



**DEPARTMENT OF
NATURAL RESOURCES**

SOUTH PUGET SOUND REGION

950 Farman Avenue North
Enumclaw, WA 98022

360-825-1631

SOUTHPUGET.REGION@DNR.WA.GOV
WWW.DNR.WA.GOV

August 30, 2024

**Notice of Final Determination
Next Contestant Timber Sale #30-103625
SEPA File No. 24-022903**

The Department of Natural Resources issued a Determination of Non-significance (DNS), Mitigated Determination of Non-significance (MDNS), Modified DNS/MDNS on **February 29, 2024** for this proposal under the State Environmental Policy Act (SEPA) and WAC 197-11-340(2).

This threshold determination is hereby:

Retained.

Modified. Modifications to this threshold determination include the following:

An acreage correction to Unit 2 following the SEPA comment period reduced Unit 2 from 11 acres to 10 acres. This subsequently reduces the proposal estimated harvest volume to 3,549 mbf. Attached is an updated timber sale map.

The following additional documents are also included:

- Appendix A- DNR's westside HCP planning unit older forest management
- Landscape Assessment to Identify and Manage Structurally Complex Stands to Meet Older-Forest Targets in Western Washington (May 2024).
- Stand Development Stage Assessment for Next Contestant
- Washington Natural Heritage Program Site Survey, Next Contestant Timber Sale

Withdrawn. This threshold determination has been withdrawn due to the following:

Delayed. A final threshold determination has been delayed due to the following:

Summary of Comments and Responses (if applicable):

Comment: Received March 12, 2024 from Shaun Dinubilo of the Squaxin Island Tribe, Cultural Resource Department. They have no specific concerns with this project and recommended DNR consult with the Skokomish Tribe regarding cultural resources.

Response: DNR responded to Mr. Dinubilo on March 12, 2024 that DNR was in direct contact with the Skokomish Tribe, who also received notification of the Next Contestant SEPA.



**DEPARTMENT OF
NATURAL RESOURCES**

SOUTH PUGET SOUND REGION

950 Farman Avenue North
Enumclaw, WA 98022

360-825-1631

SOUTHPUGET.REGION@DNR.WA.GOV
WWW.DNR.WA.GOV

Comment: Received March 8, 2024 from Mason County Climate Justice (MCCJ) concerning the need for an EIS in consideration of environmental and cultural impacts. MCCJ attached letters from individual Skokomish Tribal members.

Comment: Received March 11, 2024 from Mason County Climate Justice stating DNR needs to consider alternatives under SEPA and should complete an EIS for this project.

Response: DNR provided a response to MCCJ.

Comment: Received March 11, 2024 from Joshua Wright with Legacy Forest Defense Coalition reporting the presence of plant community *Pseudotsuga menziesii* – (*Abies grandis*, *Thuja plicata*) / *Mahonia nervosa* – *Gaultheria shallon* Forest) CEGL002845 in Unit 1.

Response: DNR responded to Mr. Wright on May 28, 2024 and provided the survey results and report completed by Washington Natural Heritage Program (WNHP). The survey by WNHP resulted in no element occurrences of any plant community within the Next Contestant timber sale units.

Comment: Received multiple comments from the public between March 8, 2024 and the end of the comment period on March 14, 2024. Each comment was based on templated auto-generated letter from environmental groups' websites. Comments included concerns of ecological significance of mature forests, and climate concerns.

Response: Information provided in this modified Notice of Final Determination will be sent to commenters.

Comment: Received March 14, 2024 from Christopher James, a Skokomish Tribal member expressing opposition to the project to preserve tribal rights, hunting grounds, and history.

Response: DNR provided a response to Mr. James.

Comment: Received March 14, 2024 from Stephen Kropp with Legacy Forest Defense Coalition regarding management of "structurally complex forests".

Response: DNR provided a response to Mr. Kropp regarding the Department's older forest management.

Responsible Official: Don Melton

Position/title: South Puget Sound Region Manager

Phone: (360) 825-1631

Address: 950 Farman Avenue North, Enumclaw, WA 98022

Date: 8/30/2024

Signature: Don Melton 

There is no DNR administrative SEPA appeal.



**DEPARTMENT OF
NATURAL RESOURCES**

SOUTH PUGET SOUND REGION

950 Farman Avenue North
Enumclaw, WA 98022

360-825-1631

SOUTHPUGET.REGION@DNR.WA.GOV
WWW.DNR.WA.GOV

Comment: Received March 8, 2024 from Mason County Climate Justice (MCCJ) concerning the need for an EIS in consideration of environmental and cultural impacts. MCCJ attached letters from individual Skokomish Tribal members.

Comment: Received March 11, 2024 from Mason County Climate Justice stating DNR needs to consider alternatives under SEPA and should complete an EIS for this project.

Response: DNR provided a response to MCCJ.

Comment: Received March 11, 2024 from Joshua Wright with Legacy Forest Defense Coalition reporting the presence of plant community *Pseudotsuga menziesii* – (*Abies grandis*, *Thuja plicata*) / *Mahonia nervosa* – *Gaultheria shallon* Forest) CEGL002845 in Unit 1.

Response: DNR responded to Mr. Wright on May 28, 2024 and provided the survey results and report completed by Washington Natural Heritage Program (WNHP). The survey by WNHP resulted in no element occurrences of any plant community within the Next Contestant timber sale units.

Comment: Received multiple comments from the public between March 8, 2024 and the end of the comment period on March 14, 2024. Each comment was based on templated auto-generated letter from environmental groups' websites. Comments included concerns of ecological significance of mature forests, and climate concerns.

Response: Information provided in this modified Notice of Final Determination will be sent to commenters.

Comment: Received March 14, 2024 from Christopher James, a Skokomish Tribal member expressing opposition to the project to preserve tribal rights, hunting grounds, and history.

Response: DNR provided a response to Mr. James.

Comment: Received March 14, 2024 from Stephen Kropp with Legacy Forest Defense Coalition regarding management of "structurally complex forests".

Response: DNR provided a response to Mr. Kropp regarding the Department's older forest management.

Responsible Official: Don Melton

Position/title: South Puget Sound Region Manager

Phone: (360) 825-1631

Address: 950 Farman Avenue North, Enumclaw, WA 98022

Date: 8/30/2024

Signature: Don Melton *DM*

There is no DNR administrative SEPA appeal.



**DEPARTMENT OF
NATURAL RESOURCES**

SOUTH PUGET SOUND REGION

950 Farman Avenue North
Enumclaw, WA 98022

360-825-1631

SOUTHPUGET.REGION@DNR.WA.GOV
WWW.DNR.WA.GOV

APPENDIX A – DNR’s westside HCP planning unit older forest management

SEPA File No. 24-022903

DNR is providing an appendix to this SEPA analysis to document updated data and modeling analyses showing the evaluation and identification of suitable structurally complex forests to meet the older-forest targets expected as a modeled byproduct of management in the westside HCP planning units under the 1997 Trust lands Habitat Conservation Plan (HCP) and as a policy target in DNR’s Policy for Sustainable Forests (PSF).

In May 2024, the DNR produced a document titled ‘*Landscape Assessment to Identify and Manage Structurally Complex Stands to Meet Older-Forest Targets in Western Washington*’, which is incorporated by reference in this Addendum. This document describes the background, historical analyses regarding attainment of older forest conditions in western Washington, and updated data and modeling analyses showing when the various HCP planning units across western Washington are expected to attain a level of older forest conditions through implementation of the HCP and other conservation objectives, and outlined as targets within the PSF.

This landscape assessment identifies the existing structurally complex forests of existing structurally complex stands, and additional stands suitable to be managed for older forest targets over time. The identified stands are located in conservation areas and deferred stands unavailable for regeneration harvest. These stands include areas identified as long-term forest cover under the marbled murrelet long-term conservation strategy, riparian areas, areas conserved under the multispecies conservation strategy, potentially unstable slopes, spotted owl nest patches, old growth, Natural Areas and Natural Resource Conservation Areas, and other conservation areas deferred from regeneration harvest.

The results from the May 2024 landscape assessment, and included in the above-referenced memorandum, show that while the Straits HCP Planning Unit does not currently contain 10 to 15 percent older forest conditions, it demonstrates that through implementation of the HCP and other Policies and laws, stands containing structurally complex forests or managed for older forest targets in conservation areas is projected to exceed 10 percent in the Straits HCP Planning Unit by 2090 (Table 1). Stands currently identified to meet older forest targets are represented in the attached map titled, “2021 Older Forest Within Conservation STRAITS” (2024). Additionally, those stands projected to meet older-forest targets are depicted in the attached map titled, “Projected 2100 Older Forest Within Conservation STRAITS” (2024).

Table 1. Percent area western Washington HCP planning units with older-forest stands in conservation areas by decade through 2120. With plot discounts and disturbance factor.



**DEPARTMENT OF
NATURAL RESOURCES**

SOUTH PUGET SOUND REGION

950 Farman Avenue North
Enumclaw, WA 98022

360-825-1631

SOUTHPUGET.REGION@DNR.WA.GOV
WWW.DNR.WA.GOV

ADJUSTED QUERY OUTPUT (WITH PLOT DISCOUNT & DISTURBANCE FACTOR)											
HCP Planning Unit	Year										
	2021	2030	2040	2050	2060	2070	2080	2090	2100	2110	2120
COLUMBIA	1.1%	1.2%	1.4%	1.8%	2.6%	4.3%	6.8%	10.1%	14.0%	17.3%	18.9%
N. PUGET	3.2%	3.9%	4.9%	6.2%	7.9%	10.2%	13.2%	16.7%	20.6%	23.9%	25.0%
OESF	10.2%	10.7%	11.0%	11.7%	12.6%	13.9%	16.0%	20.1%	25.0%	28.4%	29.6%
S. COAST	0.2%	0.3%	0.6%	1.2%	2.2%	3.6%	6.0%	8.8%	12.3%	16.0%	18.7%
S. PUGET	1.7%	2.1%	2.7%	3.6%	4.6%	6.1%	8.4%	11.3%	14.4%	17.2%	18.7%
STRAITS	1.8%	2.5%	3.2%	4.3%	5.6%	7.4%	9.9%	12.6%	15.0%	17.9%	19.3%

The Next Contestant timber sale remains not identified as one of those stands designated to meet older-forest targets over time. In the Next Contestant timber sale 91 acres are being harvested, while 40 acres are being conserved (30% of proposal area) in riparian and wetland management zones, potentially unstable slopes, and leave tree areas that will contribute to older forests over time. Following the timber sale, the variable retention harvest units will be replanted with native, conifer tree species that will be supplemented by natural regeneration expected to occur as a result of the conservation areas in and around the harvested units.



**DEPARTMENT OF
NATURAL RESOURCES**

SOUTH PUGET SOUND REGION

950 Farman Avenue North
Enumclaw, WA 98022

360-825-1631

SOUTHPUGET.REGION@DNR.WA.GOV
WWW.DNR.WA.GOV

APPENDIX A – DNR’s westside HCP planning unit older forest management

SEPA File No. 24-022903

DNR is providing an appendix to this SEPA analysis to document updated data and modeling analyses showing the evaluation and identification of suitable structurally complex forests to meet the older-forest targets expected as a modeled byproduct of management in the westside HCP planning units under the 1997 Trust lands Habitat Conservation Plan (HCP) and as a policy target in DNR’s Policy for Sustainable Forests (PSF).

In May 2024, the DNR produced a document titled ‘*Landscape Assessment to Identify and Manage Structurally Complex Stands to Meet Older-Forest Targets in Western Washington*’, which is incorporated by reference in this Addendum. This document describes the background, historical analyses regarding attainment of older forest conditions in western Washington, and updated data and modeling analyses showing when the various HCP planning units across western Washington are expected to attain a level of older forest conditions through implementation of the HCP and other conservation objectives, and outlined as targets within the PSF.

This landscape assessment identifies the existing structurally complex forests of existing structurally complex stands, and additional stands suitable to be managed for older forest targets over time. The identified stands are located in conservation areas and deferred stands unavailable for regeneration harvest. These stands include areas identified as long-term forest cover under the marbled murrelet long-term conservation strategy, riparian areas, areas conserved under the multispecies conservation strategy, potentially unstable slopes, spotted owl nest patches, old growth, Natural Areas and Natural Resource Conservation Areas, and other conservation areas deferred from regeneration harvest.

The results from the May 2024 landscape assessment, and included in the above-referenced memorandum, show that while the Straits HCP Planning Unit does not currently contain 10 to 15 percent older forest conditions, it demonstrates that through implementation of the HCP and other Policies and laws, stands containing structurally complex forests or managed for older forest targets in conservation areas is projected to exceed 10 percent in the Straits HCP Planning Unit by 2090 (Table 1). Stands currently identified to meet older forest targets are represented in the attached map titled, “2021 Older Forest Within Conservation STRAITS” (2024). Additionally, those stands projected to meet older-forest targets are depicted in the attached map titled, “Projected 2100 Older Forest Within Conservation STRAITS” (2024).

Table 1. Percent area western Washington HCP planning units with older-forest stands in conservation areas by decade through 2120. With plot discounts and disturbance factor.



**DEPARTMENT OF
NATURAL RESOURCES**

SOUTH PUGET SOUND REGION

950 Farman Avenue North
Enumclaw, WA 98022

360-825-1631

SOUTHPUGET.REGION@DNR.WA.GOV
WWW.DNR.WA.GOV

ADJUSTED QUERY OUTPUT (WITH PLOT DISCOUNT & DISTURBANCE FACTOR)											
HCP Planning Unit	Year										
	2021	2030	2040	2050	2060	2070	2080	2090	2100	2110	2120
COLUMBIA	1.1%	1.2%	1.4%	1.8%	2.6%	4.3%	6.8%	10.1%	14.0%	17.3%	18.9%
N. PUGET	3.2%	3.9%	4.9%	6.2%	7.9%	10.2%	13.2%	16.7%	20.6%	23.9%	25.0%
OESF	10.2%	10.7%	11.0%	11.7%	12.6%	13.9%	16.0%	20.1%	25.0%	28.4%	29.6%
S. COAST	0.2%	0.3%	0.6%	1.2%	2.2%	3.6%	6.0%	8.8%	12.3%	16.0%	18.7%
S. PUGET	1.7%	2.1%	2.7%	3.6%	4.6%	6.1%	8.4%	11.3%	14.4%	17.2%	18.7%
STRAITS	1.8%	2.5%	3.2%	4.3%	5.6%	7.4%	9.9%	12.6%	15.0%	17.9%	19.3%

The Next Contestant timber sale remains not identified as one of those stands designated to meet older-forest targets over time. In the Next Contestant timber sale 91 acres are being harvested, while 40 acres are being conserved (30% of proposal area) in riparian and wetland management zones, potentially unstable slopes, and leave tree areas that will contribute to older forests over time. Following the timber sale, the variable retention harvest units will be replanted with native, conifer tree species that will be supplemented by natural regeneration expected to occur as a result of the conservation areas in and around the harvested units.

Landscape Assessment to Identify and Manage Structurally Complex Stands to Meet Older-Forest Targets in Western Washington

Washington State Department of Natural Resources | May 7, 2024

Summary

The Washington Department of Natural Resources (DNR) actively manages suitable forest stands to achieve, over time, older-forest structures across 10 to 15 percent of each 1997 *State Trust Lands Habitat Conservation Plan* (HCP) planning unit in western Washington. These “older-forest targets” are described in DNR’s *Policy for Sustainable Forests* (PSF).

This document (2024 Landscape Assessment) provides updated projections on the amount of older-forest stands, as defined by the PSF and discussed in this document, that will develop in western Washington by 2100 as a result of implementing landscape-level management strategies. It describes how DNR has implemented these landscape-level management strategies at the HCP planning unit scale, and how DNR has identified and prioritized suitable stands to be managed to meet older-forest targets.

This document is an update to a landscape assessment titled “Identifying Stands to Meet Older-Forest Targets in Western Washington” dated May 11, 2021 (2021 Landscape Assessment). This 2024 Landscape Assessment:

- Utilizes the same methodologies and data sources as the 2021 Landscape Assessment, which are discussed in Part 2 of this document.
- Refines and updates conservation areas from the 2021 Landscape Assessment, including the addition of newly designated areas, to better identify areas deferred from stand replacement harvest. Conservation areas include areas being conserved under the HCP; Natural Areas such as Natural Resource Conservation Areas and Natural Area Preserves; areas deferred by the PSF; and areas conserved under the Forest Practices Act.
- Updates the results tables from the 2021 Landscape Assessment that detail DNR’s projected timeline for reaching the PSF’s older-forest targets to reflect the refined and updated conservation areas.

As with the 2021 Assessment, DNR identified and designated the forest stands that will contribute to older-forest targets within its GIS spatial database. The identified stands are also illustrated on the maps in Appendix 2. The identified stands comprise some existing, suitable structurally complex stands, and additional stands suitable to be managed for older-forest targets over time. The identified stands are all located within conservation areas.

Part 1: Overview of DNR's Management Framework

Development of older-forest structures is an expected outcome of DNR's management under the HCP and a policy objective of the PSF. DNR also analyzed stand structure as part of its consideration of alternatives for the 2004 Sustainable Harvest Level calculation. For more information on older-forest structure, refer to Part 2, Identifying Older-Forest Stands.

Habitat Conservation Plan

The HCP mentions stand structure in the Multispecies Conservation Strategy for Unlisted Species. Specifically, the HCP discusses the likely outcomes of DNR's management under the HCP:

DNR has modeled the age-class distribution that will likely result from expected management under the HCP and existing policies. Results from this modeling have been used to develop a table (refer to HCP Table IV.14) of ranges of expected percentages of each of several forest habitat/structural types, using age-class as a surrogate, that would likely exist 100 years following implementation of such management (HCP pg. IV.179).

The HCP uses age classes as a surrogate for stand structure. Specifically, it utilizes an age of 150 years in the five west-side planning units, and 200 years in the Olympic Experimental State Forest (OESF) as representative of a stand in the fully functional stand stage. In the HCP's analysis, the modeling projected that forest stands in the fully functional stand stage would occur on approximately 10 to 15 percent of the five west-side planning units and the OESF after 100 years of HCP implementation (in other words, by 2097).

Sustainable Harvest Calculation

The 2004 *Final Environmental Impact Statement on Alternatives for Sustainable Forest Management of State Trust Lands in Western Washington and for Determining the Sustainable Harvest Level* (2004 Sustainable Harvest FEIS) includes an analysis of forest stands over time using eight stand development stages. (Refer to Appendix 1 of this document for forest inventory queries used to identify stand development stages in the 2004 Sustainable Harvest FEIS.) The Board of Natural Resources adopted its preferred alternative, which includes a proposed policy change, in Resolution 1110:

The proposed Preferred Alternative would target 10 to 15 percent of each westside HCP Planning Unit as older forests based on structural characteristics. The desired structural characteristics are represented by stand development classes understory development through old natural forests (as described in the Sustainable Forest Management DEIS)." (Resolution 1110, pg. 3 of Document 2). The 2004 Sustainable Harvest FEIS defined structurally complex stands as those stands in the botanically diverse, niche diversification, and fully functional stages of stand development (2004 Sustainable Harvest FEIS, pg. 4-22).

The FEIS further indicates that the preferred alternative includes a proposed policy to "Manage 10-15% of each Planning Unit in Mature Forest Component" (2004 Sustainable Harvest FEIS, pg. 4-23 Table 4.2-

12). The proposed policy was analyzed within the 2004 Sustainable Harvest FEIS, and then later adopted with the then-anticipated PSF (which was an update to the 1992 *Forest Resources Plan*):

The policies amended through the Final Environmental Impact Statement on Alternatives for Sustainable Forest Management of State Trust Lands in Western Washington (2004) have already been analyzed and adopted by the Board of Natural Resources and will be included in the PSF” (Final Environmental Impact Statement on the Policy for Sustainable Forests [PSF FEIS] pg. 1-3).

Policy for Sustainable Forests

The Board of Natural Resources adopted the PSF in 2006. The PSF contains a suite of landscape-level management strategies, including the General Silvicultural Strategy, which adopted the proposed policy analyzed in the 2004 Sustainable Harvest FEIS (PSF pg. 46). The PSF states that “DNR intends to actively manage suitable structurally complex forests to achieve older-forest structures across 10 to 15 percent of each western Washington HCP planning unit in 70 to 100 years.” Meeting older-forest targets within 70 to 100 years equates to target dates of 2076 to 2106. The PSF emphasized that DNR anticipates reaching the older-forest targets over time. The PSF, relying on the analysis in the 2004 Sustainable Harvest FEIS (pg. 3-44), states, “Older-forest structures that contribute to this target are represented by stands in the fully functional or niche diversification stage of stand development.” It also states that, “Through landscape assessments, the department will identify suitable structurally complex forest stands to be managed to help meet older-forest targets” (PSF pg. 47).

DNR will identify stands to be managed to achieve older-forest structures in conservation areas. As noted earlier, conservation areas include Natural Areas; areas conserved under the HCP, areas deferred from harvest by the PSF, and areas conserved under the Forest Practices Act.

Part 2. Identifying Older-Forest Stands

Definitions and Query Criteria

In the 1990s and 2000s, several research teams developed and published definitions of stand development stages for Pacific Northwest forests (for example, Carey and Curtis 1996, Oliver and Larson 1996, and Franklin and others 2002, refer to references at the end of this document). These definitions are also used in the description of the policy in the PSF FEIS.

Older-forest stands are defined as those in the “niche diversification” or “fully functional” stand-development stages (PSF FEIS pg. 3-177). However, the published literature did not provide guidance about how to identify these stands based on forest inventory data.

To address this issue, DNR developed stand-level variables and associated threshold values that can be applied to DNR’s inventory data to identify forests in these two stand development stages. The variables were based on the type of inventory data that DNR collects. This work was done as part of the 2004 Sustainable Harvest FEIS and was based on scientific literature. Using these variables and threshold values, DNR was able to identify stands in these stand development stages across the landscape. Table

B.2.2-2 of the 2004 Sustainable Harvest FEIS provides the stand-development stages and representative stand-level variables and associated threshold values used in the project and is also included in Appendix 1 of this document.

DNR conducted this 2024 Landscape Assessment to monitor forest conditions existing on the landscape. For this work, DNR used the definitions of stand development stages adopted in the PSF and queried them using the identified, representative stand-level variables and associated threshold values as shown in Appendix 1.

DNR did not use descriptions or methods of identifying these forests that were produced after the 2004 Sustainable Harvest FEIS. For example, *Identifying Mature and Old Forests in Western Washington* (Van Pelt 2007), and environmental impacts statements for the *South Puget Forest Land Plan* (DNR 2010), *OESF Forest Land Plan* (DNR 2016), and the 2019 sustainable harvest level (DNR 2019) used different methods to classify stand development and older-forest stands for the purposes of those analyses. Van Pelt (2007) also provides a method to identify older-forest stands and trees in the field. The descriptions and analyses in these documents complement but do not redefine the direction set in the PSF or any of the strategies or policies contained in the PSF.

Identification of Suitable Stands

The HCP projected that the 10 to 15 percent older-forest structure target will likely be achieved over time through implementation of its conservation strategies (HCP IV.179). The HCP's projection is based on the premise that fully functional structure is likely to develop in riparian zones, wildlife habitat, and other areas conserved by the HCP. The PSF directs DNR to manage suitable stands to meet older-forest targets, as defined in the PSF (PSF pg. 46). The PSF notes that “the size of the stand, its proximity to old growth or other structurally complex forest stands, or the scarcity of old growth or other structurally complex forest stands are all factors in determining whether a stand is suitable for contributing to older-forest targets” (PSF pg. 46).

DNR manages approximately 1.6 million acres of forested land in western Washington under the HCP. Approximately 681,000 acres (43 percent) of that land is permanently deferred from harvest by the HCP or PSF or has been incorporated into a Natural Area. These conserved areas provide good connectivity with other conserved and federal land, may be centered around old growth, provide optimal wildlife habitat, and contain the majority of older-forest structure on DNR-managed lands. Based on these factors, DNR has determined that conserved areas are the most suitable places to manage for older-forest targets.

While some of the forest stands DNR has identified to be managed for older-forest structure are not currently structurally complex, DNR anticipates that all identified stands will reach the niche diversification or fully functional stand development stage between 2076 and 2106. Stands within conserved areas that are capable of achieving older-forest structure within the anticipated time frame were prioritized over existing structurally complex stands in general ecological management areas (areas that are generally available for harvest) because their heightened connectivity to existing older forest make them more suitable to be managed to meet the older-forest targets.

Analysis

Following is an updated analysis that was completed by applying the stand-development stage stand-level variables and associated threshold values from the 2004 sustainable harvest FEIS to DNR's inventory data from 2021. The methods in this 2024 Landscape Assessment are the same as those used in the 2021 Landscape Assessment, with modifications to the conservation areas.

Methods

In both the 2021 and 2024 landscape assessments, DNR developed queries based on the stand-level variables and associated threshold values defined in the 2004 Sustainable Harvest FEIS. These queries were applied to DNR's forest inventory data and allowed DNR to identify stands (including older-forest stands) across the landscape.

The stand-level variables and associated threshold values in 2004 Sustainable Harvest FEIS were designed for use with DNR's plot-based inventory. In 2017, DNR changed the inventory system from a fully plot-based system to a system called RS-FRIS that pairs plots with remote sensing data. Due to this change in methods, the data are not structured in the same manner. As a result, DNR modified the data queries to be compatible with RS-FRIS Version 3.

Conserved Areas

For the 2021 Landscape Assessment, DNR identified conserved areas using the large data overlay. Conserved areas included Natural Areas; areas conserved under the HCP, including long-term forest cover designated under the marbled murrelet long-term conservation strategy, riparian areas, areas conserved under the multispecies conservation strategy, potentially unstable slopes, and spotted owl nest patches; areas deferred from harvest by the PSF, including old-growth forest; and areas conserved under the Forest Practices Act.

In preparing this 2024 Landscape Assessment, DNR included recently designated Natural Areas and newly identified old-growth forest in the delineated conserved areas. Further, DNR added 2,000 acres of forests designated to be set aside to the conserved areas under the fiscal year 2023-25 Capital Budget (Chapter 474, Laws of 2023, Section 3130). Lastly, DNR removed areas that are not permanently deferred, such as suitable northern spotted owl habitat that will be available for harvest once habitat thresholds are met, from the delineated conserved areas.

This 2024 Landscape Assessment confirms that DNR is on track to achieve the PSF's older-forest targets through implementation of the HCP and other conservation strategies within 100 years, by prioritizing and designating suitable structurally complex stands within conservation areas. Accordingly, DNR has not included areas outside of conservation areas to be managed to reach the PSF's older-forest targets.

Key Metrics

Max RD Age

A key starting point for identifying older-forest stands is “max RD age.” This is the age at which unthinned stands reach their maximum relative density (RD)¹. DNR used yield curves² developed for the 2019 sustainable harvest calculation to determine max RD age. These yield curves are produced by the Forest Vegetation Simulator (Dixon 2002) and adjusted to fit growing conditions on DNR-managed lands in Western Washington, based on a comparison with inventory plot data. DNR has yield curves for three cover types (Douglas-fir, red alder, and western hemlock) and four site index classes³.

In this analysis, DNR used the max RD age for each of these cover types and site index classes. Since stands in Western Washington tend to stay at or near max RD age for many decades, DNR defined max RD age as the point at which the RD yield curve levels off. The 2004 Sustainable Harvest FEIS defined the niche diversification stage, in part, as stands at least 80 years older than the max RD age, and the fully functional stage as stands at least 160 years older than the max RD age.

Table 1. Age of max RD for the three forest cover types and four site index classes on DNR managed land (refer to DNR 2019 Appendix F for more details).

Cover type	Site index class	Max RD age
Douglas fir	1	43
Douglas fir	2	43
Douglas fir	3	44
Douglas fir	4	47
Red alder	1	44
Red alder	2	43
Red alder	3	43
Red alder	4	44
Western hemlock	1	46
Western hemlock	2	44
Western hemlock	3	48
Western hemlock	4	50

Canopy Layers

Both the niche diversification and fully functional stand development stages can be defined in part by the presence of more than one canopy layer. Figure 1 shows the average number and variability of canopy

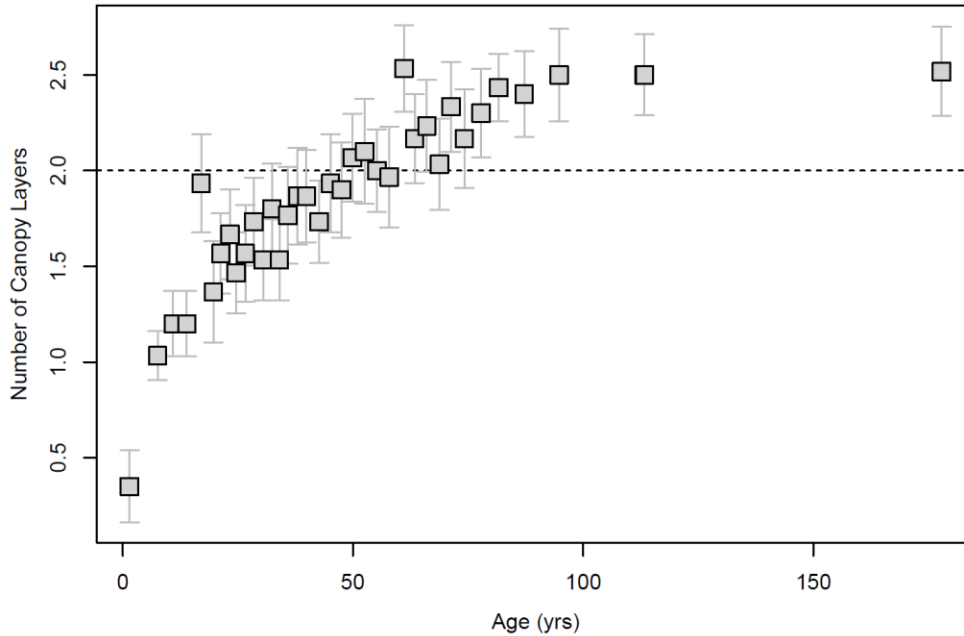
¹ Relative density (RD) is a quantification of the current density of a forest stand in comparison to a maximum level.

² A yield curve projects the volume growth of a forest over time.

³Site index describes the potential for trees to grow at a particular location.

layers in stands of different ages. By about age 80, stands average over 2 canopy layers, with 90 percent confidence intervals above 2 layers.

Figure 1. Canopy layers by age from DNR inventory plots. Each box represents the average of 30 plots. Lines show 90 percent confidence intervals.



Legacy Structures

The niche diversification and fully functional stand development stages include biological legacies in the form of snags and woody debris. DNR’s data show that stands roughly 90 years old and older average more than 3 snags per acre that are over 20 inches in diameter, with 90 percent confidence intervals extending only slightly below 3 snags per acre (Figure 2). Likewise, stands over 115 years old average more than 2,400 cubic feet of dead and down woody debris per acre (Figure 3).

Figure 2. Number of snags greater than or equal to 20 inches by age from DNR inventory plots. Each box represents the average of 30 plots. Lines show 90 percent confidence intervals.

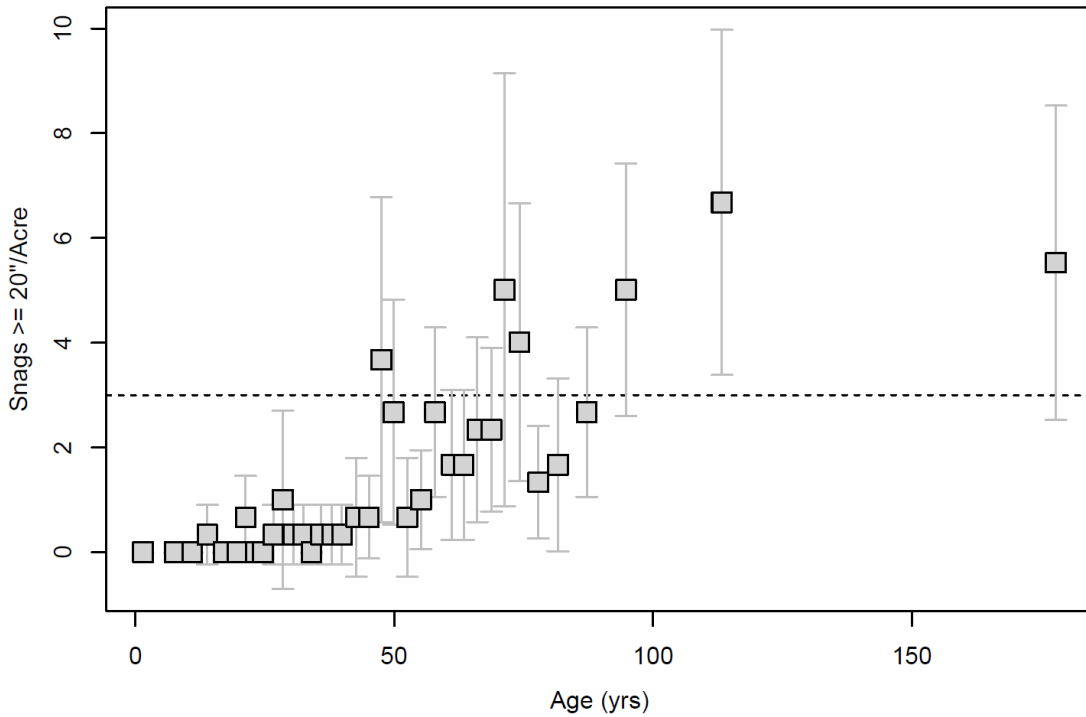
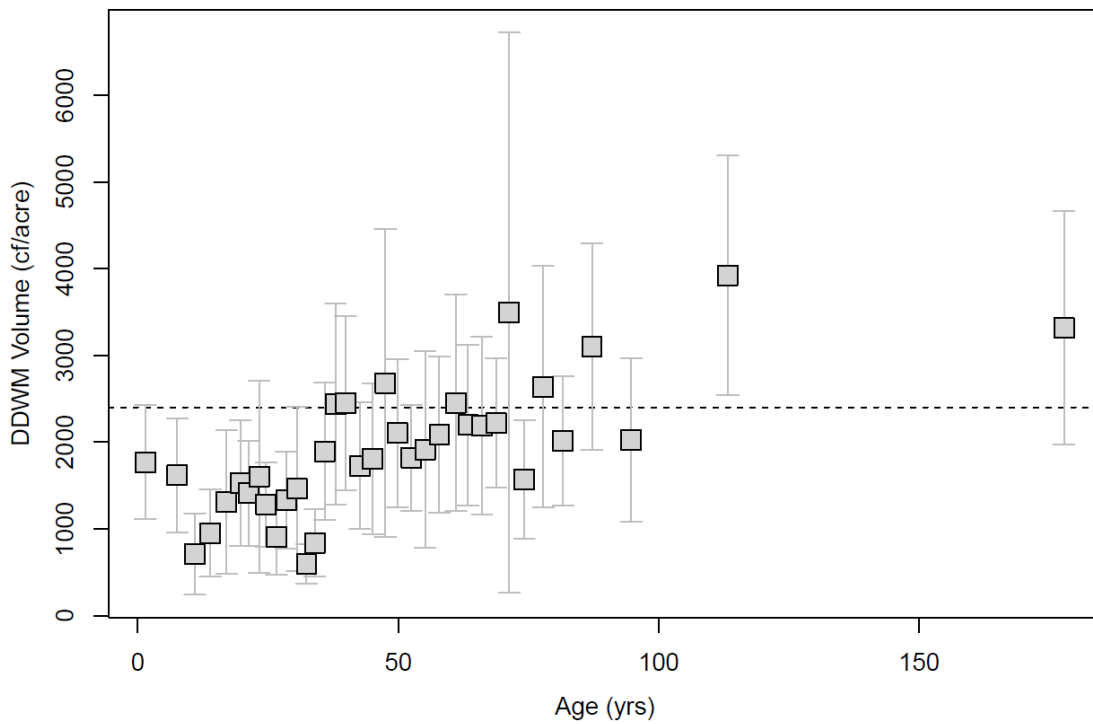


Figure 3. Cubic feet of dead and down wood material (DDWM) by age from DNR inventory plots. Each box represents the average of 30 plots. Lines show 90 percent confidence intervals.



Plot Data

Figures 2 and 3 show that aggregated RS-FRIS inventory plots in stands averaging over 115 years old have the characteristics of the niche diversification stand development stage. However, at the stand level, not all characteristics are present in all stands.

DNR used data from its older, field-plot-based inventory system, FRIS, to further analyze stand-level conditions. As stated previously, the HCP uses age classes as a surrogate for stand structure. Specifically, the HCP utilizes an age of 150 years in the five west-side HCP planning units, and 200 years in the OESF, to represent a fully functional stand development stage. DNR calculated the area of each HCP planning unit that contained stands at least five acres in size that were over 150 years old (200 years old in the OESF). Sixty-eight percent of those stands with at least 5 FRIS plots that were identified as older-forest based on age alone contained the legacy components of the older-forest stand definition. To reflect this information, DNR reduced the raw projections displayed in Table 3 by 32 percent, which is termed a plot discount. These discounts are shown in Table 2.

This current analysis made no adjustment for the time since the collection of FRIS plot data, some of which is over 20 years old. Therefore, this result is likely an underestimate of older-forest conditions at the stand level.

Disturbance

For this analysis, DNR assumed that all stands, including older-forest stands, will be subject to stand-replacing disturbances over time. As a result, not all areas projected to develop older-forest structure based on growth alone will actually achieve that structure within 100 years. In 2016, Raphael and others completed a study looking at stands that provide higher-quality marbled murrelet habitat, which is generally similar to older-forest conditions. They reported a decadal disturbance rate of 0.43 percent. DNR then assumed that disturbance rates in marbled murrelet habitat would increase by 20 percent per decade, resulting in doubling of the decadal disturbance rate over 5 decades. The marbled murrelet long-term conservation strategy disturbance rate assumption was applied across this analysis. DNR refers to this rate as a disturbance factor.

Active Management

This analysis does not project the acceleration of stand development stages due to forest management. Published literature, such as Carey and Curtis (1996), indicate that active management can advance stands through stand development stages. The PSF also envisioned active management contributing to the development of older-forest structures. DNR's management in certain conservation areas is designed to accelerate older-forest structure development. For example, the goal of the Riparian Forest Restoration Strategy (RFRS) is to hasten the development of older-forest structures in riparian areas: "The main objective of silvicultural activities will be to put the Riparian Management Zone on an accelerated trajectory toward the riparian desired future conditions" (DNR 2006c, pg. 20). Based on modeling for the 2019 Sustainable Harvest FEIS, DNR anticipates over 4,000 acres of thinning will occur in riparian areas per the RFRS between 2019 and 2067, the end of the initial HCP agreement period. Thinned stands are

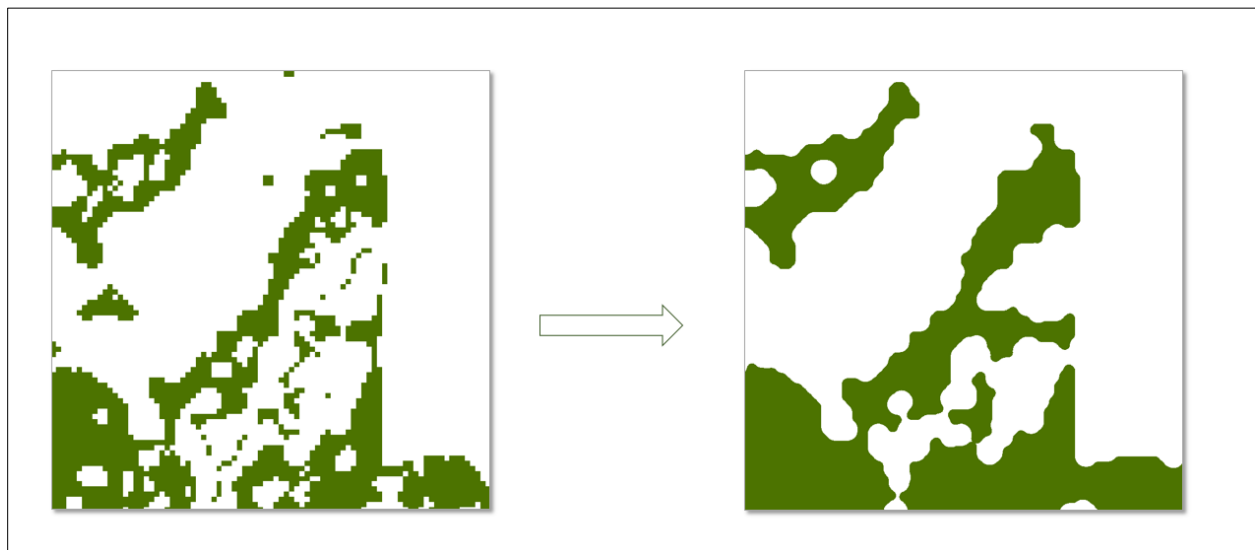
likely to develop older-forest structures faster than if left untreated. As this acceleration is not accounted for in this analysis, the query may underestimate the actual area achieving older-forest structures.

Identification of Stands

DNR maintains age data in both polygon and raster format. For this 2024 Landscape Assessment, DNR used the raster format to avoid misidentifying a stand's development stage based on polygons that do not precisely match stand boundaries. For this analysis, DNR used the same raster aggregation method that it uses to delineate northern spotted owl habitat.

DNR used the combined origin year raster in RS-FRIS as the source for age data. This data source shows age for all DNR-managed lands in western Washington in a 0.1-acre grid. In the delineation process, DNR calculated the median age of each cell by utilizing the age of the cell and the adjacent eight cells, and then assigned the median age to that cell. The resulting cells over a specified age are then converted to polygons, with adjacent cells dissolved into a single, larger polygon. Further processing is then done to fill gaps 132 feet across (two chains or double the width of an RS-FRIS cell), and to remove patch portions that are narrower than 132 feet. DNR then removed any stands under 5 acres identified in this process. As a result, only older-forest stands larger than 5 acres are counted towards the estimated area of older-forest stands in a given decade. DNR repeated this process for 10 decades, projecting the age of each cell forward to future years. This process creates smoothed, contiguous stands from the pixelated original data that DNR used, to estimate the area of older-forest stands in conservation areas into the future (Figure 4).

Figure 4. An example of spatial arrangement of input data for and results of the stand identification process converting RS-FRIS grid data into stand polygons.



Part 3: Results

Older-Forest Stands

The following tables contain the results of DNR’s 2024 Landscape Assessment, utilizing the methodologies and queries described in Part 2 with updated conservation areas. As illustrated in Table 2, through implementation of the HCP and other policies and laws, over 10 percent of the OESF HCP Planning Unit currently contains older-forest stands. The North Puget HCP Planning Unit is on track to achieve 10 percent older-forest stands by 2070; South Puget, Columbia, and Straits are on track to achieve 10 percent older-forest stands by 2090; and South Coast is on track to achieve 10 percent older-forest stands by 2100. (Table 2). **DNR will meet the PSF’s older-forest targets before 2106.**

Table 2: Percent area western Washington HCP planning units with older-forest stands in conservation areas by decade through 2120. Adjusted query output with plot discounts and disturbance factor.

HCP Planning Unit	Year										
	2021	2030	2040	2050	2060	2070	2080	2090	2100	2110	2120
Columbia	1.1%	1.2%	1.4%	1.8%	2.6%	4.3%	6.8%	10.1%	14.0%	17.3%	18.9%
North Puget	3.2%	3.9%	4.9%	6.2%	7.9%	10.2%	13.2%	16.7%	20.6%	23.9%	25.0%
OESF	10.2%	10.7%	11.0%	11.7%	12.6%	13.9%	16.0%	20.1%	25.0%	28.4%	29.6%
South Coast	0.2%	0.3%	0.6%	1.2%	2.2%	3.6%	6.0%	8.8%	12.3%	16.0%	18.7%
South Puget	1.7%	2.1%	2.7%	3.6%	4.6%	6.1%	8.4%	11.3%	14.4%	17.2%	18.7%
Straits	1.8%	2.5%	3.2%	4.3%	5.6%	7.4%	9.9%	12.6%	15.0%	17.9%	19.3%

Table 2 represents the most conservative time estimate of DNR meeting older-forest targets. The plot discount removed query results that were determined to be “false positives;” however, it is likely that the query also produced “false negatives.” In other words, the query likely eliminated stands that did not meet certain criteria from the inventory data, but do, in fact, exhibit older-forest structure. There is no way at this time to determine the rate of false negatives and so DNR did not account for them. Table 2 is the most conservative estimate of projected older-forest stands across the westside HCP Planning Units and the assessments show that DNR will meet older-forest targets in 70 to 100 years. Table 3 illustrates a less-conservative time estimate by eliminating the plot discount and disturbance factor. Refer to Appendix 3 for maps of those stands that are referenced in Table 3, year 2100.

Table 3. Percent area Western Washington HCP planning units with older-forest stands in conservation areas by decade through 2120. Values over 10% in bold. Raw query output without plot discount or disturbance factor.

HCP Planning Unit	Year										
	2021	2030	2040	2050	2060	2070	2080	2090	2100	2110	2120
Columbia	1.5%	1.7%	2.0%	2.6%	3.9%	6.5%	10.5%	15.8%	22.1%	27.8%	31.1%
North Puget	4.7%	5.8%	7.2%	9.2%	11.9%	15.6%	20.3%	26.1%	32.5%	38.5%	41.0%
OESF	14.9%	15.7%	16.3%	17.5%	18.9%	21.2%	24.5%	31.3%	39.6%	45.6%	48.6%
South Coast	0.3%	0.5%	1.0%	1.8%	3.2%	5.5%	9.2%	13.8%	19.5%	25.8%	30.7%
South Puget	2.5%	3.2%	4.0%	5.3%	6.9%	9.2%	12.9%	17.7%	22.8%	27.6%	30.7%
Straits	2.7%	3.7%	4.8%	6.3%	8.4%	11.2%	15.2%	19.6%	23.8%	28.8%	31.7%

References

Carey, A.B. and R.O. Curtis. 1996. Conservation of biodiversity: a useful paradigm for forest ecosystem management. *Wildlife Society Bulletin* 1996, 24(2): 610-620.

Dixon, G.E. (Comp.), 2002. *Essential FVS: A User's Guide to the Forest Vegetation Simulator*. Internal Report. U.S. Department of Agriculture, Forest Service, Forest Management Service Center, Fort Collins, CO, 189 pp.

DNR: refer to Washington Department of Natural Resources.

Franklin, J. F., T. A. Spies, R. Van Pelt, A. B. Carey, D. A. Thornburgh, D. R. Berg, D. B. Lindenmayer, M. E. Harmon, W. S. Keeton, D. C. Shaw, K. Bible, and J. Chen. 2002. Disturbances and Structural Development of Natural Forest Ecosystems with Silvicultural Implications, Using Douglas-fir Forests as an Example. *Forest Ecology and Management* 155:399–423. Oliver, C. D. and B. C. Larson. 1996. *Forest Stand Dynamics*, update edition. John Wiley & Sons, New York, New York. 520 p.

Raphael, M.G., G.A. Falxa, D. Lynch, S.K. Nelson, S.F. Pearson, A.J. Shirk, and R.D. Young. 2016. Status and trend of nesting habitat for the marbled murrelet under the Northwest Forest Plan. Chapter 2, in Falxa, G.A. and M.G. Raphael (tech. eds.), 2016: *Northwest Forest Plan—the first 20 years (1994-2013): Status and trend of Marbled Murrelet populations and nesting habitat*. Gen.Tech. Rep. PNW-GTR933. Portland, OR: U.S. Department of Agriculture, Forest Service, Pacific Northwest Research Station. 132 p

Van Pelt, R. 2007. *Identifying Mature and Old Forests in Western Washington*. Washington State Department of Natural Resources, Olympia, WA. 104 p.

Washington Department of Natural Resources. 1997. *Habitat Conservation Plan*. Washington State Department of Natural Resources, Olympia, Washington.

Washington Department of Natural Resources. 2004. *Final Environmental Impact Statement on Alternatives for Sustainable Forest Management of State Lands in Western Washington and for Determining the Sustainable Harvest Level*. Washington Department of Natural Resources, Olympia, Washington.

Washington Department of Natural Resources. 2005. *Draft Environmental Impact Statement on the Policy for Sustainable Forests*. Washington State Department of Natural Resources, Olympia, Washington.

Washington Department of Natural Resources. 2006a. *Policy for Sustainable Forests*. Washington State Department of Natural Resources, Olympia, Washington.

Washington Department of Natural Resources. 2006b. *Final Environmental Impact Statement on the Policy for Sustainable Forests*. Washington Department of Natural Resources, Olympia, Washington.

Washington Department of Natural Resources. 2006c. *Implementation Procedures for the Habitat Conservation Plan Riparian Forest Restoration Strategy*. Olympia, Washington.

Washington Department of Natural Resources. 2007a. Addendum to a Final Environmental Impact Statement (SEPA File #02-022201). Washington Department of Natural Resources, Olympia, Washington.

Washington Department of Natural Resources. 2008. Final Environmental Impact Statement on the Policy for Sustainable Forests. Washington Department of Natural Resources, Olympia, Washington.

Washington Department of Natural Resources. 2010. South Puget HCP Planning Unit Forest Land Plan Final Environmental Impact Statement. Washington Department of Natural Resources, Olympia, Washington.

Washington Department of Natural Resources. 2013. Olympic Experimental State Forest HCP Planning Unit Forest Land Plan Revised Draft Environmental Impact Statement. Washington Department of Natural Resources, Olympia, Washington.

Washington Department of Natural Resources. 2016. Olympic Experimental State Forest HCP Planning Unit Forest Land Plan Final Environmental Impact Statement. Washington Department of Natural Resources, Olympia, Washington.

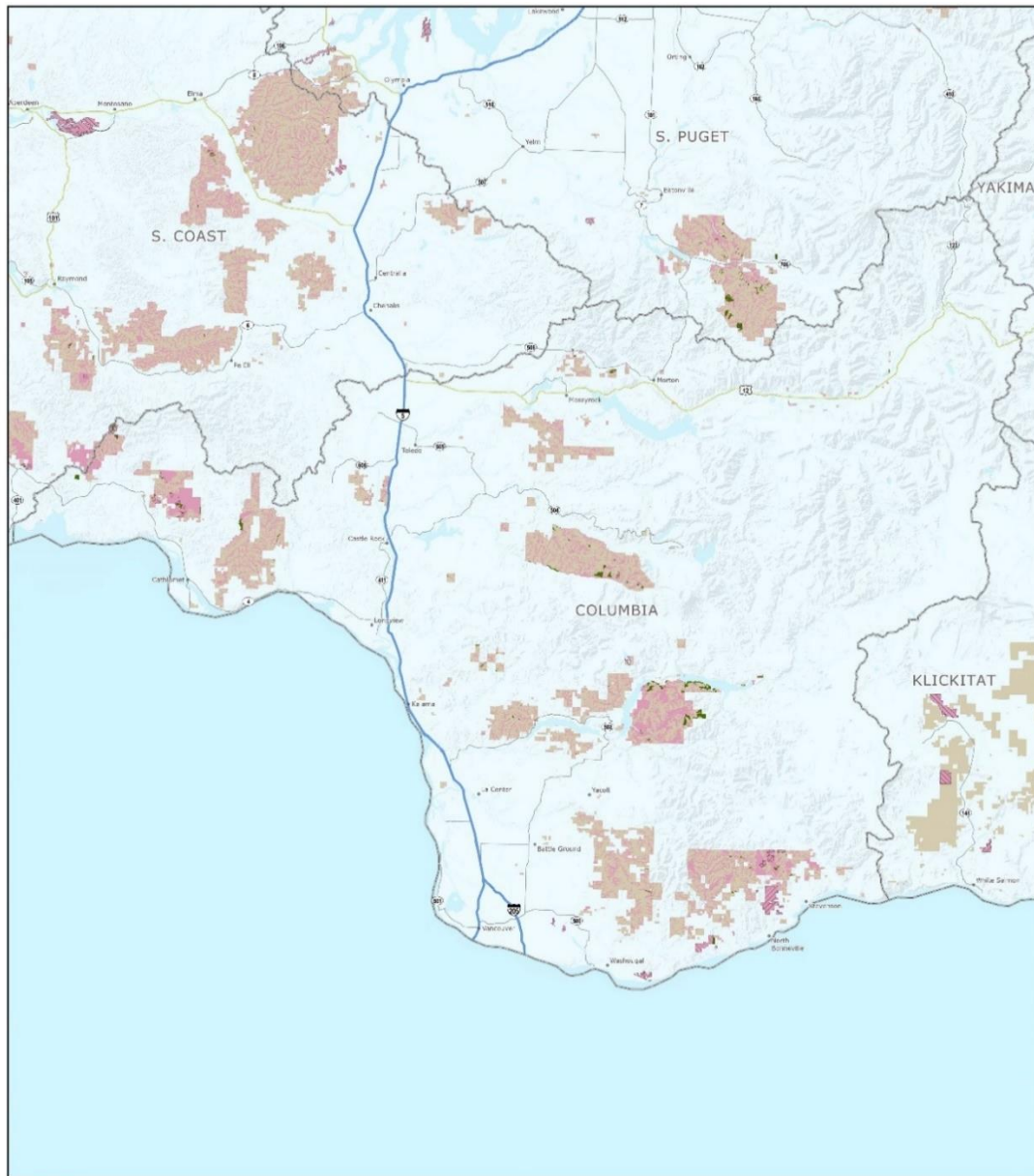
Washington Department of Natural Resources. 2019. Final Environmental Impact Statement on Alternatives for the Establishment of a Sustainable Harvest Level for Forested State Trust Lands in Western Washington. Washington Department of Natural Resources, Olympia, Washington.

Appendix 1: Stand Development Stage Definitions in DNR 2004

Stages		Stand-level Variable and Associated Threshold Value										
Summarized	Detailed	QMD	Canopy Layer	RD	Stand Age	Management Activity				Snag Ratio ¹	CWD	
						BioThin Age	Years Since BioThin	Thin Age	Years Since Thin			
Ecosystem Initiation	Ecosystem Initiation	<2										
Competitive Exclusion	Sapling Exclusion	>=2										
	Pole Exclusion	>5										
		or							>0	>=0		
	Large Tree Exclusion	>11										
		or	>11							>0	>=0	
	Understory Development		>=2	>1								
or		>=2		>=MaxRD								
or		>=2			>MaxRD Age							
Structurally Complex	Botanically Diverse	>=2	>1									
		or	>=2	>1		>=MaxRD Age+60						
		or	>=2	>1			>0	>=0				
		or	>=2	>1	>=MaxRD							
		or	>=2		>=MaxRD	>=MaxRD Age+60						
		or	>=2		>=MaxRD		>0	>=0				
		or	>=2			>=MaxRD Age+60	>0	>=0				
		or	>=2				>0	>5				
		or	>=2	>1		>MaxRD Age						
		or	>=2			>=MaxRD Age+60						
		or	>=2			>MaxRD Age	>0	>5				
		Niche Diversification		>=2	>1		>=MaxRD Age+80					>0.07
	or		>=2	>1		>=MaxRD Age+80	>0	>0				
	or		>=2	>1			>0	>5				
	or		>=2		>=MaxRD	>=MaxRD Age+80					>0.07	>2400
	or		>=2		>=MaxRD	>=MaxRD Age+80	>0	>0				
	or		>=2		>=MaxRD		>0	>5				
	or		>=2			>=MaxRD Age+80					>0.07	>2400
	or		>=2			>=MaxRD Age+80	>0	>0				
	or		>=2			>MaxRD Age	>0	>5				
	or		>=2			>=MaxRD Age+80	>0	>=0			>0.07	>2400
	or		>=2			>=MaxRD Age+80	>0	>0				
	Fully Functional			>=2	>1		>=MaxRD Age+160					>0.07
		or	>=2	>1		>=MaxRD Age+160	>0	>0				
or		>=2	>1			>0	>40					
or		>=2		>=MaxRD	>=MaxRD Age+160					>0.07	>2400	
or		>=2		>=MaxRD	>=MaxRD Age+160	>0	>0					
or		>=2		>=MaxRD		>0	>40					
or		>=2			>=MaxRD Age+160					>0.07	>2400	
or		>=2			>=MaxRD Age+160	>0	>0					
or		>=2			>MaxRD Age	>0	>40					
or		>=2			>=MaxRD Age+160	>0	>=0			>0.07	>2400	
or	>=2			>=MaxRD Age+160	>0	>0						
or	>=2				>0	>40			>0.07	>2400		

Appendix 2: Maps of Stands to Attain Older-forest Conditions in 2021

Older-forest stands and westside forest cover represent stands that have been set aside to meet older-forest targets.

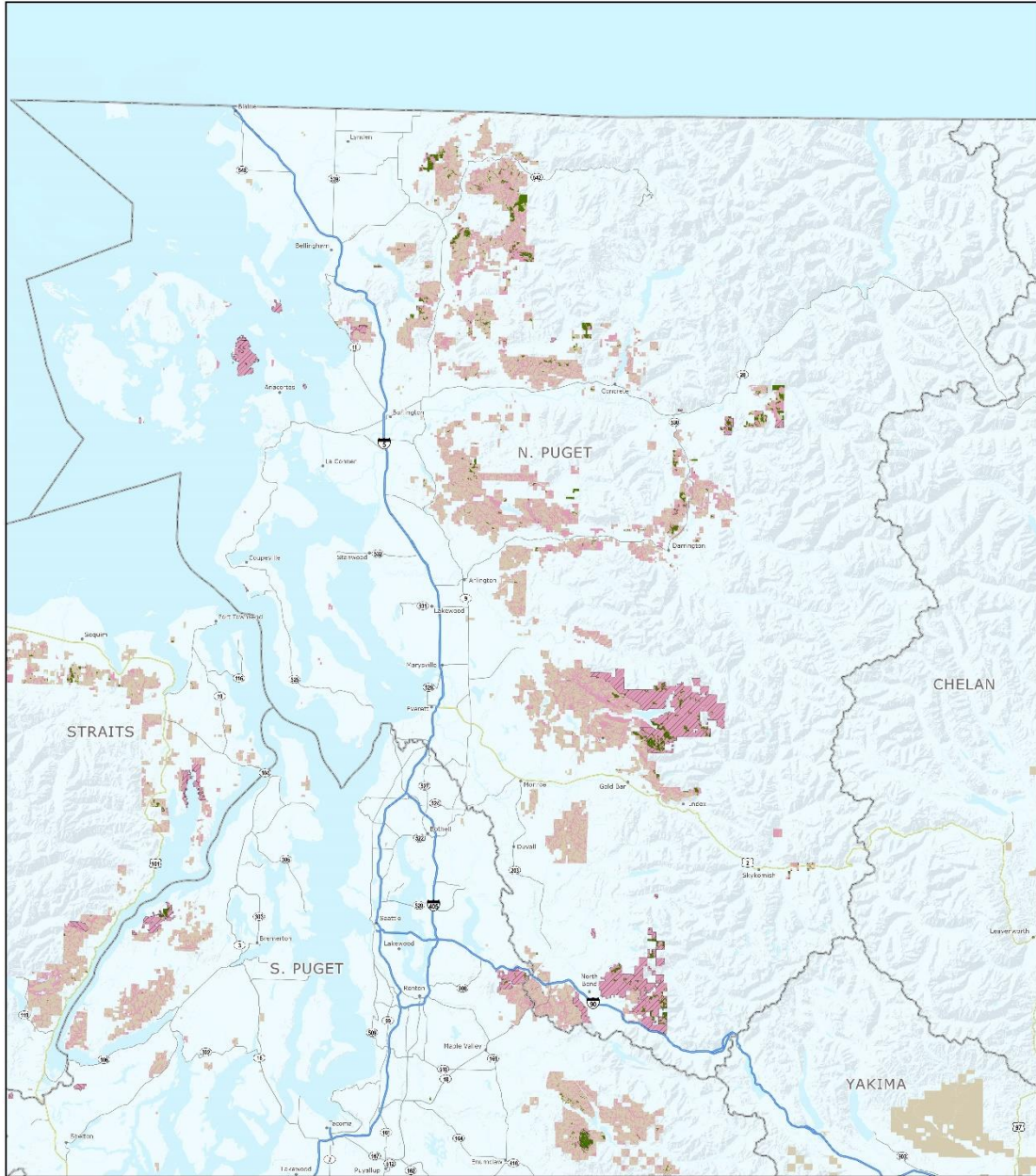


2021 Older Forest Within Conservation COLUMBIA



- Older Forest in 2021
- Westside Forest Cover
- HCP Planning Units
- Natural Area Preserve
- Natural Resource Conservation Area
- Other DNR-Managed Lands

Map created on 4/18/2024 of older forests and westside forest cover identified from the analysis documented within the memo titled "Identifying Stands to Meet Older Forest Targets in Western Washington, May 11, 2021." All data are draft and subject to change.

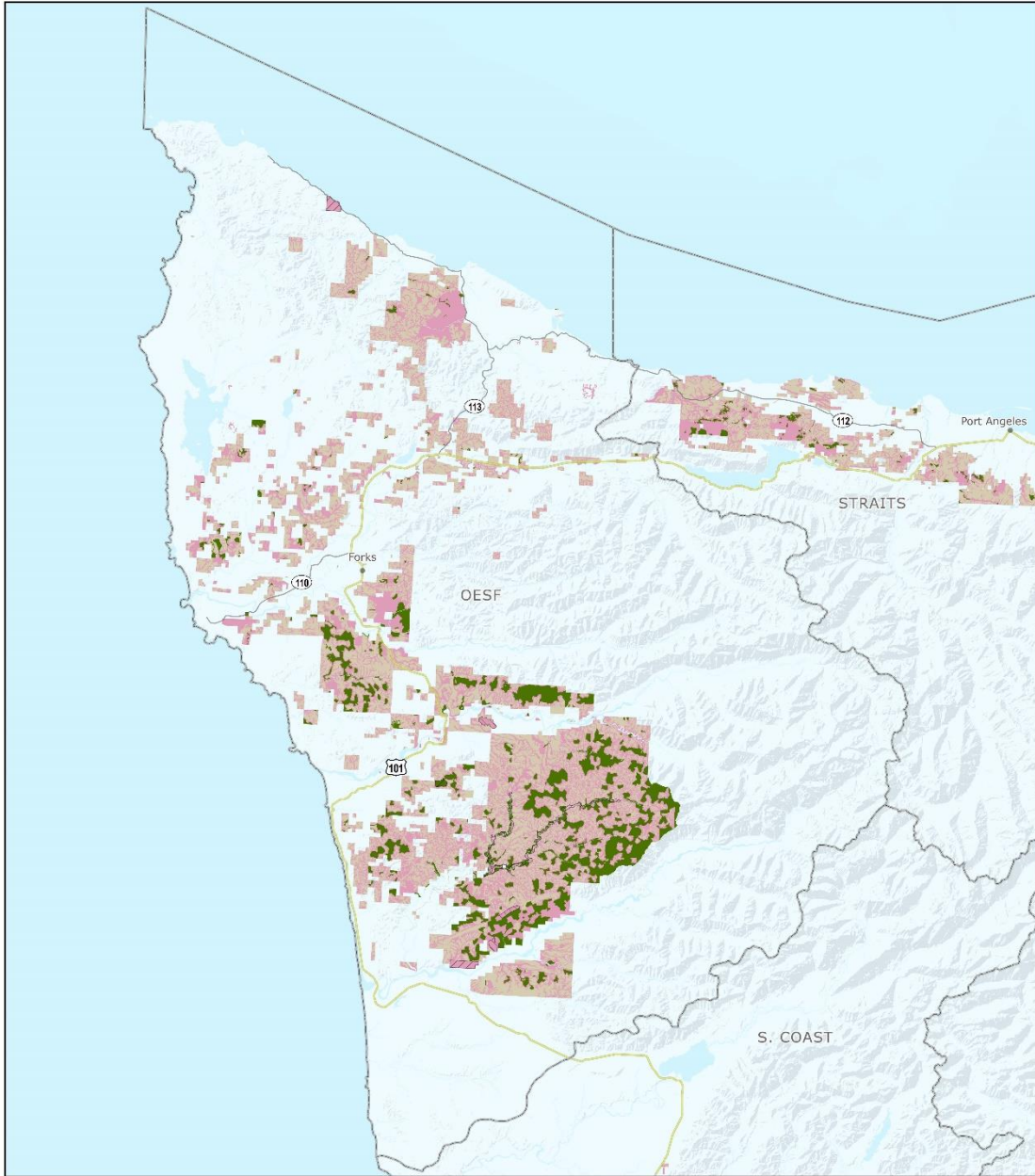


2021 Older Forest Within Conservation N. PUGET



- Older Forest in 2021
- Westside Forest Cover
- HCP Planning Units
- Natural Area Preserve
- Natural Resource Conservation Area
- Other DNR-Managed Lands

Map created on 4/18/2024 of older forests and westside forest cover identified from the analysis documented within the memo titled "Identifying Stands to Meet Older Forest Targets in Western Washington, May 11, 2021." All data are draft and subject to change.



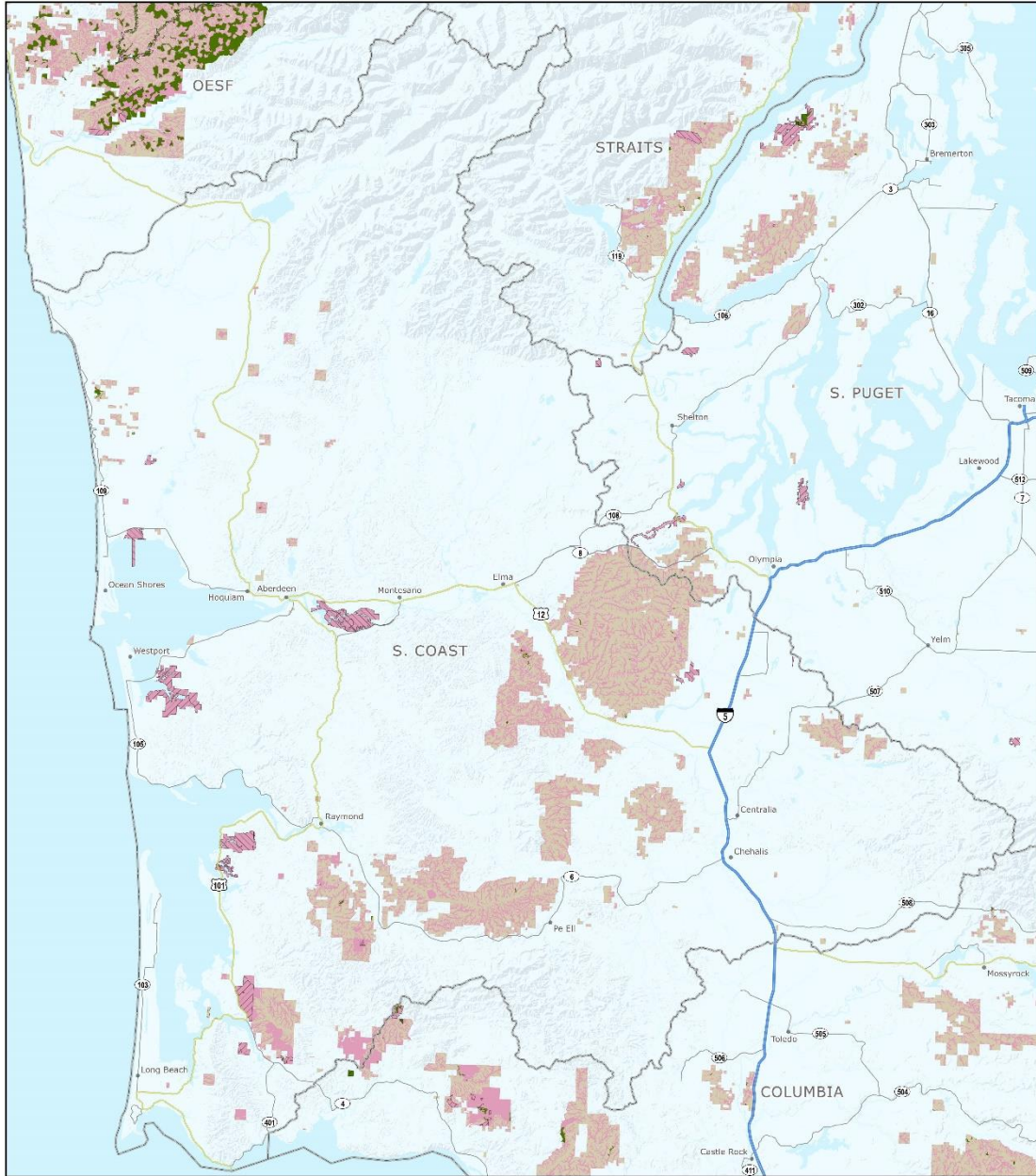
WASHINGTON STATE DEPARTMENT OF
NATURAL RESOURCES

2021 Older Forest Within Conservation OESF

- Older Forest in 2021
- Westside Forest Cover
- HCP Planning Units
- Natural Area Preserve
- Natural Resource Conservation Area
- Other DNR-Managed Lands



Map created on 4/18/2024 of older forests and westside forest cover identified from the analysis documented within the memo titled "Identifying Stands to Meet Older Forest Targets in Western Washington, May 11, 2021." All data are draft and subject to change.

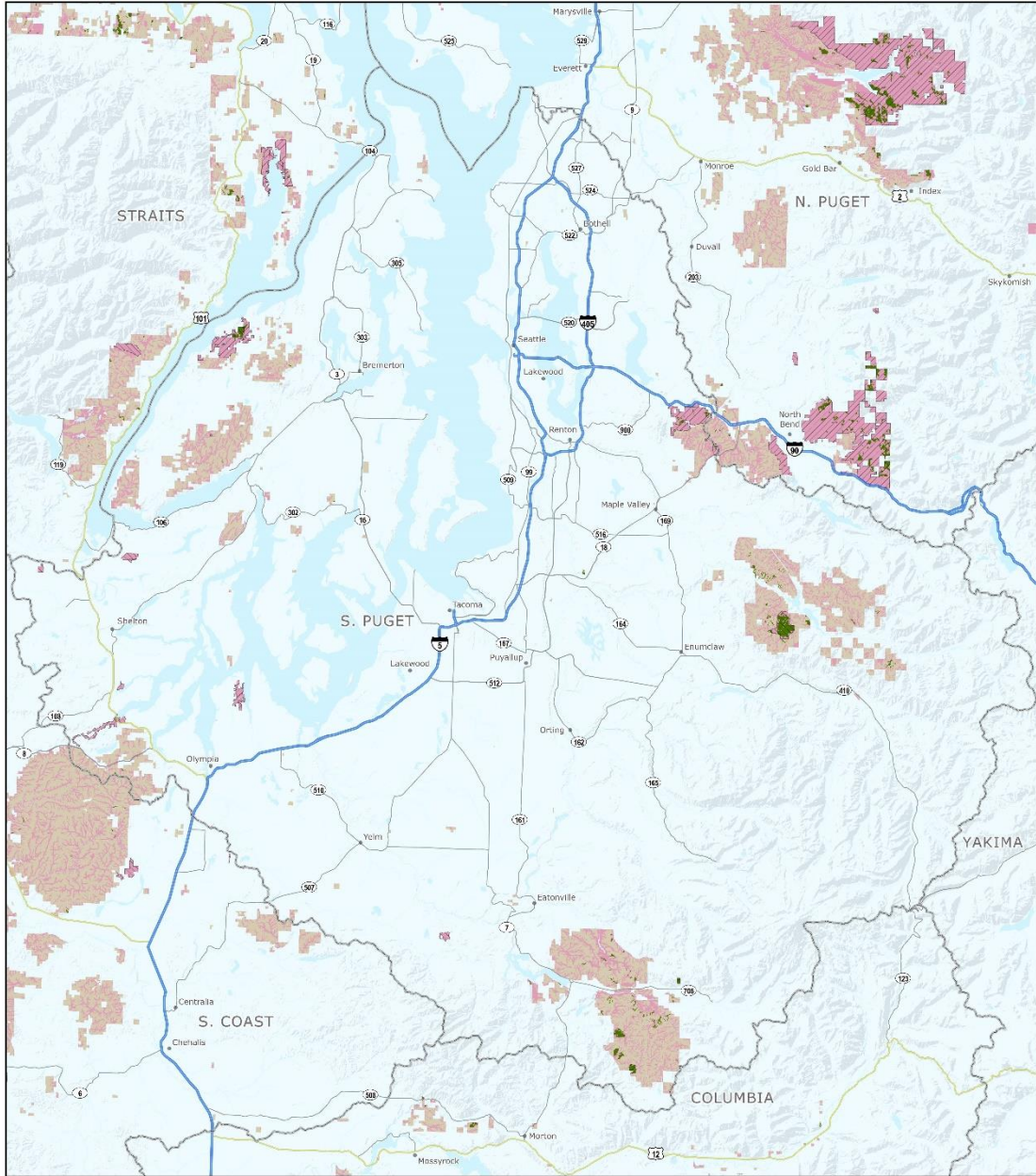


2021 Older Forest Within Conservation S. COAST

- Older Forest in 2021
- Westside Forest Cover
- HCP Planning Units
- Natural Area Preserve
- Natural Resource Conservation Area
- Other DNR-Managed Lands

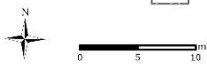


Map created on 4/18/2024 of older forests and westside forest cover identified from the analysis documented within the memo titled "Identifying Stands to Meet Older Forest Targets in Western Washington, May 11, 2021." All data are draft and subject to change.

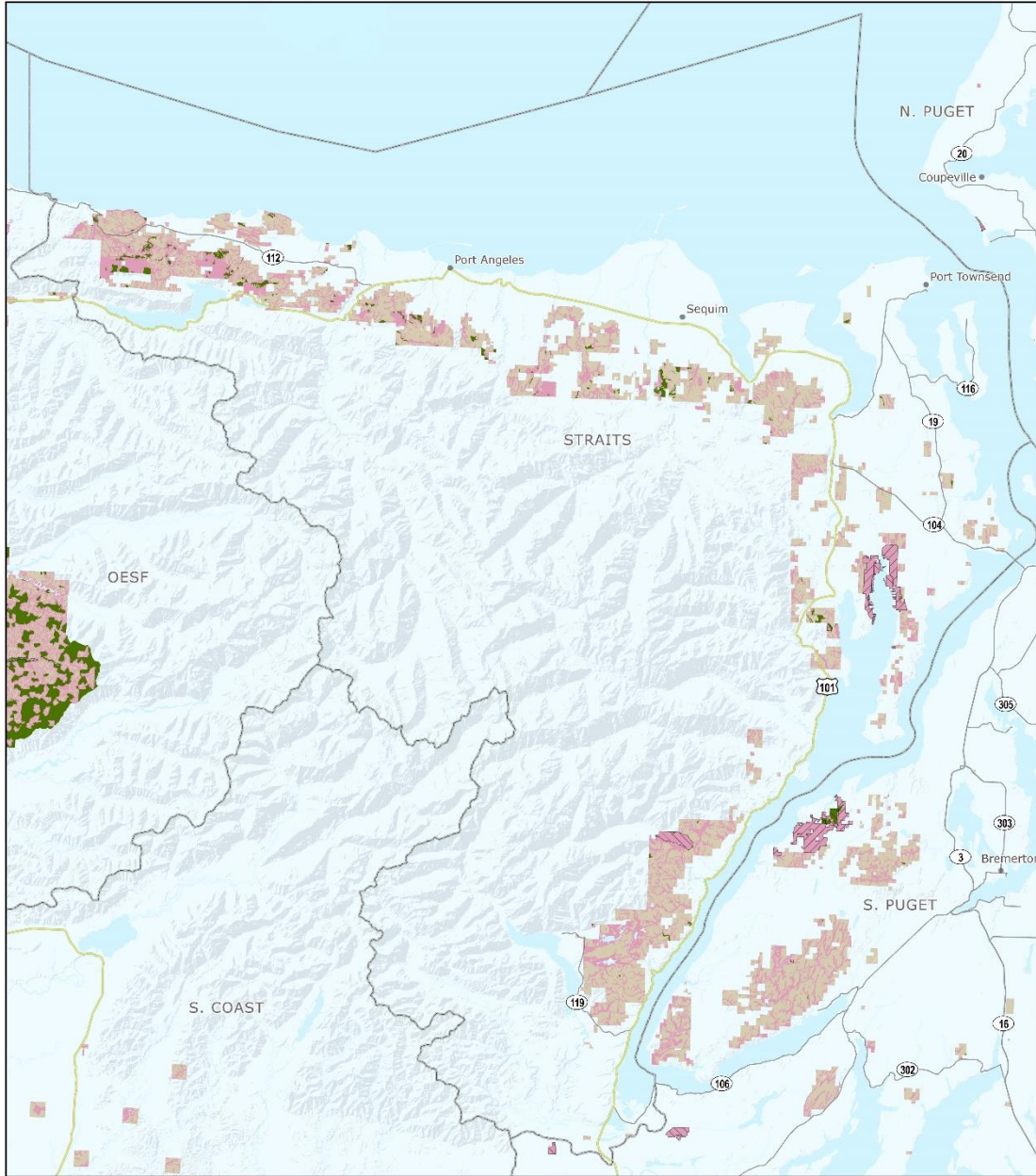


2021 Older Forest Within Conservation S. PUGET

- Older Forest in 2021
- Westside Forest Cover
- HCP Planning Units
- Natural Area Preserve
- Natural Resource Conservation Area
- Other DNR-Managed Lands



Map created on 4/18/2024 of older forests and westside forest cover identified from the analysis documented within the memo titled "Identifying Stands to Meet Older Forest Targets in Western Washington, May 11, 2021." All data are draft and subject to change.



2021 Older Forest Within Conservation STRAITS

- Older Forest in 2021
- Westside Forest Cover
- HCP Planning Units
- Natural Area Preserve
- Natural Resource Conservation Area
- Other DNR-Managed Lands



Map created on 4/18/2024 of older forests and westside forest cover identified from the analysis documented within the memo titled "Identifying Stands to Meet Older Forest Targets in Western Washington, May 11, 2021." All data are draft and subject to change.

Appendix 3: Maps of Projected Older-Forest Stands in 2100

Older-forest stands are those that were set aside to meet older-forest targets.



Projected 2100 Older Forest Within Conservation COLUMBIA

- Projected Older Forest in 2100
- Westside Forest Cover
- HCP Planning Units

- Natural Area Preserve
- Natural Resource Conservation Area
- Other DNR-Managed Lands



Map created on 4/18/2024 of older forests and westside forest cover identified from the analysis documented within the memo titled "Identifying Stands to Meet Older Forest Targets in Western Washington, May 11, 2021." All data are draft and subject to change.



**Projected 2100
Older Forest
Within Conservation
N. PUGET**

Projected Older Forest in 2100



Westside Forest Cover



HCP Planning Units



Natural Area Preserve



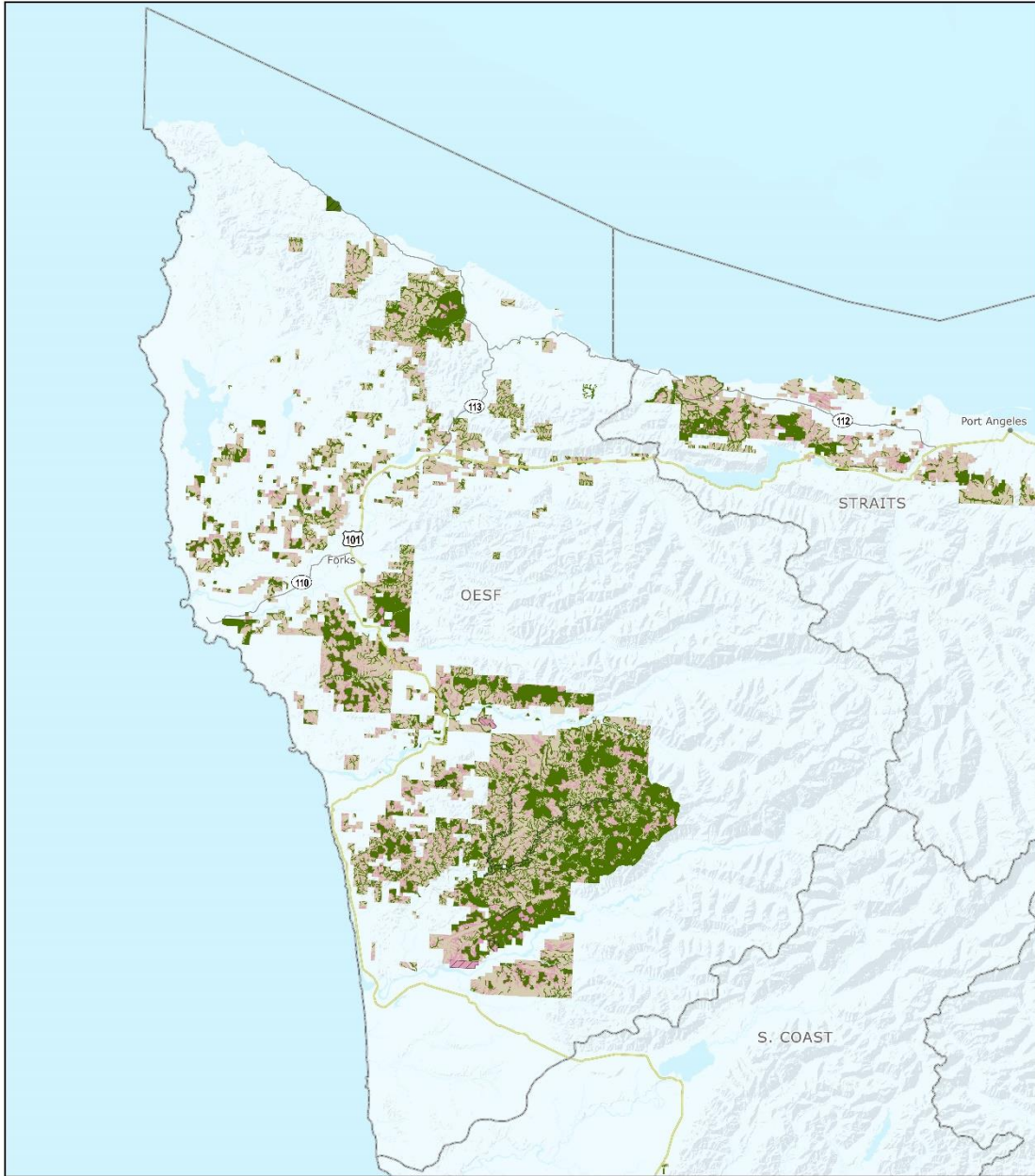
Natural Resource Conservation Area



Other DNR-Managed Lands



Map created on 4/18/2024 of older forests and westside forest cover identified from the analysis documented within the memo titled "Identifying Stands to Meet Older Forest Targets in Western Washington, May 11, 2021." All data are draft and subject to change.

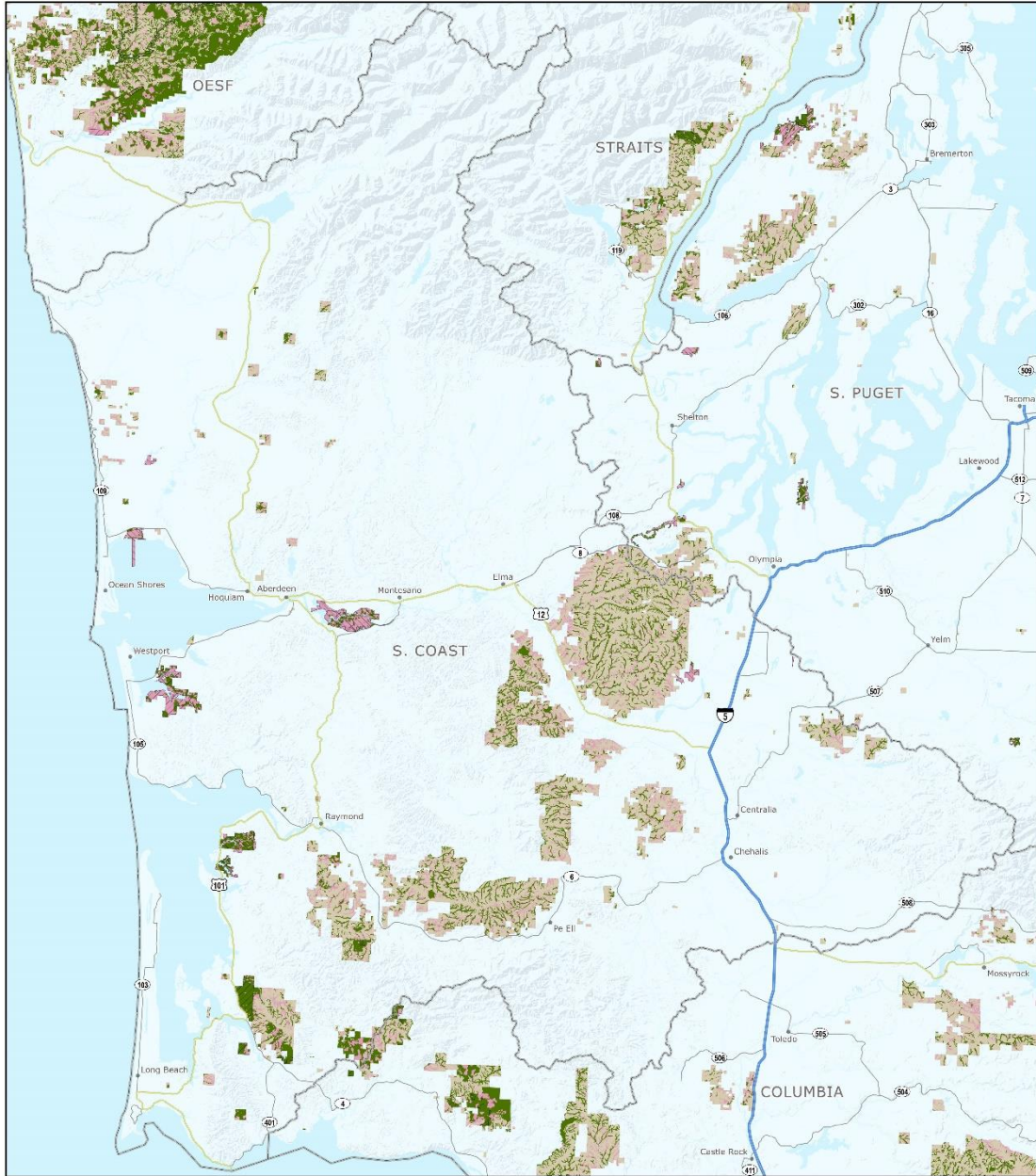


 WASHINGTON STATE DEPARTMENT OF
NATURAL RESOURCES
**Projected 2100
Older Forest
Within Conservation
OESF**

 Projected Older Forest in 2100	 Natural Area Preserve
 Westside Forest Cover	 Natural Resource Conservation Area
 HCP Planning Units	 Other DNR-Managed Lands

Map created on 4/18/2024 of older forests and westside forest cover identified from the analysis documented within the memo titled "Identifying Stands to Meet Older Forest Targets in Western Washington, May 11, 2021." All data are draft and subject to change.



**Projected 2100
Older Forest
Within Conservation
S. COAST**

Projected Older Forest in 2100

Westside Forest Cover

HCP Planning Units



Natural Area Preserve

Natural Resource Conservation Area

Other DNR-Managed Lands



Map created on 4/18/2024 of older forests and westside forest cover identified from the analysis documented within the memo titled "Identifying Stands to Meet Older Forest Targets in Western Washington, May 11, 2021." All data are draft and subject to change.



**Projected 2100
Older Forest
Within Conservation
S. PUGET**

Projected Older Forest in 2100

Westside Forest Cover

HCP Planning Units



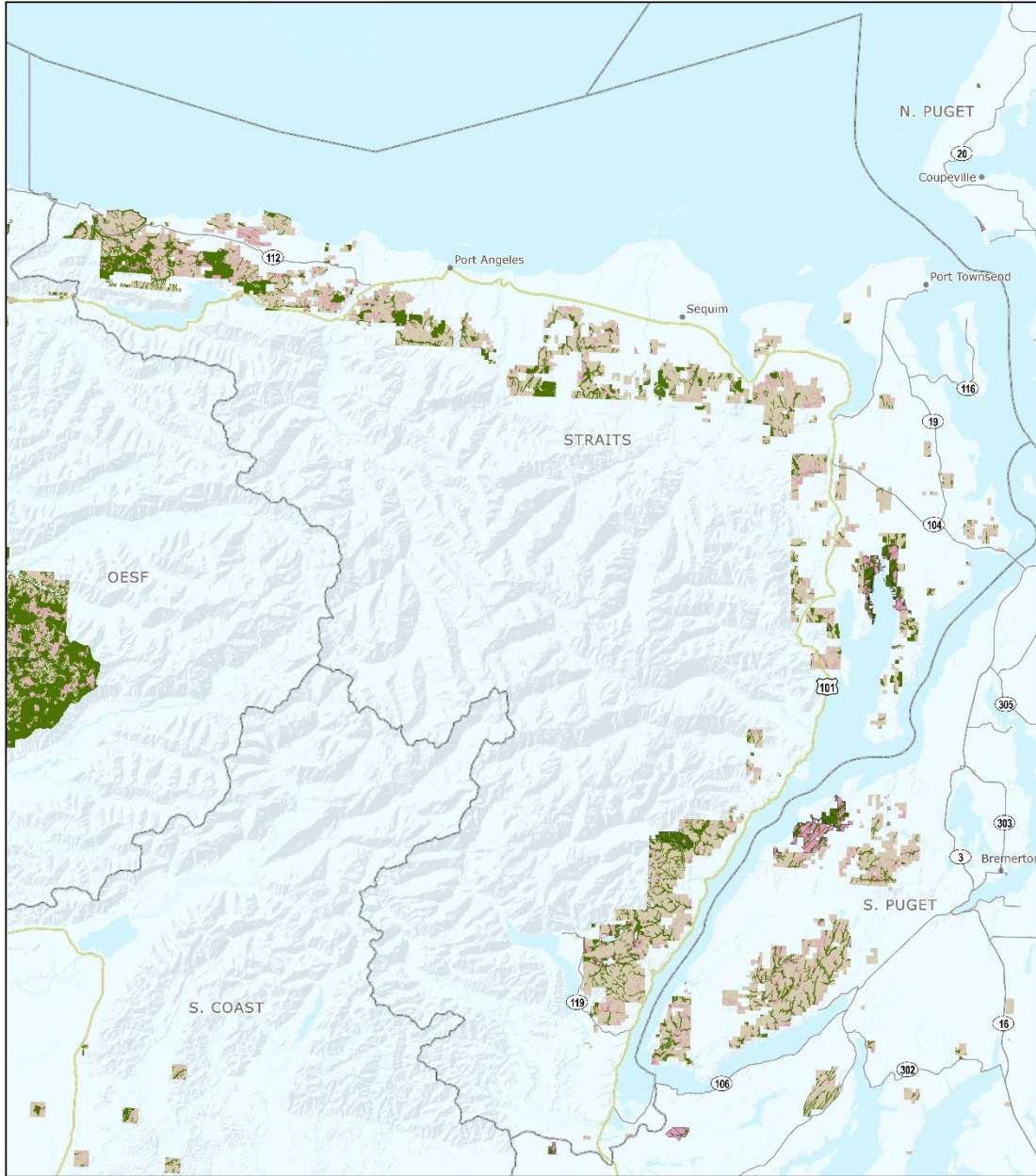
Natural Area Preserve

Natural Resource Conservation Area

Other DNR-Managed Lands



Map created on 4/18/2024 of older forests and westside forest cover identified from the analysis documented within the memo titled "Identifying Stands to Meet Older Forest Targets in Western Washington, May 11, 2021." All data are draft and subject to change.



Projected 2100 Older Forest Within Conservation STRAITS

Projected Older Forest in 2100

Westside Forest Cover

HCP Planning Units

Natural Area Preserve

Natural Resource Conservation Area

Other DNR-Managed Lands



Map created on 4/18/2024 of older forests and westside forest cover identified from the analysis documented within the memo titled "Identifying Stands to Meet Older Forest Targets in Western Washington, May 11, 2021." All data are draft and subject to change.

WASHINGTON NATURAL HERITAGE PROGRAM SITE SURVEY

Next Contestant Timber Sale (South Puget Sound Region)

April 29th, 2024

Tynan Ramm-Granberg
Lead Vegetation Ecologist

Executive Summary

The purpose of this inventory effort was to survey the Next Contestant timber sale, near Lake Cushman, for ecosystem (=plant community) element occurrences (EOs). Natural Heritage Methodology was used to identify plant associations and assess their ecological integrity. No element occurrences of any plant community were documented.

Introduction

On April 24th, Tynan Ramm-Granberg surveyed the Next Contestant timber sale for potential ecosystem (= plant community) element occurrences and, if found, assessed their ecological integrity and overall conservation value. The survey was conducted at the request of DNR staff in the South Puget Sound Region.

Methods

Site Survey Approach

A site walkthrough approach was used to observe the ecological variation within the timber sale units. This approach ensured that the topographic variability of each unit was surveyed. The surveyor stopped frequently to classify and confirm the plant association using Chappell (2006a), Ramm-Granberg et al. (2021a), and Ramm-Granberg (2024).

Classification of Plant Associations

WNHP uses the U.S. National Vegetation Classification (USNVC; 2022) to document the plant associations that occur in the state. Chappell (2006a) classified the forests of the Puget Lowlands using the USNVC and subsequent efforts (Meidinger et al., 2005; Chappell, 2006b; Crawford et al., 2009; Rocchio et al., 2012; Copass & Ramm-Granberg, 2016; Cadrin et al., 2018; Ramm-Granberg et al., 2021b) have supplemented that classification. Field keys and plant association descriptions in Chappell (2006a), Ramm-Granberg et al. (2021a), and Ramm-Granberg (2024) were used to identify the plant associations occurring within the targeted survey areas. These descriptions were also cross-referenced with NatureServe Explorer (<https://explorer.natureserve.org/>) to check for any revisions that may have occurred since publication.

Conservation Status of Plant Associations

Plant associations are assigned global (G) and subnational (=State, S) conservation status ranks using NatureServe's Conservation Status Assessment Methodology (Faber-Langendoen et al., 2012; Master et al., 2012). A conservation status rank represents an assessment of a specific plant association's risk of elimination. Conservation status ranks have been assigned to each element (ecosystem type) for its entire range, incorporating rarity, threats, and other factors.

Ecological Integrity of Plant Association Stands

The Ecological Integrity Assessment (EIA) methodology provides a rapid, standardized assessment of the current ecological integrity of a stand of a given plant association (Faber-Langendoen et al., 2019; Rocchio et al., 2020a, 2020b). The EIA results in an EIA rank ranging from 'A' to 'D', with 'A' indicating excellent ecological integrity and 'D' indicating poor ecological integrity. A size metric is then integrated to produce an element occurrence rank (EO rank), which is an estimate of the overall conservation value of the stand.

If a plant association with conservation status rank of globally imperiled (G2) or globally critically imperiled (G1) was located, its extent was mapped, and then an EIA was conducted to determine its current ecological condition (landscape context, native plant composition, invasive weed cover, vegetation structure, surficial soil condition, overall size, etc.). We also used DNR forest inventory data, historical aerial imagery, and timber harvest records to determine the stand age, corroborated by keys from Van Pelt (2007) that we also used to assess old-growth characteristics of individual trees. This information was used to help score EIA metrics related to vegetation structure.

Element Occurrence Criteria

WNHP uses the combination of a plant association’s conservation status rank and its EO rank to determine whether a stand of a given plant association is an “element occurrence”. Element occurrences (EOs) are populations of species or specific examples of ecosystems with significant conservation value that contribute to the survival or persistence of the element (i.e. the species or ecosystem) (Table 1, NatureServe, 2002). We use NatureServe’s Element Occurrence data standards to guide our delineation of plant association occurrences (see <http://www.natureserve.org/conservation-tools/standards-methods/element-occurrence-data-standard>). The EO data standards provide guidelines for decisions such as whether a particular patch of a given plant association is large enough to be considered an element occurrence. The standard also provides guidance on whether two distinct stands of the same plant association should be lumped as a single EO or split into two occurrences. The EO rank is determined by completing an EIA of the specific stand of the ecosystem in question. Common ecosystems with relatively few threats (e.g. conservation status rank of G5/S5) must be in excellent condition (EO rank ‘A+’ or ‘A-’) to be considered EOs, while all critically imperiled ecosystems (G1/S1)—even in poor condition (D)—have significant conservation value. Element occurrences are entered in the Washington Natural Heritage Program’s Biotics database used for a variety of conservation and management outcomes. For more information, please see the Washington Natural Heritage Program website (<http://www.dnr.wa.gov/natural-heritage-program>).

Table 1. Decision Matrix for Ecosystem Element Occurrences. Element conservation status ranks vary from 1 (critically imperiled) to 5 (common/secure), calculated across the element’s global (G) and subnational/state (S) range. ‘NR’ = not ranked.

EORANK	Element Conservation Status Rank				
	Global Rank	G1S1, G2S1, GNRS1, GUS1	G2S2, GNRS2, G3S1, G3S2, GUS2	GUS3, GNRS3, G3S3, G4S1, G4S2, G5S1, G5S2, any SNR	G4S3, G4S4, G5S3, G5S4, G5S5, GNRS4, GNRS5, GUS4, GUS5
A+ (3.8 to 4.0)		EO	EO	EO	EO
A- (3.5 to 3.79)		EO	EO	EO	EO
B+ (3.0 to 3.49)		EO	EO	EO	Not an Element Occurrence
B- (2.5 to 2.99)		EO	EO	EO	
C+ (2.0 to 2.49)		EO	EO	Not an Element Occurrence	
C- (1.5 to 1.99)		EO	Not an Element Occurrence		
D (1.0 to 1.49)		EO			

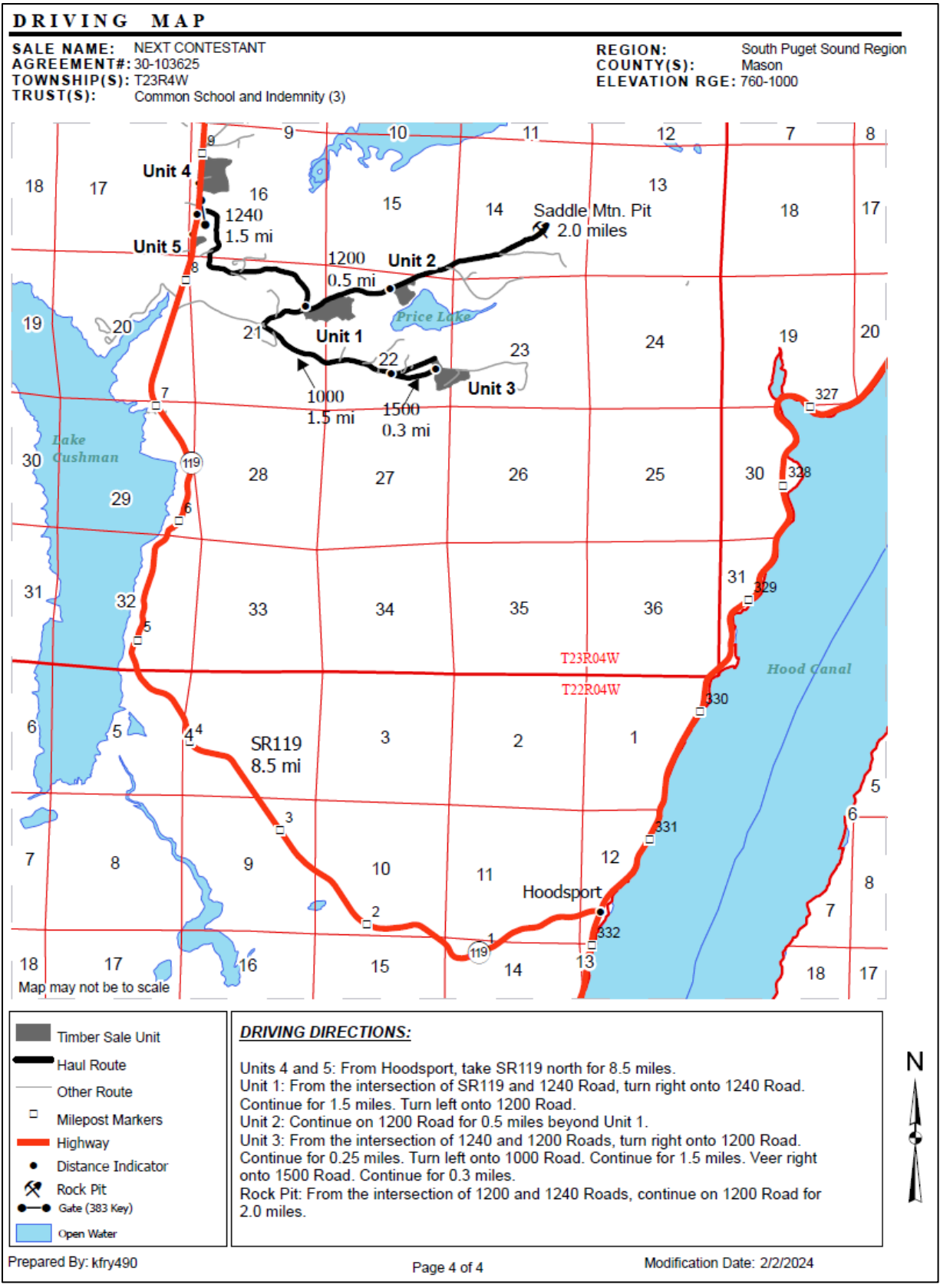


Figure 1. Area surveyed on April 24th, 2024 (modification of map prepared by South Puget Sound Region staff).

Results

The following plant communities were observed within the timber sale boundaries (Table 2).

Table 2. United States National Vegetation Classification (USNVC) Plant Associations Encountered.

USNVC Plant Association ¹	EL Code	G/S Rank
<i>Pseudotsuga menziesii</i> - <i>Tsuga heterophylla</i> / <i>Gaultheria shallon</i> - <i>Vaccinium parvifolium</i> Forest	CEGL005539	GNR/S4
<i>Pseudotsuga menziesii</i> - <i>Tsuga heterophylla</i> / <i>Gaultheria shallon</i> - <i>Mahonia nervosa</i> Forest	CEGL005538	G4/S4
<i>Pseudotsuga menziesii</i> - <i>Tsuga heterophylla</i> / <i>Gaultheria shallon</i> / <i>Polystichum munitum</i> Forest	CEGL005536	G4G5/S4
<i>Pseudotsuga menziesii</i> - <i>Tsuga heterophylla</i> / <i>Mahonia nervosa</i> - <i>Polystichum munitum</i> Forest	CEGL005543	G4/S4
<i>Pseudotsuga menziesii</i> - <i>Tsuga heterophylla</i> / <i>Mahonia nervosa</i> Forest	CEGL005541	G4/S4

¹Associations keyed using Chappell (2006a), Ramm-Granberg et al. (2021a), and Ramm-Granberg (2024) and crosswalked to current USNVC Hierarchy (<http://www.usnvc.org>)

EIA Results

None of the observed plant communities were large/contiguous enough nor appeared to have sufficient ecological integrity (relative to their conservation status rank) to warrant further assessment.

Conclusion

No element occurrences of any plant community were documented.

References

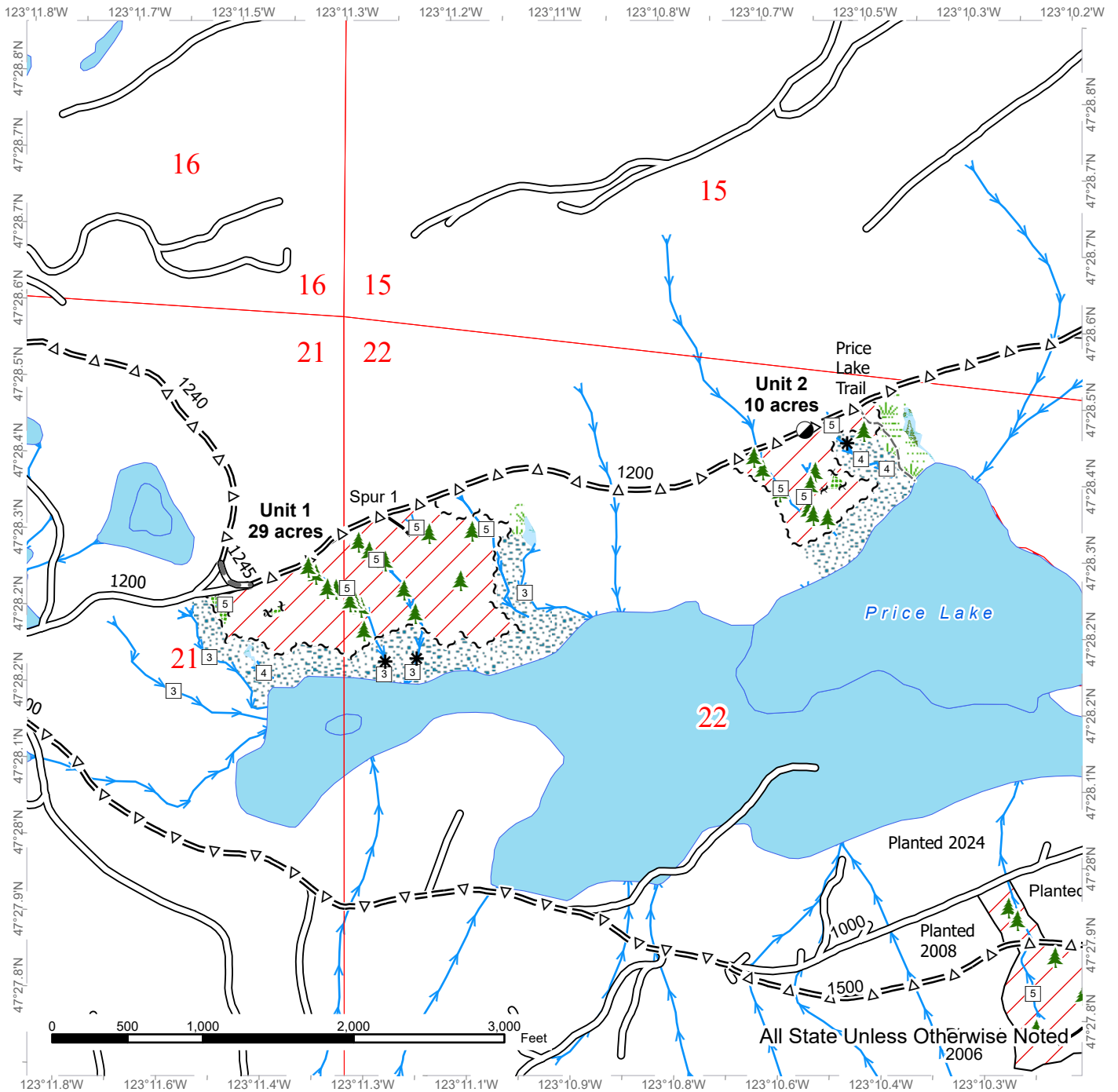
- Cadrin C., D. Meidinger, and G. Kittel. 2018. Boreal and Coastal Conifer Correlation Project: a quantitative crosswalk of conifer-dominated plant associations of coastal areas of British Columbia, Washington and Oregon (update of 2004 report). *USNVC Proceedings*.
- Chappell C.B. 2006a. Upland plant associations of the Puget Trough ecoregion, Washington. Washington Natural Heritage Program, Department of Natural Resources, Olympia, WA. NHR-2006-01. Online: https://www.dnr.wa.gov/publications/amp_nh_upland_puget.pdf
- Chappell C.B. 2006b. Plant associations of balds and bluffs of western Washington. Washington Natural Heritage Program, Department of Natural Resources, Olympia, WA. NHR-2006-02. Online: https://dnr.wa.gov/publications/amp_nh_balds_bluffs.pdf
- Copass C. and T.C. Ramm-Granberg. 2016. Ebey's Landing National Historical Reserve vegetation inventory and mapping project. US Department of the Interior, National Park Service, Fort Collins, CO. NPS/NCCN/NRR—2016/1127.
- Crawford R.C., C.B. Chappell, C.C. Thompson, and F.J. Rocchio. 2009. Vegetation classification of Mount Rainier, North Cascades, and Olympic National Parks. US Department of the Interior, National Park Service, Fort Collins, CO. Natural Resource Report NPS/NCCN/NRTR—2009/211. Online: https://dnr.wa.gov/publications/amp_nh_mt_rainier_veg.pdf
- Faber-Langendoen, J.N. D., L. Master, K. Snow, A. Tomaino, R. Bittman, G. Hammerson, B. Heidel, L. Ramsay, A. Teucher, and B. Young. 2012. NatureServe Conservation Status Assessments: methodology for assigning ranks. NatureServe, Arlington, VA.
- Faber-Langendoen D., J. Lemly, W. Nichols, F.J. Rocchio, K. Walz, and R. Smyth. 2019. Development and evaluation of NatureServe's multi-metric Ecological Integrity Assessment for wetland ecosystems. *Ecological Indicators* 104(9):764–775.
- Master L.L., D. Faber-Langendoen, R. Bittman, G.A. Hammerson, B. Heidel, L. Ramsay, K. Snow, A. Teucher, and A. Tomaino. 2012. NatureServe Conservation Status Assessments: factors for evaluating species and ecosystem risk. NatureServe, Arlington, VA.
- Meidinger D., C.B. Chappell, C. Cadrin, G. Kittel, C. McCain, K. Boggs, J. Kagan, G. Cushon, A. Banner, and T. DeMeo. 2005. International Vegetation Classification of the Pacific Northwest: International correlation of temperate coastal forest plant associations of Oregon, Washington, British Columbia and Alaska. Contributors: B.C. Ministry of Forests, USDA Forest Service, B.C. Conservation Data Centre, Alaska Natural Heritage Program, Washington Natural Heritage Program, and Oregon Natural Heritage Information Center.
- NatureServe. 2002. Element Occurrence data standard. NatureServe, Arlington, VA.
- Van Pelt R. 2007. *Identifying mature and old forests in western Washington*. Washington State Department of Natural Resources, Olympia, WA.
- Ramm-Granberg T. 2024. Key to the Plant Associations of the Puget Sound Drainage Basin. Washington Natural Heritage Program, Department of Natural Resources, Olympia, WA. Draft Version 2024.04.24.
- Ramm-Granberg T., F.J. Rocchio, R. Brunner, and E. Nielsen. 2021a. Revised vegetation classification for Mount Rainier, North Cascades, and Olympic National Parks: descriptions and identification keys for plant associations and wetland alliances. North Coast and Cascades Network, National Park Service,

- Port Angeles, WA. Online: https://www.dnr.wa.gov/publications/amp_nh_veg_natl_parks_keys.pdf
- Ramm-Granberg T., F.J. Rocchio, C. Copass, R. Brunner, and E. Nielsen. 2021b. Revised vegetation classification for Mount Rainier, North Cascades, and Olympic National Parks: project summary report. National Park Service, Fort Collins, CO. Natural Resource Report NPS/NCCN/NRR—2021/2225. Online: https://www.dnr.wa.gov/publications/amp_nh_veg_natl_parks_2021.pdf
- Rocchio F.J., R.C. Crawford, and C. Copass. 2012. San Juan Island National Historical Park vegetation classification and mapping project report. National Park Service, Fort Collins, CO. Natural Resource Report NPS/NCCN/NRR—2012/603. Online: http://dnr.wa.gov/publications/amp_nh_san_juan_veg.pdf
- Rocchio F.J., R.C. Crawford, and T. Ramm-Granberg. 2020a. Field manual for applying rapid Ecological Integrity Assessments in wetlands and riparian areas in Washington State. Version 1.3. Washington Natural Heritage Program, Department of Natural Resources, Olympia, WA. NHR-2020-06. Online: https://www.dnr.wa.gov/publications/amp_nh_eia_protocol_wetland_2020.pdf
- Rocchio F.J., T. Ramm-Granberg, and R.C. Crawford. 2020b. Field manual for applying rapid Ecological Integrity Assessments in upland plant communities of Washington state. Version 1.4. Washington Natural Heritage Program, Department of Natural Resources, Olympia, WA. NHR-2020-05. Online: https://www.dnr.wa.gov/publications/amp_nh_eia_protocol_upland_2020.pdf
- USNVC (United States National Vegetation Classification). 2022. United States National Vegetation Classification Database, v2.04. usnvc.org. Accessed: April 6, 2023.

TIMBER SALE MAP

SALE NAME: NEXT CONTESTANT
AGREEMENT #: 30-103625
TOWNSHIP(S): T23R4W
TRUST(S): Common School and Indemnity (3)

REGION: South Puget Sound Region
COUNTY(S): Mason
ELEVATION RGE: 760-1000



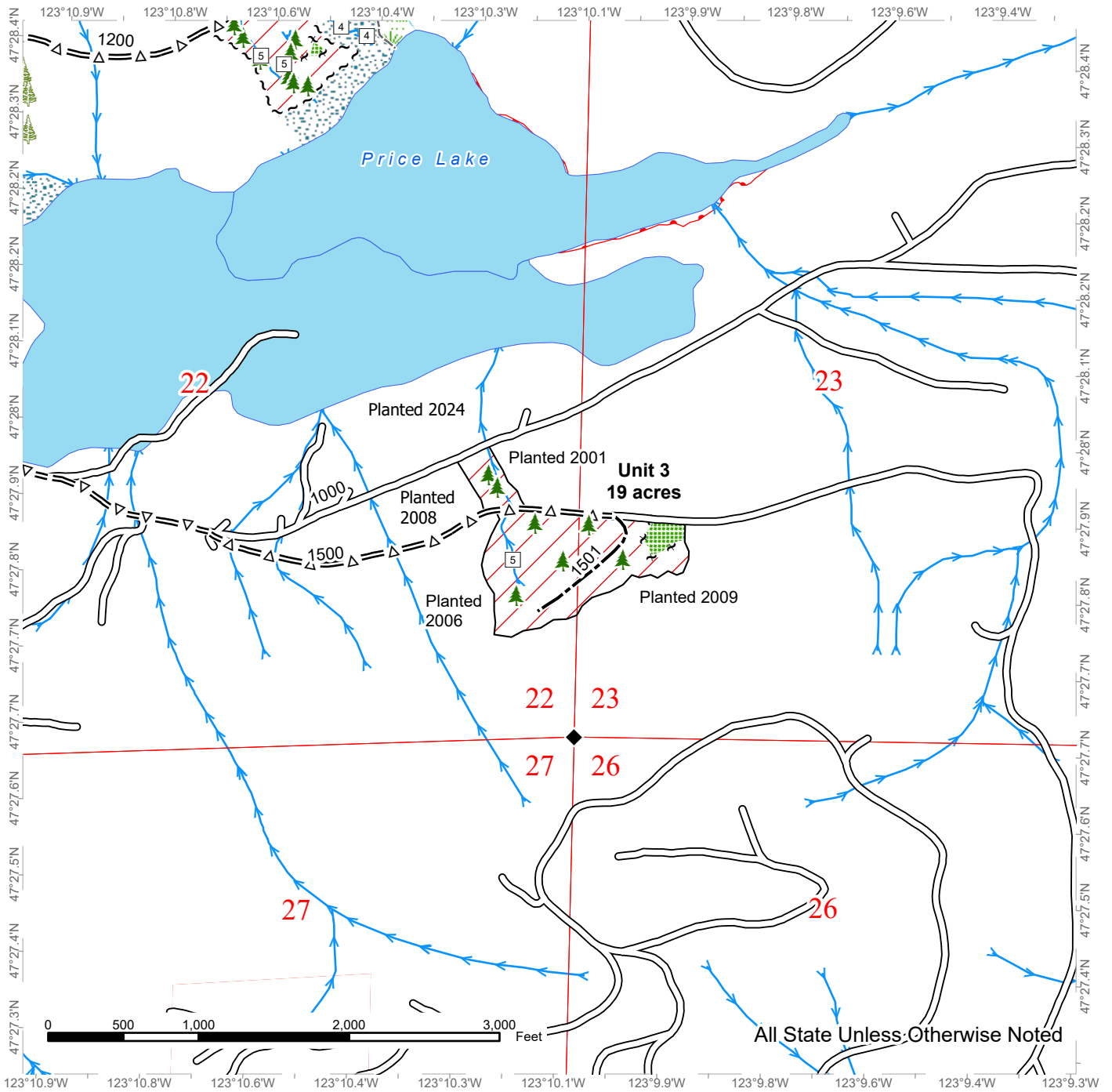
Sale Area	Timber Type Change	Stream Type
Leave Tree Area	Existing Roads	Stream Type Break
Riparian Mgt Zone	Required Pre-Haul Maintenance	Designated Landing
Forested Wetland	Optional Pre-Haul Maintenance	Leave Tree Area <1/4-acre
Wetland Mgt Zone	Optional Construction	Open Water
Sale Boundary Tags	Trails	
Leave Tree Tags	Streams	



TIMBER SALE MAP

SALE NAME: NEXT CONTESTANT
AGREEMENT #: 30-103625
TOWNSHIP(S): T23R4W
TRUST(S): Common School and Indemnity (3)

REGION: South Puget Sound Region
COUNTY(S): Mason
ELEVATION RGE: 760-1000



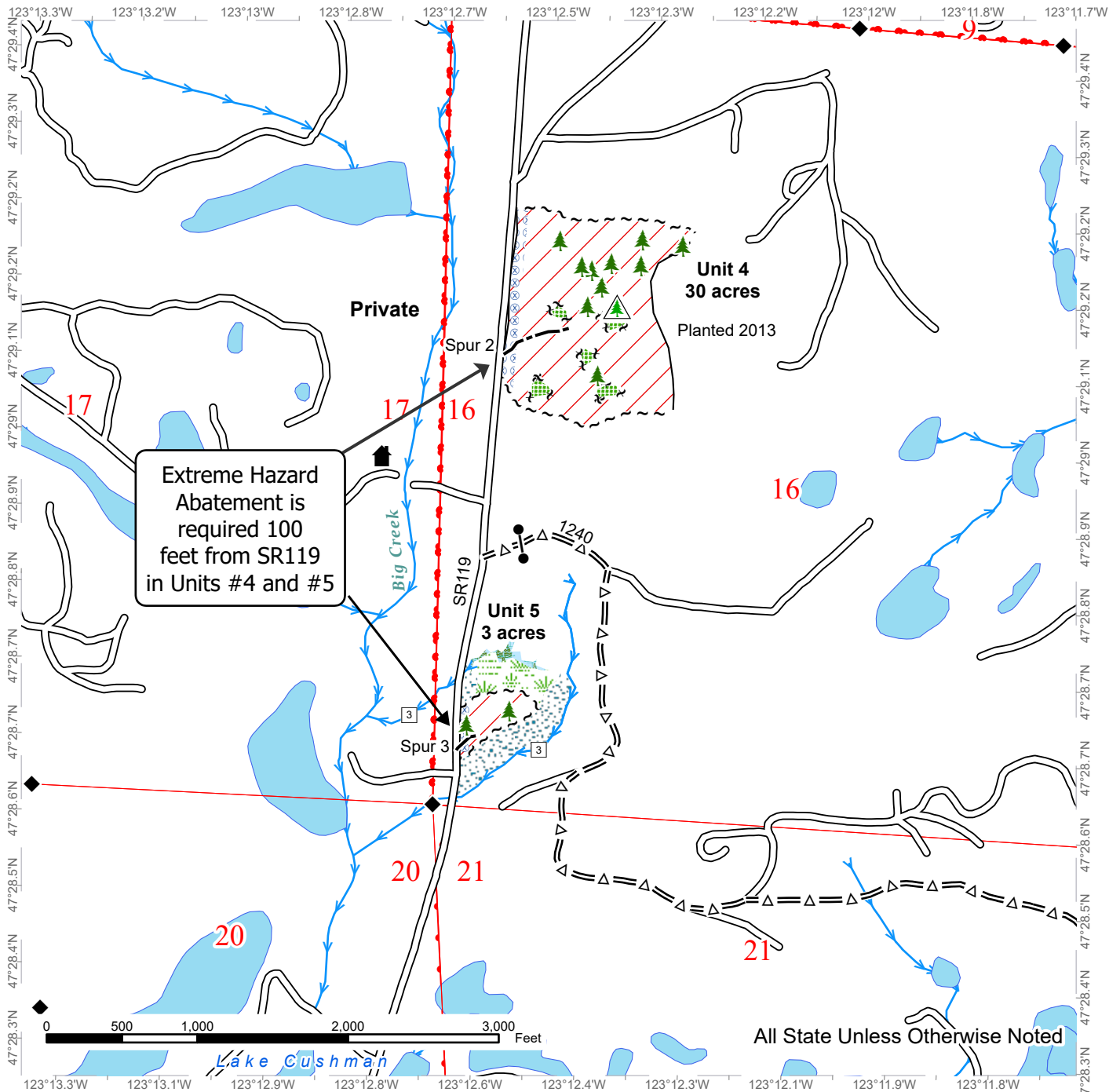
All State Unless Otherwise Noted

Sale Area	Leave Tree Tags	Streams
Leave Tree Area	Timber Type Change	Leave Tree Area <1/4-acre
Riparian Mgt Zone	Existing Roads	Survey Monument
Forested Wetland	Optional Pre-Haul Maintenance	Open Water
Wetland Mgt Zone	Optional Construction	
Sale Boundary Tags	Trails	

TIMBER SALE MAP

SALE NAME: NEXT CONTESTANT
AGREEMENT #: 30-103625
TOWNSHIP(S): T23R4W
TRUST(S): Common School and Indemnity (3)

REGION: South Puget Sound Region
COUNTY(S): Mason
ELEVATION RGE: 760-1000



All State Unless Otherwise Noted

Sale Area	Leave Tree Tags	Stream Type
Leave Tree Area	Property Line	Gate
Riparian Mgt Zone	Timber Type Change	Leave Tree Area <1/4-acre
Forested Wetland	Existing Roads	Non-Tradeable Leave Trees
Wetland Mgt Zone	Optional Pre-Haul Maintenance	Structure
Hazard Abatement Area	Optional Construction	Survey Monument
Sale Boundary Tags	Streams	Open Water

