

WASHINGTON NATURAL HERITAGE PROGRAM SITE SURVEY

TCB23 Timber Sale, Unit 1

December 19th, 2023

Tynan Ramm-Granberg
Lead Vegetation Ecologist

Executive Summary

The purpose of this inventory effort was to survey Unit 1 of the TCB23 timber sale, near Elwha, for element occurrences (EOs) of globally critically imperiled or imperiled (i.e., G1 or G2) plant communities. Natural Heritage Methodology was used to identify plant associations and assess their ecological integrity. A stand of *Thuja plicata* - *Abies grandis* / *Polystichum munitum* Forest (G1/S1) was identified and found to have sufficient ecological integrity (EO Rank of C-) to be considered an element occurrence.

Introduction

On December 19th, Tynan Ramm-Granberg surveyed Unit 1 of the TCB23 timber sale for critically imperiled and imperiled ecosystems and, when found, assessed their ecological integrity and overall conservation value. The survey was conducted at the request of the DNR Olympic Region Manager.

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 (2006).

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 (2006) classified the forests of the Puget Lowlands using the USNVC—the field keys and plant association descriptions in that document 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			

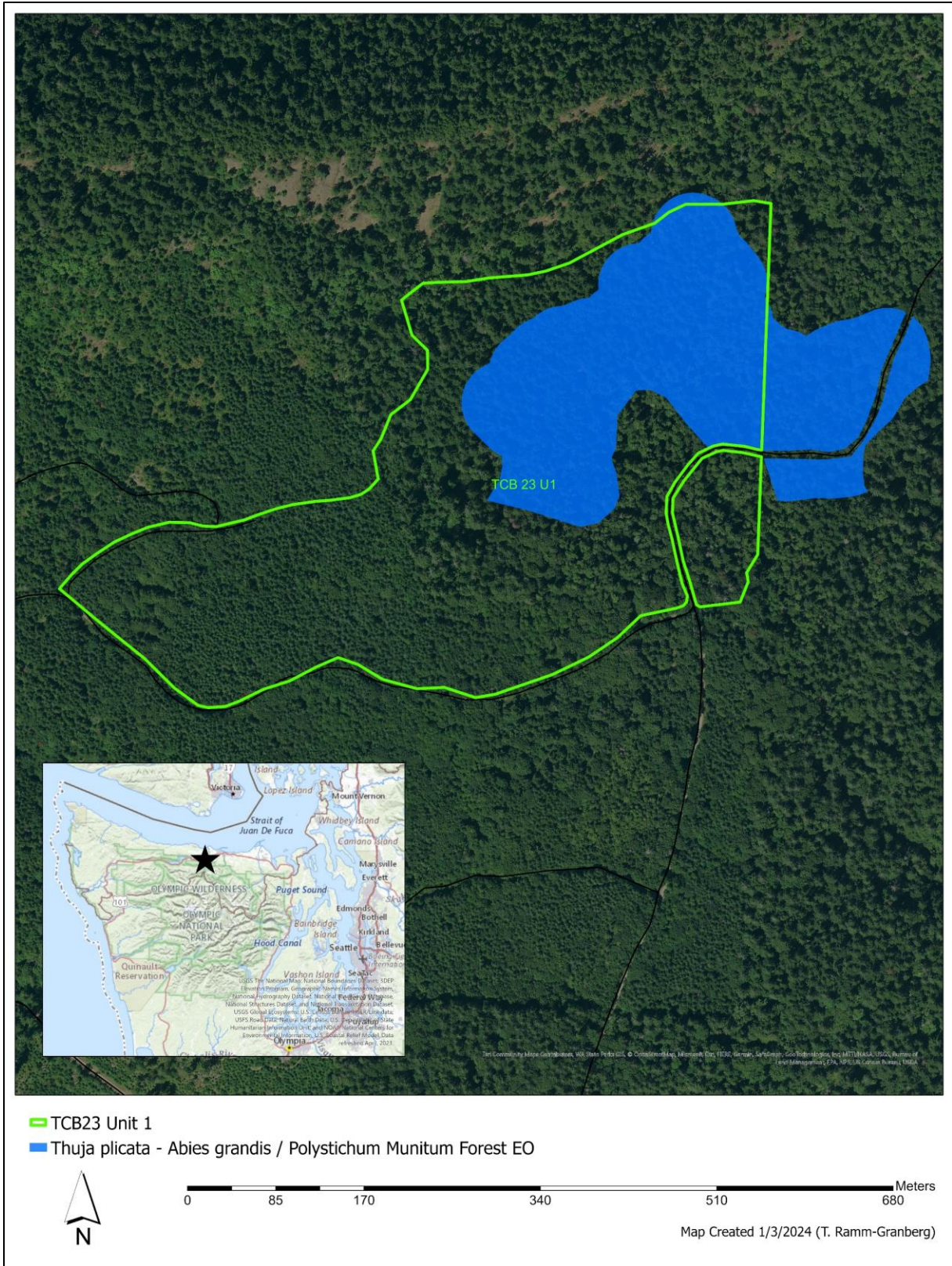


Figure 1. Area surveyed on December 19th, 2023.

Results

G1 & G2 Plant Associations

Unit 1 of the TCB23 timber sale contains a small stand (~18 acres) of *Thuja plicata* - *Abies grandis* / *Polystichum munitum* Forest (G1/S1; Table 2). This location is on the fringes of the association's expected range. The community is more typically found on the northeastern tip of the Olympic Peninsula and the San Juan Islands, in the heart of the Olympic rain shadow ([https://explorer.natureserve.org/Taxon/ELEMENT_GLOBAL.2.689671/Thuja_plicata - \(Abies grandis\) - Polystichum munitum Forest](https://explorer.natureserve.org/Taxon/ELEMENT_GLOBAL.2.689671/Thuja_plicata_-_Abies_grandis_-_Polystichum_munitum_Forest)). Small inclusions (up to ~0.5 acres) of *Pseudotsuga menziesii* - (*Abies grandis*, *Thuja plicata*) / *Mahonia nervosa* - *Gaultheria shallon* Forest (G2/S1) were also identified in Unit 1, but these were not large enough for assessment. This effort did not represent a comprehensive survey of the area and was largely restricted to the timber sale unit boundary.

EIA Results

This stand received a 'B-' for Condition (2.67) and Landscape Context (2.72). The overall size of the documented stand is 18 acres—as a “large-patch” ecosystem, this receives a size rank of 'C' (2.00). The calculated EO Rank was 'C+' (2.34). The surveyor rounded down, assigning an EO Rank of 'C-' (as allowed in EIA methodology). The surveyor chose to assign a slightly lower rank due to the small extent of the stand, the logging history, and the dense network of trails. Still, a 'C-' meets the EO criteria for a G1/S1 community (Table 1). A complete EIA score breakdown may be found in Appendix A.

Table 2. United States National Vegetation Classification (USNVC) hierarchy for imperiled (G2, S2) or critically imperiled (G1, S1) plant associations encountered. *Found in small patches treated as inclusions.

1 Forest & Woodland

1.B Temperate & Boreal Forest & Woodland

1.B.2 Cool Temperate Forest & Woodland

1.B.2.Nd Vancouverian Forest & Woodland

M024 Vancouverian Lowland & Montane Forest

G240 North Pacific Maritime Douglas-fir - Western Hemlock Forest

A3378 *Tsuga heterophylla* - *Pseudotsuga menziesii* / *Cornus unalaschensis* Mesic Forest Alliance

CEGL002845	<i>Pseudotsuga menziesii</i> - (<i>Abies grandis</i> , <i>Thuja plicata</i>) / <i>Mahonia nervosa</i> - <i>Gaultheria shallon</i> Forest*
CEGL000468	<i>Thuja plicata</i> - <i>Abies grandis</i> / <i>Polystichum munitum</i> Forest

Conclusion

Unit 1 of the TCB23 timber sale overlaps with an element occurrence (EO) of *Thuja plicata* - *Abies grandis* / *Polystichum munitum* Forest, which has a Conservation Status Rank of G1/S1.

References

- Chappell C.B. 2006. 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
- 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.
- 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.
- 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.

Appendix A: Ecological Integrity Assessment (EIA) Calculations

Ecological Integrity varied slightly over the four timber sale units and neighboring parcels. The table below presents the range of metric ranks and major ecological factors, followed by the weighted average of primary factors, EIA scores, and the overall EO rank.

Table A-1. EIA Calculations.

Roll-up Calculations	Rating	Score	Comments
LAN1. Contiguous Natural Land Cover	B	3	73% contiguous natural land cover. Fragmenting features are forest roads.
LAN2. Land Use Index	C	2	LUI = 6.46; primarily timberland in various stages of regeneration, plus extensive mountain biking trails. Some apparent old-growth present w/i 500m buffer.
LAN MEF Score = (LAN1+LAN2)/2	B-	2.50	
EDG1. Perimeter with Natural Edge	B	3	75-99%
EDG2. Width of Natural Edge	C	2	25-75 m average
EDG3. Condition of Natural Edge (do not include in calculation if not scored)	B	3	Extensively logged and areas of developed recreation, but generally minimal exotic species away from road edges.
EDG MEF Score = (((EDG1*EDG2)^{1/2})*EDG3)^{1/2} [Note: ½ exponent = square root]	B-	2.71	
LANDSCAPE CONTEXT PRIMARY FACTOR SCORE = (EDG Score*0.67)+(LAN Score*0.33)	Large-Patch		
Matrix = (EDG Score*0.33)+(LAN Score*0.67) Large-Patch = (EDG Score*0.50)+(LAN Score*0.50) Small-Patch = (EDG Score*0.67)+(LAN Score*0.33)	B-	2.61	
VEG1. Native Plant Species Cover	A-	3.5	95-99% relative native cover (<i>Geranium robertianum</i> and <i>Mycelis muralis</i> most abundant exotic species)
VEG2. Invasive Nonnative Plant Species Cover	B	3	1-4% absolute cover of <i>Geranium robertianum</i> + <i>Ilex aquifolium</i> .
VEG3. Native Plant Species Composition	B	3	All diagnostic species present in expected proportions. Some increase in <i>Alnus rubra</i> and <i>Rubus ursinus</i> due to past logging.

VEG4. Vegetation Structure	D	1	Logged and likely burned post-logging. Current stand is early mature, with branch stobs remaining on most canopy trees. Some subcanopy development. Some large <i>Abies grandis</i> present (largest measured was 102cm DBH) and starting to die, but historical logging removed all large <i>Thuja plicata</i> and there are no living trees with diameters as large as the remaining stumps. No trees cored.
VEG5. Woody Regeneration	A	4	Does not appear to have been planted. <i>Thuja plicata</i> dominates regeneration.
VEG6. Coarse Woody Debris	C	2	CWD and snags reduced by logging, but there are a few large logs and snags from <i>Abies grandis</i> mortality.
VEG MEF Score = (VEG4+VEG6)/2*0.7+(VEG1+VEG2+VEG3+VEG5)/4*0.3	B-	2.67	
SOI1. Soil Condition	B	3	Some soil disturbance from historical logging and modern trail development, but limited in extent.
SOI MEF Score = SOI1	B	3	
CONDITION PRIMARY FACTOR SCORE = (VEG Score*0.85)+(SOI Score*0.15)	B-	2.72	
ECOLOGICAL INTEGRITY (EIA) SCORE Matrix/Large-Patch = (CONDITION SCORE*0.55)+(LANDSCAPE CONTEXT SCORE*0.45) Small-Patch = (CONDITION SCORE*0.7)+(LANDSCAPE CONTEXT SCORE*0.3)	B-	2.67	
SIZ1. Comparative Size	C	2	Total mapped area = ~18 acres; large-patch ecosystem type
SIZ2. Change in Size (optional)	Not Scored		Original stand extent not known at this time.
SIZ MEF Score = SIZ1 OR (SIZ1+SIZ2)/2	C	2	
SIZE Points	C	-0.33	
CALCULATED EO RANK = EIA Score + SIZE Points	C+	2.34	
ASSIGNED EO RANK	C-		Rounded down because of small extent (on the low end of the range for a 'C' in size), logging history, and dense network of mountain bike trails.

Table A-2. Metric Rank / Score Conversions

Rank	A	A-	B	C	C-	D
Score	4	3.5	3	2	1.5	1

Table A-3. Score / Rank Conversions for MEF, EIA, and EORANK calculations

Rank	A+	A-	B+	B-	C+	C-	D
Score	3.8 - 4.00	3.5 - 3.79	3.0 - 3.49	2.5 - 2.99	2.0 - 2.49	1.5 - 1.99	1 - 1.49

Table A-4. Point Contribution of Size Primary Factor Score

Size Primary Factor Rating	Very Small/Small Patch	Large Patch	Matrix
A = Size meets A ranked rating	+ 0.75	+ 1.0	+1.5
B = Size meets B ranked rating	+ 0.25	+ 0.33	+0.5
C = Size meets C ranked rating	- 0.25	- 0.33	-0.5
D = Size meets D ranked rating	- 0.75	-1.0	-1.5