H. J. Dewar, and M. B. Fenton. 1987. Habitat Use by Foraging Insectivorous Bats. *Canadian Journal of Zoology* 65: 284-288.

- Haight, R. G., D. J. Mladenoff, and A. P. Wydeven. 1998. Modeling Disjunct Gray Wolf Populations in Semi- Wild Landscapes. *Conservation Biology* 12: 879-888.
- International Union for Conservation of Nature (IUCN). 2018. The IUCN Red List of Threatened Species. Version 2017-3. Accessed June 2018. Available online: <http://www.iucnredlist.org/>
- Isaak, D.J., C.C. Muhlfeld, A.S. Todd, R. Al-Chokhachy, J. Roberts, J.L. Kershner, K.D. Fausch, S.W. Hostetler. 2012. The Past as a Prelude to the Future for Understanding 21st-Century Climate Effects on Rocky Mountain Trout. *Fisheries*. Vol. 37, No. 12. December.
- Independent Scientific Advisory Board (ISAB). 2007. Climate Change Impacts on Columbia River Basin Fish and Wildlife. ISAB Climate Change Report ISAB 2007-2.
- Keith, L. B. 1983. Population Dynamics of Wolves. Pp. 67-77. L. N. Carbyn, ed. *In: Wolves in Canada and Alaska*. Canadian Wildlife Service Report Series 45.
- Knight, R. L. and S. K. Skagen. 1988. Effects of Recreational Disturbance on Birds of Prey: A Review. R. L. Glinski et al., ed. *Proceedings of the Southwest Raptor Management Symposium and Workshop*, National Wildlife Federation, Washington, D. C. 355-359 p.
- Kunkel, K.E., T.R. Karl, D.R. Easterling, K. Redmond, J. Young, X. Yin, and P. Hennon. 2013. Probable maximum precipitation and climate change. *Geophysical Research Letters*. Volume 40, Issue 7. April. 1402-1408.
- Lertzman-Sepofsky, G.F., A.M.m Kissel, B. Sinervo, W.J. Palen. 2020. Water Loss and Temperature Interact to Compound Amphibian Vulnerability to Climate Change. *Global Change Biology*; doi: 10.1111/gcb. 15231.
- Mantua, N.J., I. Tohver, and A.F. Hamlet. 2009. Chapter 6 in *The Washington Climate Change Impacts Assessment: Evaluating Washington's Future in a Changing Climate*, Climate Impacts Groups, University of Washington, Seattle, Washington.
- Mantua, N.J. and I. Tohver. 2010. Climate Change Impacts on Streamflow Extremes and Summertime Stream Temperature and Their Possible Consequences for Freshwater Salmon Habitat in Washington State. *Climate Change*, 102(1): 187-223.
- Mattson, T. A., S. W. Buskirk, and N. L. Stanton. 1996. Roost Sites of the Silver-Haired Bat (*Lasionycteris noctivagans*) in the Black Hills, South Dakota. *Great Basin Naturalist* 56: 247-253.
- McLaughlin, R. T. 2002. Northern Goshawk Nest Monitoring on Br 128, Sproat Lake Timberlands. [Unpublished Report]. Nanaimo Woodlands, B.C. Coastal Group, Nanaimo, British Columbia, Canada.
- Mote, P., A. K. Snover, S. Capalbo, S. D. Eigenbrode, P. Glick, J. Littell, R. Raymond, and S. Reeder, 2014: Ch. 21: Northwest. *Climate Change Impacts in the United States: The Third National Climate Assessment*, J. M. Melillo, Terese (T.C.) Richmond, and G. W. Yohe, Eds., U.S. Global Change Research Program, 487-513.
- National Environmental Policy Act (NEPA). 1969. 42 United States Code Annotated (USCA) 4321-4370e. [Public Law 91-190, § 2, January 1, 1970, 83 Statute 852.].
- National Historic Preservation Act. 1966. [Public Law 89-665.]. October 15, 1966.

- National Marine Fisheries Service (NMFS). 2013. ESA Recovery Plan for Lower Columbia River Coho Salmon, Lower Columbia River Chinook Salmon, Columbia River Chum Salmon, and Lower Columbia River Steelhead. Northwest Region. 503 p.
- National Marine Fisheries Service (NMFS). 2016. Endangered Species Act Section 7(a)(2) Biological Opinion and Magnuson-Stevens Fishery Conservation and Management Act Essential Fish Habitat for the Resource Management Plan for Western Oregon. NMFS, West Coast Region, Portland, Oregon. July 15, 2016.
- National Oceanic and Atmospheric Administration (NOAA). 2017. Policy and Procedures for Compliance with the National Environmental Policy Act and Related Authorities Companion Manual for NOAA Administrative Order 216-6A. January 13.
- NatureServe. 2018a. Bat Species Comprehensive Reports. NatureServe Explorer, Plants/Animals/Bats. Accessed March 13, 2018. Available online: http://explorer.natureserve.org/servlet/NatureServe#anchor_node
- NatureServe. 2018b. Natureserve Explorer. NatureServe Explorer: An Online Encyclopedia of Life [web application]. Version 7.1. Accessed multiple dates. Available online: <http://explorer.natureserve.org/>
- Oakleaf, J. K., D. L. Murray, J. R. Oakleaf, E. E. Bangs, C. M. Mack, D. W. Smith, J. A. Fontaine, M. D. Jimenez, T. J. Meier, and C. C. Niemeyer. 2006. Habitat Selection by Recolonizing Wolves in the Northern Rocky Mountains of the United States. *Journal of Wildlife Management* 70: 554-563. doi: 10.2193/0022-541X(2006)70[554:HSBRWI]2.0.CO;2.
- Oregon Biodiversity Information Center (ORBIC). 2016. Rare, Threatened and Endangered Species of Oregon. Institute for Natural Resources, Portland State University, Portland, Oregon. 130 p.
- Oregon Forest Practice Administrative Rules and Forest Practices Act. Available online: <https://www.oregon.gov/odf/Documents/workingforests/fpa-rule-book-2021.pdf>
- Oregon Department of Fish and Wildlife (ODFW). 2010. R. Beamesderfer, L. Berg, M. Chilcote, J. Firman, E. Gilbert, K. Goodson, D. Jepsen, T. Jones, S. Knapp, C. Knutsen, K. Kostow, B. McIntosh, J. Nicholas, J. Rodgers, T. Stahl and B. Taylor. Lower Columbia River Conservation and Recovery Plan for Oregon Populations of Salmon and Steelhead. Oregon Department of Fish and Wildlife, Salem, Oregon.
- Oregon Department of Fish and Wildlife (ODFW). 2015. Updated Biological Status Review for the Gray Wolf (*Canis lupus*) in Oregon and Evaluation of Criteria to Remove the Gray Wolf from the List of Endangered Species under the Oregon Endangered Species Act. Oregon Department of Fish and Wildlife. October 9, 2015.
- Oregon Department of Fish and Wildlife (ODFW) and National Marine Fisheries Service (NMFS). 2011. Upper Willamette River Conservation and Recovery Plan for Chinook Salmon and Steelhead. Prepared by Oregon Department of Fish and Wildlife and the National Marine Fisheries Service, Northwest Region. August 5. 462 pp.
- Oregon Department of Forestry (ODF). 1996. Forest tree seed zones for western Oregon. Information compiled by William K. Randall, U.S. Forest Service. Oregon Department of Forestry, Salem, Oregon. 122 pp.
- Oregon Department of Forestry (ODF). 2018a. Forest Practice Administrative Rules and Forest Practices Act. ODF, Salem, Oregon.

- Oregon Department of Forestry (ODF). 2018b. Streams (FP). ODF Stream Data Layer Compiled from Various Sources. Oregon Department of Forestry, GIS Database Dictionary, Final v. 2.0.2. Complete September 9, 2009.
- Oregon Forest Resources Institute (OFRI). 2017. A Guide to Priority Plant and Animal Species in Oregon Forests. 52 p.
- Population Research Center. 2017. Coordinated Population Forecast for Clackamas County, Its Urban Growth Boundaries (UGB), and Area Outside UGBs 2017 – 2067. Population Research Center, College of Urban and Public Affairs, Portland State University, Portland, Oregon.
- Port Blakely. 2018a. GIS Forest Stand Inventory Database. Port Blakely, Tumwater, Washington.
- Port Blakely. 2018b. GIS Road Layer Database. Port Blakely, Tumwater, Washington.
- Port Blakely. 2018c. GIS Stream Layer Database Verified with Lidar. Port Blakely, Tumwater, Washington.
- Port Blakely and Oregon Department of Forestry (ODF). 2020. Stewardship Agreement between Port Blakely and Oregon Department of Forestry, North Cascade District and Private Forests Division. February 2020. 17 pp.
- Raley, C. M., E. C. Lofroth, R. L. Truex, J. S. Yaeger, and J. M. Higley. 2012. Habitat Ecology of Fishers in Western North America: A New Synthesis. K. B. Aubry, W. J. Zielinski, M. G. Raphael, G. Proulx, and S. W. Buskirk, editors, ed. In *Biology and Conservation of Martens, Sables, and Fishers: A New Synthesis*. Cornell University Press, Ithaca, New York, U.S.A., 51 p.
- Reynolds, R. T., E. C. Meslow, and H. M. Wight. 1982. Nesting Habitat of Coexisting Accipiter in Oregon. *Journal of Wildlife Management* 46(1): 124-138.
- Squires, J. R. and R. T. Reynolds. 1997. Northern Goshawk (*Accipiter gentilis*). A. Poole, ed. In: *The Birds of North America*. Cornell Lab of Ornithology, Ithaca, New York. Retrieved from The Birds of North America Online: <http://bna.birds.cornell.edu/bna/species/298>
- Taylor, D. A. R. 2006. Forest Management & Bats. Bat Conservation International. May 2, 2006. Available online: <http://www.batcon.org/pdfs/Bats%20and%20Forests%20Handbook.pdf>
- U.S. Department of Agriculture (U.S. Forest Service), U.S. Department of Interior (USDI), U.S. Department of Commerce, and Environmental Protection Agency. 1993. Forest Ecosystem Management: An Ecological, Economic, and Social Assessment. Report of the Forest Ecosystem Management Assessment Team. USDA, Forest Service, USDI, Fish and Wildlife Service, National Marine Fisheries Service, National Park Service, USDI, Bureau of Land Management, and Environmental Protection Agency. Interagency SEIS Team, Portland, Oregon. 1004 p.
- U.S. Department of the Interior (USDI). 1998. Status Review of the Northern Goshawk in the Forested West. Office of Technical Support- Forest Resources. U.S. Fish and Wildlife Service, Unpublished Report. 250 p.
- U.S. Fish and Wildlife Service (USFWS). 1998. Endangered and Threatened Wildlife and Plants; Notice of 12-Month Finding on a Petition to List the Northern Goshawk in the Contiguous United States West of the 100th Meridian. Federal Register 63 (124): 35183-35184. June 29, 1998.

- U.S. Fish and Wildlife Service (USFWS). 2003. Biological Opinion and Letter of Concurrence for Effects to Bald Eagles, Marbled Murrelets, Northern Spotted Owls, Bull Trout, and Designated Critical Habitat for Marbled Murrelets and Northern Spotted Owls from Olympic National Forest Program of Activities for August 5, 2003, to December 31, 2008. U.S. Department of the Interior, USFWS, Lacey, Washington.
- U.S. Fish and Wildlife Service (USFWS). 2011. Revised Recovery Plan for the Northern Spotted Owl (*Strix occidentalis caurina*). USFWS, Portland, Oregon. xvi + 258 p.
- U.S. Fish and Wildlife Service (USFWS). 2013. Biological Opinion for Effects to Northern Spotted Owls, Critical Habitat for Northern Spotted Owls, Marbled Murrelets, Critical Habitat for Marbled Murrelets, Bull Trout, and Critical Habitat for Bull Trout from Selected Programmatic Forest Management Activities March 25, 2013 to December 31, 2023 on the Olympic National Forest, Washington. USFWS Reference: 13410-2009-F-0388. USFWS, Washington Fish and Wildlife Office, Lacey, Washington. 404 p.
- U.S. Fish and Wildlife Service (USFWS). 2016. Final Species Report Fisher (*Pekania pennanti*), West Coast Population. March 2016.
- U.S. Fish and Wildlife Service (USFWS). 2017. Status of the Spotted Owl and Its Critical Habitat. USFWS, Oregon Fish and Wildlife Office, Portland, Oregon. September 18, 2017. 86 p.
- U.S. Fish and Wildlife Service (USFWS). 2018. Species Fact Sheet: Northern Spotted Owl (*Strix occidentalis caurina*). USFWS, Washington Fish and Wildlife Office, Lacey, Washington. June 14, 2018.
- U.S. Fish and Wildlife Service (USFWS). 2021. NHPA Section 106 Review: Port Blakely Oregon Forestlands ITPs and HCP. Memo from Anan Raymond to Terry Fredericks. October 26, 2021