



961 12th Avenue • PO Box 3007 • Longview, WA 98632

ELECTRONIC FILING – PUBLIC

March 21, 2018

Ms. Kimberly D. Bose, Secretary
Federal Energy Regulatory Commission
888 First Street, NE
Washington, D.C. 20426

**P-2213 – 034 Swift No. 2 Hydroelectric Project
License Article 403 Wildlife Habitat Management Plan
2018 Annual Plan**

Dear Ms. Bose:

Pursuant to the requirements of Article 403 of the Commission's June 26, 2008 *Order Issuing New License*, and Section 10.8.3 of the November 30, 2004 *Lewis River Settlement Agreement*, Public Utility District No. 1 of Cowlitz County, Washington (Cowlitz PUD) is pleased to submit to the Commission for approval, the Swift No. 2 P-2213 *Wildlife Habitat Management Plan: 2018 Annual Plan* (Annual Plan).

Cowlitz PUD's 2018 Annual Plan was developed in consultation with the Terrestrial Coordinating Committee (TCC) and describes a specific suite of actions to be taken during 2018. The 2018 Annual Plan meets the objectives of the Standard and Guidelines Document completed by the TCC in July 2006 and the Wildlife Habitat Management Plan (WHMP) approved by the Commission on March 31, 2009.

Under the WHMP, Cowlitz PUD manages 525 acres of land specifically for wildlife. The WHMP, as implemented through the Annual Plan, manages for species and habitat diversity to benefit a broad range of fish, wildlife, and native plant species, including, but not limited to, large and small game, amphibians, bats, forest raptors, neo-tropical birds, and culturally significant native plants.

If you have any questions concerning this filing, please feel free to contact me at (360) 501-9374 or afroberg@cowlitzpud.org.

Sincerely,

A handwritten signature in black ink that reads "Amanda Froberg". The signature is written in a cursive, flowing style.

Amanda Froberg
Environmental Compliance Manager

Enclosure: Cowlitz PUD Wildlife Habitat Management Plan: 2018 Annual Plan
cc: Service List

This page is intentionally blank.

Swift No. 2 Hydroelectric Project
FERC No. 2213

March 21, 2018

**Wildlife Habitat Management Plan
2018 (Year 10) Annual Plan
For The
Swift No. 2 Wildlife Management Area**



Prepared by
Public Utility District No. 1 of
Cowlitz County, Washington



This page is intentionally blank.

Contents

1.0	Introduction.....	1
2.0	2018 (Year 10) Management Activities.....	3
2.1	2018 (Year 10) Annual Plan Budget.....	4
3.0	Site Management Plans	6
3.1	Devil’s Backbone Management Unit.....	7
	Site Management Plan: DBMU-1	10
	Site Management Plan: DBMU-2.....	12
	Site Management Plan: DBMU-3.....	15
	Site Management Plan: DBMU-4.....	17
	Site Management Plan: DBMU-5.....	19
	Site Management Plan: DBMU-6.....	20
	Site Management Plan: DBMU-7.....	21
	Site Management Plan: DBMU-8.....	23
	Site Management Plan: DBMU-9.....	24
	Site Management Plan: DBMU-10.....	26
	Site Management Plan: DBMU-11.....	28
	Site Management Plan: DBMU-12.....	30
3.2	PROJECT WORKS MANAGEMENT UNIT.....	32
	Site Management Plan: PWMU-REV	35
	Site Management Plan: PWMU-PUB.....	38
	Site Management Plan: PWMU-FOR.....	40
	Site Management Plan: PWMU-ROW	42

List of Figures

Figure 1.0-1.	Project area map, project vicinity inset.....	2
Figure 3.1-1.	Devil’s Backbone Management Unit.....	7
Figure 3.1-2.	Devil’s Backbone Management Unit cover type map.	8
Figure 3.1-3.	Devil’s Backbone Management Unit Weed Survey and Treatment Areas.....	9
Figure 3.2-1.	Project Works Management Unit (Google Earth, August, 2012).....	32
Figure 3.2-2.	Project Works Management Unit cover type map.	33
Figure 3.2-3.	Project Works Management Unit Weed Survey and Treatment Areas.	34

List of Tables

Table 2.1-1. Anticipated 2018 (Year 10) Annual Plan Budget (2018 dollars). 5

Appendices

Appendix A. 2017 Cowlitz and Skamania County Weed Lists
Appendix B. Annual Plan Consultation Record
Appendix C. Devil's Backbone Patch Cut Implementation Plan

Acronyms

BMPs	Best Management Practices
DB	Devil's Backbone
FERC	Federal Regulatory Energy Commission
HEP	Habitat Evaluation Procedures
HSI	Habitat Suitability Indexes
LWD	Large Woody Debris
MU	Management Unit
PUD	Public Utility District
PW	Project Works
SGD	Standards and Guidelines Document
SOPs	Standard Operating Procedures
TCC	Terrestrial Coordination Committee
WDFW	Washington Department of Fish and Wildlife
WHMP	Wildlife Habitat Management Plan
WMA	Wildlife Management Area

This page is intentionally blank.

**2018 (YEAR 10) Annual Plan
for the
Swift No. 2 Wildlife Management Area**

1.0 INTRODUCTION

Public Utility District No. 1 of Cowlitz County, Washington (Cowlitz PUD) owns the Swift No. 2 Hydroelectric Project (FERC No. 2213) on the Lewis River at River Mile 44 in Cowlitz and Skamania counties, Washington (Figure 1.0-1). The Swift No. 2 Project is one of four Lewis River Hydroelectric Projects. In 1999, Cowlitz PUD and PacifiCorp¹ began the Alternative Licensing Procedure (ALP) for the Lewis River Projects. In April of 2004, Cowlitz PUD filed with the Federal Energy Regulatory Commission (FERC) an Application for New License for Swift No. 2. In November 2004, Cowlitz PUD, PacifiCorp and 24 other Parties signed the Lewis River Settlement Agreement (SA) for the purpose of resolving all of the issues between the Licensees and the other Parties regarding the relicensing. The FERC issued a new 50-year License for Swift No. 2 on June 26, 2008 that incorporates without material modification Cowlitz PUD's obligations under the Settlement Agreement.

In accordance with License Article 403, Cowlitz PUD filed a Wildlife Habitat Management Plan (WHMP) with the Commission on December 23, 2008. The WHMP provides long-term guidance for management of 525 acres of Cowlitz PUD lands within the Swift No. 2 Wildlife Management Area (WMA). The WHMP includes the following:

- Section 1 explains development of the WHMP through the relicensing process.
- Section 2 describes the Swift No. 2 WMA, which includes the Devil's Backbone and Project Works management units (MUs). It describes the vegetation cover types and baseline Habitat Suitability Indexes (HSI) for Habitat Evaluation Species (HEP) evaluation species, and provides maps and acreage tables for each MU.
- Section 3 summarizes the habitat-based and program-wide goals and objectives taken from the Standards and Guidelines Document (SGD) that apply to habitat types that occur in the Swift No. 2 WMA.
- Section 4 describes potential management activities designed to meet the SGD goals and objectives and provides a tentative timeframe for implementation.
- Section 5 includes Best Management Practices (BMPs) and Standard Operating Procedures (SOPs) that explain how each of the management prescriptions will be implemented. Section 5 also contains references for specific methods.
- Section 6 contains general references used in development of the WHMP.

¹ PacifiCorp owns the Swift No. 1 (P-2111), Yale (P-2071) and Merwin (P-935) projects, also on the Lewis River. PacifiCorp filed the Application for New License for Yale in 1999 and filed Applications for Merwin and Swift No. 1 in April 2004.

Appendices attached to the WHMP include: A) 2017 Cowlitz and Skamania County Weed Lists, B) Annual Plan Consultation Record and C) Devil’s Backbone Patch Cut Implementation Plan.

License Article 403 states that Cowlitz PUD should file an annual plan for implementation of the WHMP. On March 31, 2009, the Commission issued an order modifying and approving the WHMP, which specifies that Cowlitz PUD should file annual reports and annual plans with the Commission by April 30 of each year. In accordance with that order, this Year 10 Annual Plan outlines proposed wildlife measures and anticipated costs for work to be completed in 2018. The annual report is being filed under separate cover.

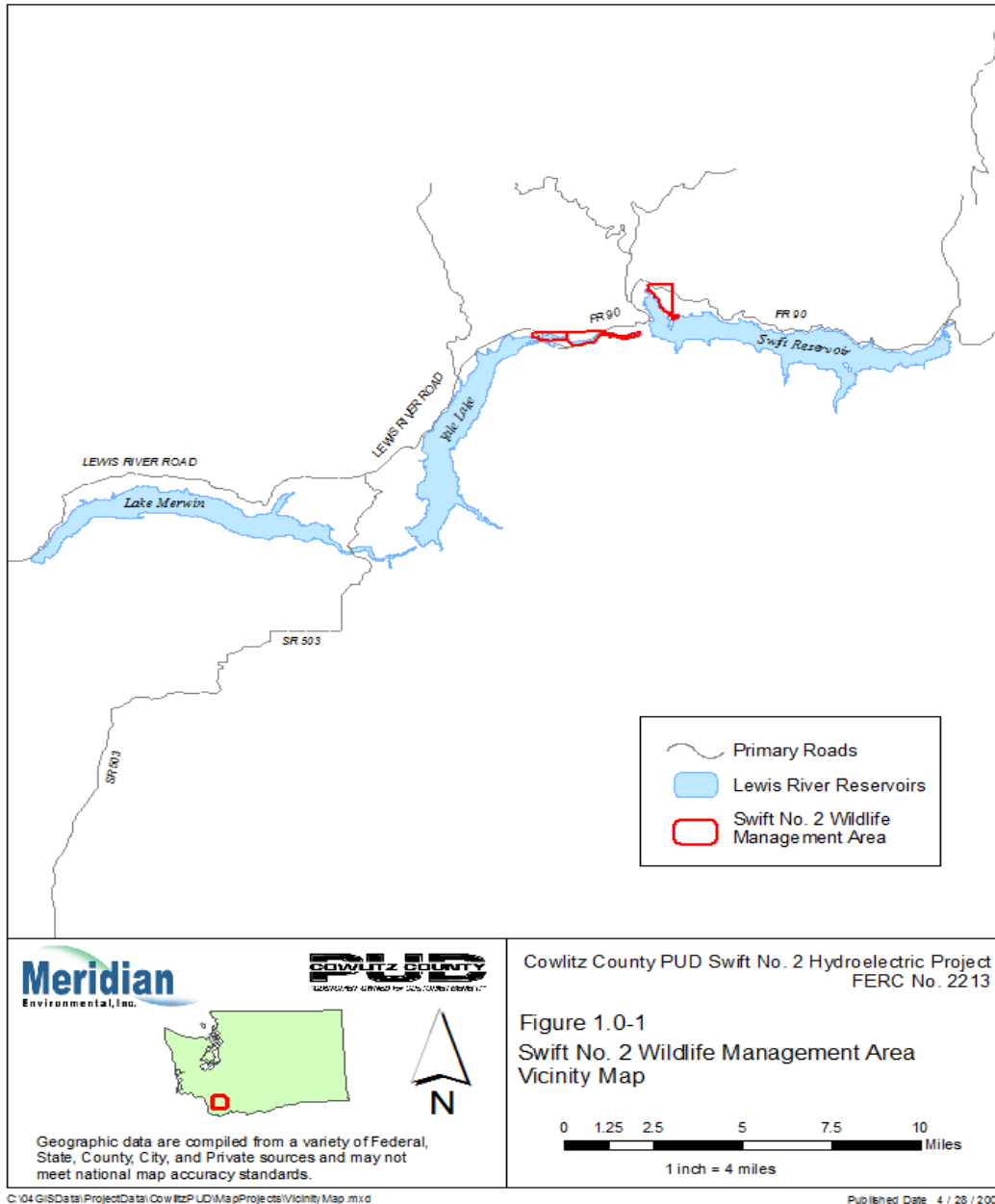


Figure 1.0-1. Project area map, project vicinity inset.

2.0 2018 (YEAR 10) MANAGEMENT ACTIVITIES

Management activities planned for 2018 (Year 10) include the following:

- *Conduct follow-up surveys at sites where weed control efforts have already been implemented.* Meridian Environmental, together with Cowlitz PUD staff, will conduct the invasive plant surveys in conjunction with the public access surveys. The biological goal and objectives for Invasive Plant Species Management are described in Section 3.2.1 of the WHMP. Sections 4.2.8 and 4.3.6 of the WHMP explain their application to the Devil's Backbone and Project Works MUs, while Section 5.8 of the WHMP provides detail about how the activity is to be implemented. For additional background regarding invasive plants, please see Chapter 4.1 of the Standards and Guidelines Document (WHMP Appendix B).

Initial surveys have been completed in all high priority areas in the Devil's Backbone MU. Follow-up surveys in May 2018 will focus on evaluation of Canada thistle, tansy ragwort and foxglove control efforts in DBMU-11. Although not designated as a noxious weed, foxglove is invasive and increasing densities have the potential to displace forbs and grasses preferred by elk.

Initial surveys have been completed in all high priority areas in the Project Works MU. In May 2018, follow-up surveys will include monitoring of Scotch broom, Himalayan blackberry, Robert's geranium, and Common cat's-ear that were treated with herbicides or removed using hand tools in previous years.

Updated 2017 Cowlitz and Skamania County weed lists are attached to this Annual Plan as Appendix A.

- *Treat high priority weed infestations.* In 2017, Cowlitz PUD renewed its interlocal agreement with Skamania County to perform weed control in the WMA. Based on invasive plant surveys to date, most weed occurrences within the Swift No. 2 WMA are located within wetland, unique habitat and/or riparian buffers. Herbicides selected for application in these areas will be safe for wetland use. Herbicides will be applied in summer and/or fall, depending on the target species and the herbicide selected. Hand-pulling and mechanical methods may also be implemented at sites where these approaches are likely to be effective. Targets for 2018 include retreatment of existing Canada thistle, tansy ragwort, Robert's geranium, Common cat's-ear, and Scotch broom infestations, and continued hand-pulling of foxglove where densities are increasing.
- *Inspect all accessible lands in the Project Works and Devil's Backbone MUs to evaluate public access activity and identify any habitat concerns or major changes in habitat conditions.* Meridian Environmental, together with Cowlitz PUD staff, will conduct the public access surveys in conjunction with the invasive plant species surveys. The biological goal and objectives for Public Access Management are described in Section 3.2.3 of the WHMP. Sections 4.2.10 and 4.3.8 of the WHMP explain their application to the Devil's Backbone and Project Works MUs. Section 5.10 provides details regarding

how the activity is to be implemented. For additional background relating to public access management, please see Chapter 4.3 of the Standards and Guidelines Document (WHMP Appendix B).

- *Adaptively manage this 2018 WHMP Annual Plan.* At the December 10, 2014 meeting, The TCC agreed to the following language regarding management of the WHMP funds:

TCC members desire that Cowlitz PUD accrue funds in order to accomplish WHMP enhancement forestry actions on Cowlitz PUD's Devil's Backbone site. TCC members therefore request Cowlitz PUD defer 35% of Annual Plan spending, starting in 2015 and continuing in subsequent years, until the TCC agrees on the allocation of these accrued funds toward a WHMP action. During preparation of each year's Annual Plan by Cowlitz PUD, TCC may request more or less than a 35% deferral, based on expected needs of the next project year and changing circumstances. Cowlitz PUD shall manage these deferred funds in accordance with Section 10.8.2.3 of the Lewis River Settlement Agreement.

- *Complete planning activities, including site layout and silvicultural prescriptions, for the creation of one 5 acre patch cut in mid-successional forest in the Devil's Backbone MU in 2019.* Forestland goals and objectives are described in Section 3.1.7 of the WHMP. Section 4.2.4 explains the purpose and approach to creating patch cuts. Patch cuts would be implemented in accordance with Forestland Management Standard Operating Procedures (SOPs) outlined in Section 5.7 of the WHMP, and in accordance with Invasive Plant Management SOPs (Section 5.8) and Raptor Management SOPs (Section 5.9). The two-year, phased approach to planning, implementing, and documenting the patch cuts is provided in Appendix C of this Annual Plan.

2.1 2018 (YEAR 10) ANNUAL PLAN BUDGET

Consistent with the SA budget of \$27 per acre per year to manage 525.2 acres, the total WHMP budget is \$14,180 in 2003 dollars. Adjusting that base amount for inflation (using the formula specified in the Definitions section of the SA) yields a 2018 (Year 10) budget of \$18,814.

As provided in Section 10.8.2.3, WHMP funds shall accrue interest from the date the monies are due to be placed in the fund. Funds remaining from previous years, if any, are also added to the fund. At year end, \$41,114 remained in the WHMP fund and was carried forward from 2017, including \$1,581 accrued interest, \$19,245 2017 carry forward, and \$20,287 timber fund carry forward. For these reasons, the total budget for 2018 is \$59,928 (\$41,114 carry forward and \$18,814 annual payment).

Consistent with SA Section 10.8.3, the anticipated 2018 starting budget shown in Table 2.1-1 includes an estimate of the costs of Cowlitz PUD employees and contractors to implement all aspects of the WHMP in 2018, including overall management, administrative costs associated with specific management activities, and implementation costs for specific management activities. These budget numbers are very preliminary and the actual costs may be considerably lower or higher than those shown in Table 2.1-1. As mentioned above, monies not spent remain in the WHMP budget and could be used to implement additional management activities during the current plan year or during following years.

If during the course of implementing this Annual Plan, to the extent known and at such time as Cowlitz PUD identifies significant cost savings or identifies cost overruns, Cowlitz PUD will notify the TCC.

Table 2.1-1. Anticipated 2018 (Year 10) Annual Plan Budget (2018 dollars).

2018 Budget		
Dec 26, 2017 Annual Payment	\$18,814	
2017 Carry Forward	\$ 19,245	Does not include 2015 - 2017 Timber Fund
Interest on 2017 Ending Balance	\$ 1,581	
Total 2018 Budget	\$ 39,640	
WHMP Activity	Estimated 2018 Cost	Assumptions
Administration	\$5,000	Includes general oversight and accounting, preparing Annual Report and Annual Plan, contracting, maintaining project files, participating in TCC meetings related to implementing Cowlitz PUD's WHMP.
Annual inspection to monitor and manage public access	\$0	Included in invasive plant surveys.
Invasive plant surveys at high priority sites	\$3,850	Includes labor and mileage. 3% increase over 2017.
Invasive plant species control	\$5,000	Includes 2 herbicide applications in 2018.
2018 Timber Management Fund	\$6,585	Defer at least 35% of the annual payment (not including any other carry forward).
Planning for Devil's Backbone Patch Cut	\$9,000	Based on cost estimates in Appendix C.
Estimated cost of management activities	\$29,435	
Estimated amount remaining in 2018 budget at year end	\$10,205	Any funds not spent by year end, plus accrued interest, remain in the WHMP budget to be carried into the following year. ²

Timber Fund	Balance	
2015 -2017 Timber Fund Carry Forward	\$20,287	
2018 Timber Fund Carry Forward	\$6,585	
Total	\$26,872	

Total Carry Forward to 2019 Timber Fund + Unspent Budget	\$37,077	
--	----------	--

² TCC members desire that any unspent monies/carry forward be designated for future timber management activities.

3.0 SITE MANAGEMENT PLANS

As discussed in sections 4.2 and 4.3 of the WHMP, Cowlitz PUD delineated and mapped 12 management sites within the Devil’s Backbone MU and four within the Project Works MU. The site boundaries are based on vegetation cover type mapping, review of aerial photographs and site visits, but also take into account factors such as slope, soils, understory composition, and access, that represent management opportunities and constraints.

Cowlitz PUD has developed a Site Management Plan for each site, as a means of identifying management opportunities and needs, and tracking the implementation of management activities through the license period. Each Site Management Plan identifies the SGD goals and objectives, baseline HSI values, and analysis species associated with the cover type; summarizes baseline site conditions, including any apparent management constraints; identifies proposed management actions; and documents the actions that were implemented. The Site Management Plans will also serve as the basis for each Annual Report and the following year’s Annual Plan.

Each Site Management Plan is part of a Site File in the Swift No. 2 WMA database. Site Files are the “home” for the documentation associated with each site’s management. In addition to the Site Management Plan, each Site File includes a site map and all photos and field forms that record the results of inspections, treatments, and follow-up activities.

3.1 DEVIL'S BACKBONE MANAGEMENT UNIT

The following section provides an aerial photo of the Devil's Backbone MU (Figure 3.1-1), cover type map showing management sites (Figures 3.1-2), and Site Management Plans for sites 1 through 12. No management sites were delineated in the Devil's Backbone Conservation Covenant area because no management activities are planned, other than protection of existing habitat values.



Figure 3.1-1. Devil's Backbone Management Unit.

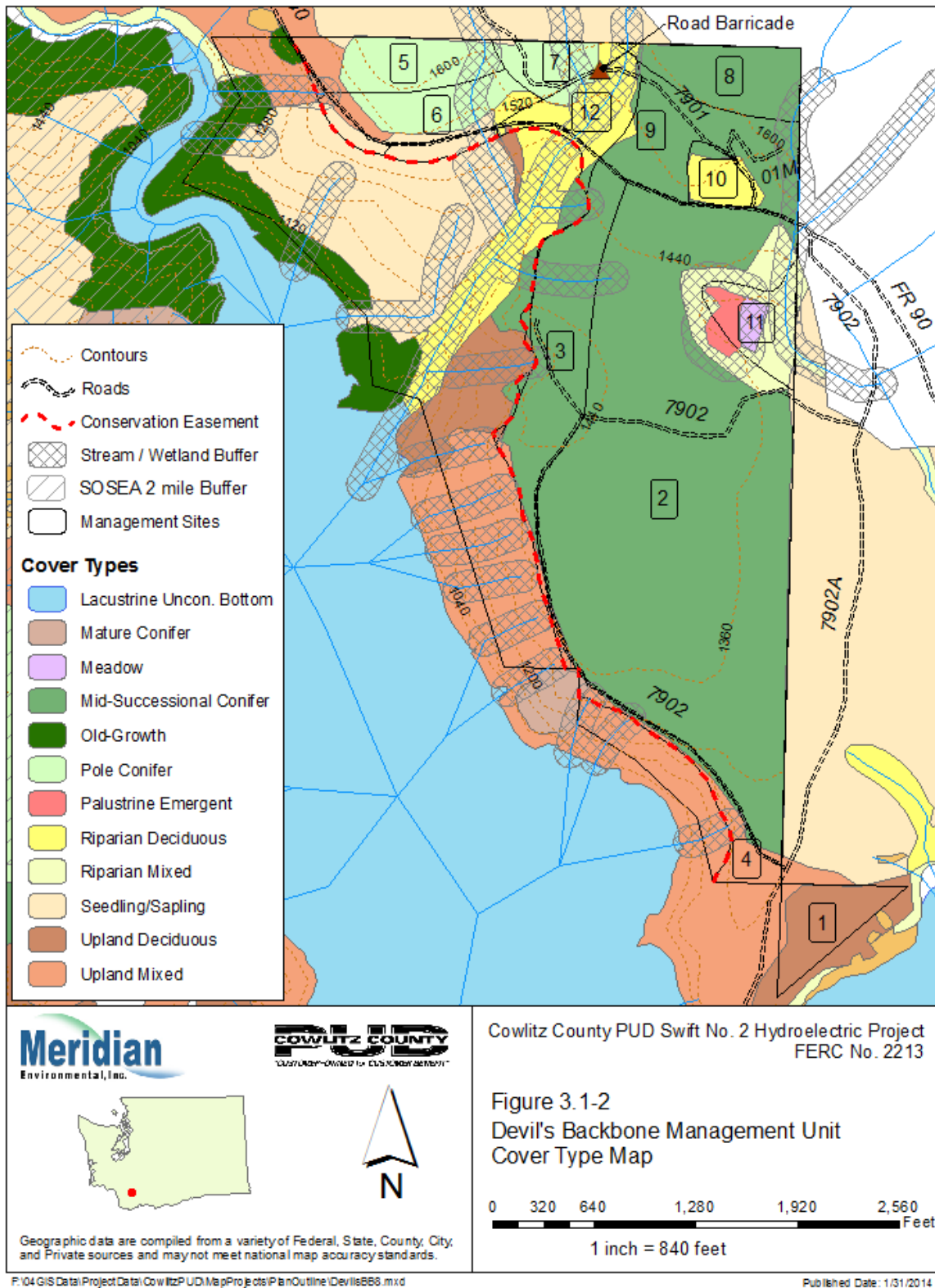
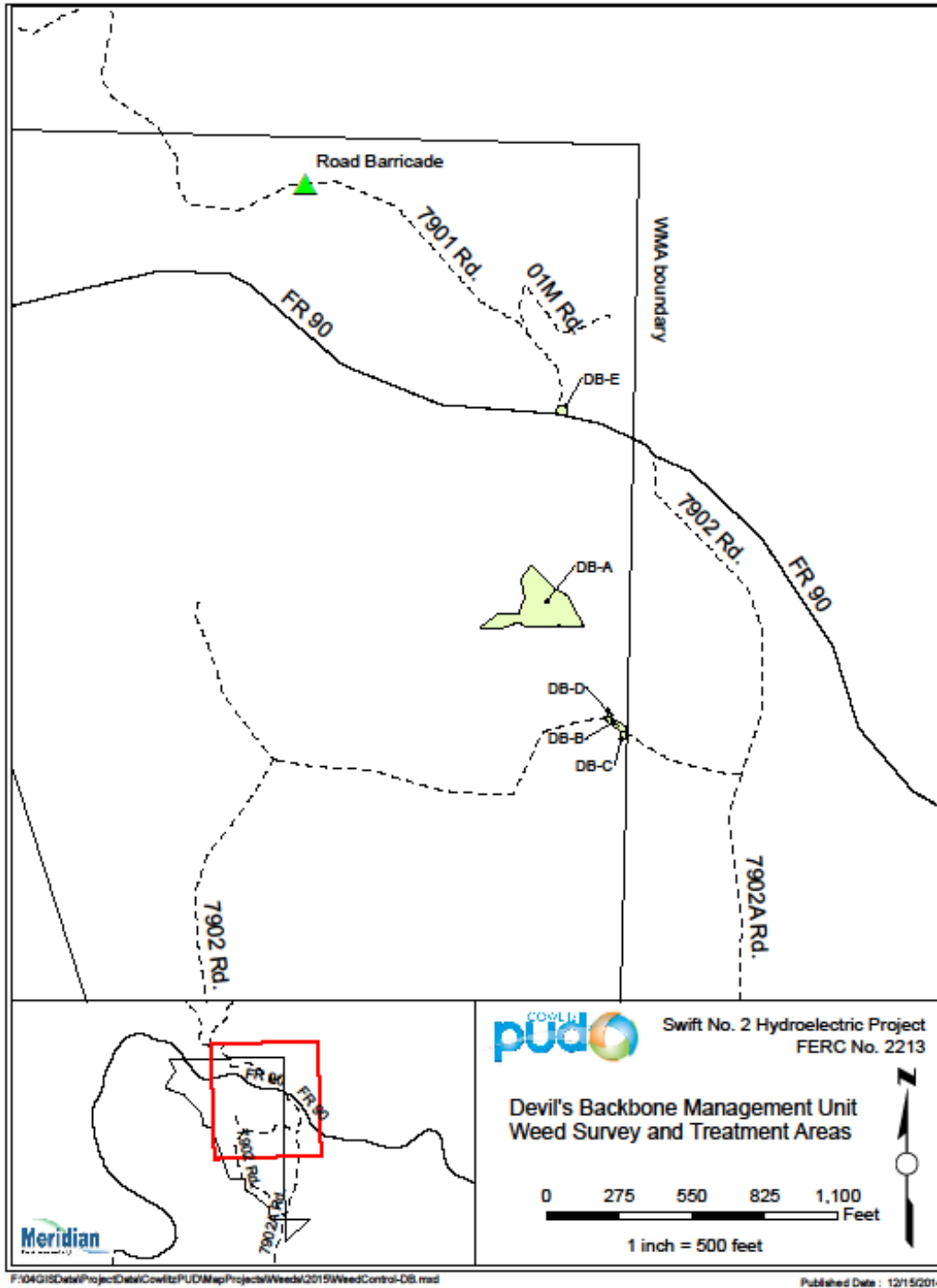


Figure 3.1-2. Devil's Backbone Management Unit cover type map.



Site Management Plan: DBMU-1		
Cover type	Upland deciduous forest	
Acres	6.6	
SGD Management Goals	Forestlands: Promote forestland species composition and structures that benefit wildlife and provide an appropriate mosaic of big game hiding cover and forage.	
SGD Management Objectives	Forestland-c: At the MU level, promote habitat diversity by increasing or maintaining minor native tree species composition.	
HEP Evaluation Species and Baseline HSIs	Pileated woodpecker: 0.28 Black-capped chickadee : 0.80 Elk: 0.43 in Unit S-1	
Analysis Species	Forestland: Northern flying squirrel, northern spotted owl	
Site Description	Mix of deciduous trees and conifers, including some western red cedars > 24 in. dbh.	
Site Constraints	None	
Access	FR 90 to 7902 Rd (gated near FR 90); 7902A Rd. crosses corner of site. Cowlitz PUD has easement on 7902 Rd.	
Management Strategies	Maintain as mixed stand. Manage for species and habitat diversity. Monitor and manage invasive plants and public access.	
Implementation		
Year	Planned Management Activity	Implemented Management Activity/Documentation
2009	Monitor and manage public access.	Surveys conducted May 13. No access concerns identified.
2009	Conduct invasive plant survey at 7902 Rd./7902A Rd. in May and control invasive plants as needed.	Surveys conducted May 13. No invasive plants observed within the site, but invasive plants were documented along the 7902A Rd. on adjacent property near the entrance to the Devil's Backbone MU
2010	Monitor and manage public access.	Survey conducted May 28. No access concerns identified.
2010	Contact adjacent landowner to evaluate invasive plant treatment options	Survey conducted May 28. Scotch broom documented in 2009 has been effectively treated by adjacent landowner.
2011	Monitor and manage public access.	Survey conducted June 8. No access concerns identified.
2011	Monitor invasive plants on adjacent property in conjunction with public access surveys.	Survey conducted June 8. No re-growth of Scotch broom on adjacent ownership was noted.
2012	Monitor and manage public access.	Survey conducted on July 2, 2012. Vehicular access noted on the 7902 Road, likely related to the illegal squatter's cabin on BLM land at the south end of the 7902 Rd. No access concerns noted in DBMU-1.
2012	Monitor invasive plants on adjacent property in conjunction with public access surveys.	Not done due to safety concerns related to the illegal squatter's cabin on BLM land at the south end of the 7902 Rd.
2013	Monitor and manage public access.	Survey conducted on June 28, 2013. No evidence of motorized access or other access concerns noted.
2013	Monitor invasive plants on adjacent property in conjunction with public access surveys.	Survey conducted on June 28, 2013. No re-growth of Scotch broom noted on property adjacent to DBMU-1.
2014	Monitor and manage public access.	Survey conducted on June 30, 2014. No evidence of motorized access or other access concerns noted.
2014	Monitor invasive plants on adjacent property in conjunction with public access surveys.	Survey conducted on June 30, 2014. No re-growth of Scotch broom noted on property adjacent to DBMU-1.

Site Management Plan: DBMU-1		
2015	Monitor and manage public access.	Survey conducted on June 24, 2015. No evidence of motorized access or other access concerns noted.
2015	Monitor invasive plants on adjacent property in conjunction with public access surveys.	Survey conducted on June 24, 2015. No re-growth of Scotch broom noted on property adjacent to DBMU-1.
2016	Monitor and manage public access.	Survey conducted on May 25, 2016. No evidence of motorized access or other access concerns noted. Squatter's cabin on BLM land at the south end of the 7902 Rd was removed December 1, 2015.
2016	Monitor invasive plants on adjacent property in conjunction with public access surveys.	Survey conducted on May 25, 2016. No re-growth of Scotch broom noted on property adjacent to DBMU-1.
2017	Monitor and manage public access.	Survey conducted on May 30, 2017. No evidence of motorized access or other access concerns noted.
2017	Monitor invasive plants on adjacent property in conjunction with public access surveys.	Survey conducted on May 30, 2017. No re-growth of Scotch broom noted on property adjacent to DBMU-1.
2018	Monitor and manage public access.	
2018	Monitor invasive plants on adjacent property in conjunction with public access surveys.	



Swift No. 2 WMA wildlife tree, June 2013

Site Management Plan: DBMU-2		
Cover type	Mid-successional conifer forest	
Acres	104.5	
SGD Management Goals	<p>Old-growth: Promote the development, maintenance, and connectivity of old-growth coniferous forest and/or associated habitat components for wildlife species that use old-growth habitat.</p> <p>Forestlands: Promote forestland species composition and structures that benefit wildlife and provide an appropriate mosaic of big game hiding cover and forage.</p>	
SGD Management Objectives	<p>Old-growth-c: Protect and manage forested buffers to promote development of large trees where appropriate. Old-growth-e: Within areas to be thinned to develop old-growth characteristics, leave LWD. Forestland-a: At the MU level, provide a range of alternatives for developing and maintaining a mix of forage and hiding cover for elk. Forestland-b: Maintain or create at least 8 snags, green retention trees, or wildlife reserve trees per acre, if available; retain larger trees and snags, and retain or create 4 logs/acre if possible. Forestland-c: At the MU level, promote habitat diversity by increasing or maintaining minor native tree species composition.</p>	
HEP Evaluation Species and Baseline HSIs	<p>Black-capped chickadee: 0.85</p> <p>Pileated woodpecker: 0.47</p> <p>Elk: 0.43 in Unit S-1</p>	
Analysis Species	<p>Old-growth: Northern flying squirrel, marten, Larch Mountain salamander, northern spotted owl, bald eagle</p> <p>Forestland: Northern flying squirrel, northern spotted owl</p>	
Site Description	<p>Flat site dominated by Douglas-fir and western hemlock from 8 to 18 in. dbh, with a quadratic mean diameter of 11.6 in. Stand age = 35 yrs in 2006; crown closure = 100%; canopy height = 80 ft., trees per acre = 266. Few small diameter snags, no large diameter snags, moderate LWD. Variable understory; dominated by Oregon grape and swordfern. Patchy herbaceous cover includes oxalis, inside-out flower, bedstraw, vanilla leaf.</p>	
Site Constraints	None	
Access	<p>Good: FR 90 to 7092 Rd. (gated near FR 90); 7092A Rd. crosses through stand. Cowlitz PUD has easement on 7092 Rd.</p>	
Management Strategies	<p>Consider patch cuts to mimic canopy gaps in old-growth stands and increase number of vegetation layers. Consider thinning to accelerate development of large diameter live trees and potential snags, and increase shrub and herbaceous cover that will improve elk forage. Seed disturbed soils with elk forage mix. Consider establishing and maintaining elk forage plots. Monitor and manage snags/LWD to meet target densities as trees mature. Monitor and manage invasive plants and public access.</p>	
Implementation		
Year	Planned Management Activity	Implemented Management Activity/Documentation
2009	Monitor and manage public access.	Surveys conducted on May 13. No access concerns identified.
2009	Conduct invasive plant survey at 7902 Rd. in May and control invasive plants as needed.	Surveys conducted on May 13. Invasive plants documented within project boundary along 7902 Rd. were treated with herbicide in July and September. Invasive plants also observed on adjacent property along the MU boundary.

Site Management Plan: DBMU-2 cont.		
2010	Monitor and manage public access.	Survey conducted on May 28. No access concerns identified.
2010	Conduct follow-up invasive plant surveys in May and re-treat as necessary. Contact adjacent landowner to evaluate treatment options.	Survey conducted on May 28. Scattered Canada thistle and common cat's ear remain within previously treated areas. Scotch broom treatment 100 percent effective.
2011	Monitor and manage public access.	Survey conducted on June 8. No access concerns identified.
2011	Conduct follow-up invasive plant survey in May and re-treat as necessary.	Scattered common cat's ear remains; one large, well-established Scotch broom plant observed inside WMA boundary that was overlooked in 2010 survey. Scotch broom re-sprouting vigorously on adjacent ownership, outside WMA boundary.
2012	Monitor and manage public access.	Survey conducted on July 2, 2012. Vehicular access noted on the 7902 Road, likely related to the illegal squatter's cabin on BLM land at the south end of the 7902 Rd. No access concerns noted in DBMU-2.
2012	Conduct follow-up invasive plant survey in conjunction with public access survey; remove Scotch broom inside WMA boundary using hand tools; coordinate with adjacent landowner regarding re-treatment.	Not done due to safety concerns related to the illegal squatter's cabin on BLM land at the south end of the 7902 Rd.
2013	Monitor and manage public access.	Survey conducted on June 28, 2013. No evidence of non-motorized access or other access concerns noted.
2013	Conduct follow-up invasive plant survey in conjunction with public access survey; remove Scotch broom inside WMA boundary using hand tools; coordinate with adjacent landowner regarding re-treatment.	Survey conducted on June 28, 2013. Scattered Scotch broom plants observed within the WMA boundary were sprayed in conjunction with herbicide application in DBMU-11 (DB-A) in July and September, 2013. Dense patches of Scotch broom and scattered individual plants were observed along the 7902 Road outside the WMA boundary; coordination with the adjacent landowner has been deferred until plans for forest management activities in DBMU-1 are finalized and needs for road improvements, if any, are identified.
2013	Complete planning for patch cuts, as described in Appendix B (Patch Cut Implementation Plan)	Patch cuts laid out as planned on June 20-21, 2013, and site visit with the TCC conducted on September 11, 2013. Based on TCC recommendations, the PUD requested non-binding quotes for three different forest management alternatives (patch cuts, thinning, and a combination of the two) from 12 logging firms. No firms provided quotes.
2014	Monitor and manage public access.	Survey conducted on June 30, 2014. No evidence of motorized access or other access concerns noted.
2014	Conduct follow-up invasive plant survey in conjunction with public access survey; continue to treat Scotch broom inside WMA boundary; coordinate with adjacent landowner regarding Scotch broom treatment as forest management plans are finalized.	Survey conducted on June 30, 2014. On December 10, 2014, the TCC agreed to defer forest management actions until sufficient WHMP funds have accrued.

Site Management Plan: DBMU-2, cont.		
2015	Monitor and manage public access.	Survey conducted on June 24, 2015. Observed motorcycle track, but no evidence of off-road activity.
2015	Monitor invasive plants in conjunction with public access surveys.	Survey conducted on June 24, 2015. Good control of weeds within project boundary. Scotch broom observed outside boundary. Herbicides applied to DB-A in August 2015.
2016	Monitor and manage public access.	Survey conducted on May 25, 2016. Blowdown trees continue to encroach into 7902 Road at the south end.
2016	Monitor invasive plants in conjunction with public access surveys.	Survey conducted on May 25, 2016. Scotch broom on land just east of project boundary has been treated recently and is under better control. No Scotch broom observed inside boundary.
2017	Monitor and manage public access.	Survey conducted on May 30, 2017. One patch of broken glass on 7902 Road at west end. Blowdown trees continue to encroach into 7902 Road at the south end.
2017	Monitor invasive plants in conjunction with public access surveys.	Survey conducted on May 30, 2017. A few Scotch broom on adjacent property are regenerating, but none observed inside boundary.
2018	Monitor and manage public access.	
2018	Monitor invasive plants in conjunction with public access surveys.	
2018	Complete planning for patch cuts, as described in Appendix C – Patch Cut Implementation Plan.	

Site Management Plan: DBMU-3		
Cover type	Mid-successional conifer forest	
Acres	17.2	
SGD Management Goals	<p>Old-growth: Promote the development, maintenance, and connectivity of old-growth coniferous forest and/or associated habitat components for wildlife species that use old-growth habitat.</p> <p>Forestlands: Promote forestland species composition and structures that benefit wildlife and provide an appropriate mosaic of big game hiding cover and forage.</p>	
SGD Management Objectives	<p>Old growth-c: Protect and manage forested buffers to promote development of large trees where appropriate. Old-growth-e: Within areas to be thinned to develop old-growth characteristics, leave LWD. Forestland-a: At the MU level, provide a range of alternatives for developing and maintaining a mix of forage and hiding cover for elk. Forestland-b: Maintain or create at least 8 snags, green retention trees, or wildlife reserve trees per acre, if available; retain larger trees and snags, and retain or create 4 logs/acre if possible. Forestland-c: At the MU level, promote habitat diversity by increasing or maintaining minor native tree species composition.</p>	
HEP Evaluation Species and Baseline HSIs	<p>Black-capped chickadee: 0.85</p> <p>Pileated woodpecker: 0.47</p> <p>Elk: 0.43 in Unit S-1</p>	
Analysis Species	<p>Old-growth: Northern flying squirrel, marten, Larch Mountain salamander, northern spotted owl, bald eagle</p> <p>Forestland: Northern flying squirrel, northern spotted owl</p>	
Site Description	Flat site dominated by Douglas-fir and western hemlock from 8 to 18 in. dbh.	
Site Constraints	None	
Access	Good: FR 90 to 7902 Rd. (gated near FR 90), which crosses through stand. Cowlitz PUD has easement on 7902 Rd.	
Management Strategies	<p>Consider 1) patch cuts to mimic canopy gaps in old-growth stands and increase number of vegetation layers; 2) thinning to accelerate development of large diameter live trees and potential snags, and increase shrub and herbaceous cover that will improve elk forage, and seed disturbed soils with elk forage mix; and 3) establishing and maintaining elk forage plots. Monitor and manage snags/LWD to meet target densities as trees mature. Monitor and manage invasive plants and public access.</p>	
Implementation		
Year	Planned Management Activity	Implemented Management Activity/Documentation
2009	Monitor and manage public access.	Surveys conducted on May 13. No access concerns identified.
2009	Conduct invasive plant survey at 7902 Rd. in May and control invasive plants as needed.	Surveys conducted on May 13. No invasive plants observed. Low priority for additional weed surveys.
2010	Monitor and manage public access.	Survey conducted on May 28. No access concerns identified.
2011	Monitor and manage public access.	Survey conducted on June 8. No access concerns identified.
2012	Monitor and manage public access.	Survey conducted on July 2, 2012. Vehicular access noted on the 7902 Road, likely related to the illegal squatter's cabin on BLM land at the south end of the 7902 Rd. No access concerns noted in DBMU-3.

Site Management Plan: DBMU-3, cont.		
2013	Monitor and manage public access.	Survey conducted on June 28, 2013. No evidence of non-motorized access or other access concerns noted.
2013	Complete planning for patch cuts, as described in Appendix B (Patch Cut Implementation Plan)	No patch cuts were sited in DBMU-3 (see above, DBMU-2).
2014	Monitor and manage public access.	Survey conducted on June 30, 2014. No evidence of non-motorized access or other access concerns noted.
2015	Monitor and manage public access.	Survey conducted on June 24, 2015. Observed motorcycle track, but no evidence of off-road activity.
2016	Monitor and manage public access.	Survey conducted on May 25, 2016. No evidence of non-motorized access or other access concerns noted.
2017	Monitor and manage public access.	Survey conducted on May 30, 2017. No evidence of non-motorized access or other access concerns noted.
2018	Monitor and manage public access.	

Site Management Plan: DBMU-4		
Cover type	Upland mixed forest	
Acres	4.3	
SGD Management Goal	Forestlands: Promote forestland species composition and structures that benefit wildlife and provide an appropriate mosaic of big game hiding cover and forage.	
SGD Management Objectives	Forestland-a: At the MU level, provide a range of alternatives for developing and maintaining a mix of forage and hiding cover for elk. Forestland-b: Maintain or create at least 8 snags, green retention trees, or wildlife reserve trees per acre, if available; retain larger trees and snags, and retain or create 4 logs/acre if possible. Forestland-c: At the MU level, promote habitat diversity by increasing or maintaining minor native tree species composition.	
HEP Evaluation Species and Baseline HSI	Black-capped chickadee: 0.71 Pileated woodpecker: 0.19 Elk: 0.43 in Unit S-1	
Analysis Species	Northern flying squirrel, northern spotted owl	
Site Description	Primarily Douglas-fir and hemlock, 8 to 18" dbh, with some big-leaf maple and alder growing on western edge.	
Site Constraints	Narrow, linear configuration between project road and steep slope down to the Conservation Easement boundary. One intermittent stream/stream buffer.	
Access	Good: adjacent to 7902 Rd. (gated near FR 90). Cowlitz PUD has easement on 7902 Rd.	
Management Strategies	Maintain as buffer between road and Conservation Easement. Manage for species and habitat diversity. Monitor and manage invasive plants and public access.	
Implementation		
Year	Planned Management Activity	Implemented Management Activity/Documentation
2009	Monitor and manage public access.	Surveys conducted on May 13. No access concerns identified.
2009	Conduct invasive plant survey at 7902 Rd. in May and control invasive plants as needed.	Surveys conducted May 13. No invasive plants observed within the site boundary, but documented on adjacent property.
2010	Monitor and manage public access.	Survey conducted on May 28. No access concerns identified.
2010	Contact adjacent landowner to evaluate invasive plant treatment options.	Survey conducted on May 28 indicated Scotch broom effectively treated by adjacent landowner.
2011	Monitor and manage public access.	Survey conducted on June 8. No access concerns identified.
2011	Monitor Scotch broom in conjunction with public access surveys.	Survey conducted on June 8 indicated no re-growth of Scotch broom on adjacent land ownership.
2012	Monitor and manage public access.	Survey conducted on July 2, 2012. Vehicular access noted on the 7902 Road, likely related to the illegal squatter's cabin on BLM land at the south end of the 7902 Rd. No access concerns noted in DBMU-4.
2012	Monitor Scotch broom in conjunction with public access surveys.	Not noted during July access survey.
2013	Monitor and manage public access.	Survey conducted on June 28, 2013. No evidence of motorized access or other access concerns noted.
2013	Monitor Scotch broom in conjunction with public access surveys.	Survey conducted on June 28, 2013. No re-growth of Scotch broom noted on property adjacent to DBMU-4.

Site Management Plan: DBMU-4		
2014	Monitor and manage public access.	Survey conducted on June 30, 2014. One tree was cut and bucked but there is no evidence of motorized access.
2014	Monitor invasive plants in conjunction with public access surveys.	Survey conducted on June 30, 2014. No re-growth of Scotch broom noted on property adjacent to DBMU-4.
2015	Monitor and manage public access.	Survey conducted on June 24, 2015. Observed motorcycle track, but no evidence of off-road activity.
2015	Monitor invasive plants in conjunction with public access surveys.	Survey conducted on June 24, 2015.
2016	Monitor and manage public access.	Survey conducted on May 25, 2016. Blowdown trees continue to encroach into 7902 Road at the south end.
2016	Monitor invasive plants in conjunction with public access surveys.	Survey conducted on May 25, 2016. No Scotch broom observed inside property boundary.
2017	Monitor and manage public access.	Survey conducted on May 30, 2017. Blowdown trees continue to encroach into 7902 Road at the south end.
2017	Monitor invasive plants in conjunction with public access surveys.	Survey conducted on May 30, 2017. No invasive species observed inside property boundary.
2018	Monitor and manage public access.	
2018	Monitor invasive plants in conjunction with public access surveys.	

Site Management Plan: DBMU-5		
Cover type	Pole conifer forest	
Acres	8.8	
SGD Management Goal	Forestlands: Promote forestland species composition and structures that benefit wildlife and provide an appropriate mosaic of big game hiding cover and forage.	
SGD Management Objectives	Forestland-b: Maintain or create at least 8 snags, green retention trees, or wildlife reserve trees per acre, if available; retain larger trees and snags, and retain or create 4 logs/acre if possible. Forestland-c: At the MU level, promote habitat diversity by increasing or maintaining minor native tree species composition.	
HEP Evaluation Species and Baseline HSI	Black-capped chickadee: 0.43 Pileated woodpecker: 0.18 Elk: 0.43 in Unit S-1	
Analysis Species	Forestland: Northern flying squirrel, northern spotted owl	
Site Description	Primarily Douglas-fir and western hemlock	
Site Constraints	Steep slopes, possible wet soils.	
Access	Bordered by FR 90 on the west. 7901 Rd. does not pass through site.	
Management Strategies	Manage for species and habitat diversity. Monitor and manage snags/LWD to meet target densities as trees mature. Monitor and manage invasive plants and public access.	
Implementation		
Year	Planned Management Activity	Implemented Management Activity/Documentation
2009	Monitor and manage public access.	Surveys conducted on May 13. No access concerns identified.
2010	Monitor and manage public access.	No survey conducted; 7901 Rd. does not pass through site and access from FR 90 is difficult. Low priority for additional survey.
2011	No survey planned.	No survey conducted.
2012	No survey planned.	No survey conducted.
2013	No survey planned.	No survey conducted.
2014	Monitor and manage public access.	No survey conducted; 7901 Rd. does not pass through site. Barrier in 7901 Rd intact and working well. Access from FR 90 is difficult. Low priority for additional survey.
2015	No survey planned.	No survey conducted.
2016	No survey planned.	No survey conducted.
2017	No survey planned.	No survey conducted.
2018	No survey planned.	

Site Management Plan: DBMU-6		
Cover type	Pole conifer forest	
Acres	8.2	
SGD Management Goal	Forestlands: Promote forestland species composition and structures that benefit wildlife and provide an appropriate mosaic of big game hiding cover and forage.	
SGD Management Objectives	Forestland-b: Maintain or create at least 8 snags, green retention trees, or wildlife reserve trees per acre, if available; retain larger trees and snags, and retain or create 4 logs/acre if possible. Forestland-c: At the MU level, promote habitat diversity by increasing or maintaining minor native tree species composition.	
HEP Evaluation Species and Baseline HSI	Black-capped chickadee: 0.43 Pileated woodpecker: 0.18 Elk: 0.43 in Unit S-1	
Analysis Species	Forestland: Northern flying squirrel, northern spotted owl	
Site Description	Primarily Douglas-fir and western hemlock	
Site Constraints	Steep slopes, possible wet soils.	
Access	Bordered by FR 90 on the west and south. 7901 Rd. does not pass through site.	
Management Strategies	Manage for species and habitat diversity. Monitor and manage snags/LWD to meet target densities as trees mature. Monitor and manage invasive plants and public access.	
Implementation		
Year	Planned Management Activity	Implemented Management Activity/Documentation
2009	Monitor and manage public access.	Survey conducted on May 13. No access concerns identified.
2010	Monitor and manage public access.	No survey conducted; 7901 Rd. does not pass through site and access from FR 90 is difficult. Low priority for additional survey.
2011	No survey planned.	No survey conducted.
2012	No survey planned.	No survey conducted.
2013	No survey planned.	No survey conducted.
2014	Monitor and manage public access.	No survey conducted; 7901 Rd. does not pass through site. Barrier in 7901 Rd intact and working well. Access from FR 90 is difficult. Low priority for additional survey.
2015	No survey planned.	No survey conducted.
2016	No survey planned.	No survey conducted.
2017	No survey planned.	No survey conducted.
2018	No survey planned.	

Site Management Plan: DBMU-7		
Cover type	Pole conifer forest	
Acres	4.3	
SGD Management Goal	Forestlands: Promote forestland species composition and structures that benefit wildlife and provide an appropriate mosaic of big game hiding cover and forage.	
SGD Management Objectives	Forestland-b: Maintain or create at least 8 snags, green retention trees, or wildlife reserve trees per acre, if available; retain larger trees and snags, and retain or create 4 logs/acre if possible. Forestland-c: At the MU level, promote habitat diversity by increasing or maintaining minor native tree species composition.	
HEP Evaluation Species and Baseline HSI	Black-capped chickadee: 0.43 Pileated woodpecker: 0.18 Elk: 0.43 in Unit S-1	
Analysis Species	Forestland: Northern flying squirrel, northern spotted owl	
Site Description	Primarily Douglas-fir and western hemlock	
Site Constraints	Steep slopes, possible wet soils.	
Access	FR 90 to 7901 Rd.	
Management Strategies	Manage for species and habitat diversity. Monitor and manage snags/LWD to meet target densities as trees mature. Monitor and manage invasive plants, public access, and erosion along 7901 Rd.	
Implementation		
Year	Planned Management Activity	Implemented Management Activity/Documentation
2009	Monitor and manage public access.	Survey conducted on May 13. No access concerns identified.
2009	Monitor and manage invasive plant species in conjunction with public access surveys.	No invasive plant species observed during survey along 7901 Rd. Low priority for additional survey.
2010	Monitor and manage public access.	Survey conducted on May 28. No access concerns identified. Low priority for additional survey.
2011	Monitor and manage public access.	Survey conducted on June 8. Kelly humps have been repaired, small diameter trees removed from road margin, and unauthorized access is possible via 4-wheel drive.
2011	Monitor and manage invasive plant species in conjunction with public access surveys.	Survey conducted on June 8. Scattered Scotch broom along both road margins near Kelly hump repair site.
2012	Monitor effectiveness of gate or barricade planned for installation in spring of 2012.	Survey conducted on May 17, 2012. Unauthorized access, dispersed camping, and littering continue to occur. Barricade completed in July, 2012.
2012	Monitor and manage invasive plant species in conjunction with public access surveys.	No survey done. Barricade completed in July, 2012.
2013	Monitor and manage public access, including evaluation of barricade effectiveness.	Survey conducted on June 28, 2013. Barricade and road closure signs in good repair; no evidence of attempts to bypass the barricade.
2013	Monitor and manage invasive plant species in conjunction with public access surveys.	Survey conducted on June 28, 2013. A few Scotch broom plants both north and south of the barricade.
2014	Monitor and manage public access, including evaluation of barricade effectiveness.	Survey conducted on June 30, 2014, Barrier in 7901 Rd intact and working well. No evidence of attempts to drive over or around it.
2014	Monitor and manage invasive plant species in conjunction with public access surveys.	Survey conducted on June 30, 2014. No Scotch broom observed, but a few bull thistles at the barrier, and a few tansy

Site Management Plan: DBMU-7		
		ragwort, oxeye daisy, St. John's wort individuals and scattered common cats'-ear above the barrier.
2015	Monitor and manage public access, including evaluation of barricade effectiveness.	Survey conducted on June 24, 2015. Barrier in 7901 Rd intact and working well. No evidence of attempts to drive over or around it.
2015	Monitor and manage invasive plant species in conjunction with public access surveys.	Survey conducted on June 24, 2015. No tansy or St John's wort observed above the barrier. Cut the single bull thistle above the barrier.
2016	Monitor and manage public access, including evaluation of barricade effectiveness.	Survey conducted on May 25, 2016. Barrier in 7901 Rd intact and working well. No evidence of attempts to drive over or around it.
2016	Monitor and manage invasive plant species in conjunction with public access surveys.	Survey conducted on May 25, 2016. No invasive species observed.
2017	Monitor and manage public access, including evaluation of barricade effectiveness.	Survey conducted on May 30, 2017. Barrier in 7901 Rd intact and working well. Truck tire tracks present before barrier and slope failure blowdown. One campfire present near barrier.
2017	Monitor and manage invasive plant species in conjunction with public access surveys.	Survey conducted on May 30, 2017. No invasive species observed.
2018	Monitor and manage public access, including evaluation of barricade effectiveness.	
2018	Monitor and manage invasive plant species in conjunction with public access surveys.	

Site Management Plan: DBMU-8		
Cover type	Mid-successional conifer forest	
Acres	8.6	
SGD Management Goal	Forestlands: Promote forestland species composition and structures that benefit wildlife and provide an appropriate mosaic of big game hiding cover and forage.	
SGD Management Objectives	Forestland-b: Maintain or create at least 8 snags, green retention trees, or wildlife reserve trees per acre, if available; retain larger trees and snags, and retain or create 4 logs/acre if possible. Forestland-c: At the MU level, promote habitat diversity by increasing or maintaining minor native tree species composition.	
HEP Evaluation Species and Baseline HSI	Black-capped chickadee: 0.85 Pileated woodpecker: 0.47 Elk: 0.43 in Unit S-1	
Analysis Species	Forestland: Northern flying squirrel, northern spotted owl	
Site Description	Primarily Douglas-fir and western hemlock, 8 to 18" dbh.	
Site Constraints	Possible wet soils.	
Access	FR 90 to 7901 Rd. 7901 Rd. does not pass through site.	
Management Strategies	Manage for species and habitat diversity. Monitor and manage snags/LWD to meet target densities as trees mature. Monitor and manage invasive plants and public access.	
Implementation		
Year	Planned Management Activity	Implemented Management Activity/Documentation
2009	Monitor and manage public access.	Surveys conducted on May 13. No access concerns identified.
2009	Conduct invasive plant survey at 7901 Rd. in May and control invasive plants as needed.	7901 Rd. does not pass through DBMU-8, so invasive plant survey did not cover this site.
2010	Monitor and manage public access.	Survey conducted on May 28. No access concerns identified. Low priority for additional survey.
2011	No survey planned	No survey conducted.
2012	No survey planned.	No survey conducted.
2013	No survey planned.	No survey conducted.
2014	Monitor and manage public access.	No survey conducted; 7901 Rd. does not pass through site. Barrier in 7901 Rd intact and working well. Access from FR 90 is difficult. Low priority for additional survey.
2015	No survey planned.	No survey conducted.
2016	No survey planned.	No survey conducted.
2017	No survey planned.	No survey conducted.
2018	No survey planned.	

Site Management Plan: DBMU-9		
Cover type	Mid-successional conifer forest	
Acres	13.2	
Site Review Type	Vegetation cover typing, aerial photo review	
SGD Management Goal	Forestlands: Promote forestland species composition and structures that benefit wildlife and provide an appropriate mosaic of big game hiding cover and forage.	
SGD Management Objectives	Forestland-b: Maintain or create at least 8 snags, green retention trees, or wildlife reserve trees per acre, if available; retain larger trees and snags, and retain or create 4 logs/acre if possible. Forestland-c: At the MU level, promote habitat diversity by increasing or maintaining minor native tree species composition.	
HEP Evaluation Species and Baseline HSIs	Black-capped chickadee: 0.85 Pileated woodpecker: 0.47 Elk: 0.43 in Unit S-1	
Analysis Species	Forestland: Northern flying squirrel, northern spotted owl	
Site Description	Primarily Douglas-fir and western hemlock, 8 to 18" dbh.	
Site Constraints	Possible wet soils.	
Access	Bordered by FR 90 on the south; 7901 Rd. and 01M Rd. pass through site.	
Management Strategies	Manage for species and habitat diversity. Monitor and manage snags/LWD to meet target densities as trees mature. Monitor and manage invasive plants, public access, and erosion.	
Implementation		
Year	Planned Management Activity	Implemented Management Activity/Documentation
2009	Monitor and manage public access.	Survey conducted on May 13. No access concerns identified. Erosion in the road cut at intersection of 7901 Rd. and 01M roads, but no soil disturbance or loss of vegetation within the site itself. Erosion within 7901 Rd. roadbed between 01M Rd. and FR 90.
2009	Monitor and manage invasive plant species.	Survey conducted on May 13. No invasive plant species observed. Low priority for future surveys.
2010	Monitor and manage public access; monitor erosion.	Survey conducted on May 28. A few signs of unauthorized (motorized) access (dishwasher dumped over the side of the road, and some litter observed). No change in erosion, no soil disturbance or loss of vegetation within DBMU-9.
2011	Monitor and manage public access; monitor erosion.	Survey conducted on June 8. Kelly humps have been repaired, small diameter trees removed from road margin, and unauthorized access is possible via 4-wheel drive. No change in erosion noted at broken culvert upslope of the 7901 Rd. near the junction with the 01M Rd.; no soil disturbance or loss of vegetation within DBMU-9.
2011	Monitor and manage invasive plant species in conjunction with public access surveys.	No invasive plant species observed inside WMA boundary. Scotch broom along both road margins near Kelly hump repair site.
2012	Monitor effectiveness of gate or barricade planned for installation in spring of 2012. Continue to monitor erosion.	Survey conducted on May 17, 2012. Unauthorized access, dispersed camping and littering continue to occur. Barricade completed in July, 2012.
2012	Monitor and manage invasive plant species in conjunction with public access surveys.	No survey done. Barricade completed in July, 2012.

Site Management Plan: DBMU-9		
2013	Monitor and manage public access, including evaluation of barricade effectiveness.	Survey conducted on June 28, 2013. Barricade and road closure signs in good repair; no evidence of attempts to bypass the barricade.
2013	Monitor and manage invasive plant species in conjunction with public access surveys.	Survey conducted on June 28, 2013. A few Scotch broom plants both north and south of the barricade.
2014	Monitor and manage public access, including evaluation of barricade effectiveness.	Survey conducted on June 30, 2014. Barrier in 7901 Rd intact and working well, no evidence of attempts to drive over or around it. No evidence of human activity on 01M Rd.
2014	Monitor and manage invasive plant species.	Survey conducted on June 30, 2014; no invasives noted in DBMU-9.
2015	Monitor and manage invasive species and public access	Survey conducted on June 24, 2015; no invasives noted. One road closed sign needs repair.
2016	Monitor and manage invasive species and public access.	Survey conducted on May 25, 2016. No invasive species observed. Vehicle tracks visible in a couple spots.
2017	Monitor and manage invasive species and public access. Replace one "Road Closed" sign and re-install one sign.	Survey conducted May 30, 2017. No invasive species observed. Tracks on road and campfires indicate motorized and non-motorized access. Signs installed.
2018	Monitor and manage invasive species and public access. Check leaning "Road Closed" sign and re-install if needed.	

Site Management Plan: DBMU-10		
Cover type	Riparian Deciduous Forest	
Acres	3.1	
Site Review Type	Vegetation cover typing, aerial photo review, visual walk-through 9/1/05 and 6/14/06	
SGD Management Goal	Riparian: Protect, maintain, and/or enhance riparian areas to include a diversity of native plant species and vegetation structures to benefit wildlife species that use riparian habitats.	
SGD Management Objectives	Riparian-a: Identify and establish buffers. Riparian d: Protect existing large snags. Riparian-e: As part of implementation of WHMP, identify riparian sites damaged by anthropogenic processes and prepare restoration plans within 5 years, if feasible.	
HEP Evaluation Species and Baseline HSIs	Black-capped chickadee: 0.19 Pileated woodpecker: 0.32 Yellow warbler: 0.65 Elk: 0.43 in Unit S-1	
Analysis Species	Cascade torrent salamander, papillose tail-dropper	
Site Description	Red alder overstory, sparse mid-story shrub and understory forb component, bisected by an unnamed stream. Western Hemlock/Coolwort Foamflower PA, with several old, large diameter hemlock stumps, but no snags and little LWD.	
Site Constraints	Seasonal flooding, wet soils, stream buffer.	
Access	Bordered by FR 90 on the south; 7901 on the east.	
Management Strategies	Manage for species and habitat diversity. Monitor and manage invasive plants, public access and erosion along 7901/01M Rd.	
Implementation		
Year	Planned Management Activity	Implemented Management Activity/Documentation
2009	Monitor and manage public access.	Survey conducted May 13, 2009. No access concerns identified. Erosion within 7901 Rd. roadbed between intersection with 01M Rd. and FR 90.
2009	Conduct invasive plant survey at 7901 Rd. in May and control invasive plants as needed.	Survey conducted May 13, 2009. Invasive plant species documented at intersection of 7901 Rd. and FR 90.
2010	Monitor and manage public access; monitor erosion.	Survey conducted May 28. A few signs of unauthorized (motorized) access (dishwasher dumped over the side of the road, and some litter observed). No change in erosion, no soil disturbance or loss of vegetation within DBMU-10.
2010	Treat invasive plant species, as needed.	Weeds growing at the intersection of the 7901 Rd. and FR 90 are within the FR 90 right-of-way. Weeds at this site appear to have been sprayed in 2009.
2011	Monitor and manage public access.	Survey conducted on June 8. Kelly humps have been repaired, small diameter trees removed from road margin, and unauthorized access is possible via 4-wheel drive. No change in roadbed erosion near junction with FR 90.
2011	Monitor invasive plants adjacent to project boundary.	No invasive plant species observed inside WMA boundary. Scotch broom along both road margins near Kelly hump repair site, outside WMA boundary.

Site Management Plan: DBMU-10		
2012	Monitor effectiveness of gate or barricade planned for installation in spring of 2012. Continue to monitor erosion.	Survey conducted on May 17, 2012. Unauthorized access, dispersed camping and littering continue to occur. Barricade completed in July, 2012. An increase in public access and littering south of the barricade was observed during fall 2012 site visits.
2012	Monitor and manage invasive plant species in conjunction with public access surveys.	No survey done. Barricade completed in July, 2012.
2013	Monitor and public access, including evaluation of barricade effectiveness.	Survey conducted on June 28, 2013. Barricade and road closure signs in good repair; no evidence of attempts to bypass the barricade.
2013	Monitor and manage invasive plant species.	Survey conducted on June 28, 2013. A few Scotch broom plants both north and south of the barricade.
2014	Monitor and manage public access.	Survey conducted on June 30, 2014. Barrier in 7901 Rd intact and working well, no evidence of attempts to drive over or around it.
2014	Monitor and manage invasive plant species.	Survey conducted on June 30, 2014; no invasives noted
2014	Evaluate habitat conditions, including riparian habitat and conifer regeneration within alder-dominated stand, and wildlife use.	Signs of elk use; no evidence of other disturbance. Conifer regeneration scattered, with numerous saplings but few seedlings observed.
2015	Monitor and manage public access.	Survey conducted on June 24, 2015. Old erosion on 7901 Rd healing. One Road Closed sign missing, one needs repair.
2015	Monitor and manage invasive plant species.	Conducted Initial Invasive Species Survey on June 24, 2015. No invasive species observed, no vectors for spread, low priority for monitoring,
2016	Monitor and manage public access.	Survey conducted on May 25, 2016. Vehicle tracks visible in a couple spots.
2017	Monitor and manage public access. Replace one "Road Closed" sign and re-install one sign.	Survey conducted May 30, 2017. Tracks on road and campfires indicate motorized and non-motorized access. Signs installed.
2018	Monitor and manage public access. Check leaning "Road Closed" sign and re-install if needed.	

Site Management Plan: DBMU-11		
Cover type	Palustrine Emergent Marsh/Meadow/Riparian Mixed Forest	
Acres	PEM 1.8 ac.; MD 1.0 ac.; RM 3.4 ac.	
Review Type	Vegetation cover typing, aerial photo review, walk-throughs 9/1/05, 6/14/06, 9/9/08, and 4/16/09	
SGD Management Goals	Wetland: Protect, maintain, and/or enhance wetlands to provide a diversity of habitat types for native amphibians, waterfowl, and other wildlife species. Meadow: Perpetuate and enhance to benefit elk and other species that use open habitats. Forestland: Promote forestland species composition and structures that benefit wildlife and provide an appropriate mosaic of big game hiding cover and forage.	
SGD Management Objectives	Wetland-e: Identify and establish buffers to maintain and protect wetland habitat and functions. Meadow-c: Manage select meadows and old fields over the license periods to prevent shrub/tree encroachment, and maintain a diverse composition and structure of desirable grasses and forbs for birds and mammals. Forestland-c: At the MU level, promote forest habitat diversity for wildlife by increasing or maintaining minor native tree species composition where appropriate site conditions exist over the life of the licenses.	
HEP Evaluation Species and Baseline HSIs	Black-capped chickadee: 0.58 Pileated woodpecker: 0.46 Elk: 0.43 in Unit S-1 No suitable habitat for yellow warbler (wetland, riparian mixed forest) or Savannah sparrow (meadow)	
Analysis Species	Wetland: No suitable habitat for wetland associated analysis species (beaver, great blue heron (rookeries), wood duck). Meadow: elk (no suitable habitat for Savannah sparrow). Forestland: Northern flying squirrel, northern spotted owl.	
Site Description	Sedge and grass wetland/meadow with 100% herbaceous cover within narrow band of mixed riparian forest. Scattered snowberry and vine maple shrub in meadow shows signs of heavy browsing. Several small diameter standing snags and small diameter woody debris. Non-native invasive plants observed, that may provide elk forage (e.g., clovers), but Canada thistle also abundant in 2008.	
Site Constraints	Wetland buffer.	
Access	Good. FR 90 to 7902 (gated) to 7902A. Cowlitz PUD has easement on 7902 Rd.	
Management Strategies	Control conifer encroachment to maintain wetland/meadow characteristics over time. Thin forest edges to promote shrub development to improve elk forage. Monitor and manage invasive plants and public access. Consider establishing elk forage plot(s) near meadow.	
Implementation		
Year	Planned Management Activity	Implemented Management Activity/Documentation
2009	Monitor and manage public access.	Survey conducted on May 13. No access concerns identified.
2009	Flag wetland buffer boundary in May.	Weed treatment areas flagged; all were considered within wetland or riparian boundary, so wetland buffers not flagged.
2009	Conduct invasive plant survey in wetland and meadow in May and control invasive plants as needed.	Survey conducted on May 13. Weed treatments applied in July and September.
2010	Monitor and manage public access.	Survey conducted on May 28. No public access concerns identified.

Site Management Plan: DBMU-11		
2010	Conduct follow-up invasive plant survey of treated areas in May.	Survey conducted on May 28. Canada thistle abundance somewhat reduced.
2010	Mark the perimeter of the meadow.	Perimeter marked with 20 steel tent pegs, points GPS'd and mapped in GIS.
2011	Monitor and manage public access.	Survey conducted on June 8. No public access concerns identified.
2011	Re-treat Canada thistle and conduct follow-up survey.	Survey conducted on June 8. Canada thistle abundance similar to 2010. Herbicide applied on June 15.
2012	Monitor and manage public access.	Survey conducted on July 2, 2012. Vehicular access noted on the 7902 Road, likely related to the illegal squatter's cabin on BLM land at the south end of the 7902 Rd. No access concerns noted in DBMU-11.
2012	Conduct follow-up invasive plant survey in June; consider re-treatment in both summer and fall as budget allows.	No survey done due to safety issues. Solicited bids for weed control twice; first call resulted in 0 bidders, second call resulted in 1 bid that was deemed too costly. In August, Cowlitz PUD employees clipped seed heads off Canada thistle and tansy ragwort.
2013	Monitor and manage public access.	Survey conducted on June 28, 2013. No evidence of unauthorized access.
2013	Conduct follow-up invasive plant survey in June; consider re-treatment in both summer and fall as budget allows.	Survey conducted on June 28, 2013 indicated increasing cover of Canada thistle and tansy ragwort. Herbicide applications completed in July and September, 2013.
2014	Monitor and manage public access.	Survey conducted on June 30, 2014, No evidence of motorized access.
2014	Conduct follow-up invasive plant survey in June; evaluate success of 2013 treatments and continue to treat invasive plant species.	Survey conducted on June 30, 2014, Overall cover of Canada thistle and tansy ragwort was significantly less than observed in 2013. Site treated with Transline in June 2014.
2015	Monitor and manage public access.	Survey conducted on June 24, 2015. No evidence of motorized access.
2015	Conduct follow-up invasive plant survey in June; evaluate success of 2014 treatments and continue to treat invasive plant species.	Survey conducted on June 24, 2015. Canada thistle treatment appears effective. No tansy ragwort observed. Grasses and forbs look great.
2016	Monitor and manage public access.	Survey conducted on May 25, 2016. No evidence of motorized access.
2016	Conduct follow-up invasive plant survey in June; evaluate success of 2015 treatments, continue to treat invasive plant species.	Survey conducted on May 25, 2016. Thistle under good control – improvement from 2014 combined with 2015 treatment. Grasses and forbs look great. Foxglove and birdsfoot trefoil increasing.
2017	Monitor and manage public access.	Survey conducted on May 30, 2017. No evidence of motorized access.
2017	Conduct follow-up invasive plant survey in June; evaluate success of 2016 treatments, continue to treat invasive plant species.	Survey conducted on May 30, 2017. Thistle under good control. Foxglove much less than last year, under good control. Birdsfoot trefoil (good forage) increased from last year. One patch of hairy cat's-ear.
2018	Monitor and manage public access.	
2018	Monitor and manage invasive plant species.	

Site Management Plan: DBMU-12		
Cover type	Riparian deciduous forest	
Acres	6.1	
Review Type	Vegetation cover typing, aerial photo review	
SGD Management Goals	Riparian: Protect, maintain, and/or enhance riparian areas to include a diversity of native plant species and vegetation structures to benefit wildlife species that use riparian habitats.	
SGD Management Objectives	Riparian-a: Identify and establish buffers. Riparian d: Protect existing large snags. Riparian-e: As part of implementation of WHMP, identify riparian sites damaged by anthropogenic processes and prepare restoration plans within 5 years, if feasible.	
HEP Evaluation Species and Baseline HSIs	Black-capped chickadee: 0.19 Pileated woodpecker: 0.32 Yellow warbler: 0.65 Elk: 0.43 in Unit S-1	
Analysis Species	Cascade torrent salamander, papillose tail-dropper	
Site Description	Red alder overstory. Permanent stream/stream buffer in steep canyon.	
Site Constraints	Steep slopes, stream/stream buffer.	
Access	Bordered by FR 90 on the south; 7901 Rd. crosses north edge.	
Management Strategies	Maintain cover on steep slopes. Manage for species and habitat diversity. Monitor and manage public access, invasive plants, and erosion.	
Implementation		
Year	Planned Management Activity	Implemented Management Activity/Documentation
2009	Monitor and manage public access.	Survey conducted on May 13. No access concerns identified.
2010	Monitor and manage public access.	Survey conducted on May 28. No access concerns identified.
2011	Monitor and manage public access.	Survey conducted on June 8. Kelly humps have been repaired, small diameter trees removed from road margin, and unauthorized access is possible via 4-wheel drive.
2011	Monitor and manage invasive plant species in conjunction with public access surveys.	No invasive plant species observed inside WMA boundary. Scotch broom along both road margins near Kelly hump repair site.
2012	Monitor effectiveness of gate or barricade planned for installation in spring of 2012.	Survey conducted on May 17, 2012. Unauthorized access, dispersed camping and littering continue to occur. Barricade completed in July, 2012.
2012	Monitor and manage invasive plant species in conjunction with public access surveys.	No survey done. Barricade completed in July, 2012.
2013	Monitor and manage invasive plant species in conjunction with public access surveys, including evaluation of barrier effectiveness.	Survey conducted on June 28, 2013. Barricade and road closure signs in good repair; no evidence of unauthorized access. A few Scotch broom plants both north and south of the barricade.
2014	Monitor and manage invasive plant species in conjunction with public access surveys, including evaluation of barrier effectiveness	Survey conducted on June 30, 2014. Barrier in 7901 Rd intact and working well, no evidence of attempts to drive over or around it. A few bull thistle plants observed at barrier.

Site Management Plan: DBMU-12		
2015	Monitor and manage invasive plant species in conjunction with public access surveys, including evaluation of barrier effectiveness	Survey conducted on June 24, 2015. Barrier in 7901 Rd intact and working well, no evidence of attempts to drive over or around it. Well-established deer trails around barrier.
2016	Monitor and manage invasive plant species in conjunction with public access surveys, including evaluation of barrier effectiveness.	Survey conducted on May 25, 2016. Slope failure just south of barrier led to several trees falling across road and has exposed new soil. Elk/deer trails around the barrier also expose soil locally. No invasive plant species observed.
2017	Monitor and manage invasive plant species in conjunction with public access surveys, including evaluation of barrier effectiveness.	Survey conducted on May 30, 2017. Slope failure area contains exposed soil. Elk/deer trails around barrier are causing some soil erosion. Most of the road surface was not disturbed. No invasive plant species observed.
2018	Monitor and manage invasive plant species in conjunction with public access surveys, including evaluation of barrier effectiveness.	



Looking south from the barrier to the slope failure along 7901 Rd.

3.2 PROJECT WORKS MANAGEMENT UNIT

The following section provides an aerial photo of the Project Works MU (Figure 3.2-1), a cover type map of the Project Works MU (Figure 3.2-2), and Site Management Plans for four management classifications. These include areas that were revegetated following reconstruction of the canal in 2002 (PWMU-REV); a constructed wetland within the revegetated area (PWMU-PUB); forested areas that were not disturbed during reconstruction activities (PWMU-FOR); and the transmission line right-of-way (PWMU-ROW).



Figure 3.2-1. Project Works Management Unit (Google Earth, August, 2012).

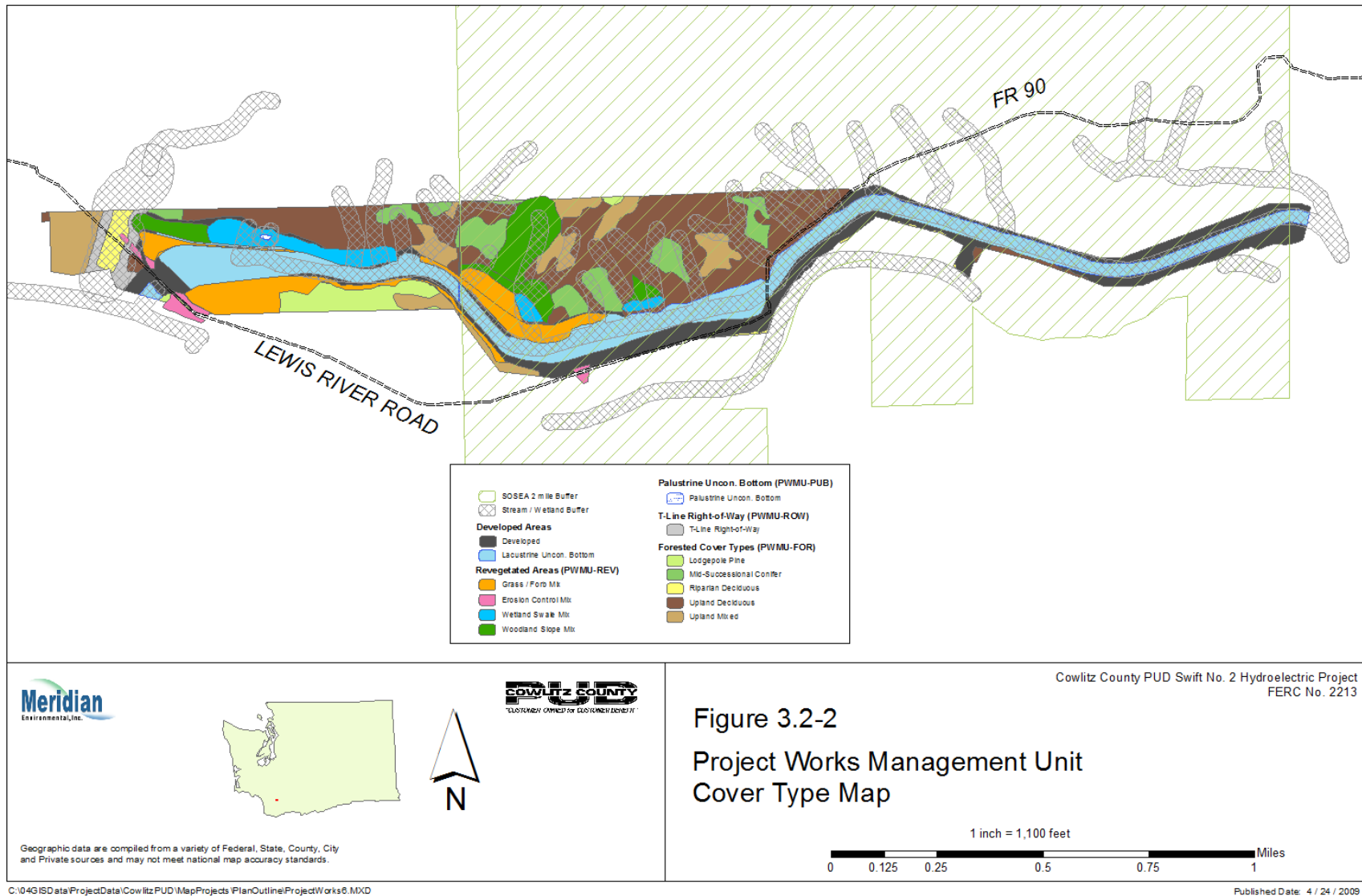


Figure 3.2-2. Project Works Management Unit cover type map.

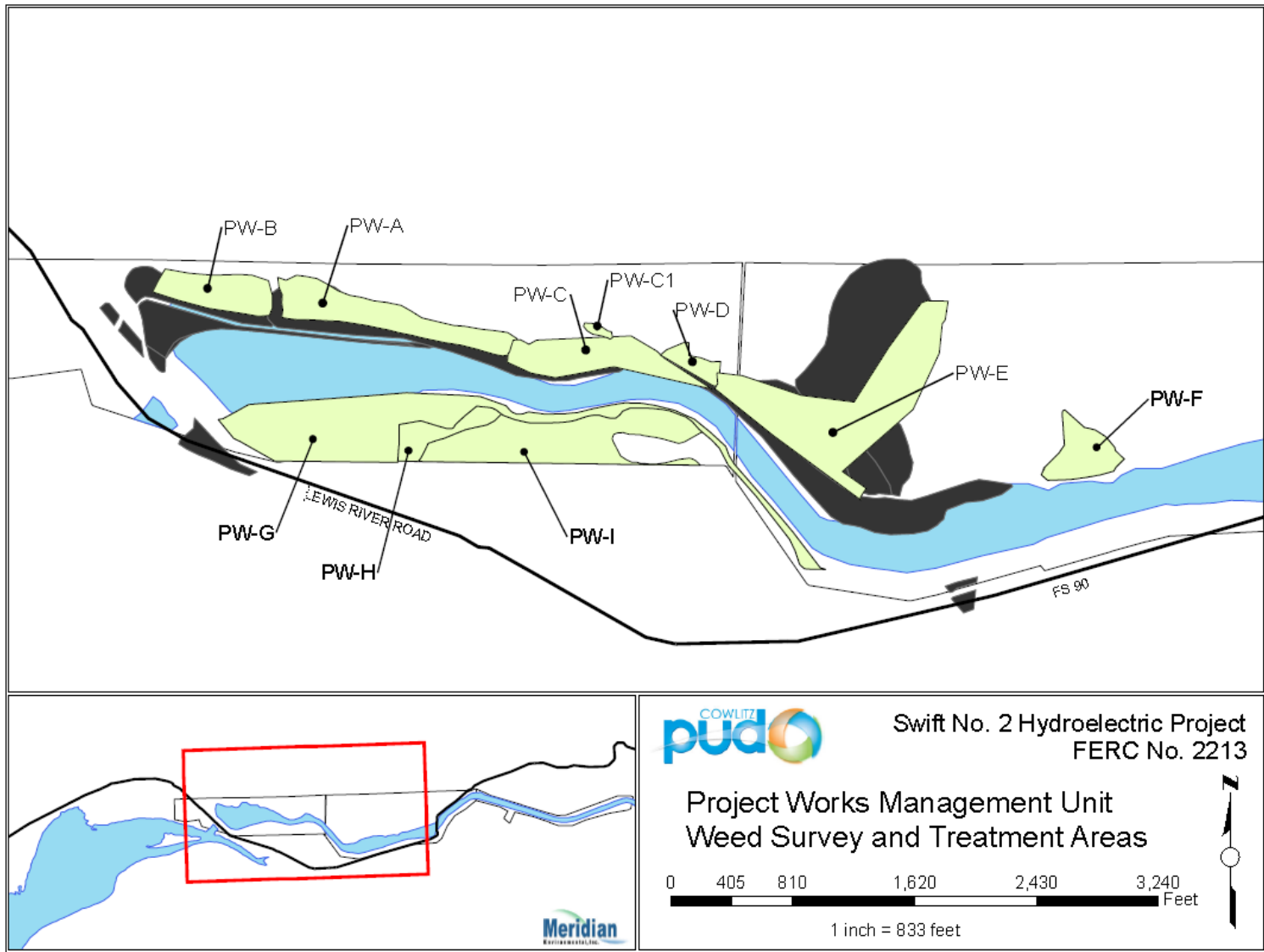


Figure 3.2-3. Project Works Management Unit Weed Survey and Treatment Areas.

Site Management Plan: PWMU-REV		
Cover type	Revegetated: wetland swale, woodland, forage, roadside areas	
Acres	61.82 (seeded with following mixes: 14.65 wetland; 10.54 woodland; 33.34 forage; 3.29 roadside)	
SGD Management Goals	NA	
SGD Management Objectives	NA	
HEP Evaluation Species and Baseline HSIs	NA	
Analysis Species	NA	
Site Description	Areas cleared or exposed during Swift No. 2 reconstruction, revegetated and stabilized. Areas around the wetland (PWMU-PUB) were covered with soil and large woody debris from natural slides on January 8, 2009. As a result, Cowlitz PUD reconfigured site drainage (ditches and culverts) during the summer of 2009 to minimize the risk that future landslides would interfere with project operation.	
Site Constraints	Some accessible flat areas, some very steep inaccessible areas with unstable slopes.	
Access	Good: Gated project maintenance roads.	
Management Strategies	Manage for species and habitat diversity. Monitor and manage invasive plants. <i>Note: public access is not allowed.</i>	
Implementation		
Year	Management Activity Planned	Management Activity Implemented/Documentation
2009	Flag wetland and riparian buffer boundaries in May.	Weed treatment areas flagged; all were considered within wetland or riparian boundary, so buffers not flagged.
2009	Conduct invasive plant survey in May and control invasive plants as needed.	Survey conducted May 13. Some Scotch broom hand-cut in June. Weed treatment applied (herbicides and hand-pulling) in August and September.
2009	Seed exposed soils with pasture mix in April; evaluate management needs and opportunities in May.	Exposed soils seeded in April.
2010		Planted 370 Douglas fir seedlings randomly between the transmission line and the west debris basin. Low survival due to frost damage to the seedlings in the nursery prior to planting.
2010	In May, conduct follow-up invasive plant survey of treated areas and high priority areas not yet surveyed. Control invasive plants as needed.	Follow-up survey on May 28 indicated effective Scotch broom treatment with 2009 herbicide applications. Mixed results where hand tools used for removal in February 2010; these areas re-treated by hand-pulling and digging in November, 2010. Three new areas surveyed, mapped and treated by hand-pulling and digging Himalayan blackberry, Scotch broom, and a few Canada thistle plants in November 2010.

Site Management Plan: PWMU-REV		
2011	Conduct initial invasive plant survey of borrow areas and follow-up invasive plant survey of treated areas in May, and control invasive plants as needed.	Survey on June 8 indicated varying levels of success in the five Weed Treatment Areas mapped and surveyed to date, i.e., good control of Scotch broom in PW-A and PW-B; incomplete treatment of Himalayan blackberry in PW-C, with new invasive species appearing; incomplete treatment of Scotch broom in PW-D, and scattered Canada thistle remaining in PW-E. Herbicide applied to Himalayan blackberry and Scotch broom on June 14.
2012	Conduct follow-up invasive plant surveys of all treated areas in June. Re-evaluate treatment approach to manage Himalayan blackberry in PW-C; re-treat Scotch broom in PW-D; use hand tools to remove Canada thistle in PW-E.	Survey not done.
2013	Conduct follow-up invasive plant surveys of all treated areas in June. Re-evaluate treatment approach to manage Himalayan blackberry in PW-C; re-treat Scotch broom in PW-D; use hand tools to remove Canada thistle in PW-E.	Herbicides were applied to weeds in PW-A, PW-B, PW-C, PW-D, and the lower section of PW-E on June 11 and 12, 2013. Weed survey conducted on June 27, 2013. Mix of natives and non-natives, including tansy ragwort and Canada thistle, growing in PW-C where Himalayan blackberry cover has been reduced, and no change observed in broom cover in PW-D.
2014	Conduct follow-up invasive plant surveys of all treated areas in June. In late fall, plant Douglas fir seedlings where Himalayan blackberry cover has been reduced in PW-C. Re-treat Scotch broom in PW-A, PW-B, and PW-D. Use hand tools or spot-spray to control weeds (primarily Canada thistle and tansy ragwort) in PW-E and PW-F.	Survey conducted on June 30, 2014. Re-growth of Scotch broom in northwest portion of PW-B, along with new observations of tansy ragwort. Occurrences of Himalayan blackberry and a few bull thistle, Canada thistle, and tansy ragwort individuals present in PW-C. Survey area of PW-C expanded, and infestation of Robert's geranium documented. A few Scotch broom in PW-D remain after fairly successful treatment in 2011. No Douglas fir seedlings planted, TCC agreed to discontinue this project. Some areas treated with herbicides in 2014, but daily pesticide application reports did not distinguish between Areas A through F and herbicide spraying for project maintenance.
2014	Install four bluebird boxes.	No bluebird boxes installed. TCC agreed to discontinue this project
2015	Conduct follow-up invasive plant surveys of all treated areas in June. Apply herbicides as appropriate.	Survey conducted on June 24, 2015. Scotch broom increasing in 2 patches on the northern side of PW-A. Areas previously treated in PW-B responded well, but high densities of Scotch broom along the forest edge above the upper maintenance road could serve as a seed source for re-infestation. Scotch broom increasing in PW-D. Applied herbicide to PW-A, B,C, C-1, D, E and F.
2016	Conduct follow-up invasive plant surveys of all treated areas in June. Apply herbicides as appropriate, particularly north of the upper maintenance road.	Survey conducted on May 25, 2016. Good control of Scotch broom in PW-A, only three live plants observed scattered within alder north of pond. Good control of Scotch broom throughout PW-B, including NW corner surveyed in 2015. Robert's geranium increasing in PW-C. Scotch broom still scattered throughout PW-D, some plants are partially treated and some growing within other shrub species. Applied herbicide to PW-A, B,C, C-1, D, E and F.

Site Management Plan: PWMU-REV		
2017	Conduct follow-up invasive plant surveys of all treated areas in June. Apply herbicides as appropriate, particularly north of the upper maintenance road.	Survey conducted on May 30, 2017. Good control of Scotch broom in PW-A, but Himalayan blackberry establishing around wetland and north of dirt road. Good control of Scotch broom and Himalayan blackberry throughout PW-B. In PW-C, Robert's geranium is reduced but growing back throughout the site, and Himalayan blackberry is reduced but recovering in places. Common cat's-ear and Tansy ragwort have sprouted along the access road. Scotch broom control has been successful in PW-D, but Common cat's-ear is increasing throughout the site. Applied herbicide to PW-A, B,C, C-1, D, E and F.
2018	Conduct follow-up invasive plant surveys of all treated areas in June. Apply herbicides as appropriate.	



Robert's geranium located in PW-C.

Site Management Plan: PWMU-PUB		
Cover type	Palustrine unconsolidated bottom (may develop PEM and/or PSS characteristics)	
Acres	0.1 (may be expanding)	
SGD Management Goals	NA	
SGD Management Objectives	NA	
HEP Evaluation Species and Baseline HSIs	NA. In the future, pond breeding amphibians, yellow warbler, and black-capped chickadee may apply.	
Analysis Species	NA	
Site Description	New open-water wetland developing in regraded, revegetated soils on the north side of the canal. Hydrology supplied by upslope surface flows and subsurface drainage. Wetland was partially covered with soil and large woody debris from slides that occurred following a severe rainstorm on January 8, 2009. As a result, Cowlitz PUD re-configured site drainage (ditches and culverts) during the summer of 2009 to minimize the risk that any future landslides would interfere with project operation.	
Site Constraints	None	
Access	Good: Lewis River Rd., gated project maintenance roads.	
Management Strategies	Manage for species and habitat diversity. Monitor and manage and invasive plants. <i>Note: Public access is not allowed.</i>	
Implementation		
Year	Management Activity Planned	Management Activity Implemented/Documentation
2009	Conduct invasive plant survey in May and control invasive plants as needed.	Survey conducted on May 13. Some Scotch broom removed by hand-cutting in June. Herbicide applied in August and September.
2009	Evaluate enhancement opportunities in May.	TCC developed site design in June. Berm constructed in September, soils re-seeded using a wetland mix and willow stakes planted around the margin of the pond.
2010		Site Inspection in April evaluated survival of willow stakes and effectiveness of Scotch broom removal.
2010	Conduct follow-up survey of weed treatment areas. Control invasive plants as needed.	Survey conducted on May 28 to evaluate the results of Scotch broom removal using hand tools in February 2010. Results were mixed, and WCC crews re-treated Scotch broom around the wetland in November 2010, again by hand-pulling or digging.
2010	Plant approximately 200 shrubs or cuttings.	WCC crews planted 450 shrubs (mix of cuttings and rooted stock of willow, Nootka rose, snowberry, ninebark and dogwood) around the wetland in November.
2011	Conduct invasive plant survey in May.	Survey conducted on June 8. Good control of Scotch broom.
2011	Concurrent with invasive plant survey, evaluate survival of shrubs planted in 2010.	Survey conducted on June 8. Results are described in the Annual Report. Overall survival was about 56 percent, but surviving shrubs appeared healthy, with little browse damage.
2012	Evaluate shrub status in conjunction with invasive plant survey.	No survey conducted.

Site Management Plan: PWMU-PUB		
2013	Evaluate shrub status in conjunction with invasive plant survey.	Survey conducted on June 27, 2013. Several live willows observed. Scattered occurrences of invasive plants and one small pocket of Scotch broom remaining.
2014	Conduct invasive plant survey in June and treat weed occurrences in July and September.	Survey conducted on June 30, 2014. No live Scotch broom observed. Some areas treated with herbicides in 2014 but daily pesticide application reports did not distinguish between Areas A through F and herbicide spraying for project maintenance.
2014	Plant shrubs in wetland/upland transition areas in late October/November (See Appendix C).	No shrubs planted. TCC agreed to discontinue this project.
2015	Conduct invasive plant survey in June and treat weed occurrences in July and September.	Survey conducted on June 24, 2015. Herbicides applied as necessary to surrounding area in August 2015. Open water decreasing as soft rush increases.
2016	Conduct invasive plant survey in June and treat as necessary.	Survey conducted on May 25, 2016. Open water continues to decrease. No invasive plant species observed.
2017	Conduct invasive plant survey in June and treat as necessary.	Survey conducted on May 30, 2017. Open water continues to decrease. Himalayan blackberry is beginning to establish northwest and west of pond.
2018	Conduct invasive plant survey in June and treat as necessary.	



Open water continues to decrease at PW-PUB wetland, May 2017.

Site Management Plan: PWMU-FOR																									
Cover types	Mid-successional conifer (MS), lodgepole pine (LP), riparian deciduous (RD), upland deciduous (UD) , upland mixed (UM)																								
Acres	177.7 (MS 24.5; LP 11.9; RD 4.0; UD105.0; UM 32.3)																								
SGD Management Goals	Forestlands: Promote forestland species composition and structures that benefit wildlife and provide an appropriate mosaic of big game hiding cover and forage. Unique Habitats/Areas: Protect unique habitats, including lava flow, and areas of culturally sensitive plant species identified as important to the Tribes.																								
SGD Management Objectives	Forestland-a: At the MU level, provide a range of alternatives for developing and maintaining a mix of forage and hiding cover for elk. Forestland-c: At the MU level, promote forest habitat diversity for wildlife by increasing or maintaining minor native tree species composition where appropriate site conditions exist over the life of the licenses. Unique Habitat-d: Identify and implement appropriate measures to protect and maintain important areas of ethnobotanically significant plants, as identified by the Tribes, over the life of the licenses.																								
HEP Evaluation Species and Baseline HSIs	<table border="1"> <thead> <tr> <th></th> <th><u>MS</u></th> <th><u>LP</u></th> <th><u>RD</u></th> <th><u>UD</u></th> <th><u>UM</u></th> </tr> </thead> <tbody> <tr> <td>Black-capped chickadee:</td> <td>0.60</td> <td>0.92</td> <td>0.68</td> <td>0.27</td> <td>0.89</td> </tr> <tr> <td>Pileated woodpecker:</td> <td>0.62</td> <td>0.00</td> <td>0.29</td> <td>0.27</td> <td>0.71</td> </tr> <tr> <td>Elk:</td> <td colspan="5">0.43 in Unit S-1.</td> </tr> </tbody> </table>		<u>MS</u>	<u>LP</u>	<u>RD</u>	<u>UD</u>	<u>UM</u>	Black-capped chickadee:	0.60	0.92	0.68	0.27	0.89	Pileated woodpecker:	0.62	0.00	0.29	0.27	0.71	Elk:	0.43 in Unit S-1.				
	<u>MS</u>	<u>LP</u>	<u>RD</u>	<u>UD</u>	<u>UM</u>																				
Black-capped chickadee:	0.60	0.92	0.68	0.27	0.89																				
Pileated woodpecker:	0.62	0.00	0.29	0.27	0.71																				
Elk:	0.43 in Unit S-1.																								
Analysis Species	<p>Forestlands: Northern flying squirrel, northern spotted owl</p> <p>Lodgepole: Pacific western big-eared bat, Larch Mountain salamander, Van Dyke's salamander.</p> <p>Riparian: Cascade torrent salamander, papillose tail-dropper</p>																								
Site Description	Very steep with potentially unstable slopes north of the canal; flat between canal and Lewis River Rd.																								
Site Constraints	Proximity to project facilities																								
Access	Good: Lewis River Rd.; gated project roads. <i>No public access allowed.</i>																								
Management Strategies	Manage for species and habitat diversity. Monitor and manage invasive plants.																								
Implementation																									
Year	Planned Management Activity	Implemented Management Activity/Documentation																							
2009	Monitor and manage invasive plants.	Low-priority (no public access, good ground cover without soil disturbance); not included in invasive plant survey area.																							
2010	Monitor and manage invasive plants as budget allows.	No survey conducted.																							
2011	Monitor and manage invasive plants as budget allows.	No survey conducted.																							
2012	Monitor and manage invasive plants as budget allows.	No survey conducted.																							
2013	Monitor and manage invasive plants as budget allows.	No survey conducted.																							
2014	Monitor and manage invasive plants as budget allows.	No survey conducted.																							
2015	Monitor and manage invasive plants as budget allows.	No survey conducted.																							
2016	No surveys planned.	Initial invasive plant survey for PW-G, PW-H, and PW-I conducted on May 25, 2016. Only common cat's-ear																							

Site Management Plan: PWMU-FOR		
		observed in PW-G. This area is maintained as project maintenance so there is no need to monitor. Scotch broom has invaded the upland mixed forest (PW-H) and is beginning to enter the lodgepole pine (PW-I).
2017	Conduct follow-up invasive plant survey for PW-H & PW-I. Evaluate potential spread into lodgepole/talus area before determining whether to treat.	Survey conducted on May 30, 2017 and it was decided to treat invasives. Applied herbicide to Scotch broom in PW-H and PW-I.
2018	Conduct follow-up invasive plant surveys of all treated areas in June. Apply herbicides as appropriate.	



Scotch broom located in PW-I.

Site Management Plan: PWMU-ROW		
Cover type	Transmission line right-of-way	
Acres	3.6	
SGD Management Goals	While allowing for safe and reliable transmission, promote establishment and maintenance of desirable vegetation to provide habitat for wintering deer and elk and a diverse mix of shrub and other early-successional vegetation.	
SGD Management Objectives	ROW-c: Identify and provide screening cover for deer and elk, where needed, where public roads cross ROW.	
HEP Evaluation Species and Baseline HSIs	Elk: 0.43 in Unit S-1. No suitable habitat for Savannah sparrow.	
Analysis Species	None identified.	
Site Description	Tall, dense shrub cover.	
Site Constraints	Proximity to traffic on Lewis River Rd. and project facilities	
Access	Good: Lewis River Rd. <i>Note: Public access not allowed.</i>	
Management Strategies	Monitor and manage invasive plants; evaluate need for visual screening. <i>Public access not allowed</i>	
Implementation		
Year	Planned Management Activity	Implemented Management Activity/Documentation
2009	Monitor and manage public access; evaluate need for visual screening.	Public access not allowed. Visual screening at Lewis River Rd. assessed; no concerns identified.
2010	Monitor invasive plant species.	Monitoring deferred to higher priority sites.
2011	Monitor invasive plant species as budget allows.	No survey conducted.
2012	Monitor invasive plant species as budget allows.	No survey conducted.
2013	Monitor and manage invasive plants as budget allows.	No survey conducted.
2014	Monitor and manage invasive plants as budget allows.	No survey conducted.
2015	Monitor and manage invasive plants as budget allows.	No survey conducted.
2016	No surveys planned.	No survey conducted.
2017	No surveys planned.	No survey conducted.
2018	No surveys planned.	

Appendix A

2017 Cowlitz and Skamania County Weed Lists

Noxious Weeds are non-native plants introduced to Washington State that can be highly destructive, competitive, and difficult to control. These plants invade our croplands, rangeland, forests, parks, rivers, lakes, wetlands, and estuaries causing both ecological and economical damage that affects us all. Noxious weeds can:

- Lower crop yields
- Reduce forage quality
- Destroy plant and animal habitat
- Displace native plants
- Reduce recreational opportunities (e.g., fishing, hunting, swimming and hiking)
- Clog waterways
- Decrease land values
- Increase erosion and wildfire risk
- And some are toxic to humans and livestock

Please help protect Washington's economy and environment from noxious weeds!

To help protect the State's resources and economy, the Washington State Noxious Weed Control Board adopts a State Noxious Weed List each year (WAC 16-750). This list classifies weeds into three major classes – A, B, and C – based on the stage of invasion of each species and the seriousness of the threat they pose to Washington State. This classification system is designed to:

- Prevent small infestations from expanding by eradicating them when they are first detected
- Restrict already established weed populations to regions of the state where they occur and prevent their movement to un-infested areas
- Allow flexibility of weed control at the local level for weeds that are already widespread.



To learn more about noxious weeds and noxious weed control in Washington State, Please contact:

**Cowlitz County
Noxious Weed Control Board**
207 Fourth Ave. N.
Kelso, WA 98628-4124
Tel. (360)577-3117

Email: noxiousweeds@co.cowlitz.wa.us

Website: <http://co.cowlitz.wa.us>

Or

WA State Noxious Weed Control Board
P.O. Box 42560
Olympia, WA 98504-2560
(360) 725-5764

Email: noxiousweeds@agr.wa.gov

Website: <http://nwcb.wa.gov>

Or

WA State Department of Agriculture
Natural Resource Building
P.O. Box 42560
1111 Washington St. SE
Olympia, WA 98504-2560
Tel. (360)902-1800

Website: <http://agr.wa.gov>

2017 Cowlitz County Noxious Weed List



Wild chervil *Anthriscus sylvestris*

Wild chervil. From Köhler's Medizinal-Pflanzen, vol. 4. Source: Biodiversity Heritage Library / Missouri Botanical Garden. Public domain. [wild chervil, *Anthriscus sylvestris*, Apiaceae]

**List arranged alphabetically by:
COMMON NAME**

Class A Weeds: Non-native species whose distribution in Washington is still limited. Preventing new infestations and eradicating existing infestations are the highest priority. **Eradication of all Class A plants is required by law.**

Class B Weeds: Non-native species presently limited to portions of the State. Species are **designated** for control in regions where they are not yet widespread. Preventing new infestations in these areas is a high priority. In regions where a Class B species is already abundant, control is decided at the local level, with containment as the primary goal. **Please contact your County Noxious Weed Control Coordinator to learn which species are designated in your area.**

Class C Weeds: These are noxious weeds typically widespread in WA State or are of special interest to the state's agricultural industry. The Class C status allows counties to require control if locally desired. Other counties may choose to provide education or technical consultation.

***Class A Weeds**

Eradication is required

common crupina	<i>Crupina vulgaris</i>
cordgrass, common	<i>Spartina anglica</i>
cordgrass, dense-flowered	<i>Spartina densiflora</i>
cordgrass, saltmeadow	<i>Spartina patens</i>
cordgrass, smooth	<i>Spartina alterniflora</i>
dyer's woad	<i>Isatis tinctoria</i>
eggleaf spurge	<i>Euphorbia oblongata</i>
false brome	<i>Brachypodium sylvaticum</i>
floating primrose-willow	<i>Ludwigia peploides</i>
flowering rush	<i>Butomus umbellatus</i>
French broom	<i>Genista monspessulana</i>
garlic mustard	<i>Alliaria petiolata</i>
giant hogweed	<i>Heracleum mantegazzianum</i>
goatsrue	<i>Galega officinalis</i>
hydrilla	<i>Hydrilla verticillata</i>
Johnsongrass	<i>Sorghum halepense</i>
knapweed, bighead	<i>Centaurea macrocephala</i>
knapweed, Vochin	<i>Centaurea nigrescens</i>
kudzu	<i>Pueraria montana</i> var. <i>lobata</i>
meadow clary	<i>Salvia pratensis</i>
oriental clematis	<i>Clematis orientalis</i>
purple starthistle	<i>Centaurea calcitrapa</i>
reed sweetgrass	<i>Glyceria maxima</i>

ricefield bulrush	<i>Schoenoplectus mucronatus</i>
sage, clary	<i>Salvia sclarea</i>
sage, Mediterranean	<i>Salvia aethiopsis</i>
silverleaf nightshade	<i>Solanum elaeagnifolium</i>
Spanish broom	<i>Spartium junceum</i>
spurge flax	<i>Thymelaea passerina</i>
Syrian beancaper	<i>Zygophyllum fabago</i>
Texas blueweed	<i>Helianthus ciliaris</i>
thistle, Italian	<i>Carduus pycnocephalus</i>
thistle, milk	<i>Silybum marianum</i>
thistle, slenderflower	<i>Carduus tenuiflorus</i>
variable-leaf milfoil	<i>Myriophyllum heterophyllum</i>
wild four-o'clock	<i>Mirabilis nyctaginea</i>

Class B Weeds- Required Control

*blueweed	<i>Echium vulgare</i>
*Brazilian elodea	<i>Egeria densa</i>
*bugloss, annual	<i>Anchusa arvensis</i>
*bugloss, common	<i>Anchusa officinalis</i>
*butterfly bush	<i>Buddleja davidii</i>
*camellthorn	<i>Alhagi maurorum</i>
*common fennel, (except bulbing fennel)	<i>Foeniculum vulgare</i> (except <i>F. vulgare</i> var. <i>azoricum</i>)
*common reed (nonnative genotypes only)	<i>Phragmites australis</i>
Dalmatian toadflax	<i>Linaria dalmatica</i> ssp. <i>dalmatica</i>
*Eurasian watermilfoil	<i>Myriophyllum spicatum</i>
*fanwort	<i>Cabomba caroliniana</i>
*gorse	<i>Ulex europaeus</i>
*grass-leaved arrowhead	<i>Sagittaria graminea</i>
*hairy willowherb	<i>Epilobium hirsutum</i>
*hawkweed, oxtongue	<i>Picris hieracioides</i>
*hawkweed, orange	<i>Hieracium aurantiacum</i>
*hawkweeds: All nonnative species and hybrids of the meadow subgenus	<i>Hieracium</i> , subgenus <i>Pilosella</i>
*hawkweeds: All nonnative species and hybrids of the wall subgenus	<i>Hieracium</i> , subgenus <i>Hieracium</i>
herb-Robert	<i>Geranium robertianum</i>
*hoary alyssum	<i>Berteroa incana</i>
*houndstongue	<i>Cynoglossum officinale</i>
*indigobush	<i>Amorpha fruticosa</i>

*knapweed, black	<i>Centaurea nigra</i>
*knapweed, brown	<i>Centaurea jacea</i>
knapweed, diffuse	<i>Centaurea diffusa</i>
knapweed, meadow	<i>Centaurea x moncktonii</i>
*knapweed, Russian	<i>Acroptilon repens</i>
knapweed, spotted	<i>Centaurea stoebe</i>
knotweed, Bohemian	<i>Polygonum x bohemicum</i>
knotweed, giant	<i>Polygonum sachalinense</i>
*knotweed, Himalayan	<i>Polygonum polystachyum</i>
knotweed, Japanese	<i>Polygonum cuspidatum</i>
*kochia	<i>Kochia scoparia</i>
*lesser celandine	<i>Ficaria verna</i>
*loosestrife, garden	<i>Lysimachia vulgaris</i>
loosestrife, purple	<i>Lythrum salicaria</i>
*loosestrife, wand	<i>Lythrum virgatum</i>
parrotfeather	<i>Myriophyllum aquaticum</i>
perennial pepperweed	<i>Lepidium latifolium</i>
poison hemlock	<i>Conium maculatum</i>
*policeman's helmet	<i>Impatiens glandulifera</i>
*puncturevine	<i>Tribulus terrestris</i>
Revenna grass	<i>Saccharum revennae</i>
*rush skeletonweed	<i>Chondrilla juncea</i>
*saltcedar	<i>Tamarix ramosissima</i>
Scotch broom	<i>Cytisus scoparius</i>
shiny geranium	<i>Geranium lucidum</i>
*spurge laurel	<i>Daphne laureola</i>
*spurge, leafy	<i>Euphorbia esula</i>
*spurge, myrtle	<i>Euphorbia myrsinites</i>
*sulfur cinquefoil	<i>Potentilla recta</i>
tansy ragwort	<i>Senecio jacobaea</i>
*thistle, musk	<i>Carduus nutans</i>
*thistle, plumeless	<i>Carduus acanthoides</i>
*thistle, Scotch	<i>Onopordum acanthium</i>
*velvetleaf	<i>Abutilon theophrasti</i>
water primrose	<i>Ludwigia hexapetala</i>
*white bryony	<i>Bryonia alba</i>
wild chervil	<i>Anthriscus sylvestris</i>
yellow archangel	<i>Lamium galeobdolon</i>
*yellow floatingheart	<i>Nymphoides peltata</i>
*yellow nutsedge	<i>Cyperus esculentus</i>
*yellow starthistle	<i>Centaurea solstitialis</i>

Class C Weeds

buffalobur	<i>Solanum rostratum</i>
nonnative cattail species and hybrids	<i>Typha</i> spp.
common groundsel	<i>Senecio vulgaris</i>
common St. Johnswort	<i>Hypericum perforatum</i>
common tansy	<i>Tanacetum vulgare</i>
common teasel	<i>Dipsacus fullonum</i>
English hawthorn	<i>Crataegus monogyna</i>
English ivy - four cultivars only	<i>Hedera helix</i> 'Baltica', 'Pittsburgh', and 'Star'; <i>H. hibernica</i> 'Hibernica'
evergreen blackberry	<i>Rubus laciniatus</i>
field bindweed	<i>Convolvulus arvensis</i>
Himalayan blackberry	<i>Rubus armeniacus</i>
Italian arum	<i>Arum italicum</i>
Jubata grass	<i>Cortaderia jubata</i>
old man's beard	<i>Clematis vitalba</i>
oxeye daisy	<i>Leucanthemum vulgare</i>
Pampas grass	<i>Cortaderia selloana</i>
Russian olive	<i>Elaeagnus angustifolia</i>
scentless mayweed	<i>Matricaria perforata</i>
spiny cocklebur	<i>Xanthium spinosum</i>
Swainsonpea	<i>Sphaerophysa salsula</i>
thistle, bull	<i>Cirsium vulgare</i>
thistle, Canada	<i>Cirsium arvense</i>
tree-of-heaven	<i>Ailanthus altissima</i>
white cockle	<i>Silene latifolia</i> ssp. <i>alba</i>
wild carrot (except where commercially grown)	<i>Daucus carota</i>
yellowflag iris	<i>Iris pseudacorus</i>
yellow toadflax	<i>Linaria vulgaris</i>

- Change to the 2017 List
- * State designated high priority for control and enforcement = Required control
- Control required especially along transportation right-of-ways, near residential communities (fire danger), areas where plants create a significant impact to managed pastures or farmland.
- Bold listings – documented plant species in Cowlitz Co.
- Highlighted listings – County select class B and C high priority weeds for control and enforcement action.

common barberry	<i>Berberis vulgaris</i>
common catsear	<i>Hypochaeris radicata</i>
common groundsel	<i>Senecio vulgaris</i>
common St. Johnswort	<i>Hypericum perforatum</i>
common tansy	<i>Tanacetum vulgare</i>
common teasel	<i>Dipsacus fullonum</i>
curlyleaf pondweed	<i>Potamogeton crispus</i>
English hawthorn	<i>Crataegus monogyna</i>
English ivy - four cultivars only	<i>Hedera helix</i>
evergreen blackberry	<i>Rubus laciniatus</i>
field bindweed	<i>Convolvulus arvensis</i>
fragrant waterlily	<i>Nymphaea odorata</i>
hairy whitetop	<i>Lepidium appelianum</i>
Himalayan blackberry	<i>Rubus armeniacus</i>
hoary cress	<i>Lepidium draba</i>
Italian arum	<i>Arum italicum</i>
Japanese eelgrass	<i>Zostera japonica</i>
jubata grass	<i>Cortaderia jubata</i>
jointed goatgrass	<i>Aegilops cylindrica</i>
lawnweed	<i>Soliva sessilis</i>
longspine sandbur	<i>Cenchrus longispinus</i>
medusahead	<i>Taeniatherum caput-medusae</i>
nonnative cattail species and hybrids	<i>Typha</i> spp.
old man's beard	<i>Clematis vitalba</i>
oxeye daisy	<i>Leucanthemum vulgare</i>
Pampas grass	<i>Cortaderia selloana</i>
perennial sowthistle	<i>Sonchus arvensis</i>
reed canarygrass	<i>Phalaris arundinacea</i>
Russian olive	<i>Elaeagnus angustifolia</i>
scentless mayweed	<i>Matricaria perforata</i>
smoothseed alfalfa dodder	<i>Cuscuta approximata</i>
spikeweed	<i>Centromadia pungens</i>
spiny cocklebur	<i>Xanthium spinosum</i>
Swainsonpea	<i>Sphaerophysa salsula</i>
thistle, bull	<i>Cirsium vulgare</i>
thistle, Canada	<i>Cirsium arvense</i>
tree-of-heaven	<i>Ailanthus altissima</i>
ventenata	<i>Ventenata dubia</i>
white cockle	<i>Silene latifolia</i> ssp. <i>alba</i>
wild carrot (except where commercially grown)	<i>Daucus carota</i>
yellowflag iris	<i>Iris pseudacorus</i>
yellow toadflax	<i>Linaria vulgaris</i>

To learn more about noxious weeds and noxious weed control in Washington State, please contact:

WA State Noxious Weed Control Board
P.O. Box 42560
Olympia, WA 98504-2560
(360)-725-5764

Email: noxiousweeds@agr.wa.gov

Website: <http://www.nwcb.wa.gov>

Or

WA State Department of Agriculture
21 North First Avenue #103
Yakima, WA 98902
(509) 249-6973

Or

Please help protect Washington's economy and environment from noxious weeds!

2017

Washington State Noxious Weed List



Photo courtesy of the Benton County NWCB

Escaped Ravenna grass plants outside of a residential development in Benton County. Ravenna grass, *Saccharum ravennae*, is a Class B noxious weed.

List arranged alphabetically by:
COMMON NAME



Class A Weeds: Non-native species whose distribution in Washington is still limited. Preventing new infestations and eradicating existing infestations are the highest priority. **Eradication of all Class A plants is required by law.**

Class B Weeds: Non-native species presently limited to portions of the State. Species are **designated** for control in regions where they are not yet widespread. Preventing new infestations in these areas is a high priority. In regions where a Class B species is already abundant, control is decided at the local level, with containment as the primary goal. Please contact your Weed District Coordinator to learn which species are designated in your area.

Class C Weeds: Noxious weeds that are typically widespread in WA or are of special interest to the state's agricultural industry. The Class C status allows counties to require control if locally desired. Other counties may choose to provide education or technical consultation.

Class A Weeds
Eradication is required

common crupina	<i>Crupina vulgaris</i>
cordgrass, common	<i>Spartina anglica</i>
cordgrass, dense-flowered	<i>Spartina densiflora</i>
cordgrass, saltmeadow	<i>Spartina patens</i>
cordgrass, smooth	<i>Spartina alterniflora</i>
dyer's woad	<i>Isatis tinctoria</i>
eggleaf spurge	<i>Euphorbia oblongata</i>
false brome	<i>Brachypodium sylvaticum</i>
floating primrose-willow	<i>Ludwigia peploides</i>
flowering rush	<i>Butomus umbellatus</i>
French broom	<i>Genista monspessulana</i>
garlic mustard	<i>Alliaria petiolata</i>
giant hogweed	<i>Heraclium mantegazzianum</i>
goatsrue	<i>Galega officinalis</i>
hydrilla	<i>Hydrilla verticillata</i>
Johnsongrass	<i>Sorghum halepense</i>
knapweed, bighead	<i>Centaurea macrocephala</i>
knapweed, Vochin	<i>Centaurea nigrescens</i>
kudzu	<i>Pueraria montana var. lobata</i>
meadow clary	<i>Salvia pratensis</i>
oriental clematis	<i>Clematis orientalis</i>
purple starthistle	<i>Centaurea calcitrapa</i>
reed sweetgrass	<i>Glyceria maxima</i>
ricefield bulrush	<i>Schoenoplectus mucronatus</i>

sage, clary	<i>Salvia sclarea</i>
sage, Mediterranean	<i>Salvia aethiopsis</i>
silverleaf nightshade	<i>Solanum elaeagnifolium</i>
Spanish broom	<i>Spartium junceum</i>
spurge flax	<i>Thymelaea passerina</i>
Syrian beancaper	<i>Zygophyllum fabago</i>
Texas blueweed	<i>Helianthus ciliaris</i>
thistle, Italian	<i>Carduus pycnocephalus</i>
thistle, milk	<i>Silybum marianum</i>
thistle, slenderflower	<i>Carduus tenuiflorus</i>
variable-leaf milfoil	<i>Myriophyllum heterophyllum</i>
wild four-o'clock	<i>Mirabilis nyctaginea</i>

Class B Weeds

blueweed	<i>Echium vulgare</i>
Brazilian elodea	<i>Egeria densa</i>
bugloss, annual	<i>Anchusa arvensis</i>
bugloss, common	<i>Anchusa officinalis</i>
butterfly bush	<i>Buddleja davidii</i>
camelthorn	<i>Alhagi maurorum</i>
common fennel, (except bulbous fennel)	<i>Foeniculum vulgare</i> except <i>F. vulgare</i> var. <i>azoricum</i>)
common reed (nonnative genotypes only)	<i>Phragmites australis</i>
Dalmatian toadflax	<i>Linaria dalmatica</i> ssp. <i>dalmatica</i>
Eurasian watermilfoil	<i>Myriophyllum spicatum</i>
fanwort	<i>Cabomba caroliniana</i>
gorse	<i>Ulex europaeus</i>
grass-leaved arrowhead	<i>Sagittaria graminea</i>
hairy willowherb	<i>Epilobium hirsutum</i>
hawkweed, oxtongue	<i>Picris hieracioides</i>
hawkweed, orange	<i>Hieracium aurantiacum</i>
hawkweeds: All nonnative species and hybrids of the meadow subgenus and wall subgenus	<i>Hieracium</i> , subgenus <i>Pilosella</i> and <i>Hieracium</i>
hawkweeds: All nonnative species and hybrids of the wall subgenus	<i>Hieracium</i> , subgenus <i>Hieracium</i>
herb-Robert	<i>Geranium robertianum</i>
hoary alyssum	<i>Berteroa incana</i>
houndstongue	<i>Cynoglossum officinale</i>
indigobush	<i>Amorpha fruticosa</i>
knapweed, black	<i>Centaurea nigra</i>
knapweed, brown	<i>Centaurea jacea</i>
knapweed, diffuse	<i>Centaurea diffusa</i>

knapweed, meadow	<i>Centaurea x moncktonii</i>
knapweed, Russian	<i>Acroptilon repens</i>
knapweed, spotted	<i>Centaurea stoebe</i>
knotweed, Bohemian	<i>Polygonum x bohemicum</i>
knotweed, giant	<i>Polygonum sachalinense</i>
knotweed, Himalayan	<i>Polygonum polystachyum</i>
knotweed, Japanese	<i>Polygonum cuspidatum</i>
kochia	<i>Kochia scoparia</i>
lesser celandine	<i>Ficaria verna</i>
loosestrife, garden	<i>Lysimachia vulgaris</i>
loosestrife, purple	<i>Lythrum salicaria</i>
loosestrife, wand	<i>Lythrum virgatum</i>
parrotfeather	<i>Myriophyllum aquaticum</i>
perennial pepperweed	<i>Lepidium latifolium</i>
poison hemlock	<i>Conium maculatum</i>
policeman's helmet	<i>Impatiens glandulifera</i>
puncturevine	<i>Tribulus terrestris</i>
Ravenna grass	<i>Saccharum ravennae</i>
rush skeletonweed	<i>Chondrilla juncea</i>
saltcedar	<i>Tamarix ramosissima</i>
Scotch broom	<i>Cytisus scoparius</i>
shiny geranium	<i>Geranium lucidum</i>
spurge laurel	<i>Daphne laureola</i>
spurge, leafy	<i>Euphorbia esula</i>
spurge, myrtle	<i>Euphorbia myrsinites</i>
sulfur cinquefoil	<i>Potentilla recta</i>
tansy ragwort	<i>Senecio jacobaea</i>
thistle, musk	<i>Carduus nutans</i>
thistle, plumeless	<i>Carduus acanthoides</i>
thistle, Scotch	<i>Onopordum acanthium</i>
velvetleaf	<i>Abutilon theophrasti</i>
water primrose	<i>Ludwigia hexapetala</i>
white bryony	<i>Bryonia alba</i>
wild chervil	<i>Anthriscus sylvestris</i>
yellow archangel	<i>Lamium galeobdolon</i>
yellow floatingheart	<i>Nymphoides peltata</i>
yellow nutsedge	<i>Cyperus esculentus</i>
yellow starthistle	<i>Centaurea solstitialis</i>

Class C Weeds

absinth wormwood	<i>Artemisia absinthium</i>
Austrian fieldcress	<i>Rorippa austriaca</i>
babysbreath	<i>Gypsophila paniculata</i>
black henbane	<i>Hyoscyamus niger</i>
blackgrass	<i>Alopecurus myosuroides</i>
buffalobur	<i>Solanum rostratum</i>
cereal rye	<i>Secale cereale</i>

Appendix B

Annual Plan Consultation Record

2018 ANNUAL PLAN CONSULTATION RECORD

As required by License Article 403, this section documents Cowlitz PUD's consultation with the TCC regarding the development of the Annual Plan for the Swift No. 2 Wildlife Management Area. The 30-day Review Draft of this Annual Plan was emailed to the TCC on February 5, 2018 and discussed at the February 7, 2018 TCC meeting. Comments were due on March 9, 2018 and written comments were received from Washington Department of Fish and Wildlife. The table below summarizes the comments from the WDFW and provides Cowlitz PUD's response.

Cowlitz PUD's Response to TCC Comments on the Draft 2018 WHMP Annual Plan

Comment Number	Comment	Cowlitz PUD Response
1	<i>WDFW recommends the Terrestrial Coordinating Committee have a discussion for the long-term goal/objectives of the patch cut. WDFW recommends efforts to minimize regeneration and promote the longevity of the opening.</i>	This comment was discussed at the March 14, 2018 TCC meeting and it was decided that the cut should be maintained as a permanent opening which will require some level of maintenance. Maintenance efforts could include invasive species control and efforts to minimize regeneration and encroachment.
2	<i>When selecting the patch cut site, also consider distance to the nearest open road as well as where groundcover is minimal or where existing desirable groundcover could be released and enhanced. The distance of the site from open, drivable roads correlates to improved conditions for elk.</i>	Site selection criteria will include these suggestions and there will be a site visit with the TCC on May 9, 2018 for input on the most desirable location.
3	<i>For inclusion in the silvicultural treatment prescription, WDFW recommends limiting the brush piles to one per acre. This will reduce future fire hazard and maximize ground available for forage.</i>	Plan revised.



State of Washington
DEPARTMENT OF FISH AND WILDLIFE

Mailing Address: P.O. Box 43200, Olympia, WA 98504-3200 • (360) 902-2200 • TDD (360) 902-2207
Main Office Location: Natural Resources Building, 1111 Washington Street SE, Olympia, WA

February 28, 2018

Amanda Froberg
Environmental Compliance Manager ·
Cowlitz PUD
961 12th Avenue
Longview, WA 98632

RE: 2018 (Year 10) Annual Plan for the Swift No. 2 Wildlife Management Area

Dear Ms. Froberg:

Washington Department of Fish and Wildlife (WDFW) appreciates this opportunity to comment on the *2018 (Year 10) Annual Plan for the Swift No. 2 Wildlife Management Area* pursuant to the Cowlitz PUD Swift No. 2 Hydroelectric Project FERC License No. 2213 and Settlement Agreement. WDFW has read the 2018 annual plan and provides comments below as well as comments embedded in the enclosed draft plan.

WDFW, under state law, has the responsibility to preserve, protect, perpetuate, and manage the wildlife and food fish, game fish, and shellfish in state waters and offshore waters (77.04.012, RCW). In addition WDFW's mission is to preserve, protect and perpetuate fish, wildlife and ecosystems while providing sustainable fish and wildlife recreational and commercial opportunities. To ensure the highest level of resource protection WDFW appreciates the opportunity to work cooperatively with Cowlitz PUD to implement their hydroelectric license and settlement agreement.

WDFW would like to commend Cowlitz PUD and Ms. Froberg for their dedication to promoting wildlife values on their Wildlife Management Units. All past and planned activities closely follow their Wildlife Habitat Management Plan goals and objectives. In particular, WDFW would like to recognize Ms. Froberg's dedication and persistence to ensuring that the Devil's Backbone Management Unit 5 acre patch cut becomes a reality. This effort will promote stand diversity and provide an additional elk forage area next to existing hiding cover.

WDFW recommends the Terrestrial Coordinating Committee have a discussion for the long term goal/objectives of the patch cut. The cut could be maintained as a permanent opening or allowed to close with natural succession. Both options have benefits and drawbacks. The permanent opening would provide a consistent source of forage for ungulates and prolong the beneficial cover/forage ratio. The drawbacks are that it will require some level of maintenance to stop encroachment in future years, and a line item in the budget. Allowing the opening to close through natural succession eliminates the future need for funds and any maintenance. In addition, the opening and the eventual natural succession will help the overall stand to develop into a multi-age class forest. The drawbacks are that the loss of forage and reduction in forage to cover ratio over time. The benefits realized from the patch cut will be for a

limited time and should be taken into consideration when considering costs for the project. Ultimately, allocating funds in the future and staying on top of encroachment will prolong the benefits.

When selecting the patch cut site also consider distance to the nearest open road as well as where groundcover is minimal or where existing desirable groundcover could be released and enhanced. The distance of the site from open, drivable roads correlates to improved conditions for elk.

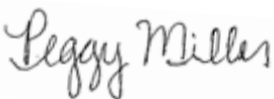
For inclusion in the silvicultural treatment prescription, WDFW recommends limiting the brush piles to one per acre. This will reduce future fire hazard and maximize ground available for forage.

Regeneration is also included in the silvicultural treatment prescription outline as well as brush piles. In addition, micro-sites for seedling establishment is listed in the WHMP as a function of woody debris left on-site. Although woody debris may provide micro-site seedling establishment leading to regeneration, it is not a function WDFW would want to promote. Although the WHMP management goal – promote forestland species composition and structures that benefit wildlife and provide an appropriate mosaic of big game hiding cover and forage – listed in Appendix C does not specify the duration of the goal, the objectives - increase understory species and structural diversity in mid-successional forest stands over time by opening the canopy to improve shrub and groundcover; improve HSIs for elk over time - alludes to maintaining the opening. Maximizing the amount of time the opening is functional and maintaining the optimal cover/forage ratio through the next Habitat Evaluation Procedures is especially important to improve HSIs for elk. WDFW recommends efforts to minimize regeneration and promote the longevity of the opening.

WDFW looks forward to continuing to work with Cowlitz PUD and partners on the Swift 2 hydroelectric project to protect, restore and enhance fish and wildlife and their habitats, while providing sustainable fish and wildlife-related recreational opportunities within the Lewis River watershed.

Thank you for the opportunity to comment, if you have any questions concerning this letter, please feel free to contact Eric Holman at (360) 696-6211 ex 6755, eric.holman@dfw.wa.gov or myself at (360) 902-2593, peggy.miller@dfw.wa.gov.

Very truly yours,



Peggy Miller, Major Projects and Energy Biologist/FERC Coordinator
Washington State Department of Fish and Wildlife
(360) 902-2593
peggy.miller@dfw.wa.gov

and

Eric Holman, District Wildlife Biologist, Cowlitz, Lewis and Wahkiakum Counties
Washington State Department of Fish and Wildlife
(360) 696-6211 ex 6755
eric.holman@dfw.wa.gov

Appendix C

Devil's Backbone Patch Cut Implementation Plan

Swift Wildlife Management Area
Devil's Backbone Management Unit
 Patch Cut Implementation Plan

Task Summary	
WHMP Management Goal	Promote forestland species composition and structures that benefit wildlife and provide an appropriate mosaic of big game hiding cover and forage.
Objectives	Increase understory species and structural diversity in mid-successional forest stands over time by opening the canopy to improve shrub and groundcover; improve HSIs for elk over time.
Silvicultural treatment	Locate a single 5-acre patch where canopy gaps will maximize benefits to understory and minimize loss of larger diameter trees. Fell all trees within the patch, removing all merchantable logs. Remove all stumps from the ground and burn with non-merchantable slash. Retain 10 of the largest diameter logs and distribute within the patch for wildlife habitat. Retain 40 wildlife reserve trees (8/acre), using 10 trees for the immediate creation of snags. Non-merchantable logs and slash should be piled and burned. Distribute a seed mix throughout the patch to provide forage for big game species (deer and elk). Conduct treatment in accordance with Forestland Standard Operating Procedures (SOPs) found in WHMP Section 5.7; Invasive Plant Management SOPs found in Section 5.8, and Raptor Management SOPs provided in Section 5.9.
Number and size of patches	One, 5-acre patch.
Cost	Total Logging Cost = \$55,360 Sale Prep, and Admin Cost = \$9,000 Post-harvest documentation = \$3,000 Total = \$67,360 (see Task Description, below)
Schedule	Identify and lay out patches in summer, 2018. Fell trees, limb and pile slash, and create brush piles in early fall (October) 2019 to avoid the northern spotted owl and northern goshawk breeding/fledging seasons. Burn slash piles in winter (December) 2019 when fire hazard is low.
Documentation	Conduct site visit within 2 weeks of logging to verify that treatment was completed as prescribed.
Monitoring	Use photo documentation to evaluate vegetation response at 3 years and 6 years following treatment to determine if additional patch cuts would be beneficial and cost-effective.
Maintenance	Include site in annual review of invasive species monitoring.

Task Description

Under existing conditions, DBMU-2 and DBMU-3 are densely forested. Trees range from about 4 inches in diameter at breast height (dbh) to about 20 inches dbh. Table 1 summarizes stand data collected in June 2013.

Table 1. DBMU-2 and DBMU-3 stand attributes.

Trees per Acre	320
Basal Area per Acre	227
Quadratic Mean Diameter	11.4
Relative Density	67
Bd. Ft. Volume per Acre	37,352

Few snags are present, although coarse woody debris is fairly abundant. The understory supports a patchy distribution of shrubs (primarily Oregon grape), swordfern, and some herbaceous plants, such as oxalis, vanilla leaf, inside-out- flower, and trailplant. Small amounts of vine maple, red huckleberry, and rose are also present; but in many areas, groundcover is very sparse (Figure 1).



Figure 1. Example of stand conditions in DBMU-2.

The WHMP goal for Forestland is to promote species composition and structures that benefit wildlife and provide an appropriate mosaic of big game hiding cover and forage. Specific objectives are to:

- a. Provide and maintain a mix of forage and hiding cover for elk, considering activities on adjacent lands, over the life of the license.
- b. Maintain or create at least 8 snags ($\geq 20''$ dbh), green retention trees or wildlife reserve trees (≥ 15 in. dbh) per acre if available; and retain larger trees and snags representative of the area, unless different sizes or quantities are needed to meet specific wildlife objectives. To the extent possible, retain or create 4 logs/acre ($\geq 24''$ dbh) and 50 ft. long.
- c. Promote habitat diversity by increasing or maintaining native tree species composition where appropriate site conditions exist over the life of the license.

The objective of creating a patch cut is to remove all trees within a patch to produce an opening in the overstory canopy that will allow greater light to the forest floor to promote forage production and understory development. The treatment will consist of removing all trees within the interior boundary of a 5-acre patch. The dominant overstory species in DBMU-2 and DBMU-3 is Douglas-fir, with some western hemlock (estimated at 40 percent). Trees to be removed will consist primarily of Douglas-fir and hemlock, but some alder may also be removed. The patch cut will be sited to avoid western red cedar, cottonwood, and big-leaf maple. Merchantable trees will be removed from the site and sold to a local mill. Stumps will be removed from the ground and burned with other slash to provide more area for forage production. Two large logs per acre will be distributed within the opening to provide micro habitat sites, mimicking the natural conditions that occur when root rot or windthrow causes a pocket of tree mortality or an opening in a forest stand and creates a canopy gap in an otherwise closed canopy forest. Some limbs will be used to create wildlife brush piles (one per acre), the remainder will be piled and burned on-site to reduce fire hazard. The patch cut will be seeded with an elk forage seed mix.

The patch will be located in an area with the highest tree densities and smallest tree diameters, however the presence of an existing understory will also be an important factor in choosing the location for the patch cut. A location where removal of the overstory would release desirable elk forage species will be targeted, as well as a location that currently receives very little light and supports no ground cover.

The patch cut will be implemented in accordance with Forestland Standard Operating Procedures (SOPs) found in Section 5.7 of the WHMP for initial inspections (Section 5.7.1); best management practices (Section 5.7.3), and patch cuts (Section 5.7.3.3). Quick-plots conducted in 2005 and 2013 should provide adequate information to support patch cut silvicultural prescriptions.

The patch cut will also take into account plan-wide SOPs for Invasive Plant Management (Section 5.8) and Raptor Management (Section 5.9). Patches will be located away from areas where there is a risk of weed establishment or spread from nearby sources. Patches will be located in mid-successional stands to avoid suitable nesting habitat for northern spotted owls or northern goshawks, and treatments will be implemented in early fall to avoid breeding seasons and fledgling dispersal periods for both species.

The basic planning, implementation, and documentation steps outlined in the Forestland SOPs can be broken into the following tasks:

Task 1 Planning (2018)

Task 1a. Site Visit

The planning step will begin with a site visit to DBMU-2 and DBMU-3 to identify appropriate patch locations. The site visit will be conducted by a forester and a wildlife biologist to locate sites most likely to benefit from the treatment, i.e., where groundcover is minimal or where existing desirable groundcover could be released and enhanced by overstory removal. During the site visit, the team will:

- identify patch locations and flag patch boundaries with pink flagging
- mark all trees to be removed within each patch with blue tree paint in advance of the crew conducting the treatment
- tally and record all proposed cut trees by species and diameter class
- GPS patch boundaries; and
- photo-document pre-treatment stand conditions.

Task 1b. Mapping and Silvicultural Prescription

Following the site visit, the forester will prepare a detailed GIS map and air photo showing location of patches and access to the site, and write a detailed silvicultural treatment prescription. The map and the prescription will be included in the bid package, and the forester will be available to accompany prospective logging contractors during a mandatory on-site pre-bid meeting.

The treatment prescription will include the following:

- Specific management objectives
- Site constraints
- Permitting requirements
- Size of patch cut
- Number of trees to be felled, by size and species
- One brush pile per acre to be created
- Anticipated slash accumulation
- Suggested elk forage seed mix
- Anticipated regeneration
- Estimated costs and benefits

Retain 10 of the largest diameter logs and distribute within the patch for wildlife habitat. Retain 40 wildlife reserve trees (8/acre), using 10 trees for the immediate creation of snags.

As discussed in Section 5.7.3.3 of the WHMP, woody debris left on-site would add nutrients to the forest floor, provide micro-sites for seedling establishment, and afford cover to small mammals, terrestrial salamanders, and birds that forage on the ground. However, large accumulations of wood may increase the risk of wildfire, inhibit the movement of deer and elk, and create conditions that promote insect infestations that could spread to the live forest. These

types of concerns and objectives will be evaluated prior to conducting any patch cuts and addressed in the treatment prescription.

At this time, to minimize fire hazard, Cowlitz County PUD is proposing to pile and burn smaller material (limbs) not used to create wildlife brush piles. But if site inspections indicate that slash accumulations would be low, an alternative would be to distribute slash on-site to ensure that depths do not exceed 1 foot (i.e., to ensure slash does not interfere with wildlife movement).

Northern spotted owl and northern goshawk surveys will be conducted if it is determined that they are necessary at the time to comply with standard operating procedures.

The cost of Tasks 1a and 1b would total approximately \$9,000.

Task 2 Implementation (2019)

The prescription to be included in the bid package for logging will specify the management of non-merchantable debris on-site to benefit wildlife, and the selection and placement of retained merchantable large woody debris. Logging work will be completed by crews using mechanical equipment for efficiency and safety of the work crew. Heavy equipment will minimize impact on the site by travelling on top of slash and non-merchantable material.

Based on rough estimates from potential logging contractors, logging is expected to cost approximately \$52,360, including hauling of merchantable trees to the mill, pulling all stumps, piling and burning slash, and distributing retained large woody debris on-site. Burning, including DNR and Skamania County permits, is anticipated to cost approximately \$3,000, as a fire watch must be maintained during this activity and fire suppression equipment must be available on-site. Together, the cost of implementation in 2019 would be \$55,360.

Task 3 Documentation (2019)

The forester will conduct a post-harvest site visit within 2 weeks of implementation to document site conditions and confirm that work has been completed as specified in the contract documents. The forester will provide written and photographic documentation to Cowlitz PUD, and any recommendations for follow-up that may be necessary. The estimated cost of Task 3 is \$3,000.

Monitoring of each site's response to the patch cuts will be conducted at 3 years and 6 years post-implementation, primarily through the use of photo comparisons, to determine if additional patch cuts should be implemented. Costs for monitoring would be addressed in 2022 and 2025.