

◀ Data derived from LiDAR (Light Detection and Ranging) reveals forest canopy structure achieved by thinning (left) compared with the structure of an unthinned stand (right). The bottom images show an index of canopy complexity (known as rumple). Light blue colors show less complex canopy structure and purple/dark blue colors correspond to more complex canopy structure. The average rumple value of the thinned stand (on the left) is 2.4, in contrast to the unthinned stand (right) value of 1.7. Quantitative comparison of stand complexity is just one of the possibilities with access to LiDAR data.

State Trust Lands Habitat Conservation Plan 2013 Annual Report

For Fiscal Year 2013

Published April 2014



WASHINGTON STATE DEPARTMENT OF
Natural Resources
 Peter Goldmark - Commissioner of Public Lands

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Washington State Department
of Natural Resources
Forest Resources Division



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Natural Resources
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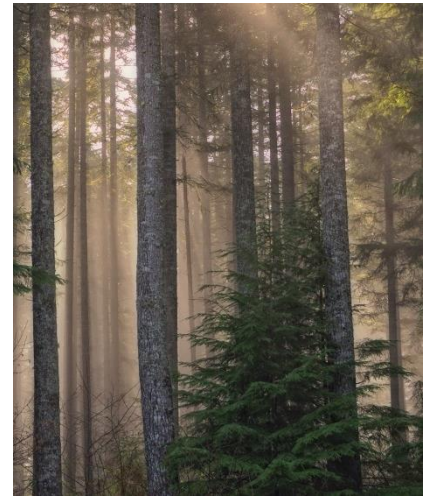
Acronyms

dbh	Diameter at breast height
DEIS	Draft environmental impact statements
DFC	Desired future condition
DNR	Washington State Department of Natural Resources
ESA	Endangered Species Act
FEIS	Final environmental impact statement
FRIS	Forest resource inventory system
FIU	Forest inventory unit
FY	Fiscal year
HCP	State Trust Lands Habitat Conservation Plan
LiDAR	Light detection and ranging
MoRF	Movement, roosting, and foraging
MOU	Memorandum of understanding
NAP	Natural area preserve
NRCA	Natural resource conservation area
NRF	Nesting roosting and foraging
NOAA	National Oceanic and Atmospheric Administration
OESF	Olympic Experimental State Forest
QMD	Quadratic mean diameter
P&T	DNR's forest management planning and tracking database
PNWRS	Pacific Northwest Research Station
RCO	Recreation and Conservation Office
RCW	Revised Code of Washington
RDEIS	Revised draft environmental impact statement
RDFC	Riparian desired future condition
RD	Relative density
REGIS	Road easement geographic information system
RFRS	Riparian Forest Restoration Strategy
RMAP	Road maintenance and abandonment plan
SEPA	State Environmental Policy Act
SOMU	Northern spotted owl management unit
USFWS	United States Fish and Wildlife Service
USFS	United States Forest Service
WAU	Watershed administrative unit
WDFW	Washington Department of Fish and Wildlife
Federal Services	USFWS and NOAA Fisheries

Introduction

Background on the State Trust Lands HCP

The Washington State Department of Natural Resources' (DNR) *State Trust Lands Habitat Conservation Plan (HCP) 2013 Annual Report* contains information on completed programmatic management activities, including silvicultural and harvest activities, land transactions, non-timber resource activities, monitoring and research efforts, conservation strategy achievements and updates, and other related programs, on state trust lands managed under the HCP. This report provides a record of activities that are covered under the HCP and allows us to document trends and the factors influencing them.



In most cases, we report activities completed within fiscal year (FY) 2013 (July 1, 2012, through June 30, 2013). However, some activities are reported by calendar year or another time period, depending on the data management system used and the specific information being reported.

In this report, we also include information on our Natural Areas Program, under which we manage natural area preserves (NAPs) and natural resources conservation areas (NRCAs). Although these natural areas are not state trust lands, they contribute to the HCP's overall conservation objectives. In this document, the term "DNR-managed lands" refers to these areas as well as state trust lands.

Report Organization

Activities on state trust lands managed under the HCP and the accomplishments of our Natural Areas Program are reported and discussed in the main body of the report. [Appendix A](#), which follows the report, supplies background information for most sections. It is accessible via links located at the beginning of sections in this report. [Appendix B](#) is a glossary of terms that readers may encounter throughout the report. For more information on DNR's HCP, visit [DNR's HCP webpage](#).

Highlights for FY 2013

DNR's HCP program is regaining momentum in the wake of the economic challenges of the last five years. With increased budget flexibility, we have resumed several activities and practices that had been curtailed by lack of funding, enabling us to better support the objectives and implementation of the HCP. Highlights for FY 2013 include:

- **A new installment of the HCP comprehensive review that addresses forest land management activities.** The HCP includes projections of the number of acres of management activities that would take place in the first decade of the HCP. In our review, we compare these projections to actual management activity levels. We also explain how tracking of northern spotted owl data for Westside HCP planning units and the Olympic Experimental State Forest (OESF) has changed over time.

- **Resumption of pre-commercial thinning.** Pre-commercial thinning activities were resumed. In FY 2013, we treated approximately 17,600 acres of state trust lands managed under the HCP.
- **Resumption of comprehensive presales training for all new foresters for all DNR regions.** This training included instruction on all aspects of timber sale layout under the HCP.
- **Allocation of additional funding for OESF status and trends monitoring of riparian and aquatic habitat.** DNR, in cooperation with the United States Forest Service (USFS) Pacific Northwest Research Station, is monitoring nine different habitat indicators on 50 Type 3 streams. In addition, funding has been allocated for fish biologist and information manager positions to assist with OESF research and monitoring.
- **Allocation of additional funding for increasing DNR's light detection and ranging (LiDAR) coverage.** LiDAR (a remote sensing method for examining the earth's surface) will support our work in forest inventory and other programs, including presales screening and HCP implementation. Acquisition of about 463,000 additional acres of coverage is either in progress or planned for FY 2014 and FY 2015.
- **A new GIS-based road easement tracking system (REGIS).** This system, which is nearing completion, joins spatial information to existing tabular information. It allows us to determine more accurately the location of DNR access to state trust lands, the specific rights that are part of each agreement, and the easements that are associated with each road segment.

Comprehensive Review of Selected Elements of the HCP

The HCP Implementation Agreement (Section 21.0, p. B.8) requires periodic (comprehensive) reviews of the HCP, the Incidental Take Permit, and the Implementation Agreement and consultation in good faith between DNR and the Federal Services to identify amendments that might more effectively and economically mitigate incidental take. In 2012, DNR and the Federal Services agreed to conduct the comprehensive review by subject over the next few years, as funding and staffing allow.

For this annual report, we focus on reporting activities described in the “Forest Land Management Activities” section of the HCP (p. IV.191). We compare completed, mean annual acres of silvicultural activities to the projected acres of silvicultural activities listed in Table IV.15 of the HCP (p. IV.211) for the first decade of the HCP. We also describe how tracking of northern spotted owl data has changed over time. We anticipate that reviews and adjustments of HCP conservation strategies will continue to occur through other planning processes, such as forest land planning for HCP planning units or development of the long-term Marbled Murrelet Conservation Strategy and the Riparian Forest Restoration Strategy (RFRS) published in 2006.

Forest Land Management Activities

Section H, “Forest Land Management Activities” of the HCP (p. IV.191) describes common forest practices that were projected to occur on state trust lands managed under the HCP during the first decade of its implementation. Some activities are related to timber harvests; others, such as land transactions, are not, but are important elements of forest management under the HCP.

Harvest level projections in the HCP were developed using a harvest simulator model. These projections were based on typical silvicultural regimes that were estimated to a) achieve the habitat goals that constitute the minimization and mitigation of take under the HCP, and b) increase the commercial productivity and value of forest products from state trust lands. These harvest levels were not intended as targets; it is neither practical nor prudent to commit to specific levels of silvicultural activities as part of this HCP. Instead, we optimize and adjust harvest levels through other planning processes, such as the sustainable harvest calculation, which take both ecological values and revenue production goals into account.

In Table 1 in this section, we compare projected mean annual acres of silvicultural activities in Table IV.15 of the HCP (p. IV.211) to completed mean annual acres for the first decade of the HCP. While activities reported as complete during the first decade may be similar to those listed in Table IV.15, categorization of those activities has changed over time. Therefore, a crosswalk has been provided within the table to capture those changes.

Silviculture activities for FY 2013, as well as the completed mean annual acres for the second decade, are reported in the [Silvicultural Activities](#) section.

Table 1. Projected and Completed Mean Annual Acres of Silvicultural Activities on Forested State Trust Lands Managed Under the HCP During the First Decade (January 1, 1999 – June 30, 2008)

Silvicultural activities		Projected mean annual acres ¹			Completed mean annual acres ²		
Planning and tracking activity category ⁴	HCP activity category ³	Eastside HCP planning units	Westside HCP planning units	OESF HCP planning unit	Eastside HCP planning units	Westside HCP planning units	OESF HCP Planning Unit
Harvest							
Clearcut	Clearcut	300-600	14,000-16,500	300-1,500	501	10,659	440
Variable retention harvest							
Seed tree intermediate cut	Seed tree	0	50-100	0-30	646	13	0
Seed tree removal cut							
Shelterwood intermediate cut	Shelterwood	100-500	100-500	30-100	401	84	52
Shelterwood removal cut							
Temporary retention, first cut							
Temporary retention, removal cut							
Selective product logging	Selective	2,500-3,500	2,000-3,000	800-1,130	1,783	849	8
Uneven-aged management							
(Not a stand-alone activity in database)	Salvage ⁵	500-1,000	0	150-250	(included in harvest categories – refer to Table 2 for explanation)		
Commercial thinning	Commercial thinning	400-1,000	3,000-4,500	2,500-3,500	1,349	4,163	799
Variable density thinning							
Harvest totals		3,800-6,600	19,150-24,600	3,780-6,510	4,680	15,768	1,299
Site preparation							
Broadcast burn	Broadcast burn	0-100	50-100	0-100	0	0	0
Aerial herbicide	Herbicide	50-500	500-1,000	0	118	3,112	29
Ground herbicide							
Ground mechanical	Scarification	200-800	100-300	0-100	904	63	0
Hand cutting	(Not in HCP table)	0	0	0	29	1	0
Pile and burn ⁶	(Not in HCP table)	0	0	0	201	488	9
Site preparation totals		250-1,400	650-1,400	0-200	1,252	3,664	38
Regeneration							
Planting	Planting	600-2,000	12,000-16,000	300-1,500	1,779	11,339	536
Natural	Natural seeding	3,000-5,000	500-3,000	80-120	317	85	15
Regeneration totals		3,600-7,000	12,500-19,000	380-1,620	2,096	11,424	551
Vegetation management							
Hand cutting	Hand slashing	0	6,000-10,000	500-1,000	216	7,888	213

Silvicultural activities		Projected mean annual acres ¹			Completed mean annual acres ²		
Planning and tracking activity category ⁴	HCP activity category ³	Eastside HCP planning units	Westside HCP planning units	OESF HCP planning unit	Eastside HCP planning units	Westside HCP planning units	OESF HCP Planning Unit
		Ground herbicide	Ground herbicide	0	4,000-5,000	0-100	1,013
Aerial herbicide	Aerial herbicide	500-1,500	2,000-3,000	0-50	77	2,050	0
Seeding grass ⁷	(Not in HCP table)	0	0	0	51	0	0
Vegetation management totals		500-1,500	12,000-18,000	500-1,150	1,357	13,026	290
Forest health treatment							
Underburning	Under-burning	300-1,000	0	0-50	0	14	0
(No root-rot treatment in database)	Root-rot control	100-500	250-500	0-50			
Aerial insecticide	Insect damage control	200-1,500	0	0-50	914	0	0
Forest health treatment totals		600-3,000	250-500	0-150	914	14	0
Pre-commercial thinning		300-1,000	10,000-20,000	1,000-2,500	1,166	4,890	3,329
Fertilization		400-1,000	3,000-11,500	0-100	0	321	0
Other							
Tree pruning	(Not in HCP table)	0	0	0	0	42	8
Animal repellent	(Not in HCP table)	0	0	0	0	105	0
Animal trapping	(Not in HCP table)	0	0	0	0	21	0
Shielding or fencing	(Not in HCP table)	0	0	0	0	134	0
Other totals		0	0	0	0	302	8

¹Projected acres from Table IV.15 of the HCP (p.IV.211) have been converted from decadal to mean annual acres.

² Per the HCP Implementation Agreement (Section 16.2, p. B.4), DNR is required to incorporate relevant commitments of the HCP into all timber sales sold on or after January 1, 1999. Therefore, the completed mean includes 9 ½ years of data (January 1, 1999 – June 30, 2008). The first half of FY 2009 was grandfathered and not required to be compliant with the HCP. Completed mean acres from DNR’s planning and tracking database as of November 8, 2013, have been converted from decadal to mean annual acres for the first decade.

³Under “HCP activity category,” the activity titles used are representative of those used in Table IV.15 (p.IV.211) of the HCP.

⁴ Under “Planning and tracking activity category,” the activity titles used represent the timber harvest activity type currently used in DNR’s planning and tracking database. In order to report comparable information for the first decade, it is necessary to cross-reference the categories used in Table IV.15 of the HCP (p.IV.211) to those used today. Timber harvest activity types are defined in [Appendix B: Glossary of Terms](#).

⁵Salvage activities (under “HCP activity category”) are not a stand-alone activity in DNR’s planning and tracking database; instead, they are included in the planning and tracking activity category that best fits the silvicultural prescription for the stand being managed. Salvaged acres by planning and tracking activity category are listed in Table 2.

⁶Data reporting is highly inconsistent for the “pile and burn” activity. In some cases, only the footprint of the burn piles is included. In other cases, the entire unit is counted.

⁷Seeding grass is rarely implemented; it is usually used to restore areas with large noxious weeds infestations.

As noted in Table 1, we do not treat salvaged acres as an individual timber harvest type in our planning and tracking (P&T) database. Instead, we include salvage areas in the timber harvest activity type that best fits the silvicultural prescription for the stand being managed, and flag them to capture those acres separately. Table 2 lists projected and completed mean annual salvage acres by P&T timber harvest activity type for the first decade of the HCP.

Table 2. Completed and Projected Mean Annual Salvage Acres by Timber Harvest Activity Type for the First Decade (January 1, 1999 – June 30, 2008)

Salvage harvests	Eastside HCP planning unit acres	Westside HCP planning unit acres	OESF acres
Timber harvest - clearcut	41	5	61
Timber harvest - commercial thinning	0	150	0
Timber harvest - seed tree intermediate cut	356	0	0
Timber harvest - selective product logging	0	15	8
Timber harvest - variable density thinning	27	7	0
Timber harvest - variable retention harvest	69	78	8
Completed mean annual salvage acres¹	492	255	77
HCP projected mean annual salvage acres²	500-1,000	0	150-250

¹ Per the HCP Implementation Agreement (Section 16.2, p. B.4), DNR is required to incorporate relevant commitments of the HCP into all timber sales sold on or after January 1, 1999. Therefore, the completed mean includes 9 ½ years of data (January 1, 1999 – June 30, 2008). The first half of FY 2009 was grandfathered and not required to be compliant with the HCP. Completed acres from DNR’s planning and tracking database as of November 8, 2013, have been converted from decadal to mean annual acres for the first decade.

²HCP projected mean annual salvage acres were derived from Table IV.15 in the HCP (p. IV.211) and converted from decadal to mean annual for the first decade.

Northern Spotted Owl Data

Background on the Northern Spotted Owl Conservation Strategy

In this portion of the review, we describe how our tracking and management of northern spotted owl data for Westside HCP planning units and the OESF has evolved since the HCP was implemented. Tracking and management of northern spotted owl data for Eastside HCP planning units will be presented at a later date.

When DNR wrote the HCP, we identified those lands that were most important to northern spotted owl conservation using age class. These lands were designated as northern spotted owl management areas ([refer to background information in Appendix A](#)). Three types of areas were identified in the HCP: nesting, roosting and foraging (NRF) management areas, dispersal management areas, and the OESF.



Northern Spotted Owl
Photo courtesy USFWS

The HCP's northern spotted owl conservation strategy involves maintaining thresholds of habitat in each northern spotted owl management area or OESF landscape unit. Per the HCP, the spatial unit at which we would track habitat thresholds differed by HCP planning unit.

- In most Westside HCP planning units, DNR would maintain at least 50 percent of designated NRF and dispersal watershed administrative units (WAUs) as suitable habitat.
- In the OESF HCP planning unit, DNR would maintain at least 40 percent of each landscape planning unit as suitable habitat (the OESF is divided into 11 landscape planning units, which are administrative areas designated primarily along watershed boundaries).

To help us implement the northern spotted owl conservation strategy, we developed the RIUOWLWAW spatial data layer using the best data available at that time. We used forest resource inventory system (FRIS) data to screen for habitat parameters and identified forest inventory units (FIU) that were expected to meet HCP northern spotted habitat requirements.

The RIUOWLWAW data layer was used to calculate the percentage of northern spotted owl habitat within each WAU. However, in this calculation we evaluated only the minimum habitat type for each NRF and dispersal management area (for example, sub-mature habitat for NRF and dispersal habitat for dispersal management areas). This process essentially missed higher-quality habitat and resulted in an erroneous (lower) habitat percentage for each WAU. This was a major shortcoming of the RIUOWLWAW data layer.

In addition, WAU boundaries were originally based on the 1997 forest practices designation. Since that time, WAU boundaries have shifted based on new or more current hydrographic information. Managing multiple WAU layers for different HCP objectives became problematic (that is, we used one WAU layer for northern spotted owl management and another layer to manage hydrologic maturity). Also, the RIUOWLWAW data layer was not corrected for any timber sales until 2002, when DNR's Forest Resources Inventory Program implemented a system to model growth and activity updates of the sample inventory.

With the completion of the 2004 sustainable harvest calculation ([*Final EIS on Alternatives for Sustainable Forest Management of State Trust Lands in Western Washington and for Determining the Sustainable Harvest Level, July 2004*](#)), the onset of forest land planning, and the implementation of a new northern spotted owl procedure (PR 14-004-120, September 2004), our Forest Resources Inventory Program initiated development of an improved, detailed dataset for northern spotted owl habitat in western Washington. For this northern spotted owl dataset (2004 dataset), we used model-grown data that was updated from a 2004 inventory dataset and sample inventory. The 2004 dataset identified all northern spotted owl habitat types in western Washington as determined by a hierarchical assessment. When forest stands met multiple habitat types, we assigned them the highest quality habitat type and corresponding habitat code. Any given area had to meet each of multiple parameter thresholds in order to be identified as a specific habitat type (refer to [definitions for northern spotted owl habitat types](#)).

However, before the 2004 dataset could be fully implemented as a core dataset, we entered into the 2006 Settlement Agreement (*Washington Environmental Council, et al v. Sutherland, et al (King County Superior court No. 04-2-26461-8SEA, vacated April 7, 2006)*). As a result of this agreement:

- We designated a fourth type of owl management area, called an owl area. Owl areas are those areas which were (a) designated in HCP Implementation Memorandum No. 1 (January 12, 1998), (b) located within Washington Department of Fish and Wildlife (WDFW) Status 1-R (reproductive) owl circles, and (c) located within the four areas identified in Standard Practice Memorandum SPM 03-07 (*Management of Northern Spotted Owl Circles And The Identification Of Northern Spotted Owl Habitat In Southwest Washington*). Owl areas do not include any areas within NRF or dispersal management areas or the OESF.
- We used the 2004 dataset, along with maps and acreage summaries, to re-delineate northern spotted owl habitat in all northern spotted owl management areas in western Washington, including the new owl areas. The 2004 dataset was renamed the Settlement Agreement habitat layer.
- For the OESF, we included non-FRIS identified older forest stands in the Settlement Agreement habitat layer as “Old Forest.” These stands had been identified through a field and map review and approval process.

Around this time, we obtained a concurrence letter from USFWS allowing the WAU boundaries used for habitat thresholds to be modified slightly and renamed as spotted owl management units (SOMUs) to distinguish them from WAUs. A spatial layer was created displaying SOMU boundaries. This SOMU layer contained a table showing the percent of habitat for NRF and dispersal management areas using the habitat categories in the Settlement Agreement habitat layer. The SOMU layer also displays habitat percentages in the 11 landscape planning units of the OESF.

Also around this time, we compared the method used to evaluate each habitat parameter for the 2004 dataset and for the Settlement Agreement habitat layer. With a few exceptions, it became apparent that most habitat parameters were evaluated in the same way. We also recognized the importance of updating and maintaining the Settlement Agreement habitat layer in an accurate and current status.

Between 2007 and 2009, we held conversations with the Settlement Partner Representatives to negotiate the best way to update the Settlement Agreement habitat layer and habitat maps outlined in section 1.D.1 of the Settlement Agreement. From those discussions, it was concluded that DNR would update the Settlement Agreement habitat layer (renamed the NSO habitat layer) as needed to respond to information accuracy triggers and would consult with Settlement Partner Representatives and the Federal Services should updates be required due to habitat-based triggers. Information accuracy triggers are day-to-day operational updates that need to take place in order for the maps to reflect accurate on-the-ground conditions (for example, timber harvest events, new or updated inventory, data clarification, next best designations, land transactions, and resolved Settlement Agreement items). Habitat-based triggers are those updates involving habitat type changes that require consultation and/or approval from the Settlement Partners and the Federal Services (for example, redesignation of northern spotted owl management areas and habitat definition adjustments).

Currently, we use the NSO habitat layer to track acres of both habitat and non-habitat within northern spotted owl management areas. Per our agreement, we update this layer regularly to reflect accurate on-the ground conditions (information accuracy triggers).

■ Age Class Versus Structure

Estimates of current and future northern spotted owl habitat have evolved over time. Initially, the HCP utilized age-class distribution as a surrogate for habitat, acknowledging that age class does not necessarily equate to habitat (p.IV.29). Table IV.16 in the “Forest Management Activities” section of the HCP (p. IV.212) provides an estimate of the number of acres of habitat expected to develop on state trust lands managed under the HCP in Westside planning units including the OESF at the end of the first decade, based on age class. Table IV.16 has been reproduced as Table 3 for this report.

Table 3. Estimated Number of Acres of Northern Spotted Owl Habitat on DNR-managed lands in Westside and OESF HCP Planning Units at the End of the First Decade of the HCP (p.IV.212)

Type of habitat	Westside HCP planning units	OESF HCP Planning Unit
Dispersal	58,000	N/A
NRF ¹	66,000	56,000

¹Habitat, not to be confused with NRF management areas; refer to p. IV.88 in the HCP and Hanson et al 1993

Since the HCP was adopted, DNR has transitioned to northern spotted owl habitat definitions that are based on forest structure, not age class, because we believe forest structure is a more effective way to define habitat. For example, it is difficult to predict the development of forest structures such as down wood or snags through age class alone. We have also, through planning processes such as development of the South Puget HCP Planning Unit Forest Land Plan, adjusted habitat definitions to better reflect the owls’ needs in a particular area. Because of these changes, and because we are no longer using age class as a surrogate for habitat, it is not possible to directly compare the estimates in Table 3 (Table IV.16 in the HCP) to current estimates. The most appropriate and accurate way to capture current acreages is to report habitat within northern spotted owl management areas at a particular point in time. Current estimates (as of August 28, 2013) are presented in Table 4.

Table 4. Estimated Number of Acres of Habitat and Non-habitat in Northern Spotted Owl Management Areas in Westside and OESF HCP Planning Units as of August 28, 2013

Northern spotted owl (NSO) management area		Habitat class	Habitat type ¹	Habitat acres	Non-habitat acres	Unknown acres ²	Next best acres ³	Total NSO management area acres	
NRF		NRF habitat	High quality habitat	High quality nesting	0	64,582	12,750	69,492	166,132
			Type A	1,122					
			Type B	150					
		Sub-mature habitat	Sub-mature	18,036					
Dispersal	All other Westside planning units	Dispersal habitat	High quality habitat	High quality nesting	0	18,832	1,674	2,919	125,245
			Type A	74					
			Type B	0					
		Sub-mature habitat	Sub-mature	4,064					
		Dispersal habitat	Young forest marginal	3,751					
			Dispersal	15,892					
	South Puget HCP Planning Unit only	Dispersal habitat	Movement, roosting, and foraging (MoRF) plus habitat	High quality nesting	0	31,410	7,152	19,671	
				Type A	522				
				Type B	107				
				MoRF	2,097				
			Movement plus habitat	Sub-mature	461				
				Young forest marginal	3,075				
				Movement	13,546				
OESF	Old Forest	Old Forest	Old Forest	40,085	199,839	9,513	n/a	271,867	
			High quality nesting	8					
			Type A	541					
			Type B	99					
		Structural habitat	Sub-mature	7,486					
			Young forest marginal	14,297					
Owl area	High quality habitat	High quality nesting	0	87,421	5,378	n/a	97,860		
		Type A	2						

Northern spotted owl (NSO) management area	Habitat class	Habitat type ¹	Habitat acres	Non-habitat acres	Unknown acres ²	Next best acres ³	Total NSO management area acres
		Type B	0				
	Low quality habitat	Sub-mature	536				
		Young forest marginal	4,523				

¹Definitions of northern spotted owl habitat types can be found in the [Northern Spotted Owl Conservation Strategy](#) background section.

² Unknown stands are stands containing insufficient FRIS information to query and classify the stand. Any unknown stands greater than 25 years of age must have a FRIS inventory conducted to adequately classify it prior to any harvest activity. Once a new inventory is completed for the stand, it will be updated according to the new/updated inventory trigger and subsequent habitat classification. Stand ages are based upon the current FRIS origin date and are assessed at each layer update.

³Next best stands are those non-habitat or unknown stands that have been identified as most likely to meet a northern spotted owl habitat classification in the shortest possible time, with or without silvicultural treatment.

Program Activities

Silvicultural Activities for FY 2013

Background on Silvicultural Activities

Information and analysis provided in this section is based on completed activities on forested state trust lands (activities designated as complete in P&T as of November 8, 2013). Note that P&T is a dynamic system; data is updated or changed on a continual basis.

Five major silvicultural activity types are discussed in this report: timber harvest, site preparation, forest regeneration, vegetation management, and pre-commercial thinning. While there is some variation, these activities generally occur in this sequence for any given unit where timber has been harvested. Timber harvests are the primary driving force for other silvicultural activities, as most harvests remove enough trees to require reforestation of the stand.

During FY 2013, DNR implemented forest management activities at expected levels, with one major exception: pre-commercial thinning, which had been virtually absent for several years due to funding constraints, has recommenced. Refer to Table 5 at the end of this section for completed acres of silvicultural activities in the second decade of the HCP.

■ Timber Harvest

The rights to harvest timber from state trust lands are purchased at regional public auctions held each month. A timber sale contract allows the purchaser to remove timber, typically over a one- to two-year period (the actual completion date usually falls sometime within that time frame, though it may be later if the contract is extended). Thus, the levels of sold timber sales may stay relatively stable from year to year. However, timber removals or levels of completed activities may vary based on the purchaser's

choice of when to harvest (and complete) the timber sale. The overall acreage of completed timber harvests as of November 2013 was roughly 30 percent below the five-year mean.

Variable retention harvest levels in FY 2013 were roughly 27 percent below the five-year mean. There were significant reductions (44 percent or more) in the implementation of all other harvest types, with one exception: variable density thinning increased by 12 percent overall. This gain was primarily due to 1,008 acres of variable density thinning that occurred in the Yakima HCP Planning Unit as part of the salvage effort that occurred following the Table Mountain Fire of September 2012.

■ Forest Site Preparation

Forest site preparation acreage was 10 percent greater than the five-year mean. Aerial herbicide treatments were 26 percent above average, and ground herbicide treatments were 50 percent above average. This increase reflects greater funding in FY 2012 and FY 2013 for forest site preparation, as well as an increased emphasis on controlling competing vegetation prior to (as opposed to after) regenerating forest stands. The number of acres of site preparation is expected to decline somewhat in FY 2014, due to the FY 2013 decline in variable retention harvest levels.

■ Forest Regeneration

Forest regeneration acreage was 7 percent lower than the five-year mean. Hand planting accounted for 97 percent of the FY 2013 total. Acres of forest regeneration are expected to decline somewhat in FY 2014, due to the FY 2013 decline in variable retention harvest levels.

■ Vegetation Management

The 13,569 acres of vegetation management activities in FY 2013 are 40 percent higher than the five-year mean. This increase is due to increased funding in FY 2012 and FY 2013 for vegetation management after several years of budget cuts, during which time treatments of many forest management units were postponed or cancelled. Ground herbicide treatments accounted for almost all of the increase: 6,856 acres were treated with ground herbicide in FY 2013 compared with the five-year mean of 3,291 acres (over twice as many acres). Hand cutting treatments in FY 2013 were 19 percent higher than the five-year mean. Overall levels of vegetation management are likely to remain near current levels in FY 2014.

■ Pre-Commercial Thinning

Due to budget limitations, essentially no pre-commercial thinning was done in FY 2010, FY 2011, or FY 2012. Funding was restored in FY 2013 for this activity and 17,641 acres were treated within the entire HCP area, which was almost four times the 5-year mean of 4,500 acres and over twice the 15-year mean of 7,757 acres.

Pre-commercial thinning is needed in some stands to reduce high stem densities, and when implemented within the optimal timeframe, increases the chances that stand development will lead to desired future forest conditions. Proper thinning helps maintain individual tree vigor and accelerates diameter growth, resulting in more rapid attainment of size requirements for product or habitat goals. Pre-commercial

thinning is a particularly important strategy for addressing forest health concerns, because maintaining lower stand densities with good individual tree vigor is important for making stands more resistant to insect attack. In addition, height-to-diameter ratios, a measure of stem stability, are improved, reducing risk of windthrow or stem buckling if partial cutting treatments are applied.

Pre-commercial thinning does not immediately create habitat for endangered species such as the northern spotted owl or marbled murrelet. However, it does set thinned stands on a developmental trajectory that is more likely to produce habitat in the future because thinning accelerates the development of large, live trees with stable tree architecture.

■ **Salvage**

As noted in Table 1 (in “Comprehensive Review of Selected Elements of the HCP” earlier in this report), we do not treat salvaged acres as an individual harvest type in P&T. Instead, we include salvage areas in the harvest activity type that best fits the silvicultural prescription for the stand being managed, and flag them to capture those acres separately. Table 6 compares the FY 2013 completed salvaged acres to the FY 2009 – 2013 mean annual salvage acres by P&T timber harvest activity type for the second decade of the HCP.

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Table 5. Acres of Completed Silvicultural Activities on State Trust Lands Managed Under the HCP From FY 2009 – FY 2013

Activity	FY 2013								FY 2013 (totals)				FY 2009-13 mean annual acres ¹			
	EAST				WEST				East	West	OESF	TOTAL	East	West	OESF	TOTAL
	Chelan	Klickitat	Yakima	Columbia	N. Puget	S. Coast	S. Puget	Straits								
TIMBER HARVEST																
Clearcut												0	15	22	51	87
Commercial thinning		174		694	180				174	874	17	1,065	803	959	145	1,907
Seed tree intermediate cut												0	148	7		155
Selective product logging												0		296		296
Shelterwood intermediate cut												0	103	34		137
Shelterwood removal cut			75						75			75	151	13		165
Temporary retention first cut												0		4		4
Uneven-aged management	79	461							540			540	993	105		1,098
Variable density thinning	4		1,008	262	301	9	467	12	1,012	1,051		2,063	569	1,190	90	1,850
Variable retention harvest	35	197	621	2,852	2,083	1,975	947	1,080	853	8,937	846	10,636	737	12,839	1,084	14,659
Salvage ² (Not a stand-alone timber harvest activity type)	Included in timber harvest activity types – refer to Table 6 for explanation															
TOTAL timber harvest	118	832	1,704	3,808	2,564	1,984	1,414	1,092	2,654	10,862	863	14,379	3,520	15,469	1,370	20,359
FOREST SITE PREPARATION																
Aerial herbicide				2,668	1,331	2,408				6,407		6,407		4,945	130	5,074
Ground herbicide				1,043	597	802	102	546		3,090	445	3,535	175	1,905	273	2,354
Ground mechanical			372						372			372	764	8		772
Hand cutting												0			18	18
Pile and burn ³						227				227		227	1,093	246		1,339
Underburning												0		1		1
TOTAL forest site preparation	0	0	372	3,711	1,928	3,437	102	546	372	9,724	445	10,541	2,033	7,106	421	9,559
FOREST REGENERATION																
Hand planting	21	197		3,997	2,931	3,546	1,050	1,533	218	13,057	717	13,992	849	12,786	1,066	14,700
Natural regeneration			423			14			423	14		437	808	36		843
TOTAL forest regeneration	21	197	423	3,997	2,931	3,560	1,050	1,533	641	13,071	717	14,429	1,656	12,821	1,066	15,543
VEGETATION MANAGEMENT																
Aerial herbicide				62						62		62		785		785

Activity	FY 2013								FY 2013 (totals)				FY 2009-13 mean annual acres ¹			
	EAST			WEST					East	West	OESF	TOTAL	East	West	OESF	TOTAL
	Chelan	Klickitat	Yakima	Columbia	N. Puget	S. Coast	S. Puget	Straits								
Ground herbicide				944	941	1,250	609	2,898		6,642	214	6,856	45	3,163	84	3,291
Hand cutting				664	2,200	593	2,266	745		6,468	178	6,646		5,442	164	5,606
Seeding grass ⁴	5								5			5	1			1
TOTAL vegetation management	5	0	0	1,670	3,141	1,843	2,875	3,643	5	13,172	392	13,569	46	9,390	248	9,683
PRE-COMMERCIAL THINNING																
Pre-commercial thinning	79	1,533	909	1,230	4,345	2,910	1,862	1,262	2,521	11,609	3,511	17,641	704	2,694	1,102	4,500
TOTAL pre-commercial thinning	79	1,533	909	1,230	4,345	2,910	1,862	1,262	2,521	11,609	3,511	17,641	704	2,694	1,102	4,500
OTHER																
Animal repellent												0		65		65
Shielding or fencing				134		216	12			362		362		97		97
TOTAL other	0	0	0	134	0	216	12	0	0	362	0	362	0	162	0	162
GRAND TOTAL	223	2,562	3,408	14,550	14,909	13,950	7,315	8,076	6,193	58,800	5,928	70,921	7,958	47,642	4,205	59,806

¹Completed acres from P&T as of November 8, 2013, have been converted to mean annual acres for the time period of July 1, 2009 – June 30, 2013. Therefore, the actual mean includes 5 years of data.

²Salvage activities are not a stand-alone activity in DNR's planning and tracking database; instead, they are included in the planning and tracking activity category that best fits the silvicultural prescription for the stand being managed.

³Data reporting is highly inconsistent for the "pile and burn" activity. In some cases, only the footprint of the burn piles is included. In other cases, the entire unit is counted.

⁴Seeding grass is rarely implemented, usually for restoration of areas with large noxious weeds infestations.

Table 6. Comparison of FY 2013 Completed Salvage Acres to Completed Mean Annual Salvage Acres for FY 2009 - 2013 by Timber Harvest Activity Type

Harvest type	FY 2013 completed salvaged acres				FY 2009 - 2013 completed mean annual salvaged acres ¹			
	East	West	OESF	TOTAL	East	West	OESF	TOTAL
Clear cut				0	0	21	51	72
Commercial thinning				0	0	15	0	15
Seed tree intermediate cut				0	72	0	0	72
Selective product logging				0	0	4	0	4
Temporary retention, first cut				0	0	0	0	0
Uneven-aged management				0	49	41	0	90
Variable density thinning	660			660	132	111	0	243
Variable retention harvest	609	57		666	338	703	39	1,079
Totals	1,269	57	0	1,326	590	895	89	1,574

¹Completed acres from P&T as of November 8, 2013, have been converted to mean annual acres for the time period of July 1, 2009 – June 30, 2013. Therefore, the actual mean includes 5 years of data.

Non-timber Management Activities

Background on Non-Timber Management Activities

We continue to refine our methodology for reporting non-timber management activities. The reporting timeframe for each category listed in Table 7 in this section varies; depending on the type of lease and how the information was obtained, we used several different snapshots in time (leases are continually being signed, renewed, or terminated) to report this information.

We now have the ability to report more accurately the number of acres associated with special forest product permit areas. All acres associated with special forest product permits in the Westside HCP planning units are included in the totals reported for FY 2013 (Table 7).

All oil and gas exploration leases were surrendered in FY 2013 by the brokerages. These brokerages typically lease portions of state trust lands in hopes of selling the lease agreements to interested companies for oil and gas exploration. An increase in rental fees scheduled likely precipitated the surrender of the lease agreements. Oil and gas leases on state trust lands are cyclical; we expect to see new exploration leases signed in the next five to ten years. While we expect oil and gas exploration leases to be a source of income again in the future, actual exploration is expected to be rare. Only one lease has ever resulted in actual exploration under the HCP. A well was drilled in 1996, and was subsequently capped and abandoned.

Table 7. Number and Acres of Non-Timber Management Activities

Data presented is from fall 2013, except for data on silvicultural pits. Data includes all active leases, permits, and sites.

	Number	Acres
Special forest products		
Special forest products leases	15	46,863
Special forest products permit areas	11	363,388
Total special forest products	26	410,251
Silvicultural (rock, sand, and gravel) pits¹		
Active silvicultural pits	165	317
Inactive silvicultural pits	230	216
Abandoned silvicultural pits	55	56
Total silvicultural pits	450	589
Grazing Permits/Leases		
Eastside leases ²	57	95,951
Eastside range permits ²	8	92,301
Westside leases ³	1	50
Total grazing permits/leases	66	188,302
Communications Site Leases		
Number of sites	70	106
Number of leases	254	
Total communication sites acres	324	110
Recreation Sites		
DNR recreation sites	8	32
Recreation and Conservation Office (RCO) recreation sites ⁴	91	1,298
Total recreation sites	99	1,330
Total rock, sand and gravel sales	5	290
Total special use leases	24	990

¹ Silvicultural Pits are rock, sand, or gravel pits used exclusively for construction of forest roads and timber sale landings. Data is from the last inventory of silvicultural pits, done in 2003. Actual pit numbers are expected to be very similar to those reported, due to a relatively consistent demand for road building materials.

² Most of the Eastside grazing permits/leases acres are likely non-forested, and therefore not managed under the HCP. At this time we do not have the ability to distinguish forested from non-forested acres in NatureE.

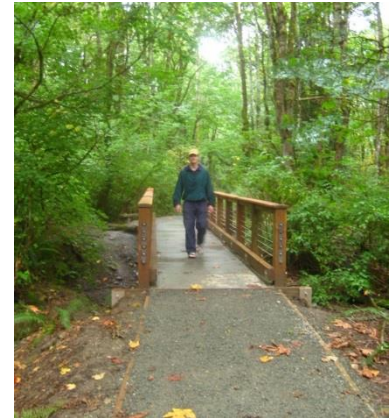
³ This lease represents an acquired parcel in which the seller was allowed to retain grazing rights. These rights will expire in 2018.

⁴ These are recreation sites that are leased using funds from RCO, formerly known as Interagency Committee for Outdoor Recreation.

Recreation Program

Background on Recreation Sites

Through our Recreation Program, we continued to improve facilities for public use at several locations around the state in FY 2013. All projects were designed, constructed, and managed consistent with the commitments of the HCP. This year's work is summarized below.



New bridge, Tiger Mountain State Forest

■ Development Projects

- **Reiter Foothills Forest, Snohomish County:** Completed .5 miles of 4x4 trails, 3 miles of motorcycle trails, 2 miles of ATV trails, and .25 miles of non-motorized equestrian/hiker trails.
- **Walker Valley Off-road Vehicle Area, Skagit County:** Constructed five off-road vehicle bridges.
- **Mailbox Peak Trailhead, King County:** Completed the trailhead for Mailbox Peak Trail. Trailhead included 45 parking stalls, a vault toilet, and an information kiosk. Construction of 5 miles of new hiking trail is in process.
- **Granite Creek Trail, King County:** Constructed approximately 2 miles of hiking trails.
- **Tiger Mountain State Forest, King County:** Completed 2 miles of mountain bike trail, two mountain bike bridges, and one ADA-accessible bridge.
- **Little Larch Trail, Capitol Forest, Thurston County:** Completed 1.5 miles of mountain bike trail.
- **Bradley Off-road Vehicle Trail, Wahkiakum County:** Completed two off-road vehicle trail bridges.
- **Ahtanum Trailhead, Yakima County:** Added two vault toilets, one accessible horse mounting ramp, three picnic areas, four equestrian highlines, and four hitching posts to the existing trailhead, and opened the trailhead for snowmobile day use in the winter.
- **Sherry Creek Campground, Stevens County:** Constructed and opened new off-road vehicle campground located near the Little Pend Oreille river. Campground features seven individual campsites, one host site, two day-use areas and three group campsites.

■ Planning

Our Recreation Program completed the Green Mountain and Tahuya State Forests Recreation Plan. Green Mountain and Tahuya State forests are located located in Kitsap and Mason counties, respectively.

The Recreation Program is continuing planning efforts in the Snoqualmie Corridor in eastern King County and the Naneum Ridge State Forest in Kittitas and Chelan counties. Planning is ongoing for relocation of the Tunerville campground in the Salmon Creek block in Southwest Washington. We also completed an inventory of the equestrian trails in the Harry Osborne State Forest in Skagit County.

■ Design

We designed five bridges, including one cable bridge and a bridge on the Granite Creek Trail, in Tiger Mountain State Forest in King County. Design is 60 percent complete for parking areas and mountain bike trails in the Yacolt Burn State Forest in Clark County and for the Youth Camp Bridge in the Tahuya State Forest in Mason County. We are also designing a relocated Elbe Hills 4x4 campground in the Elbe/Tahoma State Forest in Pierce County.

Natural Areas Program

Background on Natural Areas Program

In FY 2013, the Natural Areas Program acquired an additional 1,594 acres of NAPs and NRCAs, 1,542.1 acres of which fall within the area managed under the HCP. Acquisitions include four newly-established natural areas and additions to ten existing natural areas. Among the most significant acquisitions:

- 189 acres at the newly-established Lacamas Prairie NAP/NRCA. This was the first acquisition at this site and includes a portion of the only population of Bradshaw's lomatium (federally endangered) in Washington, as well as the highest-quality remaining wet prairie habitat in the state.
- 115 acres at North Bay NAP, including a large area of coastal bog and wetlands, as well as shoreline and saltmarsh habitat at the north end of Grays Harbor.
- 457 acres of low elevation Douglas-fir forest, riparian habitat, shorelines, and tidelands at Stavis NRCA, bringing the total area of this site and the adjacent Kitsap Forest NAP to more than 2,860 acres.
- 85.4 acres, 67 acres, and 78.4 acres, respectively, for the newly established Stevenson Ridge NRCA, Skamokawa Creek NRCA, and Ashford NRCA for protection of older forest habitat to help support northern spotted owls and marbled murrelets.

Table 8 lists the natural areas that are located in areas managed under the HCP. Table 9 lists the threatened and endangered species found in natural areas located in areas managed under the HCP, and Table 10 lists other species of concern in these areas. Table 11 lists the natural areas located in areas managed under the HCP that include late seral forests or a combination of mature and late seral forests.

Table 8. Natural Areas Located in Areas Managed Under the HCP

Name of natural area	NAP or NRCA	County	Acres added in FY 2013	Total current Acres
Admiralty Inlet	NAP	Island		33.0
Ashford	NRCA	Pierce	78.4	78.4
Bald Hill	NAP	Thurston		313.7
Bone River	NAP	Pacific		2,565.0
Camas Meadows	NAP	Chelan		1,987.2
Carlisle Bog	NAP	Grays Harbor		310.0

Table 8. Natural Areas Located in Areas Managed Under the HCP

Name of natural area	NAP or NRCA	County	Acres added in FY 2013	Total current Acres
Cattle Point	NRCA	San Juan		112.1
Charley Creek	NAP	King		1,966.0
Chehalis River Surge Plain	NAP	Grays Harbor		3,018.5
Clearwater Bogs	NAP	Jefferson		504.1
Clearwater Corridor	NRCA	Jefferson		2323.0
Columbia Falls	NAP	Skagit		1,193.9
Cypress Highlands	NAP	Skagit		1,072.3
Cypress Island	NRCA	Skagit		4,088.5
Dabob Bay	NAP/NRCA	Jefferson	343.3	2,272.1
Dailey Prairie	NAP	Whatcom		228.8
Devils Lake	NRCA	Jefferson		80.0
Elk River	NRCA	Grays Harbor		5,412.8
Ellsworth Creek	NRCA	Pacific		557.0
Goose Island	NAP	Grays Harbor		12.0
Granite Lakes	NRCA	Skagit		603.2
Gunpowder Island	NAP	Pacific		152.0
Hamma Hamma Balds	NAP	Mason		957.0
Hat Island	NRCA	Skagit		91.2
Hendrickson Canyon	NRCA	Wahkiakum		159.0
Ink Blot	NAP	Mason	30.3	183.6
Kennedy Creek	NAP	Mason		202.6
Kings Lake Bog	NAP	King		309.2
Kitsap Forest	NAP	Kitsap		571.9
Klickitat Canyon	NRCA	Yakima		1,515.8
Lacamas Prairie	NAP/NRCA	Clallam	189.1	189.1
Lake Louise	NRCA	Whatcom		137.7
Lummi Island	NRCA	Whatcom		671.5
Merrill Lake	NRCA	Cowlitz		114.2
Middle Fork Snoqualmie	NRCA	King		9,000.0
Mima Mounds	NAP	Thurston	5.0	640.5
Monte Cristo	NAP	Klickitat		1151.0
Morning Star	NRCA	Snohomish		33,592.0
Mt. Si	NRCA	King	4.5	12,532.7
Niawiakum River	NAP	Pacific	7.5	1,051.8
North Bay	NAP	Grays Harbor	114.5	1,214.9
Oak Patch	NAP	Mason		17.3
Olivine Bridge	NAP	Skagit		148.0
Point Doughty	NAP	San Juan		56.5
Rattlesnake Ridge	NRCA	King		1,771.4
Rocky Prairie	NAP	Thurston		35.0
Sand Island	NAP	Grays Harbor		8.0

Table 8. Natural Areas Located in Areas Managed Under the HCP

Name of natural area	NAP or NRCA	County	Acres added in FY 2013	Total current Acres
Shipwreck Point	NRCA	Clallum		471.8
Shumocher Creek	NAP	Mason		493.7
Skagit Bald Eagle	NAP	Skagit		1,546.0
Skamokawa Creek	NRCA	Wahkiacum	67.0	67.0
Skookum Inlet	NAP	Mason		142.6
Snoqualmie Bog	NAP	King		110.5
South Nemah	NRCA	Pacific		2,439.5
South Nolan	NRCA	Jefferson		213
Stavis	NRCA	Kitsap	456.6	2,288.5
Stevenson Ridge	NRCA	Skagit	85.4	85.4
Table Mountain	NRCA	Skagit		2,836.5
Tahoma	NRCA	Lewis		230.0
Teal Slough	NRCA	Pacific		8.4
Trout Lake	NAP	Klickitat	153.2	1,993.6
Washougal Oaks	NAP/NRCA	Clark		264.2
West Tiger Mtn	NRCA	King		3,907.9
Whitcomb Flats	NAP	Grays Harbor		5.0
White Salmon Oak	NRCA	Klickitat		551.2
Willapa Divide	NAP	Pacific		587.0
Woodard Bay	NRCA	Thurston	7.3	862.7
TOTAL ACRES¹			1,542.1	114,310

¹Table numbers and totals do not correlate due to rounding.

Table 9. Federal Threatened and Endangered Species Found in Natural Areas Located in Areas Managed Under the HCP

Species	Federal status	Natural area
Northern spotted owl ¹	Threatened	Camas Meadows NAP, Granite Lakes NRCA, Skagit Bald Eagle NAP, Morning Star NRCA, South Nemah NRCA, Stevenson Ridge NRCA, Table Mountain NRCA, Teal Slough NRCA, Trout Lake NAP
Marbled murrelet ²	Threatened	Ashford NRCA, Bone River NAP, Clearwater Bogs NAP, Clearwater Corridor NRCA, Elk River NRCA, , Morning Star NRCA, Niawiakum River NAP, Skamokawa Creek NRCA, South Nemah NRCA, South Nolan NRCA, Teal Slough NRCA, Willapa Divide NAP
Bull trout	Threatened	Chehalis River Surge Plain NAP, Carlisle Bog NAP, Olivine Bridge NAP, Skagit Bald Eagle NAP, Morning Star NRCA
Chinook Salmon – Puget Sound	Threatened	Kitsap Forest NAP, Mt. Si NRCA, West Tiger Mountain NRCA, Olivine Bridge NAP, Skagit Bald Eagle NAP
Chinook Salmon – Lower Columbia	Threatened	Klickitat Canyon NRCA
Steelhead – Lower Columbia	Threatened	Klickitat Canyon NRCA, Table Mountain NRCA, Washougal Oaks NAP/NRCA
Bradshaw’s lomatium	Endangered	Lacamas Prairie NAP/NRCA

Species	Federal status	Natural area
Golden paintbrush	Threatened	Rocky Prairie NAP, Admiralty Inlet NAP
Wenatchee Mts. checker-mallow	Endangered	Camas Meadows NAP

¹Only sites within the median home range of a status 1, 2, or 3 owl territory were included.

²Only occupied sites were included.

Table 10. Other Species of Concern Found in Natural Areas Located in Areas Managed Under the HCP

Special status species (Federal Species of Concern, State-listed, State Candidate or other sensitive species) found in Tables III.14 and III.17 of the HCP (note that new federal candidates within the area covered by the HCP and found on natural areas have been added, and any change in species status has also been updated).

Species	Natural area
Federal Candidates	
Coho salmon (Lower Columbia/SW Washington)	Washougal Oaks NAP/NRCA
Oregon spotted frog	Trout Lake NAP
Whitebark pine	Chopaka NAP, Loomis NRCA
Federal Species of Concern	
Beller's ground beetle	Snoqualamie Bog NAP, Kings Lake Bog NAP
California bighorn sheep	Morning Star NRCA
Cascades frog	Mt. Pilchuck NRCA
Columbia torrent salamander	Ellsworth Creek NRCA
Fringed myotis	Camas meadows NAP
Gorge daisy	Columbia Falls NAP
Harlequin duck	Morning Star NRCA
Hatch's click beetle	Kings Lake Bog NAP
Howell's daisy	Columbia Falls NAP, Table Mt. NRCA
Larch Mountain salamander	Table Mt. NRCA, Columbia Falls NAP
Makah copper	North Bay NAP, Carlisle Bog NAP
Northern goshawk	Clearwater Corridor NRCA, Morning Star NRCA
Northern red-legged frog	Carlisle Bog NAP, North Bay NAP, Table Mountain NRCA, Morning Star NRCA, Ellsworth Creek NRCA, Kings Lake Bog NAP
Olive-sided flycatcher	Numerous sites
Oregon sullivania	Columbia Falls NAP
Pale blue-eyed grass	Trout Lake NAP
Peregrine falcon	Table Mountain NRCA, Cypress Island NAP, Mt. Si NRCA, Elk River NRCA, Hat Island NRCA, Lummi Island NRCA, North Bay NAP
Slender-billed white-breasted nuthatch	Washougal Oaks NAP/NRCA
Suksdorf's desert-parsley	White Salmon Oak NRCA

Species	Natural area
Tailed frog	Table Mountain NRCA, Morning Star NRCA
Tall bugbane	Washougal Oaks NAP, Columbia Falls NAP
Valley silverspot	Mima Mounds NAP
Van Dyke's salamander	South Nemah NRCA, Ellsworth Creek NRCA
Wenatchee larkspur	Camas Meadows NAP
White-top aster	Rocky Prairie NAP, Mima Mounds NAP
Yuma myotis	Woodard Bay NRCA
State listed – no federal status	
Sandhill crane (State Endangered)	Trout Lake NAP, Klickitat Canyon NRCA
Dunn's salamander	Teal Slough NRCA, South Nemah NRCA
Pileated woodpecker	Table Mountain NRCA, Morning Star NRCA, Kitsap Forest NAP, and others
Puget blue	Rocky Prairie NAP
Purple martin	Woodard Bay NRCA, Kennedy Creek NAP
Vaux's swift	Numerous sites
State Sensitive or State Monitor Species	
Olympic mudminnow	Carlisle Bog NAP, Chehalis River Surge Plain NAP, West Tiger Mountain NRCA
Western bluebird	Rocky Prairie NAP, Mima Mounds NAP

Table 11. Natural Areas Located in Areas Managed Under the HCP That Include Late Seral Forests or a Combination of Mature and Late Seral Forests¹

Natural area	Acres
Coastal	
Clearwater Corridor NRCA	2,323
Ellsworth Creek NRCA	557
Hendrickson Canyon NAP	159
Kitsap Forest NAP	572
Skamokawa Creek NRCA	67
South Nemah NRCA	2,440
South Nolan NRCA	213
Stavis NRCA	2,289
Willapa Divide NAP	587
Western Cascades	
Ashford NRCA	78
Charley Creek NAP	1,966

Natural area	Acres
Columbia Falls NAP	1,194
Granite Lakes NRCA	603
Middle Fork Snoqualmie NRCA	9,001
Morning Star NRCA	33,592
Mt. Si NRCA	12,533
Rattlesnake Mt. Scenic Area	1,771
Skagit Bald Eagle NAP	1,546
Stevenson Ridge NRCA	85
Table Mt. NRCA	2,837
Tahoma NRCA	230
West Tiger Mt. NRCA	3,908
Eastern Cascades	
Klickitat Canyon NRCA	1,516
Monte Cristo NAP	1,151

¹Acreeges represent the size of the natural area, not the number of acres of late seral and mature forest.

Road Management Activities

Background on Road Management Activities

Unlike most activities addressed in this report, we report road management activities by calendar year instead of fiscal year. We do this because of the complexities of collecting data and reporting road-related activities during the height of the construction season. We present data that was available at time of report production for calendar year 2012.

During the 2012 legislative session, the 2012 Jobs Now Act allocated \$5.7 million to state trust lands to correct fish-passage barriers and bring roads up to current forest practices standards through road maintenance and abandonment plans (RMAPs). In addition to this work, we used some of these funds to relocate stream-adjacent roads away from streams and wetlands to improve water quality.

Through land transactions and inventory activities, DNR acquired 44 new fish-passage barriers during 2012 that needed to be addressed, which were in addition to our existing RMAP commitments. Despite these additions, we stayed on track to meet our October 2016 RMAP commitment. A total of 158 fish-passage barriers were removed from the work list in calendar year 2012. Of these, 134 were physically removed or replaced, opening up an estimated 67 miles of fish habitat on state trust lands managed under the HCP. The remaining 24 fish-passage barriers were removed from the work list for the following reasons:

- The stream designation was downgraded from fish to non-fish following protocol survey requirements.

- The fish-passage barrier was on a road that was not on state trust lands or not managed under Forest Practices rules (for instance, a road through agricultural or commercial properties, or a county road or highway).
- The fish-passage barrier would result in very limited habitat gain (usually less than 200 meters). These barriers were reprioritized for replacement at the end of the culvert's useful life with consensus from Washington Department of Fish & Wildlife (WDFW) and DNR Forest Practices Division staff.

These fish-passage barrier removals represent an investment of \$2.1 million dollars.

On state trust lands managed under the HCP, 138 miles of road were abandoned or decommissioned in calendar year 2012. DNR increased the total road miles on state trust lands from 10,086 to 10,141 due to land transaction activities in 2012. Table 12 summarizes road management activities by HCP planning unit.

Table 12. Road Management Activities Summary by HCP Planning Unit, Calendar Year 2012

Activity	Chelan	Columbia	Klickitat	Non-HCP lands	North Puget	OESF	South Coast	South Puget	Straits	Yakima	Grand total (miles)
New road constructed	0	16.38	0.32	23.47	33.47	0.35	8.22	8.24	8.65	5.5	104.6
Road reconstructed	0	5.63	0.07	9.93	146.87	1.55	0.53	2.95	3.51	0.33	171.38
Forest roads decommissioned	0	0.13	0.03	6.70	0	4.75	0.66	3.38	2.26	7.83	25.74
Forest roads abandoned	0	4.53	2.71	2.01	82.85	0	1.03	13.02	5.52	9.79	121.46
Inventoried road mileage	48.3	1350	609.04	3010.29	1499.59	1806	1555	1056.98	743.96	1472.08	13151.25
Total fish barriers removed (projects)	0	11	1	4	43	25	21	19	6	4	134

Easements

Background on Easements

■ Road Easements and Road Easement GIS

Easements are granted to DNR by private individuals, entities, or other agencies to allow us access to DNR-managed lands across private or other public lands. In other cases, we acquire easements as part of land transactions.

■ Easements, Utility Easements, and Road Use Permits

Easements, utility easements, and road use permits on state trust lands managed under the HCP are detailed in Tables 13 and 14. Table 13 reports the total number of acres of new easements and road use permits that created a new “footprint” (timber was cut to create a corridor or area). Table 14 reports the acres and mileage of utility easements granted during the reporting period. In this reporting period, no new footprint was created for utility easements.

Table 13. Easements and Road Use Permits (New Footprint)

	HCP planning unit				
	North Puget HCP Planning Unit	OESF HCP Planning Unit	Columbia HCP Planning Unit	Klickitat HCP Planning unit	TOTAL
New road constructed¹					
Miles	0.2	0.16	0.32	0.04	0.71
Acres impacted	0.87	0.51	0.72	0.09	2.18

¹Totals may not correlate with table data due to rounding.

Table 14. Utility Easements (No New Footprint)

	HCP planning unit	
	South Puget HCP Planning Unit	TOTAL
New construction		
Miles	1.94	1.94
Acres impacted	5.99	5.99

Land Transaction Activities

Background on Land Transaction Activities

Below, we summarize (by HCP planning unit) land transactions concluded during FY 2013. Table 15 at the end of this section summarizes our FY 2013 land transactions.

■ Chelan

There was no activity in this reporting period.

■ Columbia

- **Acquired:** DNR added 189 acres to the Lacamas Prairie Natural Area Preserve in Clark County.

We acquired a 19.8-acre forested inholding in Cowlitz County for the Common School trust. All parcels were designated as HCP permit land with “no role for northern spotted owl” under the HCP (HCP permit lands are lands managed subject to the commitments in the HCP).

A 326-acre parcel in Cowlitz County, acquired in the Plum Creek land exchange of 2001, was held out of the HCP at that time due to young forest stands that affected WAU thresholds for hydrologic maturity. As of this year, the timber has aged sufficiently to formally add the parcel to the HCP permit lands. It will be managed as “no role for northern spotted owl” under the HCP.

- **Disposed:** None
- **Trust Land Transfer/State Forest Transfer:** State Forest Trust land has been transferred to NRCAs in two counties: 80 acres in Skamania and 67 acres in Wahkiakum. Both properties will remain in the HCP under their current designations. Skamania lands are designated “NRF” for northern spotted owls, and the Wahkiakum lands are designated “no role for northern spotted owl.” The Wahkiakum property was transferred because it is marbled murrelet habitat.

■ Klickitat

- **Acquired:** None
- **Disposed:** None
- **Trust Land Transfer/State Forest Transfer:** For Trout Lake NAP, we acquired 153 acres of former Common School trust land. The property will retain its “NRF” designation under the HCP.

■ North Puget

- **Acquired:** DNR acquired 691 forested acres in King and Snohomish counties for the Common School trust through purchase and also acquired 240 acres for the State Forest trust through a land exchange in Snohomish County. We acquired about 5 acres for the Mt. Si NRCA. All of these properties were designated as HCP permit lands with “no role for northern spotted owl” under the HCP.
- **Disposed:** We sold one acre in Snohomish County to resolve a trespass, and traded 145 acres of State Forest Trust lands to a private party. These properties were designated as “no role for northern spotted owl” and have been removed from the HCP.
- **Trust Land Transfer/State Forest Transfer:** None

■ OESF

There was no activity in this reporting period.

■ South Coast

- **Acquired:** In three conservation transactions, DNR added 101 acres to North Bay NAP in Grays Harbor County; 7 acres to Niawiakum NAP, also in Grays Harbor County; and 5 acres to Mima Mounds NAP in Thurston County, for a total of 113 acres.
- **Disposed:** We sold one acre of Common School trust land in Lewis County to a cemetery district. All parcels were designated “no role for northern spotted owl” under the HCP.
- **Trust Land Transfer/State Forest Transfer:** None

■ South Puget

- **Acquired:** DNR acquired 87 acres in this HCP planning unit for three conservation areas: Stavis NRCA in Kitsap County (50 acres), Ink Blot NAP in Mason County (30 acres), and Woodard Bay NRCA in Thurston County (7 acres).
- **Disposed:** None
- **Trust Land Transfer/State Forest Transfer:** Two Common School trust properties were transferred to natural areas: 405 acres in Kitsap County were added to the Stavis NRCA, and 78 acres in Pierce County became the Ashford NRCA. The Stavis property will retain its “no role for northern spotted owl” designation and Ashford will retain its “dispersal” designation under the HCP.

■ Straits

- **Acquired:** All acquisitions in this planning unit were for the Dabob Bay NAP and NRCA in Jefferson County. A total of 343 acres were designated “no role for northern spotted owl” under the HCP.
- **Disposed:** None
- **Trust Land Transfer/State Forest Transfer:** None

■ Yakima

- **Acquired:** No new transactions occurred in FY 2013 in this HCP planning unit. However, the 8,507 acres DNR acquired for the Common School trust in 2005 were formally added to HCP permit lands in this reporting period. These lands are now designated “no role for northern spotted owl” under the HCP. When we acquired these lands in 2005, they were held out of the HCP because at that time, we were considering a re-evaluation of northern spotted owl habitat role designations across the entire Yakima HCP Planning Unit. Subsequently, we decided not to conduct this re-evaluation, and to proceed with adding these 8,507 acres to the HCP permit lands.
- **Disposed:** None
- **Trust Land Transfer/State Forest Transfer:** None

Table 15. FY 2013 Land Transactions¹

		HCP planning unit									
Physical characteristics		Chelan	Columbia	Klickitat	North Puget	OESF	South Coast	South Puget	Straits	Yakima	TOTALS
Acquired lands											
Stream miles by stream type	Type 1	-	.78	-	-	-	-	-	-	.01	.79
	Type 2	-	-	-	-	-	-	-	-	1.01	1.01
	Type 3	-	1.91	-	2.61	-	-	.25	-	8.26	13.03
	Type 4	-	.32	-	2.52	-	-	-	-	5.29	8.13
	Type 5	-	2.68	-	2.88	-	.04	-	4.93	26.25	36.78
	Type 9	-	.25	-	1.28	-	.16	-	-	25.48	27.17
	Total stream miles acquired	-	5.94	-	9.29	-	.2	.25	4.93	66.3	86.91
Acres in rain-on-snow zone	Total acres acquired in rain-on-snow zone	-	-	-	-	-	-	-	-	879	879
Acres per age class	Open (0-10 years)	-	19.83	-	279.90	-	14.47	28.01	-	912.82	1,255.03
	Regeneration (11-20 years)	-	273	-	297.30	-	-	-	7.01	3477.13	4,054.44
	Pole (21-40 years)	-	48.17	-	304.31	-	84.60	51.37	185.57	4240.53	4,914.55
	Closed (41-70 years)	-	-	-	34.24	-	-	6.59	109.31	306.47	456.61
	Complex (71-100 years)	-	-	-	9.9	-	-	-	29.40	-	39.30
	Complex (101-150 years)	-	-	-	-	-	-	-	-	-	-
	Functional (150+ years)	-	-	-	-	-	-	-	13	-	13
	Non-forested	-	194.08	-	9	-	13.99	.96	16	850.49	1,084.52
	Total acres acquired in all age classes	-	535.08	-	934.65	-	113.06	86.93	360.29	9787.44	11,817.45
Disposed lands											
Stream miles by stream type	Type 1	-	-	-	.56	-	-	-	-	-	.56
	Type 2	-	-	-	-	-	-	-	-	-	-
	Type 3	-	-	-	-	-	-	-	-	-	-
	Type 4	-	-	-	-	-	-	-	-	-	-
	Type 5	-	-	-	.36	-	-	-	-	-	.36
	Type 9	-	-	-	.24	-	-	-	-	-	.24
	Total stream miles disposed	-	-	-	1.16	-	-	-	-	-	1.16
Acres in rain-on-snow zone	Total acres disposed in rain-on-snow zone	-	-	-	-	-	-	-	-	-	-
Acres per age class	Open (0-10 years)	-	-	-	24.44	-	-	-	-	-	24.44
	Regeneration (11-20 years)	-	-	-	.2	-	-	-	-	-	.2
	Pole (21-40 years)	-	-	-	-	-	.25	-	-	-	.25
	Closed (41-70 years)	-	-	-	118.7	-	.5	-	-	-	119.2

		HCP planning unit									
Physical characteristics		Chelan	Columbia	Klickitat	North Puget	OESF	South Coast	South Puget	Straits	Yakima	TOTALS
	Complex (71-100 years)	-	-	-	-	-	-	-	-	-	-
	Complex (101-150 years)	-	-	-	-	-	-	-	-	-	-
	Functional (150+ years)	-	-	-	-	-	-	-	-	-	-
	Non-forested	-	-	-	2.4	-	.52	-	-	-	2.92
	Total acres disposed in all age classes	-	-	-	145.74	-	1.27	-	-	-	147.01

¹ This data is intended to provide a broad picture of transaction activities for the reporting period. Acreages of all categories are estimated and not field verified. This information is provided to the Services through the HCP annual report to provide a general understanding of what stand types and habitat conditions are being transacted. For HCP annual reporting purposes, the Land Transactions Section uses information available from the following sources to report data:

- **Stream Type:** Data is derived from the forest practices hydrology layer at the time of land acquisition to maintain consistency throughout HCP annual reports (it has been used in HCP annual reports since the first report was published in 1999). At the time of the land transaction, we evaluate stream typing using an old forest practices water typing system (which included water types 1 through 5 and 9), embedded within the DNR GIS hydrology layer. It may be decades before the streams are field verified and upgraded to the HCP water typing system (accurate typing).
- **Rain-on-snow:** Data is derived from DNR’s corporate rain-on-snow GIS layer.
- **Age class:** Data on acquired lands is obtained from deeds and other information relative to the holdings on the land. The Land Transactions Section categorizes the age class based on the best information available at the time of acquisition. In some cases, age class data on disposed lands is determined by DNR’s FRIS. In other cases, it is based on the appraiser’s determination.

Conservation Strategy Updates

Riparian Conservation Strategy

Background on Riparian Conservation Strategy

■ Riparian Forest Restoration Strategy (RFRS)

For this report, we report RFRS implementation by calendar year instead of fiscal year. Similar to road management activities, riparian restoration activities under the RFRS are completed primarily in the summer months.

Restoration thinning in riparian areas is a discretionary activity that is conducted through the RFRS in concert with the timber sales program. These thinnings provide large wood to streams, maintain overstory tree growth, and enhance understory development. Of the 73 timber sales completed in calendar year 2013, we implemented the RFRS on 13 sales (18 percent). As a percentage of timber sales, we increased RFRS implementation by 5 percent from 2012 (Table 16).

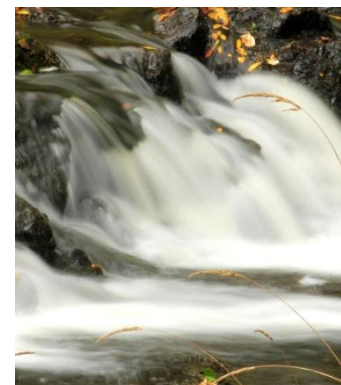


Table 16. Timber Sales Using the RFRS Completed in 2012 and 2013, by DNR Region

Region	Sales completed in 2012			Sales completed in 2013		
	Total sales	RFRS sales	% of sales with RFRS	Total sales	RFRS sales	% of sales with RFRS
Northwest	45	10	22	21	6	29
Olympic ¹	17	0	0	5	0	0
Pacific Cascade	74	8	11	37	5	14
South Puget Sound	14	2	14	10	2	20
TOTALS for Westside regions	150	20	13	73	13	18

¹Excluding the OESF, where the RFRS does not apply.

We estimate that approximately 152 acres of riparian area were treated in calendar year 2013, compared to 177 acres estimated for 2012. Similar to previous years, in 2013 the majority of the treatments (64 percent) were Type II thinnings, and only 11 percent of the treatments included removing primarily hardwoods from riparian areas. The small number of hardwood treatments is commensurate with the risk- and cost-based priorities of the RFRS.

■ Headwaters Conservation Strategy

The draft Headwaters Conservation Strategy was developed to complete the HCP riparian conservation strategy. The document represents a several-year collaborative effort between the Federal Services, the scientific community, and DNR managers. The strategy incorporates emerging ideas about the importance of non-fish-bearing stream habitat for ecosystem conservation and the linkage to downstream fish habitat quality.

In response to a letter of support from the Federal Services in November 2008, DNR conducted outreach to tribes and initiated preparations for the final State Environmental Policy Act (SEPA) process on headwater conservation. During FY 2013 there were internal discussions of resuming work, but competing priorities continue to prevent adoption and implementation.

Northern Spotted Owl Conservation Strategy

Background on the Northern Spotted Owl Conservation Strategy

As explained under [Northern Spotted Owl Data](#) in the comprehensive review in this report, DNR’s northern spotted owl conservation strategy is to maintain at least 50 percent of designated NRF and dispersal management areas as suitable habitat. In most Westside HCP planning units, both the tracking and distribution of habitat in these areas is done at the SOMU scale. Following, we describe updates to SOMU percentages by HCP planning unit.

■ Columbia

A GIS mapping error related to the Vogel Creek Timber Sale occurred in the Silverstar SOMU. This error (1 acre) resulted in a 0.04 percent decrease in habitat. A regeneration harvest (Vogel Creek Timber Sale) occurring in the Upper Washougal SOMU resulted in a 0.15 percent decrease in habitat.

■ North Puget

In the Sauk Prairie Dispersal SOMU, historical GIS boundaries related to the Camp Road Timber Sale were delineated incorrectly. These boundaries (3 acres) have been corrected, resulting in a 0.21 percent decrease in habitat.

■ South Puget

Rounding of numbers in the GIS calculations for the Green SOMU resulted in a 0.01 percent increase in habitat.

■ OESF

An increase in total acres due to the Anderson Creek acquisition resulted in a decrease in habitat of 0.34 percent in the Goodman Creek SOMU (331 acres added) and 4.27 percent in the Reade Hill SOMU (1,187 acres added).

Table 17 provides current total spotted owl habitat percentages within identified SOMUs. More information about the northern spotted owl conservation strategy and suitable habitat types for the various northern spotted owl management areas can be found in [Appendix A](#).

Table 17. Current Habitat Thresholds Per SOMU, as of August 28, 2013

SOMU	Planning unit	Management area	Percent habitat Movement, Roosting, Roosting and Foraging (MoRF)	Percent habitat Old Forest	Percent habitat TOTAL SUITABLE HABITAT
Rock Creek	Columbia	NRF	N/A	N/A	24.01
Silverstar	Columbia	Dispersal	N/A	N/A	47.13
Siouxon	Columbia	NRF	N/A	N/A	46.72
Swift Creek	Columbia	NRF	N/A	N/A	19.76
Upper Washougal	Columbia	Dispersal	N/A	N/A	57.75
Wind River	Columbia	NRF	N/A	N/A	5.23
Cougar	Columbia	NRF	N/A	N/A	41.44
Hamilton Creek Dispersal	Columbia	Dispersal	N/A	N/A	47.13
Hamilton Creek NRF	Columbia	NRF	N/A	N/A	13.52
Harmony	Columbia	Dispersal	N/A	N/A	34.85
Upper North Fork Stilly	North Puget	NRF	N/A	N/A	0.00
Wallace River	North Puget	NRF	N/A	N/A	0.00

SOMU	Planning unit	Management area	Percent habitat Movement, Roosting, Roosting and Foraging (MoRF)	Percent habitat Old Forest	Percent habitat TOTAL SUITABLE HABITAT
Canyon-Warnick	North Puget	NRF	N/A	N/A	13.78
West Shannon NRF	North Puget	NRF	N/A	N/A	0.00
West Shannon Dispersal	North Puget	Dispersal	N/A	N/A	35.11
East Shannon NRF	North Puget	NRF	N/A	N/A	0.00
East Shannon Dispersal	North Puget	Dispersal	N/A	N/A	20.47
Middle Skagit Dispersal	North Puget	Dispersal	N/A	N/A	42.84
Middle Skagit NRF	North Puget	NRF	N/A	N/A	0.00
Upper Skagit South NRF	North Puget	NRF	N/A	N/A	1.29
Upper Skagit South Dispersal	North Puget	Dispersal	N/A	N/A	58.56
Sauk Prairie Dispersal	North Puget	Dispersal	N/A	N/A	48.50
Sauk Prairie NRF	North Puget	NRF	N/A	N/A	0.42
Deer Creek	North Puget	NRF	N/A	N/A	6.10
Ebey Hill	North Puget	NRF	N/A	N/A	0.00
French Boulder	North Puget	NRF	N/A	N/A	0.17
Hazel	North Puget	NRF	N/A	N/A	1.09
Howard Creek	North Puget	NRF	N/A	N/A	3.25
Loretta	North Puget	NRF	N/A	N/A	22.24
Marmot Ridge	North Puget	NRF	N/A	N/A	1.40
North Fork Skykomish	North Puget	NRF	N/A	N/A	4.02
Pilchuck Mountain	North Puget	NRF	N/A	N/A	1.34
Rinker	North Puget	NRF	N/A	N/A	6.66
Silverton	North Puget	NRF	N/A	N/A	0.00
Spada	North Puget	NRF	N/A	N/A	0.11
Tenas	North Puget	NRF	N/A	N/A	0.00
South Snoqualmie	North Puget	NRF	N/A	N/A	3.06
Alder	North Puget	Dispersal	N/A	N/A	55.07
South Fork Skykomish	North Puget	NRF	N/A	N/A	0.00
Cavanaugh	North Puget	NRF	N/A	N/A	0.00
Clearwater	North Puget	NRF	N/A	N/A	4.32
Upper Skagit North	North Puget	NRF	N/A	N/A	0.00
North Snoqualmie	North Puget	NRF	N/A	N/A	2.73
Reade Hill	OESF	OESF	N/A	14.47	31.85
Sekiu	OESF	OESF	N/A	0.00	3.64
Upper Clearwater	OESF	OESF	N/A	25.85	29.50
Upper Sol Duc	OESF	OESF	N/A	1.03	12.88
Willy Huel	OESF	OESF	N/A	18.71	25.01
Copper Mine	OESF	OESF	N/A	14.58	18.72

SOMU	Planning unit	Management area	Percent habitat Movement, Roosting, Roosting and Foraging (MoRF)	Percent habitat Old Forest	Percent habitat TOTAL SUITABLE HABITAT
Dickodochtedar	OESF	OESF	N/A	8.26	23.34
Goodman Creek	OESF	OESF	N/A	16.81	25.59
Queets	OESF	OESF	N/A	21.96	26.42
Kalaloch	OESF	OESF	N/A	12.38	22.15
Clallam River	OESF	OESF	N/A	0.00	13.05
Black Diamond	South Puget	Dispersal	7.50	N/A	25.54
Green	South Puget	NRF	N/A	N/A	23.65
Pleasant Valley Dispersal	South Puget	Dispersal	1.35	N/A	22.13
Pleasant Valley NRF	South Puget	NRF	N/A	N/A	0.92
Tahoma	South Puget	Dispersal	1.66	N/A	16.97
Elbe Hills	South Puget	Dispersal	1.81	N/A	37.01

Marbled Murrelet Conservation Strategy

Background on the Marbled Murrelet Conservation Strategy

DNR continues to work jointly with USFWS to develop a long-term Marbled Murrelet Conservation Strategy for the six western Washington HCP planning units. The strategy is being designed to conserve marbled murrelet habitat on state trust lands in western Washington, while allowing for timber harvest and other activities that earn revenue for the trust beneficiaries.

Because DNR recognizes the importance of public input in the development of alternatives, we used an expanded scoping approach to provide additional opportunities for public input prior to issuing a draft environmental impact statement (DEIS). On May 13, 2013, we issued a scoping notice that announced opportunities for the public to comment on the draft conceptual alternatives for Phase 2 of scoping. Phase 2 represents the final phase of scoping. The objective of this phase was to evaluate the conceptual alternatives proposed in the scoping notice, and to identify any further information needed to complete the strategy, including additional conceptual alternatives, environmental issues of concern, and other considerations related to developing alternatives. We provided a 30-day comment period and held four public meetings (one each in Olympia, Sedro-Woolley, South Bend and Forks, Washington) with USFWS to facilitate public feedback. Commenters submitted a total of 1,976 letters, of which approximately 1,900 were form letters. Stakeholders providing comments included a municipality, a tribe, the timber industry, environmental organizations, individual citizens, and trust beneficiaries.



Marbled Murrelet

Photo courtesy Richard McIntosh

The next step for the strategy is to complete a comment summary document that includes comments submitted during both phases of scoping. This document will be included in the DEIS. More information on the long-term Marbled Murrelet Conservation Strategy can be found on [DNR's marbled murrelet conservation strategy webpage](#).

■ Marbled Murrelet Interim Conservation Strategy

As development of the long-term Marbled Murrelet Conservation Strategy progresses, we continue to implement the HCP Marbled Murrelet Interim Conservation Strategy throughout western Washington, with some modifications (with USFWS concurrence) in selected planning units to address local conditions. Some surveyed, unoccupied murrelet habitat has been released from deferral status, as directed in Step 4 of the State Trust Lands HCP. This released habitat includes areas within the HCP's Straits Planning Unit ([state trust lands HCP planning units map](#)), as well as that portion of the South Coast Planning Unit that is outside of Southwest Washington.

In May 2012, DNR and USFWS signed Minor Administrative Amendment No. 2 to the HCP, which revised the Marbled Murrelet Interim Conservation strategy in the Columbia and South Coast HCP planning units. This amendment was litigated, and in July 2013, it was vacated by Judge Heller of King County Superior Court. As a result, within the Columbia and South Coast HCP planning units, DNR has returned to implementing the Marbled Murrelet Interim Conservation Strategy as documented in the 1997 HCP.

Table 18 illustrates the amount of released habitat and how many acres of these forested state trust lands have been harvested to date.

Table 18. Acres of Released Marbled Murrelet Habitat by WAU

WAU name	Reclassified acres	Maximum acreage available for harvest	Harvested acres as of 6/30/2013 ¹
Straits HCP Planning Unit			
Bell Creek	220	–	–
Big Quil	113	56	1
Chimakum	13	6	–
Cushman	120	–	–
Dabob	22	10	–
Discovery Bay	1,137	568	255
Dungeness Valley	1,415	190	39
Hamma Hamma	186	92	29
Lake Crescent	156	–	–
Lilliwaup	570	285	38
Little Quil	95	47	–
Ludlow	94	47	45
Lyre	640	19	–
Morse Creek	315	4	3
Port Angeles	159	155	92

WAU name	Reclassified acres	Maximum acreage available for harvest	Harvested acres as of 6/30/2013 ¹
Salt	2,414	703	134
Sequim Bay	1,969	448	188
Siebert McDonald	1,853	474	136
Skokomish, Lower	15	–	–
Skokomish, Lower NF	73	36	10
Sutherland-Aldwell	1,933	475	158
Twins	770	225	59
South Coast HCP Planning Unit, North of Highways 8 and 12			
Cook-Elk	227	–	–
Copalis River	258	31	1
Hoquiam, EF	8	3	1
Hoquiam, WF-MF	57	–	–
Humtulpis, Middle	111	55	66 ²
Humtulpis, WF	261	30	2
Joe-Moclips	653	326	27 ³
Stevens Creek	118	59	55
Wishkah, Lower	1	–	–
South Coast HCP Planning Unit, East of I-5			
Hanaford	10	5	–
Newaukum, Lower NF	5	2	–
Scatter creek	218	108	–

¹ Data originated in P&T. Date of query: October 15, 2013; subsequent new data or corrections are not reflected here. The P&T data has been overlaid with the Marbled Murrelet (MM) Habitat Layer (SHARED_LM.MM_POLICY queried October 15, 2013) to identify timber sale activities (sold and completed) in released habitat. Values have been rounded to the nearest acre.

² DNR and USFWS agreed to set aside the same amount of habitat within the adjoining WAU that could have been harvested to mitigate for the over harvest within the Middle Humtulpis WAU.

³ In 2012, we erroneously reported that 53 cumulative acres had been harvested in the Joe-Moclips WAU. This error has been corrected.

Monitoring, Research, and Adaptive Management

Background on Monitoring and Research

Monitoring and Research

■ Implementation Monitoring

During FY 2013, we continued field-based reviews to monitor the implementation of HCP conservation strategies through our Implementation Monitoring Program. In addition, we began developing a program overview document that describes program objectives and the criteria used to determine implementation monitoring priorities.

Field monitoring efforts focused on management activities within wetland management zones and hardwood-dominated riparian management zones, guided by the wetland component of the riparian conservation strategy and the RFRS, respectively.

For wetlands, program staff monitored all harvest and road construction activities in wetlands and/or wetland management zones in timber sales completed in FY 2012 (16 units in 14 timber sales). This effort included assessment of the following:

- Wetland size, wetland management zone width, and basal area within managed wetland management zones;
- “On-site and in-kind equal acreage mitigation” of wetlands associated with road construction;
- Rutting in excess of that allowed in the contract;
- Machine entry within 50 feet of the wetland edge; and
- Implementation of two Forest Resources Division concurrence letters that allowed salvage operations to occur within wetland management zones.

For hardwood-dominated riparian management zones managed under the RFRS, our program staff monitored all 15 timber sales on which hardwood conversion and/or individual conifer release treatments have been implemented since the inception of the RFRS in 2006. For these reviews, program staff assessed:

- Unit size;
- Distance between harvest units (where applicable);
- Retention of big-leaf maple (hardwood conversion only);
- Retention of conifers where operationally feasible;
- Status of conifer regeneration (where applicable);
- Integrity of the 25-foot core stream buffer and 50-foot equipment limitation zone; and
- Site selection and documentation of site review by natural resource specialists.

The results of calendar year 2013 field work is presented in the 2014 Implementation Monitoring Report, which was recently published.

■ Northern Spotted Owl Effectiveness Monitoring

Through our Effectiveness Monitoring Program, we are evaluating whether timber harvest, most commonly in the form of variable density thinning, can maintain and/or enhance the structural features that define northern spotted owl NRF habitat as well as dispersal habitat. Thus far, five study areas have been installed: one in Northwest region (Whitehorse Flat timber sale), two in South Puget Sound region (Big Beaver and Cougarilla sales), one in Pacific Cascade region (Lyons Share sale), and one in Southeast region (Loop sale). Each study area consists of two to three treated (thinned) stands and one untreated control stand, and each area employs a before-after-control-intervention design. Briefly, this design involves the following: (1) measure all stands (including the control stand) prior to treatment to verify the degree of similarity, (2) re-measure all stands immediately after treatment, and (3) re-measure at periodic intervals of about five years to see how trajectories of stand development differ between thinned and unthinned stands. Consistent with the monitoring objectives in the HCP (p. V.2), our intent is to track habitat conditions in these treatments over the life of the HCP. The five current study sites were installed during the years 2005 through 2008 and measured immediately after treatment.

We are in the process of conducting the next scheduled re-measurement, which occurs five to seven years after treatment (some stands are being re-measured later than the scheduled five years due to funding challenges and personnel reductions associated with the economic downturn). Re-measurement data will be analyzed on a continuing basis over the next year as the sites are re-measured, and evaluated against the [habitat definitions](#) described in the HCP (p. IV.22). We also plan to augment information from these study areas with new research and monitoring installations on the Olympic Peninsula. These installations will be used to test how both variable density thinning and innovative forms of variable retention harvest may influence the structural components of northern spotted owl habitat, and how natural forests that result from wind-driven disturbance develop over time and contribute to habitat provision (many stands that regenerate after wind-driven disturbance are dominated by western hemlock and are hypothesized to develop along different structural pathways than mature stands dominated by shade-intolerant species).

Additionally, we are in the process of incorporating the effectiveness monitoring sites into a larger study on the spatial pattern of mature to older forests, in an effort to inform how variable density thinning in second-growth forests may best provide the habitat qualities of structurally mature forests. The latter study is being conducted in collaboration with forest scientists at the University of Washington.

■ Riparian Silviculture Effectiveness Monitoring

The objective of riparian silviculture effectiveness monitoring is to document a site's response to silvicultural treatments that are designed to meet the management objectives specified in the RFRS. Effectiveness monitoring increases management confidence, clarifies options, and supports continual improvement of HCP procedures related to the RFRS. We resumed field measurement of the existing monitoring sites in calendar year 2013 (refer to Table 19) after a several year budget-related hiatus.

Table 19. RFRS Effectiveness Monitoring Sites Re-measured in Calendar Year 2013

Treatments consist of thinning to Curtis relative density (RD) 40 or 50, thinning to RD 50 with intentional canopy gaps, and un-thinned reference (REF).

Site name	Region	Year established	Treatments
North Mountain	Northwest	2008	RD40, RD50, REF
H1320	Olympic	2005	RD40, RD50, REF
Salmon PC	Olympic	2005	RD40, RD50, REF
Cougarilla	South Puget Sound	2006	RD40, RD50, RD50 gap, REF
Pink Flamingo	Northwest	2008	RD40, RD50, REF
Big Beaver	South Puget Sound	2008	RD40, RD50, RD50 gap, REF

To evaluate differences between treatments, we assess a suite of variables in each treatment area before harvest, after harvest, and periodically thereafter. The variables of interest are: (1) overstory structure and composition, (2) understory structure and composition, (3) canopy structure, and (4) down wood. In FY 2013, we completed overstory stand structure and composition re-measurements, which involved measuring the diameter at breast height (dbh) on all overstory trees. Newly established trees less than 10 centimeters dbh are measured and tagged during periodic re-measurements. Repeated measurements on individual trees are tracked through time and compared with the management expectations of the treatments.

■ OESF Research and Monitoring Program

Background on OESF Research and Monitoring

The OESF was designated as a place to learn, for example through experimentation, how to integrate ecological values and revenue production across the forested landscape more effectively. DNR implements integrated management in the OESF through landscape level planning, innovative silviculture, research and monitoring, adaptive management, effective information management, and effective communication. The OESF Research and Monitoring Program coordinates and/or implements individual research and monitoring projects, adaptive management process, information management, research collaboration, and outreach.



Riparian Status and Trends Monitoring in the OESF

The goal of this project is to characterize the status and trends of riparian and aquatic habitat across the OESF. In 2011, we developed a study plan that calls for long-term (at least 10 years) monitoring of 50 Type-3 stream basins representative of riparian conditions across the OESF (refer to map [here](#)). The plan calls for sampling seven aquatic habitat indicators such as stream temperature, shade, and discharge; and two riparian habitat indicators, such as microclimate and riparian vegetation, at the outlet

of each basin. In July 2012, DNR provided \$145,000 to implement the study plan during FY 2013. The same amount of funding was approved for FY 2014 and FY 2015.

We began implementing the project in August 2012 with GIS and field reconnaissance of the selected basins. By the end of FY 2013, all basins were permanently marked, and water and air temperature data loggers were installed in each sample reach. We also installed stream-gauge stations in 14 basins, and microclimate transects with data loggers to continuously record air temperature and humidity in 10 basins. DNR field crews conducted assessments of stream morphology, large woody debris, habitat units, and shade in 10 of the 50 sample basins. The USFS Pacific Northwest Research Station (PNWRS), a key collaborator on this project, provided scientific expertise, field support, and additional funding.

In the short term, monitoring will provide needed empirical data on current in-stream and riparian conditions. The long-term objectives are to document directional change (trend) in the value (or distribution) of individual monitoring indicators or watershed condition scores across the OESF, test the assumptions around the recovery of riparian and aquatic conditions and evaluate the projections of riparian habitat over time as presented in the revised draft environmental impact statement (RDEIS) for the OESF forest land plan, supply information useful for HCP effectiveness and validation monitoring, and supply information for inferences about management effects on habitat as a basis for adaptive management.

Coordination With the OESF Forest Land Planning Project

DNR is developing a forest land plan for the OESF. In October 2013, we completed the RDEIS and draft forest land plan; the next steps are to complete the final EIS (FEIS) and then develop a final forest land plan. The OESF Research and Monitoring Program has contributed to this planning process by:

- Developing an adaptive management chapter for the draft forest land plan. This chapter describes the integration of research and monitoring activities with planned management activities and prioritizes the ecological uncertainties identified during the planning process, thus creating a fresh focus for OESF research and monitoring.
- Developing an adaptive management procedure. The procedure describes the steps in the OESF adaptive management process and the roles and responsibilities of DNR staff in this process.

An adaptive management working group, consisting of DNR staff from Olympic Region and the Forest Resources Division, was created in March 2012 to develop elements of the adaptive management process such as information management, budget, and outreach and communication. This working group is expected to provide its recommendations to DNR management in early 2014. The OESF adaptive management process is expected to start with the implementation of the final OESF forest land plan.

Collaboration With External Partners

The OESF is part of the USFS's Experimental Forest and Range Network, which promotes data-sharing and collaborative research and includes 70 experimental forests and ranges across the United States. Our participation in this network, through the OESF, is executed through a memorandum of understanding

(MOU) between DNR and the PNWRS. The annual meeting of the OESF review board was conducted in April 2013 to coordinate DNR and PNWRS activities relevant to the OESF. The active participation of PNWRS in the riparian status and trends monitoring in the OESF is largely due to this coordination.

DNR is in the process of renewing an MOU with Olympic National Forest, PNWRS, and the University of Washington's Olympic Natural Resource Center. The memorandum is intended to facilitate the collaboration and coordination of research activities conducted by the four parties.

Adaptive Management

Background on Adaptive Management

■ Adaptive Management Steering Committee

The Adaptive Management Steering Committee uses the best available information from scientific literature and research and monitoring to consider management changes that would increase the efficiency and effectiveness of current procedures and practices. The committee consists of the Forest Resources Division Manager and Assistant Managers, with support from Division scientists to aid in the interpretation of information. The Committee reviews priorities for potential research projects conducted by DNR on state trust lands, and evaluates new information to support potential changes in management practices.

The committee is currently reviewing the costs and benefits associated with allowing different, acceptable levels of bole damage within habitat when stands are thinned to improve future northern spotted owl habitat. This effort may result in new guidelines to help balance the long-term timber values with the habitat structures and other ecological costs and benefits. A monitoring project was established to collect data on the influence of bole damage within one stand designated as northern spotted owl habitat.

Other Programs

Forest Certifications

Background on Forest Certification

Forest certification is not a requirement of the HCP, but is complementary to its intent. Forest certification provides value through annual audits conducted by independent, third-party auditors. These audits help us meet HCP obligations and the commitments outlined within forest certification standards.

We include forest certification updates in the HCP annual reports to provide the auditor's annual findings.

■ Sustainable Forestry Initiative® Program (SFI®)

Fiscal Year 2013 SFI® Surveillance Audit

The FY 2013 SFI® program renewal audit was conducted by an independent, third-party auditing firm (Bureau Veritas) and was held in DNR's South Puget and Pacific Cascade regions in May 2013. The audit focused on the following:

- Forest management planning;
- Forest productivity;
- Protection and maintenance of water resources;
- Biological diversity;
- Visual quality and recreational benefits;
- Efficient use of forest resources;
- Legal and regulatory compliance;
- Forestry research; science and technology;
- Training and education;
- Community involvement;
- Communications and public reporting; and
- Management review and continual improvement.

A review of previous audits was conducted to verify the effectiveness of those audit findings and to evaluate DNR's past performance. There were no trends in the SFI® implementation of the field audit or document review that would indicate that any particular area needs special attention.



Per the 2013 audit results, DNR received one minor “non-conformance” (a minor non-conformance indicates an SFI® program weakness or a lack of objective evidence of effective implementation) related to forest inventory and decadal recalculation of the sustainable harvest level for Eastern Washington. DNR had zero “opportunities for improvement” (opportunities for improvement are weaknesses in the program that may lead to a non-conformance in the future if activities are not monitored for effectiveness), and zero “notable practices” (notable practices are practices and actions that are exemplary and indicate a strong commitment to the SFI® intent and to continual program improvement). An after-action review of the minor non-conformance determined the root cause and recommend corrective actions. DNR has until the FY 2014 SFI® surveillance audit to implement the auditor-approved corrective action plan and illustrate conformance.

Bureau Veritas summarized that DNR has a good, reliable internal audit program and monitoring system carried out at our central office that determines conformance at all regions, and that implements corrective actions when appropriate. They also found good coordination and communication between the central office and each region.

Bureau Veritas’s opinion was that DNR continues to meet SFI® program requirements and has effectively implemented the SFI® 2010-2014 program Standard. Bureau Veritas recommends continuance of SFI® certification on forested state trust lands.

Refer to the [SFI-Forest Certification Summary Report-2013](#) for more information related to the FY 2013 SFI® forest certification audit on forested state trust lands.

■ Forest Stewardship Council™ (FSC®)

Fiscal Year 2013 FSC® Recertification Audit

The FY 2013 recertification audit was conducted by an independent, third-party auditing firm and was held in the South Puget HCP Planning Unit to determine renewal of DNR’s FSC® forest management certificate. The audit focused on the following:

- Compliance with laws;
- Tenure and use rights and responsibilities;
- Indigenous peoples’ rights;
- Community relations and worker’s rights;
- Benefits from the forests (economic viability, marketing, minimization of waste, diversification and sustainable harvest);
- Environmental impacts;
- Management planning;
- Monitoring;
- Maintenance of high conservation value forests;
- Chain-of-custody;

- Use of trademarks; and
- Consultation with stakeholders.

All stakeholders contacted during consultations expressed satisfaction with DNR.

Sites were chosen based on a wide range of activities related to priorities outlined within the audit plan.

Site visits included observation of:

- Harvest areas;
- Site preparation;
- Planting;
- Vegetation management;
- Research areas;
- Recreational areas;
- New road construction;
- Road abandonments;
- Fish passage structures;
- Road maintenance projects;
- Wetland management zone protection;
- Riparian management zone buffers;
- Northern spotted owl management areas;
- Ecological site protection;
- Visual aesthetics;
- Cultural resources; and
- Natural areas.

A total of 32 sites were visited during the two days in the field.

A review was conducted of previous audits. The FSC® audit team closed a minor “corrective action request” that had been issued during the FY 2012 audit, related to HCP requirements for monitoring (the 2009 HCP Implementation Monitoring Report had not been completed at the time of the 2012 audit, but is now complete). Minor corrective action requests are issued when there is a finding of non-conformance at the indicator level. Two minor corrective action requests were issued during the FY 2013 recertification audit. The first was related to written monitoring protocol: the third-party auditing team requested that DNR include a written protocol in the next HCP Implementation Monitoring Report. The second was related to timber harvest operations compliance; the third-party auditing team requested that DNR verify, by physical inspection, that required spill kits are on-site prior to

commencement of operations. Both minor corrective action requests issued during the FY 2013 FSC® forest certification surveillance audit have been verified and closed.

The third-party auditors summarized that DNR's forest and land management system:

- Is among the best documented forest management systems on the continent;
- Ensures that all of the requirements of the FSC®-United States Forest Management Standard are met throughout the South Puget HCP Planning Unit;
- Has a very experienced complement of staff;
- Has maintained the necessary professional staff to effectively manage the forest;
- Operates an effective public planning system in an area of high public visibility; and
- Has a complete suite of monitoring systems in place.

The audit team's opinion was that DNR meets the requirements of the FSC®-United States Forest Management Standard. The FSC® third-party auditing firm recommended that FSC-certification within DNR's South Puget HCP Planning Unit be renewed for an additional five years.

Please refer to the [FSC-Forest Management Certification Public Summary Report](#) for more information related to FSC forest certification audits on forest state trust lands.

Training

Comprehensive training on state trust lands forest management was provided in each region for all new foresters during the spring of 2013. The classroom-based training began with a module called "State Lands 101" which provided context on the policies that shape management of forested state trust lands. This module was followed by pre-sales training, which covered all aspects of timber sale layout and contract administration, including how to implement HCP conservation strategies. The training was designed and taught by representatives of the regions and three relevant programs (Product Sales, Forest Roads, and HCP and Scientific Consultation), and was tailored to the specific circumstances and needs of each region. This type of training is expected to be offered to new foresters each biennium.

In addition, wetland identification, delineation, and management training was offered in each Westside region during the spring of 2013. Also, an old-growth designee training was held in Northwest Region to train qualified designees to assess stands for old-growth characteristics and document their findings in support of DNR's policy on Westside old-growth stands and structurally unique trees. Both trainings offered classroom and field components to allow participants to practice their skills.

HCP Implementation Documentation

HCP implementation documentation represents the cooperative problem-solving that is sometimes necessary in the course of HCP implementation. It includes the following:

- **Implementation consultations:** Agreements between DNR's Forest Resources Assistant Division Manager - HCP & Scientific Consultation Section, and regions or programs related to operational challenges where assistance and approval for a mitigation plan has been requested;
- **Joint concurrences:** Agreements between DNR and the Federal Services (United States Fish and Wildlife Service [USFWS] and NOAA Fisheries) related to strategy modifications and/or updates;
- **Non-compliances:** Non-approved deviations and/or violations of HCP conservation strategies and/or objectives; and
- **Other:** Informational documented issues/activities associated with HCP strategies, objectives or implementation.

Click [here](#) for documentation of consultations and other discussions for FY 2013.

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Appendix A

Background

This appendix contains background information about DNR management of forested state trust lands under the *State Trust Lands Habitat Conservation Plan*.



Olympic Experimental State Forest

For more information about the Olympic Experimental State Forest, please visit our website:

http://www.dnr.wa.gov/ResearchScience/Topics/TrustLandsHCP/Pages/lm_hcp_oesf_main.aspx

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State Trust Lands Habitat Conservation Plan

The *State Trust Lands Habitat Conservation Plan* (HCP) is a long-term land management plan that is authorized under the Endangered Species Act (ESA) and prepared in partnership with the Federal Services (United States Fish and Wildlife Service and NOAA Fisheries). The HCP describes, in a suite of habitat conservation strategies, how Washington State Department of Natural Resources (DNR) will restore and enhance habitat for threatened and endangered species such as the northern spotted owl, marbled murrelet, and salmon in conjunction with timber harvest and other forest management activities. These strategies range from passive (for example, protect unique habitats such as cliffs and springs) to active (thin forests to speed development of habitat). Each strategy is written in the context of an integrated approach to management, in which commercial forest stands are managed to provide both revenue and ecological values such as biodiversity. Through these strategies, DNR offsets the potential harm of forest management activities on individual members of a species by providing for conservation of the species as a whole.

An HCP is required to obtain an incidental take permit, which allows incidental take of a threatened or endangered species. Incidental take means harming or killing individuals of a listed species “if such take is incidental to, and not the purpose of, carrying out of an otherwise lawful activity” such as a timber harvest (16 U.S.C. 1538(a)(2)(B)).

By meeting the terms of the HCP and incidental take permit, DNR fulfills its obligations under the ESA. In this way, the HCP and incidental take permit provide DNR the stability, certainty, and flexibility it needs to meet its responsibility as a trust lands manager, which is to provide a perpetual source of revenue to trust beneficiaries while simultaneously developing a complex, healthy, resilient forest ecosystem capable of supporting native species. The HCP was signed in January 1997.

Lands Covered by the HCP

DNR manages 2.1 million acres of forested state trust lands statewide. Of this amount, the HCP guides management of approximately 1.8 million acres that lie within the range of the northern spotted owl (*Strix occidentalis caurina*). In general, these 1.8 million acres are located on the western and eastern slopes of the Cascade Range in Washington, from the Canadian border to the Columbia River. To manage these areas more effectively and efficiently, we divided this area into nine planning units based primarily on large watersheds (refer to Map A-1).

Implementation of DNR’s HCP conservation objectives for the nine HCP planning units is grouped into (1) the five Westside planning units (HCP, p. IV.3), (2) the three Eastside planning units (HCP, p.IV.19)



The Changing Landscape

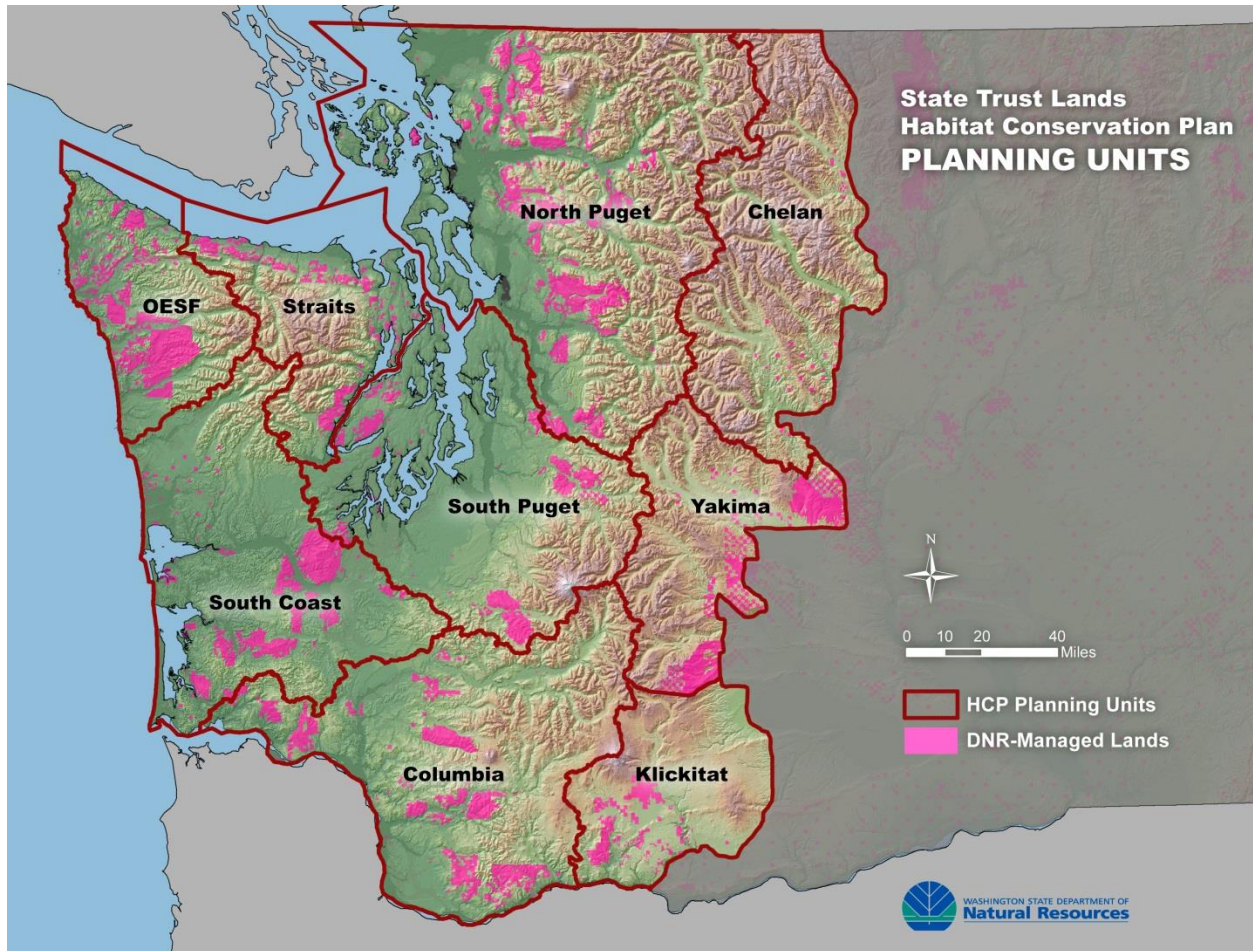
DNR uses harvest methods that promote development of structurally diverse forests. These harvest methods, in combination with the HCP’s northern spotted owl, riparian, and other habitat conservation strategies, promote biodiversity and fundamentally change the landscape from past forest practices.

and (3) the OESF (HCP, p. IV.86). The five Westside planning units are the Straits, North Puget, South Puget, South Coast, and Columbia, and the three Eastside planning units are the Yakima, Chelan, and Klickitat.

[**Back to Annual Report – Introduction**](#)

[**Back to Annual Report – Marbled Murrelets**](#)

Map A-1. HCP Planning Units



[**Back to Annual Report – Forest Land Management Activities**](#)

Conservation Objectives for ESA-Listed and Other Species

The HCP is built around four primary habitat conservation strategies: the northern spotted owl, marbled murrelet, riparian, and multispecies conservation strategies. These strategies are individually described in the HCP, but each is linked to and benefits from the other strategies.

Northern Spotted Owl Conservation Strategy

■ Northern Spotted Owl Management Areas

DNR is committed to providing habitat to help maintain nesting and foraging areas for northern spotted owls, and to facilitate the owl's movement through the landscape. When the HCP was developed, we identified those DNR-managed lands that were most important to northern spotted owl conservation. These areas were designated as northern spotted owl management areas. The HCP identified three types:

- **Nesting, roosting, and foraging (NRF) management areas:** Areas likely to provide demographic support and contribute to maintaining species distribution. Demographic support is the contribution of individual, territorial northern spotted owls or clusters of northern spotted owl sites to the stability and viability of the entire population. Maintenance of species distribution supports the continued presence of a northern spotted owl population in as much of its historic range as possible (HCP, p. IV.1).
- **Dispersal management areas:** Areas important for facilitating northern spotted owl dispersal (movement of young owls from nesting sites to new breeding sites).
- **OESF management area:** DNR-managed lands in the OESF; refer to “Northern Spotted Owl Conservation in the OESF HCP Planning Unit” later in this section for more information.

In 2006, we designated another type of northern spotted owl management area called an “**owl area.**” Owl areas are lands outlined in section I.C.1 of the Settlement Agreement (*Washington Environmental Council, et al v. Sutherland, et al (King County Superior court No. 04-2-26461-8SEA, vacated April 7, 2006)*). These areas were a) designated in HCP Implementation Memorandum No. 1 (January 12, 1998), (b) located within Washington Department of Fish and Wildlife (WDFW) Status 1-R (reproductive) owl circles, and (c) located within the four areas identified in DNR's Standard Practice Memorandum 03-07 (*Management of Northern Spotted owl Circles and the Identification of Northern Spotted Owl Habitat in Southwest Washington*). Owl areas are intended to sunset when the commitments of the Settlement Agreement are met, but no earlier than June 30, 2014.

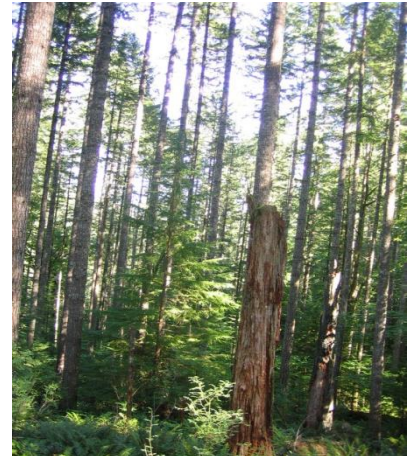
■ Northern Spotted Owl Habitat Classes and Types

Each northern spotted owl management area is managed for certain habitat classes, and each habitat class includes specific habitat types. For example:

- Within NRF management areas, we manage for NRF habitat. Suitable NRF habitat is primarily high-quality roosting and foraging habitat with enough interspersed nesting structure to allow the whole area to be utilized by reproducing owls.

NRF habitat is composed of two habitat classes: high quality habitat, and sub-mature habitat. High quality habitat includes high quality nesting, Type A, and Type B habitat types. Sub-mature habitat includes the sub-mature habitat type.

- Within the OESF, we have two habitat classes: Old Forest, and structural habitat. Old Forest includes Old Forest, high quality nesting, Type A, and Type B habitat types. Structural habitat includes both sub-mature and young forest marginal habitat types.



NRF Habitat

As stands mature into suitable NRF habitat, they develop snags and multiple canopy layers.

Through HCP research and monitoring commitments, DNR is working to develop a better understanding of what constitutes functional northern spotted owl habitat and to learn which silvicultural techniques create suitable owl habitat.

Table A-1 provides habitat classifications and types for each Westside northern spotted owl management area, and Table A-2 includes the definitions of each habitat type, as well as the data queries we use to identify it.

Table A-1. Habitat Classifications and Types for each Westside Northern Spotted Owl Management Area

Northern spotted owl management area		Habitat class		Habitat type
NRF		NRF habitat	High quality habitat	High quality nesting
				Type A
			Type B	
			Sub-mature habitat	Sub-mature
Dispersal	All other Westside planning units	Dispersal habitat	High quality habitat	High quality nesting
				Type A
				Type B
			Sub-mature habitat	Sub-mature
		Dispersal habitat	Young forest marginal	
			Dispersal	

Northern spotted owl management area		Habitat class		Habitat type
Dispersal	South Puget HCP Planning Unit only	Dispersal habitat	Movement, roosting, and foraging (MoRF) plus habitat	High quality nesting
				Type A
				Type B
				MoRF
		Movement plus habitat	Sub-mature	
			Young forest marginal	
Movement				
OESF		Old Forest		Old Forest
				High quality nesting
				Type A
				Type B
		Structural habitat	Sub-mature	
			Young forest marginal	
Owl area		High quality habitat		High quality nesting
				Type A
				Type B
		Low quality habitat	Sub-mature	
			Young forest marginal	

Table A-2. Northern Spotted Owl Habitat Types, Definitions, and Data Queries

Habitat type	Habitat definitions (HCP p. IV.11 through 12 and WAC 222-16-085)	Data query used to interpret habitat definitions
High quality nesting	At least 31 trees per acre are greater than or equal to 21 inches diameter at breast height (dbh) with at least 15 trees, of those 31 trees, per acre greater than or equal to 31 inches dbh.	(Live trees \geq 21" diameter class) \geq 31 trees/acre and (Live trees \geq 31" diameter class) \geq 15 trees/acre and
	At least 12 snags per acre larger than 21 inches dbh	(Snags \geq 21" diameter class and \geq 16 ft. tall) \geq 12 trees/acre and
	A minimum of 70 percent canopy closure	(Relative density of live trees \geq 4" diameter class) \geq 48 and
	A minimum of 5 percent ground cover of large woody debris	(Down wood \geq 4" diameter class) \geq 2,400 cu. ft./acre
	At least three of the 31 trees that are greater than or equal to 21 inches dbh have broken tops	Not in query
Type A	A multi-layered, multispecies canopy dominated by large (30 inches or greater dbh) overstory trees (typically 15-75 trees per acre)	(FVS-derived number of canopy layers) \geq 2 and (Primary species \geq 4 diameter class) $>$ 10% and (Primary species \geq 4dbh) \leq 80% (multispec = yes) and (Live trees \geq 30" diameter class) \geq 15 trees/acre and \leq 75 trees/acre and

Habitat type	Habitat definitions (HCP p. IV.11 through 12 and WAC 222-16-085)	Data query used to interpret habitat definitions
	Greater than 70 percent canopy closure	(Relative density of live trees \geq 4" diameter class) \geq 48 and
	More than two large snags per acre, 30 inches dbh or larger	(Snags \geq 30" diameter class and \geq 16 ft. tall) \geq 2.5 trees/acre and
	Large accumulations of fallen trees and other woody debris on the ground	(Down wood \geq 4" diameter class) \geq 2,400 cu. ft. /acre
	A high incidence of large trees with various deformities such as large cavities, broken tops, and dwarf mistletoe infection	Not in query
Type B	Few canopy layers, multispecies canopy dominated by large (greater than 20 inches dbh) overstory trees (typically 75-100 trees per acre, but can be fewer if larger trees are present)	(FVS-derived number of canopy layers) \geq 2 and
		Primary species $>$ 10% and primary species \leq 80% (multispec = yes) and
		(Live trees \geq 20" diameter class) \geq 75 trees/acre and \leq 100 trees/acre and
	Greater than 70 percent canopy closure	(Relative density of live trees \geq 4" diameter class) \geq 48 and
	Large (greater than 20 inches dbh) snags present	(Snags \geq 20" diameter class and \geq 16 ft. tall) \geq 1 tree/acre and
	Accumulations of fallen trees and other woody debris on the ground	(Down wood \geq 4" diameter class) \geq 2,400 Cu. Ft./acre
Some large trees with various deformities	Not in query	
MoRF	Forest community dominated by conifers, or in mixed conifer/hardwood forest, community composed of at least 30 percent conifers (measured as stems per acre dominant, co-dominant, and intermediate trees)	(Live conifers \geq 4" diameter class) \geq 30% of all live tree/acres and
	At least 70 percent canopy closure	(Relative density of live trees \geq 4" diameter class) \geq 48 and
	Tree density between 115 and 280 trees greater than 4 inches dbh per acre	(Live trees \geq 4" diameter class) \geq 115 and \leq 280 trees/acre and
	Dominant and co-dominant trees at least 85 feet tall	(Largest 40 live trees/acre) \geq 85' tall and
	Minimum of 5 percent ground cover of large down woody debris	(Down wood \geq 4" diameter class) \geq 2,400 Cu. Ft./acre and

Habitat type	Habitat definitions (HCP p. IV.11 through 12 and WAC 222-16-085)	Data query used to interpret habitat definitions
	At least three snags or cavity trees per acre that are at least 15 inches dbh	(Snags \geq 15" diameter class and \geq 16 ft. tall) \geq 3 trees/acre and
	At Least two canopy layers	(FVS-derived number of canopy layers) \geq 2
Sub-mature	Forest community dominated by conifers, or in mixed conifer/hardwood forest, community composed of at least 30 percent conifers (measured as stems per acre dominant, co-dominant, and intermediate trees)	(Live conifers \geq 4" diameter class) \geq 30% of all live tree/acres and
	At least 70 percent canopy closure	(Relative density of live trees \geq 4" diameter class) \geq 48 and
	Tree density of between 115 and 280 trees greater than 4 inches dbh per acre	(Live trees \geq 4" diameter class) \geq 115 and \leq 280 trees/acre and
	Dominant and co-dominant trees at least 85 feet tall	(Largest 40 live trees/acre) \geq 85' tall and
	At least three snags or cavity trees per acre that are at least 20 inches	(Snags \geq 20" diameter class and \geq 16 ft. tall) \geq 3 trees/acre and
	Minimum of 5 percent ground cover of large down woody debris	(Down wood \geq 4" diameter class) \geq 2,400 cu. ft./acre
Young forest marginal (same as sub-mature except for snag and down wood requirements)	Forest community dominated by conifers, or in mixed conifer/hardwood forest, community composed of at least 30 percent conifers (measured as stems per acre dominant, co-dominant, and intermediate trees)	(Live conifers \geq 4" diameter class) \geq 30% of all live tree/acres and
	At least 70 percent canopy closure	(Relative density of live trees \geq 4" diameter class) \geq 48 and
	Tree density between 115 and 280 trees greater than 4 inches dbh per acre	(Live trees \geq 4" diameter class) \geq 115 and \leq 280 trees/acre and
	Dominant and co-dominant trees at least 85 feet tall	(Largest 40 live trees/acre) \geq 85' tall and
	Snags greater than or equal to 2 per acre (greater than or equal to 20 inches dbh and 16 feet tall) OR greater than or equal to 10% of the ground covered with 4 inch diameter or larger wood, with 25 to 60% shrub cover	(Snags \geq 20" diameter class and \geq 16 ft. tall) \geq 2 trees/acre OR (Down wood \geq 4" diameter class) \geq 4,800 cu. ft./acre
Movement	Canopy closure at least 70 percent	(Relative density of live trees \geq 4" diameter class) \geq 48 and

Habitat type	Habitat definitions (HCP p. IV.11 through 12 and WAC 222-16-085)	Data query used to interpret habitat definitions
	Quadratic mean diameter of 11 inches dbh for the 100 largest trees per acre in a stand	(Largest 100 live trees/acres) \geq 11" quadratic mean diameter (QMD) and
	Forest community dominated by conifers, or in mixed conifer/hardwood forest, community composed of at least 30 percent conifers (measured as stems per acre dominant, co-dominant, and intermediate trees)	(Live conifers \geq 4" diameter class) \geq 30% of all live tree/acres and
	Tree density no more than 280 trees per acres greater than or equal to 3.5 inches dbh	(Live trees \geq 4" diameter class \leq 280 trees/acre and
	Top height of at least 85 feet (top height is the average height of the 40 largest diameter trees per acre.)	(Largest 40 live trees/acre) \geq 85' tall
	At least four trees per acre from the largest size class retained for future snag and cavity tree recruitment	Not in query
Dispersal	Canopy cover at least 70 percent	(Relative density of live trees \geq 4" diameter class) \geq 48 and
	Quadratic mean diameter of 11 inches dbh for 100 largest trees per acre in a stand	(Largest 100 live trees/acres) \geq 11" QMD and
	Top height of at least 85 feet	(Largest 40 live trees/acre) \geq 85' tall
	At least four trees per acre from the largest size class retained for future snag and cavity tree recruitment	Not in query

■ Tracking Northern Spotted Owl Habitat

Within each northern spotted owl management area, we track habitat using spotted owl management units (SOMUs).

- In most HCP planning units, SOMUs are derived from 1997 watershed administrative units (WAU) and in some cases modified, in accordance with the HCP, to improve conservation and management capability. For Eastside dispersal management areas, SOMUs are derived from ¼ townships.
- In the OESF HCP planning unit, SOMUs are derived from landscape planning units, not WAUs (the OESF is divided into 11 landscape planning units, which are administrative areas designated primarily along watershed boundaries).

- In the South Puget HCP Planning Unit, SOMUs are based on designated dispersal management landscapes (dispersal management landscapes are used only in the South Puget HCP Planning Unit and were defined through forest land planning).
- For the Klickitat HCP Planning unit, SOMUs are based on sub-landscapes (sub-landscapes are used only in the Klickitat Planning unit and were defined through an [amendment to the HCP](#)).

The HCP's northern spotted owl conservation strategy involves maintaining thresholds of habitat in each SOMU.

- Most designated NRF and dispersal SOMUs have a 50 percent overall habitat threshold objective.
- For the OESF and South Puget HCP planning units, habitat thresholds are two-tiered or have two threshold objectives. For example, the OESF has a 40 percent overall habitat threshold objective; this threshold is further defined as restoring and maintaining at least 20 percent of each SOMU as Old Forest Habitat with the rest made up of structural or better habitat. In the South Puget HCP Planning Unit, dispersal management areas have an overall 50 percent threshold, 35 percent of which is MoRF plus habitat, and 15 percent of which is movement plus habitat.

Table A-3 describes suitable habitat thresholds for selected HCP planning units. Refer to Table A-2 for habitat definitions.

In general, harvest activities must not increase the amount of time required to achieve habitat goals beyond what would be expected in an unmanaged stand. To ensure that procedures are being followed and goals are being met, we track the types and amounts of silvicultural activities in designated NRF and dispersal management areas.

Table A-3. Suitable Habitat Thresholds for HCP Planning Units

HCP planning unit	Habitat threshold		Habitat classification	Habitat types
OESF	40% of each SOMU	At least 20%	Old Forest habitat	Old Forest
				High quality nesting
				Type A
				Type B
	20%	Structural habitat	Sub-mature	
			Young forest marginal	
South Puget	50% of each NRF SOMU		High quality habitat	High quality nesting
				Type A
				Type B
			Sub-mature habitat	Sub-mature
	50% of each dispersal SOMU	At least 35%	MoRF plus habitat	High quality nesting
				Type A
				Type B
				MoRF
	15%	Movement plus habitat	Sub-mature	
			Young forest marginal	
			Movement	
All other Westside planning units	50% of each NRF SOMU		High quality habitat	High quality nesting
				Type A

HCP planning unit	Habitat threshold	Habitat classification	Habitat types
			Type B
		Sub-mature habitat	Sub-mature
	50% of each dispersal SOMU	High quality habitat	High quality nesting
			Type A
			Type B
			Sub-mature
	Dispersal		
	Young forest marginal		

■ Northern Spotted Owl Conservation in the OESF HCP Planning Unit

The HCP describes the management approach for the Olympic Experimental State Forest (OESF) as “unzoned,” in that no special zones are set aside for either ecological values or revenue production. The goal behind this experimental management approach is to learn how to integrate revenue production and ecological values across state trust lands in the OESF.

However, we acknowledge that the OESF has fixed geographic features that require special management consideration. Examples include riparian areas, wetlands, potentially unstable slopes, talus fields, and other features. Therefore, we currently use the term “integrated” instead of “unzoned” to describe our management approach for the OESF.

Under this approach, we do not designate NRF or dispersal areas. Instead, in each of the OESF’s 11 SOMUs, we restore and maintain the following minimum habitat thresholds: 40 percent northern spotted owl habitat, of which at least 20 percent is Old Forest Habitat, and the remaining 20 percent is Structural Habitat or better. This strategy, which conserves northern spotted owls by restoring habitat capability, is based on working hypotheses concerning the necessary quality, quantity, and distribution of habitat.

For more information on integrated management, refer to the [*OESF HCP Planning Unit Forest Land Plan Revised Draft Environmental Impact Statement*](#).

■ Northern Spotted Owl Conservation in the Klickitat HCP Planning Unit

In the Klickitat HCP Planning Unit, forest health is being degraded because stands are overstocked with tree species that are susceptible to stand-replacing fires, drought, disease, and insect infestations. In addition, some lands originally designated as NRF management areas are not, and never will be, capable of sustaining suitable northern spotted owl habitat. This makes the original habitat goal for this unit difficult to achieve.

In April 2004, we implemented an amended spotted owl conservation strategy ([*HCP Amendment No.1, Administrative Amendment to the Northern Spotted Owl Conservation Strategy for the Klickitat HCP Planning Unit*](#)) to address these issues in the Klickitat HCP Planning Unit. This amended strategy involved designating four sub-landscapes within the planning unit and using field assessments, forest inventory data, and spotted owl demography data to create habitat targets for each sub-landscape.

In addition, we renamed dispersal management areas as desired future condition (DFC) management areas. Klickitat DFC areas have the same habitat commitments as dispersal management areas, but are managed by vegetation series, with the goal of maintaining 50 percent of each vegetation series, by sub-landscape, in a mature DFC (at least 60 years old). Areas incapable of growing and sustaining habitat, and those better suited for a different habitat classification, have been reclassified.

We also adjusted the Klickitat HCP Planning Unit boundaries to exclude approximately 23,000 acres of dispersal management area. These acres, which are located north of Yakama Nation Lands, are now part of the Yakima HCP Planning Unit.

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Marbled Murrelet Conservation Strategy

When the HCP was signed in 1997, DNR had insufficient information to create a long-term conservation strategy for the marbled murrelet. Murrelet ecology and habitat use were not well understood at the time, particularly in relation to nesting habitat on DNR-managed lands. To address this, the HCP specified that an interim strategy be implemented while we conduct inventories, surveys, and additional research to support development of a long-term strategy.

Following extensive research and input from an independent science team, we now have enough information to develop a long-term strategy. Although previously delayed by budgetary and staffing shortfalls, development of the long-term conservation strategy has resumed as a top agency priority with additional staff in 2014.

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Riparian Conservation Strategy

For the five Westside HCP planning units, the [HCP riparian conservation strategy](#) was developed with the following specific objectives:

- Maintain or restore freshwater habitat for salmonids (species of fish in the salmon family) on state trust lands, and
- Contribute to the conservation of other species that depend on aquatic and riparian habitats, including wetlands (HCP, p. IV.55).

Meeting these objectives means providing clean water, shade, and large logs for streams through the use of riparian and wetland management zones. It also means preventing sediment delivery to streams and



Marbled Murrelet Nest

Marbled murrelets nest on large limbs covered with moss or other natural substances that create a relatively flat platform. Their nests are usually in mature or old conifer forest. Photo courtesy of Tom Bloxton.

wetlands through management standards for road building and for conducting forest management activities on potentially unstable slopes and rain-on-snow areas.

Adopted in 2006, the [Riparian Forest Restoration Strategy](#) (RFRS) is part of the HCP riparian conservation strategy. The RFRS applies to all HCP planning units except the OESF, and was developed by a technical review committee consisting of technical staff from DNR, NOAA, USFWS, Northwest Indian Fisheries Commission, and WDFW.

Under the RFRS, we design riparian forest thinnings to restore older forest species and forest structure in streamside forests in which historic timber harvest created forest stands that were even-aged and often overstocked. We use canopy gaps and “skips”— areas that are left unmanaged—to help increase structural diversity and accelerate the development of habitat. Accelerating the growth of large conifer trees is an important part of the RFRS. Over time, these trees will provide shade and nutrient-rich litter-fall to the stream when they are alive, and large woody debris to the stream channel when they die and fall over. Large woody debris in the stream channel creates pools and cover, which are important for salmon habitat. Once the riparian forest is on a developmental trajectory to reach an older forest structural condition, there will be no further harvest next to the stream.

During the three-year RFRS implementation period, thinning in stands 70 years of age or older was addressed on a site-specific basis with the Federal Services. This restriction was lifted in 2012 through a [joint concurrence letter](#) signed by DNR and the Federal Services.

When the HCP was adopted in 1997, DNR did not have enough information on the functions and protection needs of headwater streams (also known as first-order streams or Type 5 streams) to develop a full strategy for these streams. For this reason, headwater streams are currently managed through an interim strategy. The interim strategy protects these streams when they are associated with unstable slopes and when such protection is necessary for water quality, fish habitat, stream banks, wildlife, and other important elements of the aquatic system. In addition, the HCP specified that we will conduct research on the effects of forest management on headwater streams, in preparation for developing a long-term headwater strategy. Research and writing of this strategy is now complete. However, competing priorities have prevented us from completing the steps necessary for adoption and implementation.

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Multispecies Conservation Strategy

In addition to providing habitat for ESA-listed species, the conservation objectives developed for the HCP were designed to provide appropriate habitat protection for many native species not currently listed or protected under the ESA. The HCP also specifies habitat protection for numerous Washington State-listed plant and animal species of concern.

■ Uncommon Habitat Objectives

The multispecies conservation strategy involves identification and protection of uncommon habitat types for unlisted species. These habitat types include caves, cliffs, talus slopes, wetlands, balds, mineral

springs, snags, oak woodlands, and large, structurally unique trees. These habitat types provide nesting, roosting, hiding, and foraging opportunities for many species.

Adaptive Management and the Conservation Strategies

Information obtained through research and monitoring and new scientific developments sometimes identifies changes in management practices that would help address the needs of specific species and habitat conditions. For this reason, the HCP includes provisions for a dynamic, scientifically-based adaptive management process that allows continual improvements of its implementation.

Silvicultural Activities

Silviculture is the art and science of managing forests to meet objectives. Through silviculture, we work with the number, size, species, and spacing of trees in the forest to provide both quality timber for harvest and ecological values including habitat for threatened and endangered species, healthy watersheds, biodiversity, and resiliency to disease and insects.

■ Selecting Silvicultural Activities

DNR implements many types of silvicultural activities (harvest, regeneration, vegetation management, and others). Which activities we implement, when, and how often, is determined through the silvicultural prescription.

The silvicultural prescription defines what we wish to accomplish (objectives) and how we will accomplish it (activities) in a forest management unit over an entire rotation. A forest management unit is an area that is ecologically similar enough to be managed to meet common objectives, and a rotation is the length of time between stand replacement harvests.

Objectives

When we write a silvicultural prescription, we begin by understanding the unit's contribution to landscape-level objectives set by DNR policies including the HCP and the *Policy for Sustainable Forests*. Examples of landscape-level objectives include maintaining a certain percentage of the forested landscape as northern spotted owl habitat, or maintaining enough hydrologically mature forest in a watershed to prevent periods of peak flow (periods of high stream flow after storm events).

We then write specific "rotation objectives" for the unit in that context. For example, a unit that contributes to northern spotted owl habitat landscape objectives may have a rotation objective to "attain sub-mature NRF habitat." Rotation objectives are based on the biological capability of the site, including the trees suitable to the site, the site's productive capacity, the presence or absence of competing vegetation,



Leave Trees

Clumps of green trees are left following timber harvests to provide habitat and a seed source for future generations of trees. Sometimes they also protect valuable habitat features such as snags or seeps.

insect and disease issues, and other considerations. Financial and budget constraints also play a role in the selection of rotation objectives.

Each rotation objective also has a series of specific, measurable “threshold targets.” For example, the threshold target for the rotation objective to attain sub-mature NRF habitat may be “at least five percent of the ground covered by large woody debris.” Each target is assigned a time period for its attainment.

Activities

Once we define the rotation objectives and threshold targets, we determine the sequence of silvicultural activities that are necessary to meet them. The frequency and type of activities we select will depend on the biological capability of the site and the complexity of the prescription. Budget allocations and market conditions also influence the timing and extent of silvicultural activities chosen, and activities may be prioritized based on available resources and relative benefits. Other important considerations include market conditions, ecological constraints, operational constraints (for example, potentially unstable slopes), new and existing policies and procedures, and new scientific discoveries. As the stand grows, we re-assess it periodically to ensure it is on track to meet its objectives.

■ **Tracking Silvicultural Activities**

Data on silvicultural activities for HCP annual reports comes from DNR’s forest management planning and tracking (P&T) database, in which DNR records information about planned and implemented silvicultural activities. Using P&T, we summarize acres of activities across all state trust lands managed under the HCP in four categories: timber harvest, forest site preparation, forest regeneration, vegetation management, and pre-commercial thinning.

The number of acres of activities we report each year may be different than what actually took place on the ground during that year. These discrepancies are caused by differences in each DNR region’s procedure for recording activities in P&T. For example, some regions may wait to record individual activities until a sequence of activities is completed; if so, activities completed this year may not be entered into P&T until a subsequent year.

Note that significant increases or decreases in timber harvest volumes will usually be followed by corresponding increases or decreases in the overall level of silvicultural activity. For example, more stand-replacement harvest may lead to more planting, site preparation, and other activities. However, because of the possible lag time between when an activity is implemented and when it is recorded, it may be a year or more before changes in timber harvest volume and other activities are reflected in the number of acres summarized in this report.

■ **Descriptions of Silvicultural Activities**

Timber Harvest

DNR separately tracks and reports on each of the following types of harvests:

- **Commercial thinning:** Commercial thinning generates revenue and is performed to meet a wide range of objectives including improving the growth of the stand, enhancing stand health, reducing tree mortality, or accelerating the development of habitat. Regeneration of a stand is not an objective of thinning.

- **Variable density thinning:** Variable density thinning is a type of commercial thinning in which we create a mixture of small openings (gaps), un-thinned patches (skips), and varying stand densities to achieve specific objectives, such as accelerating development of a complex stand structure. Variable density thinning may also include treatments to create or encourage development of large down wood and snags.
- **Selective product logging:** With this type of harvest, we remove trees of certain species and sizes that are highly valuable. For example, we may remove trees that function well as poles or logs for cabins.
- **Seed tree intermediate cut:** A seed tree intermediate cut is the first timber harvest in a series of harvests that is conducted as part of the even-aged seed tree silvicultural harvest system. The purpose of this harvest type is to provide a desirable seed source to establish seedlings. Typically, about 10 trees per acre may be left following this harvest; once the new trees are established, some of these seed trees may be harvested.
- **Shelterwood intermediate cut:** This harvest is the first in a series of harvests conducted as part of the even-age shelterwood harvest system. The purpose of this harvest is to provide shelter (typically shade) and possibly a seed source for the seedlings that are regenerating in the stand. Compared to a seed tree intermediate cut, a shelterwood typically retains more trees per acre following harvest; retained trees are generally dispersed across the stand.
- **Temporary retention first cut:** this is a partial-cut timber harvest in which selected overstory trees are left for a portion of the next rotation. The purpose of this harvest method is to retain overstory trees without diminishing establishment of a new stand. If these overstory trees are left through the entire rotation, the result may be a two-aged stand.
- **Seed tree, shelterwood, or temporary retention removal cut:** In this cut, trees retained in the earlier harvest are removed.
- **Uneven-aged management:** In uneven-aged management, we remove trees from a multi-aged forest stand while maintaining multiple age classes within that stand. Uneven-aged management is often used on sites with poor soils on which more intensive management is not cost effective. This type of management also may be used in fire-prone areas to mimic the effects of periodic, lower-intensity fires that do not remove all of the trees.
- **Variable retention harvest:** Variable retention harvest is a type of regeneration, or stand-replacement harvest. With this type of harvest, we remove most of the existing forest stand to make room for regeneration of a new stand, but leave elements of the existing stand, such as down wood, snags, and leave trees (trees that are not harvested), for incorporation into the new stand. Variable retention harvest is different from a clearcut, in which all or nearly all of the existing stand is removed.
- **Clearcut:** According to Washington forest practices rules, a clearcut is a harvest method in which the entire stand of trees is removed in one timber harvesting operation. In the 1990s,



Variable Density Thinning

A variable density thinning in the OESF

DNR began doing variable retention harvest instead of clearcuts on the majority of its timber sales. However, between the adoption of the HCP in 1997 through fiscal year 2008, variable retention harvests were still reported as clearcuts even though the majority of those harvests met the definition of variable retention harvest. From 2009 on, few acres have been reported as clearcuts.

Forest Site Preparation

After a stand replacement harvest and before planting the new stand, we remove slash (residue of logging, such as tree limbs) and undesirable plants that would compete with seedlings for nutrients, water, and light. Site preparation may be performed during logging, for example by pulling up and disposing of brush clumps, or after logging by piling and burning slash, manually cutting undesirable vegetation, applying herbicide to undesirable tree and brush species, or a combination of methods.

Forest Regeneration

In this step, we establish a new stand by planting seedlings or allowing the site to seed naturally from adjacent stands or trees that are retained within the harvested area.

Vegetation Management

After the site has been planted, but before the seedlings have become fully established, we may remove competing vegetation to give the new seedlings room to grow. Vegetation may be removed by hand, by mechanical means, or through application of herbicide. Vegetation management is done when we determine that competing vegetation will have a negative effect on the stand's ability to meet its objectives.

Pre-commercial Thinning

In a pre-commercial thinning, we remove the less desirable trees to maintain the growth and stability of the retained trees. Pre-commercial thinning is performed before the trees are large enough to be marketable. This type of thinning does not generate revenue, and cut trees are left on site to decompose.

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Non-Timber Management Activities

Numerous non-timber management activities take place on DNR-managed lands. This section of the *State Trust Lands Habitat Conservation Plan 2013 Annual Report* details the levels of activities (numbers of sites, permits, leases, and acres involved) expected to occur within the first decade when the HCP was approved in 1997. For each category of activity, we explain trends or noticeable differences in reported numbers, if possible. In some cases, such differences may be due to improvements in our methods for identifying and tracking data.

In this section, we discuss recreation and public use activities on state trust lands and the steps we take to minimize the impacts of these activities on ecological systems. This section also includes information

on our Natural Areas Program, through which we manage and protect rare native ecosystems, habitat, and unique natural features.

We work continually to improve our methods of tracking and reporting on non-timber activities. As our systems improve, and we are able to collect more accurate data, we may change our reporting methods or make corrections to our data.

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Special Forest Products

Special forest products are Christmas greens, medicinal plants, western greens (typically used by florists), or other items that can be harvested from forested state trust lands but do not fall into traditional timber or fiber categories. We promote the sale of special forest products when doing so will benefit the trusts and not cause significant damage to the environment. Permits are selectively granted to prevent habitat degradation.

Currently, we cannot accurately report on specific categories of special forest products because we no longer have program staff dedicated to tracking this information. For instance, we cannot distinguish acres leased for Christmas greens from those leased for western greens. However, we have made improvements in the accuracy of reported acreage involved in special forest product leases as a whole.

Valuable Materials Sales

Rock, sand, and gravel (valuable materials) sales from commercial pits are handled under special sale contracts. Most of our active commercial pits are not in forested areas. Generally, the few commercial contracts we have on forested trust lands are small sales from silvicultural pits (pits used primarily for construction of forest roads).

The number of silvicultural pits and inactive commercial pits was not tracked until fiscal year 2003, when we initiated an inventory of all such pits. Since the initial inventory, changes—such as abandoning pits or creating new ones—have not been consistently tracked. We hope to find the resources to begin tracking and reporting such data more regularly and consistently. The number of pits is expected to be very close to those reported in 2003, as DNR's demand for forest road materials is relatively consistent over time.

Early in the implementation of the HCP, we had a substantial number of rock, sand, and gravel sales, but currently there are few. This primarily is due to two factors: (1) the lengthy contract development process, including requirements for more valuable or longer-term contracts to be reviewed and approved by the Board of Natural Resources; and (2) periodic charges to keep contracts alive regardless of whether or not there are removals. Most rock, sand, and gravel sales are now from private pits, which have fewer time and procedural constraints. Direct sales are one-time agreements that remove only small amounts of a resource (a maximum of \$25,000 in value) and do not require Board of Natural Resources approval. Other (non-direct) sales are active for longer periods of time and/or have larger maximum removal value limits.

Prospecting Leases and Mining Contracts

Like oil and gas leases, prospecting and mining leases are simply exploration agreements that allow a lessee to search for mineral deposits. A lease must be converted to a contract if the lessee would like to begin active mining operations that could alter habitat. Before any surface-disturbing work is conducted, the lessee must submit a plan of operations for review and approval. In 1996, when the HCP was written, there were no active mining operations (meaning activities that actually extract minerals) on lands managed under the HCP, nor have there been any since.

Oil and Gas Leases

Oil and gas exploration leases simply allow a lessee to reserve the right to explore for underground deposits. The lessee has the sole and exclusive right to explore for, drill, extract, or remove oil and gas. However, any proposed on-the-ground activities must undergo State Environmental Policy Act (SEPA) review and have a plan of operations, which we must approve.

One of the early steps of this process is acquiring a drilling permit. If the lessee then wants to actively drill or thump (measure seismological tremors caused by the dropping of large weights or detonation of explosives), he or she must obtain an “active” lease. Regulations exist to protect water and air quality, and any exploration holes must be plugged following use. Any new permits are subject to SEPA review. There has been only one active oil and gas lease involving drilling on lands that are now managed under the HCP (in 1996), and the well has since been abandoned and plugged. In 2013, all oil and gas exploration leases were surrendered, most likely due to an increase in scheduled rental fees. Historically, oil and gas leases on state trust lands are cyclical, and we expect to see new exploration leases signed in the next five to ten years.

Grazing Permits and Leases

Most DNR-managed grazing takes place on non-forested state trust lands east of the Cascade crest on lands that are not managed under the HCP. Grazing is selectively allowed on forested state trust lands managed under the HCP in both eastern and western Washington, though the number of acres permitted in western Washington is minimal.

In eastern Washington, state trust lands are grazed under permits and leases. Permits cover large acreages, and each permit includes a resource management plan with ecosystem standards that must be met, such as turnout and removal dates and the number of animals allowed on the range. Leases cover smaller areas than permits, also include a resource management plan, and can allow grazing at any time during the year, as long as guidelines in the plan are followed.

In our tracking methodology, we currently are not able to distinguish acres of grazing on forested versus non-forested state trust lands in eastern Washington. Thus the number of acres reported for grazing may be inflated. As we refine our tracking methodology we should be able to separate forested from non-forested grazing to improve the accuracy of our reports.

Land transactions, including large-scale exchanges such as the Central Cascades exchange completed in 2008, can influence which lands will be managed under the HCP and where grazing will be allowed.

Communication Site Leases

Communication site leases allow private and public entities to build new towers or attach communication equipment to existing towers (for example, cell phone towers). These sites typically are located on non-forested mountaintops or along second-growth highway corridors, and are less than an acre in size. They are accessed by the same road system as forest management activities and are subject to the same management practices.

Special-Use Leases

Special-use leases are issued for a wide variety of commercial and other uses on state trust lands. “Miscellaneous” is often the best descriptor of these leases. Some examples include golf courses, small commercial businesses and buildings, commercial recreation facilities, colleges, takeoff or landing sites for paragliding, governmental or public use facilities, honeybee hive sites, and stockpile sites. Special use leases do not cover major urban commercial uses or aquatic land uses. Often, but not always, these leases are for “interim uses,” and, as such, contain language that allows for termination should we wish to take advantage of a “higher and better use” for the land.

Recreation Sites

Recreation sites allow public recreation on forested state trust lands as long as it is compatible with state laws and the objectives of the [Policy for Sustainable Forests](#) and the HCP. Sanctioned recreational activities on state trust lands include hiking, biking, horseback riding, off-road vehicle use, and camping. The number of sites and acreage reported are only for DNR-managed trails, camping, and picnicking areas. DNR’s vision statement for recreation and public access is to “Manage public and trust lands in a manner that provides quality, safe recreational experiences that are sustainable and consistent with DNR’s environmental, financial and social responsibilities.” DNR is developing recreation plans for many of the areas it manages. Plans are developed with extensive involvement of local recreation groups and the public, many of whom also volunteer to help maintain trails and campgrounds.

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Natural Areas Program

DNR’s [Natural Areas Program](#) protects outstanding examples of the state's extraordinary biodiversity. Lands managed under this program represent the finest natural, undisturbed ecosystems in state ownership and often have one-of-a-kind features unique to this region.



Trail Restoration

These box steps were built as part of a trail restoration project and will help minimize erosion by providing a stable and water-permeable hiking surface.

The Washington State Legislature established the system of Natural Area Preserves (NAPs) in 1972 to protect the highest quality examples of native ecosystems, rare plant and animal species, and other natural features of state, regional, or national significance. The Washington State Legislature established the system of Natural Resources Conservation Areas (NRCA) in 1987 to protect areas that are a high priority for conservation because they have critical wildlife habitat, prime natural features, or examples of native ecological communities. Together, these natural areas include Puget prairies, estuaries, native forests, bogs, ponderosa pine forests, shrub steppe communities, alpine lakes and meadows, scenic vistas, and significant geological features. These areas provide opportunities for research, education and, where appropriate, low-impact public use. In addition, these areas help meet statewide conservation priorities and our HCP obligations.



Volunteer Work

Volunteers such as these students pulling invasive Scot's broom (*Cytisus scoparius*) from Mima Mounds NAP are essential to the Natural Areas Program.

Today, our Natural Areas Program includes over 150,000 acres statewide in 54 NAPs and 31 NRCAs. More than 114,000 of those acres fall within the area managed under the HCP; this total includes 69,000 acres that have been added to the program since the HCP was signed in 1997. An additional 3,000 acres have been added since 1997 in areas not managed under the HCP.

■ Habitat for Listed, Candidate, and Sensitive Species

Washington's natural areas contain habitat for 11 species listed as threatened or endangered under the ESA. Nine of these species are known to occur on natural areas located within the area managed under the HCP. Outside of HCP-managed areas, the Canada lynx (*Lynx canadensis*) is found in the Loomis NRCA and several natural areas provide suitable habitat for grizzly bears (*Ursus arctos horribilis*).

Federally listed species living on natural areas include the largest and healthiest population of golden paintbrush (*Castilleja levisecta*), the largest and most viable population of Wenatchee Mountain checker-mallow (*Sidalcea oregana var. calva*), the only Washington population of Bradshaw's lomatium (*Lomatium bradshawii*), more than 15 established territories for the northern spotted owl (*Strix occidentalis caurina*), and waters that contain listed runs of Chinook salmon (*Oncorhynchus tshawytscha*), chum salmon (*Oncorhynchus keta*), steelhead trout (*Oncorhynchus mykiss*), and bull trout (*Salvelinus confluentus*). Ten of our natural areas contain occupied marbled murrelet (*Brachyramphus marmoratus*) sites. At South Nemah NRCA, more than 30 marbled murrelet occupancies have been recorded, including a confirmed murrelet nest site.

Natural areas provide habitat for three species that are candidates for federal listing. Trout Lake NAP contains the second largest population and highest quality native habitat for the Oregon spotted frog (*Rana pretiosa*), which is currently proposed for federal listing as threatened. Washougal Oaks NAP/NRCA protects spawning habitat for coho salmon (*Oncorhynchus kisutch*). Both the Loomis NRCA and Chopaka NAP support substantial populations of whitebark pine (*Pinus albicaulis*), recently determined to be a candidate species for federal listing.

Natural areas also provide habitat for other sensitive species (federal species of concern, state-listed, state candidate, and others) identified in the HCP. Examples include butterflies like the Valley silverspot (*Speyeria zerene bremnerii*) and Puget blue (*Icaricia icarioides blackmorei*) that are associated with prairie habitat, amphibians like the Larch Mountain salamander (*Plethodon larselli*) that depend on forested talus slopes, birds like the harlequin duck (*Histrionicus histrionicus*) that are associated with mountain streams and rivers, bats that depend on maternal colonies like the colony found at Woodard Bay NRCA, and mammals like the California bighorn sheep (*Ovis canadensis sierrae*) in Morningstar NRCA that depend on high elevation rocky outcrops and alpine communities.



Oregon Spotted Frog

Our natural areas provide habitat for Oregon spotted frogs (*Rana pretiosa*) and other amphibians. Photo courtesy of W.P. Leonard.

■ Native Forests

A number of our natural areas were established because of their high-quality native forest ecosystems. These areas are dominated by mature and/or late seral forests. Late seral forests and trees with potential nesting platforms are important to two of the primary species protected under the HCP: the northern spotted owl and the marbled murrelet. The native forests on these natural areas also represent some of the highest quality examples of globally imperiled forest ecosystems.

■ Estuaries

In the Natural Areas Program, there are five high-quality estuaries, including three on Washington's coast and two on the shores of the Puget Sound. These sites protect rare tidal wetland communities and provide important foraging and cover habitat for anadromous fish during the critical transition from a freshwater to a marine environment. In addition, estuaries help dissipate potentially damaging wave energy before it reaches the land and provide a sink for sediments and wastes derived from both land and sea. Estuaries are some of the most biologically productive systems in the world.

■ Rare Species

NAPs and NRCAs protect a broad representation of ecological communities and contribute to the conservation of many species, which is important since our inventory of the state's biodiversity is incomplete. For example, Mima Mounds NAP was originally established to protect unusual geologic formations and high-quality prairie habitat. We recently learned that it also has the only known population of the ground-dwelling lichen *Cladonia ciliata* in the United States. Similarly, North Bay and Carlisle Bog NAPs were established to protect high-quality wetlands. We later discovered that they both contain populations of the rare Makah copper butterfly (*Lycaena mariposa charlottensis*).



Carlisle Bog NAP

Carlisle Bog NAP represents the most diverse and undisturbed example of a sphagnum bog ecosystem and connected lake on the Olympic Peninsula. The site supports populations of the Olympic mudminnow and Makah copper butterfly.

■ Restoration and Research

We are actively working to restore and enhance habitat for special-status species at a number of NAPs and NRCAs. At Mima Mounds and Rocky Prairie NAPs, for example, we are using prescribed fire, invasive species control, and seeding of native grassland plants to restore native prairie habitats that have been heavily fragmented and degraded over most of their range. We are restoring and enhancing oak woodland habitat at two sites (Washougal Oaks NAP/NRCA and Bald Hill NAP) by removing competing conifer trees, planting oak seedlings, and replanting native understory species. In addition, we are restoring Puget Sound estuary and nearshore habitats at Stavis and Woodard Bay NRCAs by removing bulkheads, fill, and creosote-treated structures.

Nearly 400 research, inventory, and monitoring projects have been conducted in natural areas by professors, students, and agency biologists. These projects help us identify critical habitat features for species of concern. They also help us learn new techniques for protecting and restoring rare ecological communities. Taken together, these projects demonstrate the important contribution of natural areas to the protection of biodiversity and to our HCP obligations.



Washougal Oaks NAP/NRCA

Washougal Oaks NAP/NRCA contains high-quality oak woodland habitat that is home to one of the last populations of the white-breasted nuthatch in Washington. We are restoring this landscape by removing competing conifer trees, planting oak seedlings, and replanting native understory species.

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Road Management Activities

Roads that are improperly constructed or maintained can negatively impact habitat in a number of ways. Such roads can increase the rates of slope failure, contribute sediment to streams, and block fish passages, which can potentially harm salmon and other aquatic and riparian-obligate species. Current road-building and maintenance practices create better roads that minimize damage, while also allowing us to abandon or improve poorly built roads.

In 2001, Washington State's forest practices rules were updated to reflect "Forests and Fish" legislation passed in 1999. This legislation required all large forest landowners to manage all forest roads constructed or used for timber harvest and other forest activities after 1974 under an approved road maintenance and abandonment plan (RMAP) by July 1, 2006. The legislation also stipulated that all forest roads must be improved and maintained to the standards established in WAC 222-24 by 2016.

DNR completed a full stream-crossing assessment in 2001 and a road assessment for all forested state trust lands in 2006. DNR intends to be fully compliant with RMAP standards by 2016.

Under the HCP, DNR made a commitment to develop and institute a process to achieve comprehensive, landscape-based road network management. The major components of this process include the following:

- Minimization of active road density;
- A site-specific assessment of alternatives to new road construction (for example, yarding systems) and the use of such alternatives where practicable and consistent with conservation objectives;
- A base-line inventory of all roads and stream crossings;
- Prioritization of roads for decommissioning, upgrading, and maintenance; and
- Identification of fish passage blockages caused by stream crossings, and a prioritization of their retrofitting or removal.

We evaluate overall active road density through [forest land planning](#) (completed for the South Puget HCP Planning Unit and underway in the OESF HCP Planning Unit). We conduct site-specific assessments of alternatives to new road construction at the operational level when we plan individual activities, and we address the last three components of this process through implementation of RMAPs.

As part of meeting HCP annual reporting requirements, we track and report on the number of road miles constructed (newly built roads), reconstructed (existing roads improved to a timber haul standard), decommissioned (roads stabilized and made impassable to vehicular traffic), or abandoned (roads stabilized and abandoned to forest practices standards), as well as active forest road miles and total number of fish barriers removed.

Unlike other activities, road management activities are reported on a calendar year (rather than fiscal year) basis because the end of the fiscal year is at the start of the busiest time of the construction season. Most road work is subject to a hydraulic “work window” that limits in- or near-stream work to the summer (typically June 15 to September 30).

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Easements and Road Use Permits

DNR generally grants access across its lands, and acquires access to its lands, through easements and road use permits. Easements are long term (typically permanent) agreements in which property owners grant the rights to cross their land to another individual or entity. Easements are an interest in real property, and most transfer with the land, serving landowner after landowner. DNR also receives easements when it acquires lands.

Road use permits are usually short-term rights that do not convey any interest in property and are revocable by the entity that grants them. Permits are generally non-transferrable.

DNR primarily grants easements and road use permits to other governmental entities for public roads and utilities, and to forest and agricultural landowners for access to valuable materials such as timber or rock. DNR also grants easements and road use permits for many other uses such as irrigation pipelines and railroads. We acquire easements and road use permits from private individuals and government agencies to allow us to access our lands.

Unlike for other categories of non-timber activities, we do not report easements and road use permits on a cumulative basis. Only new easements and permits that create a new “footprint” on state trust lands

managed under the HCP are reported for the fiscal year. These include easements for new roads and utilities. We do not have a system to tally total easement acres, primarily because many easements were granted in the early 1900s and hand-entered on records that are now archived.

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Land Transactions

DNR's Land Transactions Program is designed to reposition state trust lands for better long-term management and increased revenue for each of the trusts. Repositioning simply means disposing of properties that do not fit our management strategies or objectives and acquiring replacement properties that are more suitable. When we sell parcels at public auction or transfer (sell) them to other public owners, we use the proceeds to acquire replacement lands for the trusts to keep the trust "whole."

Land transactions affect the amount of habitat or potential habitat on state trust lands. Transactions may be carried out to consolidate state trust lands in certain areas. Consolidation allows for more cost-effective management and offers opportunities to optimize trust revenue while maintaining habitat and allowing public recreation as appropriate. We often consolidate state trust lands by working with owners of adjacent lands to trade their properties for scattered parcels of state trust lands elsewhere.

Lands we identify for disposal often are better suited to other public benefits, such as parks or habitat for rare, native species. We may transfer state trust lands out of trust status into protected status as an NAP or NRCA in our Natural Areas Program. We may also transfer state trust lands to other government agencies to be used as parks or open space or for public facilities. As mentioned previously, when this happens we compensate the trust at fair market value, and acquire replacement properties to maintain trust assets over time. Acquired lands are assessed to determine if they should be included as HCP permit lands (managed subject to the commitments in the HCP). If they are found to qualify, we determine whether they should be designated as northern spotted owl NRF, dispersal, or DFC management areas. We also assess their potential role in other HCP conservation strategies.

Some state trust lands have important social or ecological values. These state trust lands are best managed for protection of these special values and uses, rather than for income production. These lands may be candidates for the [Trust Land Transfer Program](#), which applies only to Common School trust lands. Through this program, we transfer state trust lands to WDFW, the State Parks and Recreation Commission, county government, city government, or the Natural Areas Program. The value of the timber (which is not cut) is given to the common school construction account, which helps fund K-12 schools statewide. The value of the land is used to purchase replacement property for the trust. State trust lands transferred to the Natural Areas Program contribute to the objectives of the HCP. State trust lands that are transferred to entities outside of DNR are evaluated for their HCP conservation value. If their conservation value is high, we either do not transfer them, or we issue a deed restriction stipulating their continued management under the HCP. However, we rarely use deed restrictions because of the complexities involved in assuring compliance with the HCP on non-DNR-managed lands.

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Monitoring, Research, and Adaptive Management

Monitoring and research provide the information necessary to improve the implementation and effectiveness of the conservation strategies in the HCP. Monitoring and research also help us document how well our plans and actions are working to achieve our desired outcomes. The information gained can be used to adjust or adapt our management practices as needed.

Since the HCP was adopted in 1997, there have been advances in understanding the biology of northern spotted owls, marbled murrelets, and other species addressed by the HCP. However, much remains to be learned, and new systems and techniques continue to be developed and tested. Monitoring and research support the completion of conservation strategies, test promising alternatives to current methods, and contribute to the ecological foundation of our management.

Implementation, Effectiveness, and Validation Monitoring

A science-informed adaptive management program relies primarily on research and monitoring to provide new, relevant information for increasing confidence in current management or developing new management options. A system consisting of three types of monitoring—implementation, effectiveness, and validation—has become a common organizational framework for monitoring programs in forest management.

- **Implementation monitoring** determines whether or not the HCP is being implemented properly on the ground, and is sometimes referred to as compliance monitoring.
- **Effectiveness monitoring** determines whether or not the HCP strategies are producing the desired habitat conditions.
- **Validation monitoring** determines whether or not a certain species responds to the desired habitat conditions as anticipated.

■ Implementation Monitoring

The HCP requires us to monitor implementation of the conservation strategies to ensure that the physical outcome of our management activities matches our intention as described in the HCP. Conservation strategies are selected for implementation monitoring based on a number of criteria. These criteria may include the level of risk or uncertainty associated with the strategy, the level of management discretion, the cost and timeliness of monitoring results, new information, and input from the Federal Services and DNR managers. Examples of monitoring projects include monitoring large, structurally unique trees left on timber sales following harvest, monitoring for compliance with the marbled murrelet interim conservation strategy and the northern spotted owl conservation strategy, and monitoring of wetland and riparian management areas.

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■ Effectiveness Monitoring and Research for HCP Conservation Strategies

Effectiveness monitoring documents changes in habitat conditions, including general forest structure and specialized habitat features that result from timber harvest and other forest management activities. Only habitat areas addressed by the conservation strategies are monitored for effectiveness.

Information from this type of monitoring increases our ability to understand the influence of land management on aquatic and upland habitat conditions, and to effectively implement the conservation strategies to reach the goals of the HCP.

Riparian Conservation Strategy Effectiveness Monitoring

The objectives of effectiveness monitoring for the riparian conservation strategy fall under four main categories:

- **Riparian forest restoration management:** Provide information on proper management to achieve older stand conditions in riparian areas by testing existing and promising alternative approaches to integrating biodiversity-type thinning into our management options.
- **Headwaters conservation:** Support the development and future implementation of the headwaters conservation strategy, including assessing the strategy's effectiveness.
- **Riparian forest integrity:** Support our understanding of the loss of riparian area integrity due to blown down trees using long-term measurements of windthrow.
- **In-stream conditions:** Provide linkage between management techniques in riparian management zone forests, and in-stream habitat conditions, habitat trends, and water quality.

Northern Spotted Owl Conservation Strategy Effectiveness Monitoring

The objective of northern spotted owl research and effectiveness monitoring is to help us better understand the habitat needs of the northern spotted owl, and how to effectively manage forest stands and landscapes to create and sustain suitable habitat. Our effectiveness monitoring program documents changes in habitat conditions, including general forest structure and specialized habitat features that result from timber harvest and other forest management activities.

Currently, effectiveness monitoring is being expanded and incorporated into broader research studies into the structural patterns and development of suitable habitat, and mature and older forests. An additional focus is how northern spotted owl habitat, and complex-structured forests in general, can best be maintained in the fire-prone eastern Cascades.

Effectiveness monitoring also supports the adaptive management goals for the northern spotted owl conservation strategy, such as developing better stand- and landscape-level habitat definitions.

OESF Research and Monitoring Program

The OESF is unique among HCP planning units in both management and purpose. The OESF is a place for applied research and monitoring to learn how to integrate revenue production and ecosystem values more effectively across state trust lands. This learning is achieved through a strong emphasis on adaptive management.

The long-term vision for the OESF is a productive, resilient, and biologically diverse commercial forest in which both revenue generation for trust beneficiaries and ecological values are maintained through integrated management. The intent behind integrated management is to actively manage as much of state trust lands as possible using innovative silviculture, landscape-level planning, and quick application of new knowledge.

The OESF Research and Monitoring Program furthers the OESF mission by implementing or coordinating research and monitoring projects; establishing and maintaining research partnerships; reaching out to stakeholders, tribes, and the general public; managing information; and linking management activities and new knowledge through a structured adaptive management process.

■ Past and Current Research and Monitoring in the OESF

A number of research and monitoring projects have taken place in the OESF since its status as an experimental forest was confirmed in 1992 (to see the catalog of past projects, refer to

http://www.dnr.wa.gov/ResearchScience/Topics/TrustLandsHCP/Pages/lm_hcp_oesf_catalog_rsrch_motrng.aspx). Some of these projects were funded and conducted by us; others were implemented through research partnerships such as silvicultural research cooperatives.

The main focus of OESF research and monitoring is innovative silviculture. Currently, we are monitoring gaps created in the forest canopy and various thinning regimes. Another ongoing project is long-term status and trends monitoring of riparian and aquatic habitat. For a list of ongoing projects, refer to http://www.dnr.wa.gov/ResearchScience/Topics/TrustLandsHCP/Pages/lm_hcp_oesf_research_interest.aspx.

Recently, we conducted a comprehensive review of current knowledge gaps (uncertainties) as part of the OESF forest land planning process (described in the next section). We also developed a process to address these gaps in a programmatic fashion and link information-gathering activities to future management decisions. Identification of knowledge gaps provides a fresh focus for OESF research and monitoring. The list of DNR priority research and monitoring activities to be implemented in the near term (within approximately five years) is available in Chapter 4 of the Draft OESF Forest Land Plan, which is Appendix A of the *Olympic Experimental State Forest HCP Planning Unit Forest Land Plan Revised Draft Environmental Impact Statement*.

■ Draft OESF Forest Land Plan

Policy direction for management of the OESF is provided by the HCP and the *Policy for Sustainable Forests*. The policies in these documents are implemented, in part, through a series of planning processes including the sustainable harvest calculation and forest land planning.

We are currently developing a forest land plan for the OESF. The forest land plan will include goals, objectives, and strategies, and research, monitoring, and adaptive management, as well as information on silviculture and expected outcomes. When completed and adopted, the forest land plan will guide management of the OESF.

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Adaptive Management

The HCP's adaptive management process allows changes to our forest management when results from our monitoring programs or new information from the scientific literature indicate that such changes are warranted. For example, adaptive management has resulted in management modifications such as the [*Riparian Forest Restoration Strategy*](#), the [*Administrative Amendment to the Northern Spotted Owl Conservation Strategy for the Klickitat HCP Planning Unit*](#), and a legacy tree procedure for eastern Washington that protects old-growth trees and stands.

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Forest Certification

Forest certification is a confirmation process conducted by an independent third-party audit team that verifies forest management practices against a set of standards demonstrating environmentally responsible, socially beneficial, and economically viable practices that promote responsible forestry. This unique commitment to responsible forestry recognized that forest landowners play a critical role in ensuring the long-term health and sustainability of our forest.

The Forest Stewardship Council™ (FSC®) is an independent, non-profit organization that promotes responsible management of the world's working forests through the development of forest management standards, a voluntary certification system, and trademarks that provide recognition and value to products bearing the FSC label in the marketplace.

Sustainable Forestry Initiative, Inc. is an independent, non-profit organization internationally endorsed and accepted around the world. The Sustainable Forestry Initiative® (SFI®) program is based on the premise that responsible environmental behavior and sound business decisions can co-exist. Its three-chamber Board of Directors governs all aspects of the SFI program, with equal representation from the environmental, economic, and social sectors.

Currently, all forested state trust lands (2.1 million acres) in Washington State are certified under the Sustainable Forestry Initiative® (SFI®) program standard. Of this amount, approximately 160,000 acres were also certified under the Forest Stewardship Council™ (FSC®) Forest Management Standard during fiscal year 2013. These FSC-certified forests are located within DNR's South Puget Sound HCP Planning Unit (located in King, Pierce, Thurston, Kitsap, and Mason counties).

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Appendix B

Glossary

This appendix contains a glossary of terms used in this annual report.



Variable Retention Harvest

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A

Abandoned road: A road that is stabilized and removed from use to Washington forest practices standards, including removing water crossings, providing erosion control, and making the road impassible to vehicles.

Activity objective: A measurable and possibly transient condition sought at the conclusion of an activity, such as a certain number of trees left following a timber harvest to serve as habitat and a seed source.

Adaptive management: A process of periodically reviewing and adjusting management practices based on feedback from internal and external research and monitoring.

Aerial herbicide: Application of herbicides from a helicopter, or sometimes a plane, to achieve site preparation or vegetation management objectives.

Aerial pesticide: Application of an insecticide, herbicide or other pesticide from a helicopter or airplane.

Age class: A grouping of trees in the same age group used to simplify data that describes age composition for a stand or landscape. Age classes are often divided into decadal groups to portray the distribution of tree ages within a stand, or stand origin dates on a landscape.

Animal repellent: Chemicals or other products applied to discourage animals from damaging seedlings.

B

Biosolids: The nutrient-rich organic materials resulting from the treatment of sewage sludge. When properly treated and processed in a sewage treatment facility, biosolids can be safely applied as fertilizer to maintain productive soil and stimulate tree growth.

Blowdown (windthrow): A tree that has been knocked over or had its top blown out by wind.

Broadcast burn: Allowing prescribed fire to burn over a designated area to achieve site preparation or vegetation management objectives.

C

Certification: See forest certification.

Clearcut: According to Washington forest practices rules, a clearcut is a harvest method in which the entire stand of trees is removed in one timber harvesting operation. In the 1990s, DNR began doing variable retention harvest instead of clearcuts on the majority of its timber sales. However, between the adoption of the *State Trust Lands Habitat Conservation Plan* in 1997 through fiscal year 2008, variable retention harvests were still being reported as clearcuts even though the majority of those harvests met the definition for variable retention harvest. From 2009 on, few acres have been reported as clearcuts.

Commercial thinning: Commercial thinning generates revenue and is performed to meet a wide range of objectives including improving the growth of the stand, enhance stand health, reduce tree mortality, or accelerating the development of habitat. Regeneration of a stand is not an objective of thinning.

D

dbh: Diameter at breast height, which is the diameter of a tree measured 4.5 feet above the ground on the uphill side of the tree.

De minimis: A legal term for a level of activity that is too small or insignificant to be concerned about.

Decommissioned road: A road made impassible to vehicles.

Demography: The study of populations or communities, including births, deaths, movement, and distribution.

Desired future condition (DFC): A set of parameters that can be compared to current conditions, showing any management changes needed to achieve specific goals. In the *Administrative Amendment to the Northern Spotted Owl Conservation Strategy for the Klickitat HCP Planning Unit*, DFC habitat represents a sustainable set of stand characteristics (canopy closure level, maximum tree height, etc.) that could realistically be achieved in a 60-year old stand that has been properly managed.

Direct sale: A one-time agreement that removes only small amounts of a resource such as gravel or trees (a maximum of \$25,000 in value) from state trust lands, and is not subject to public auction or advertisement.

Dispersal habitat: Habitat used by northern spotted owls when moving from one area of nesting, roosting, and foraging habitat to another, often to establish new breeding sites.

Dispersal: The movement of an animal from one sub-population to another, or movement from one area to another, often to establish a new nesting area.

E

Easement: Permission given by one person or business to another, allowing one to access their property by crossing through property owned by the other.

Ecoregion: An area with generally similar ecosystems and types, quality, and quantities of environmental resources. It is designed to provide a spatial framework for research and monitoring of ecosystems and their components.

Effectiveness monitoring: For the *State Trust Lands Habitat Conservation Plan*, a system used to determine whether or not a management plan and its specific strategies are producing the desired habitat conditions.

Endemic: A species that is a native of, prevalent in, or confined to a specific region.

Equestrian highline: A rope stretched taut between two secure uprights above the animal's head. The stretched rope has tie loops spaced for securing horses or other stock with lead ropes. Sturdy trees are used as anchors for highlines. When trees are not available, posts set in concrete may serve as uprights.

Even-aged management: A set of final harvest systems defined as a method to “regenerate a stand with a single age-class” (Society of American Foresters). For purposes of managing forested state trust lands, even-aged includes final harvest systems of clearcut, seed tree, variable retention harvest, and shelterwood.

F

Final harvest: The harvest that signifies the end of a rotation by harvesting trees within a forest management unit, in order to make room for regeneration of a new stand.

First order stream: A stream that does not have any other streams intersecting or feeding into it.

Forest certification: A confirmation process by an independent auditor that shows that a landowner manages forests by a set of standards that demonstrate environmentally responsible, socially beneficial, and economically viable practices. It is also known as “green” certification.

Forest fertilization: Ground or aerial-based fertilization of forest stands using chemical fertilizers or biosolids to enhance growth.

Forest land planning: A DNR process—focused at the scale of *State Trust Lands Habitat Conservation Plan* planning units—to integrate social-cultural, economic, and ecological issues into management strategies for forested state trust lands.

Forest management unit: A forested area with conditions that are ecologically similar enough to allow it to be managed to obtain specific objectives; it is the unit for which a silvicultural prescription is written.

Forest practice(s): Any activity conducted on or directly pertaining to forest land and relating to growing, harvesting, or processing timber or forest biomass, including but not limited to road and trail construction, harvesting (final and intermediate), pre-commercial thinning, reforestation, fertilization, prevention and suppression of diseases and insects, salvage of trees, and brush control.

Forest Practices: The administrative branch of DNR responsible for regulating forest practices activities on all state and private forest lands.

G

Grazing lease: A DNR lease agreement covering smaller areas of land (as compared to the larger rangeland of a grazing permit) which includes a resource management plan to protect natural resources. It allows grazing at any time of year as long as the plan’s guidelines are followed.

Grazing permit: A DNR agreement covering large areas that includes a resource management plan containing specific details regarding the number of animals allowed and when the animals may be on the land.

Ground herbicide: Ground-based applications of herbicides used to achieve site preparation or vegetation management objectives. Using ground herbicides allows for application in smaller work areas, thus avoiding spraying areas where herbicides are not desired (i.e., streams, wetlands, and adjacent properties).

Ground mechanical: In forestry, using mechanized equipment to achieve site preparation objectives.

H

Habitat conservation plan (HCP): A long-term management plan authorized under the Endangered Species Act to conserve threatened and endangered species across a large landscape while allowing activities to occur under specific conditions.

Hand planting: In forestry, planting seedlings of various species or species mixes.

Hand cutting: In forestry, using hand-held equipment to cut stems of existing vegetation to achieve site preparation or vegetation management objectives, such as removing invasive species.

Habitat Conservation Plan permit lands: Lands that are managed subject to the commitments in the *State Trust Lands Habitat Conservation Plan*.

Headwater stream: A small, first or second order stream that forms the beginning of a river. It is often seasonal and forms where saturated ground flow first emerges as a recognizable watercourse.

I

Implementation monitoring: A form of monitoring that determines whether or not a management plan (for example, the *State Trust Lands Habitat Conservation Plan*) or its components are implemented as written.

Inholding: A parcel of land owned by one party that is entirely surrounded by another ownership. In terms of DNR land transactions, it generally refers to private land entirely surrounded by state-owned property.

L

Landslide hazard zonation: A screening tool in which watershed-scale maps are created that show and describe all areas of potentially unstable slopes in a watershed as well as potential mitigation measures to minimize damage.

Large, structurally unique tree: A tree that is tall and/or has a large diameter and contains structural elements which are important for habitat, such as a hollow trunk, broken top, open crown, or large strong limbs.

Late rotation thinning (older stand thinning): A partial-cut timber harvest that extends the rotation age of a stand generally to more than 80 years, or achieves a visual or habitat objective that requires larger trees. Stands eligible for “late” thinning are typically 45 to 70 years old and contain diverse sizes of trees.

Leave tree: A live tree left on a timber sale after harvest, intended to provide habitat and structure in the developing stand.

LiDAR: Short for “light detection and ranging,” a remote sensing technology that uses lasers to detect distant objects and determine their position, velocity, or other characteristics by analyzing reflections. It has a wide variety of uses, including measuring tree canopy heights, making topographical maps, and mapping floodplains.

M

Marbled murrelet management area: Proposed areas managed to protect occupied sites and develop future marbled murrelet habitat in areas that are not occupied. More information on marbled murrelet habitat can be found [here](#).

N

Natural area preserve (NAP): A state-designated area that protects a high-quality, ecologically important natural feature or rare plant and animal species and their habitat. It often contains a unique feature or one that is typical of Washington State or the Pacific Northwest.

Natural regeneration: Allowing naturally produced seedlings to grow after harvest and produce a new forest without human intervention. DNR assesses success by carrying out a thorough regeneration survey of the stand.

Natural resources conservation area (NRCA): A state-designated area managed to protect an outstanding example of a native ecosystem or natural feature; habitat for endangered, threatened, or sensitive species; or a scenic landscape.

Nesting, roosting, and foraging (NRF) habitat: A forested area with the right forest structure, a large enough size, and adequate food to meet the needs of a nesting pair of northern spotted owls.

Next-best stands: Within spotted owl management units that are below the habitat threshold, next-best stands are considered non-habitat, but are predicted to attain the structural characteristics that define northern spotted owl habitat either through passive or active management relatively sooner than other non-habitat stands. Next best stands count towards the target amount of suitable habitat, but are still considered non-habitat. Remaining stands not identified as habitat or next best are available for the full range of silvicultural activities.

‘No role’ lands: A term used by DNR’s Land Transactions Program to refer to lands not designated as a nesting, roosting, and foraging, dispersal, or desired future condition management area and thus having no role in northern spotted owl management under the *State Trust Lands Habitat Conservation Plan*.

Non-commercial pit: Also called a “silvicultural pit.” A rock, sand, or gravel pit primarily used to supply materials for DNR’s silviculture-related activities, primarily building forest roads and logging landings.

O

Oil and gas lease: An agreement that allows the leaseholder to reserve the right to explore for underground oil and/or gas deposits on state trust land. Before active drilling or thumping can occur, the proposal must undergo State Environmental Policy Act review and have a plan of operations approved by DNR.

Overstory (upper canopy): The upper canopy in a multi-canopy stand.

P

Pest management: Treatments or management decisions designed to prevent pest populations from reaching levels that present an unacceptable risk of damage to forest stands.

Phased patch regeneration cut: An even-age timber harvest method using small patch cuts (1 to 5 acres) to progressively harvest and regenerate a single stand over a period of up to 15 years. Several separate patches are simultaneously harvested within a forest management unit. After an adequate green-up period (5-10 years), additional patches are harvested and the process is repeated until the forest management unit is completely harvested.

Pile and burn: A process where logging “slash” is placed in piles, generally using mechanized equipment, and the piles are burned under controlled conditions.

Planning unit: In the *State Trust Lands Habitat Conservation Plan* (HCP), a management unit based on large watersheds. The approximately 1.8 million acres managed under the HCP are divided into nine HCP planning units to allow for more efficient planning and management.

Pre-commercial thinning: Removal of less desirable trees to maintain the growth and stability of retained trees. Pre-commercial thinning is performed before the trees are large enough to be marketable. This type of thinning does not generate revenue, and cut trees are left on site to decompose.

Prospecting and mining lease: An exploration agreement that allows the holder to search for mineral deposits on state lands; if the leaseholder wants to begin active mining operations (extraction and removal of valuable materials) that could alter habitat, they must convert the lease to a contract which includes a plan of operations and undergoes State Environmental Policy Act review.

Q

Quadratic mean diameter (QMD): The measure of average tree diameter, conventionally used in forestry. The QMD is the diameter of a tree with average stand basal area.

R

Radio telemetry: A tracking system in which wildlife are outfitted with collars that transmit individual signals that can be monitored to track their movement.

Rain-on-snow zone: Generally, an elevation band in which it is common for snow pack to be partially or completely melted during rainstorms several times during the winter.

Relative density (RD): A mathematically derived parameter that indicates the level of intra-stand competition between trees, and consequently, a theoretical optimal range for thinning. RD guidelines for thinning vary by species and sometimes other factors, such as climatic zones. A commonly used version of RD is formally known as Curtis’ RD after Bob Curtis, a United States Forest Service biometrician who developed the measure.

Reclassified habitat: Two classes of marbled murrelet habitat, identified based on a predictive model:

1. Marginal habitat: those lands expected to contain a maximum of five percent of the occupied sites on state trust lands within each *State Trust Lands Habitat Conservation Plan* (HCP) planning unit. These areas were made available for harvest. All known occupied sites were deferred from harvest, and were not included in this habitat designation.
2. Higher-quality habitat: in contrast to marginal habitat, this is defined as those lands expected to contain at least 95% of the occupied sites on state trust lands within each HCP planning unit. This habitat is frequently referred to simply as “reclassified habitat.”

Recreation plan: A DNR document for a forest block or landscape outlining what types of recreation are appropriate in what portions of that block or landscape, as well as what facilities are needed. It includes broad management guidelines and a plan to implement them.

Regeneration: The act of renewing or re-establishing tree cover in a forest by establishing young trees through natural seeding or planting sites, usually those sites that were harvested or burned in a wildfire.

Repositioning: A land transaction process in which DNR exchanges, sells, or transfers state trust land, using the proceeds to acquire more suitable property for the affected trust(s). Repositioning occurs on lands that do not fit with management strategies or that are not appropriate for long-term revenue production for the trusts.

Riparian desired future condition: In the Riparian Forest Management Strategy, the riparian desired future condition refers to six measureable target stand conditions that are intended to eventually develop into the Fully Functional stand development stage.

Riparian management zone: A buffer of trees and shrubs applied along a stream to protect the stream and habitat for salmon and other species.

Road abandonment: The permanent closure of forest roads in compliance with DNR guidelines and state forest practices standards. Abandonment work includes placing road barriers to prevent vehicle traffic, removing all culverts and bridges, and vegetating exposed soils to prevent erosion and sediment delivery to surface waters. In some circumstances the road prism is rehabilitated to resemble the conditions that existed prior to road building. Abandoned roads are exempt from further maintenance.

Road construction: The building of new roads in compliance with DNR policy and state forest practices standards.

Road maintenance and abandonment plan (RMAP): A plan that covers all forest roads on a landowner’s property constructed or used for forest practices after 1974. It is based on a complete inventory that also shows streams and wetlands adjacent to or crossed by roads. The plan lays out a strategy for maintaining existing roads to meet state standards and shows areas of planned or potential road abandonment.

Road reconstruction: A process of bringing existing roads back to drivable conditions in compliance with DNR policy and state forest practices standards.

Rotation: The length of time between when a stand of trees is planted or naturally regenerates and when a “final harvest” occurs.

S

Salvage cut: A type of timber harvest used to log trees that are dead, dying, or deteriorating due to fire, insect damage, wind, disease, or injuries.

Seed tree intermediate cut: The first timber harvest in a series conducted as part of the even-aged seed tree silvicultural harvest system. The purpose is to provide a desirable seed source to establish seedlings. Typically, about 10 trees per acre may be left following this harvest; once the new trees are established, some of these seed trees may be harvested.

Selective product logging (selective cutting): A timber harvest that removes only specific species from certain size classes which are highly valuable, for example trees that function well as poles or logs for cabins.

Seral: Relating to the stages of an ecological sere.

Sere: The sequential stages in forest succession; the gradual replacement of one community of plants by another.

Shelterwood intermediate cut: The first harvest in a series of harvests conducted as part of the even-age shelterwood harvest system. The purpose of this harvest is to provide shelter (typically shade) and possibly a seed source for the seedlings that are regenerating in the stand. Compared to a seed tree intermediate cut, a shelterwood typically retains more trees per acre following harvest; retained trees are generally dispersed across the stand.

Shelterwood removal cut: The second or final harvest in a series of harvests conducted as part of the even-aged shelterwood harvest system. The purpose is to remove overstory trees that create shade levels that are too high to allow the new understory to thrive.

Shielding or fencing: Using a physical barrier to prevent animals from entering an area and damaging trees or other resources.

Silvicultural pit: Also called a non-commercial pit. A rock, sand, or gravel pit primarily used for construction of DNR forest roads and timber sale landings. DNR sometimes sells valuable materials (rock, sand or gravel) from silvicultural pits through a one-time direct sale (a sale with a value of no more than \$25,000). Silvicultural pits are distinct from commercial pits, from which DNR sells rock, sand or gravel through direct sales or longer-term leases.

Silvicultural regime: The specific sequence of activities defined in a silvicultural prescription.

Silviculture: The art and science of managing or cultivating trees and forests to achieve particular goals and objectives.

Site preparation: Activities performed to increase the probability of successful regeneration in a harvested unit by reducing slash and/or undesirable plants that would compete with seedlings for nutrients, water, and light. Site preparation may be performed concurrently with logging (by, for example, pulling up and disposing of brush clumps or it may be performed through piling and burning logging slash; through broadcast- or under-burning logging slash; by manually cutting undesirable vegetation; by applying herbicide (aerial or ground) to undesirable tree and brush species prior to planting; or by other methods or combinations of methods.

Slash: The residue (for example, tree tops and branches) that is left on the ground after logging or accumulates from a storm, fire, girdling, or delimiting.

Smallwood thinning: A partial-cut timber harvest in young stands (typically less than 40 years of age). Smallwood thinning maintains or enhances the stand's growth potential and improves the quality of the remaining trees.

Special forest products: Items that can be harvested from forests but do not fall in traditional timber or fiber categories, such as Christmas trees and boughs, medicinal plants, and floral greens.

Special use lease: A DNR lease for state trust lands that is issued for one of a wide variety of commercial or other uses, often best described as "miscellaneous" uses (for example, golf courses, paragliding landing sites, and public use facilities).

Stand: A group of trees that is similar enough in composition, structure, age, spatial arrangement, or condition to distinguish it from adjacent groups of trees.

Stand development stage: A developmental phase of a forest, defined using a classification system based on the structural conditions and developmental processes occurring within a forest stand.

State Environmental Policy Act (SEPA): A state law that provides a process for reviewing proposals that require permits or other forms of agency approval. It requires government agencies to consider the potential environmental consequences of their actions and incorporate environmental values into their decision-making processes. It also involves the public and provides the agency decision-maker with supplemental authority to mitigate identified impacts.

State Forest Transfer (State Forest Trust Replacement): A program in which State Forest Trust (formerly known as Forest Board) lands in timber-dependent counties are transferred from trust status to natural resources conservation areas. The state legislature provides funds to pay for the land and timber on certain properties considered not harvestable due to the presence of federally listed endangered species. The timber value is distributed to the counties as revenue, and the land value is placed in an account for purchasing replacement property for the State Forest Trust.

State trust lands: DNR-managed lands held as a fiduciary (financial) trust and managed to benefit specific trust beneficiaries (public K-12 schools and universities, capitol buildings, counties, and local services such as libraries).

T

Take: As used in the Endangered Species Act, refers to harming, hunting, wounding, collecting, capturing, or killing an endangered or threatened species or disturbing habitat in a way that disrupts a species' normal behavior.

Temporary retention first cut: This is a partial-cut timber harvest in which selected overstory trees are left for a portion of the next rotation. The purpose of this harvest method is to retain overstory trees without diminishing establishment of a new stand. If these overstory trees are left through the entire rotation, the result may be a two-aged stand.

Thumping: The measurement of seismological tremors caused by dropping large weights or by detonating explosives, used when exploring for oil or gas deposits.

Trust land transfer program: A program in which Common School state trust land is transferred from DNR to another public agency or conservation program. The state legislature provides the value of the timber (which is not cut) to the Common School Construction account to build K-12 public schools. The value of the land is placed in an account used to purchase replacement property for the school trust. Land can be transferred to the State Parks and Recreation Commission; Washington Department of Fish and Wildlife; a county or city government; or DNR's Natural Areas Program.

Trust: A legal term for a relationship in which one person, company, or entity (the trustee) holds title to a property and/or manages it for the benefit of another person, company or entity (the beneficiary).

Type II thinning: A commercial thinning that increases stand stability and diameter growth, protects existing legacy structures, maintains species diversity, and provides large woody and down woody debris to system.

U

Uneven-aged management: Removal of trees from a multi-aged forest stand while maintaining multiple age classes within that stand. Uneven-aged management is often used on sites with poor soils on which more intensive management is not cost effective. This type of management also may be used in fire-prone areas to mimic the effects of periodic, lower-intensity fires that do not remove all of the trees.

V

Validation monitoring: For the *State Trust Lands Habitat Conservation Plan*, a data-collection system that determines whether or not certain species respond as expected to habitat conditions created by following a management plan and its strategies.

Variable density thinning: Thinning to create a mosaic of different stand densities, with canopy openings generally between 0.25 and 1 acre that capitalizes on landforms and stand features. DNR uses variable density thinning to encourage development of structural diversity in areas where spotted owl habitat is needed or to meet other objectives. Diversity is created by thinning to different residual tree densities, retaining large trees, and, in some cases, adding down woody debris and snags.

Variable retention harvest: An approach to harvesting based on the retention of structural elements or biological legacies (trees, snags, logs, etc.) from the harvested stand for integration into the new stand to achieve various ecological objectives. The following threshold targets apply under the *State Trust Lands Habitat Conservation Plan*:

- Retention of at least 8 trees per acre. Of these:
 - At least 2 per acre are suitable for wildlife, and are from the largest size class,
 - At least 3 per acre are snag recruits, and
 - At least 3 per acre are snags, provided that safety requirements are met; if snags are not available, then 3 live trees will be retained.
- There are at least 2 down logs per acre of largest size class (but at least 12" on small end by 20' long).

Vegetation management: Using hand-cutting, herbicide, mechanical, or other means to remove undesirable competing vegetation in a stand after planting but before seedlings become fully established.

Vegetation series: A conceptual grouping of related plant associations that have, in the absence of disturbance, the same predicted, dominant conifer species, also known as potential vegetation. In practice, vegetation series represents a way to stratify growing sites by ecological characteristics that determine the bounds of tree species occurrence, growth rates, management potential, and vulnerabilities to climate change and other risk factors.

W

Washington Administrative Code (WAC): Administrative regulations, or rules, adopted by state agencies to enact legislation and [Revised Codes of Washington \(RCWs\)](#).

Windthrow (blowdown): A tree that has been knocked over or had its top blown out by wind.

Appendix B

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Appendix C

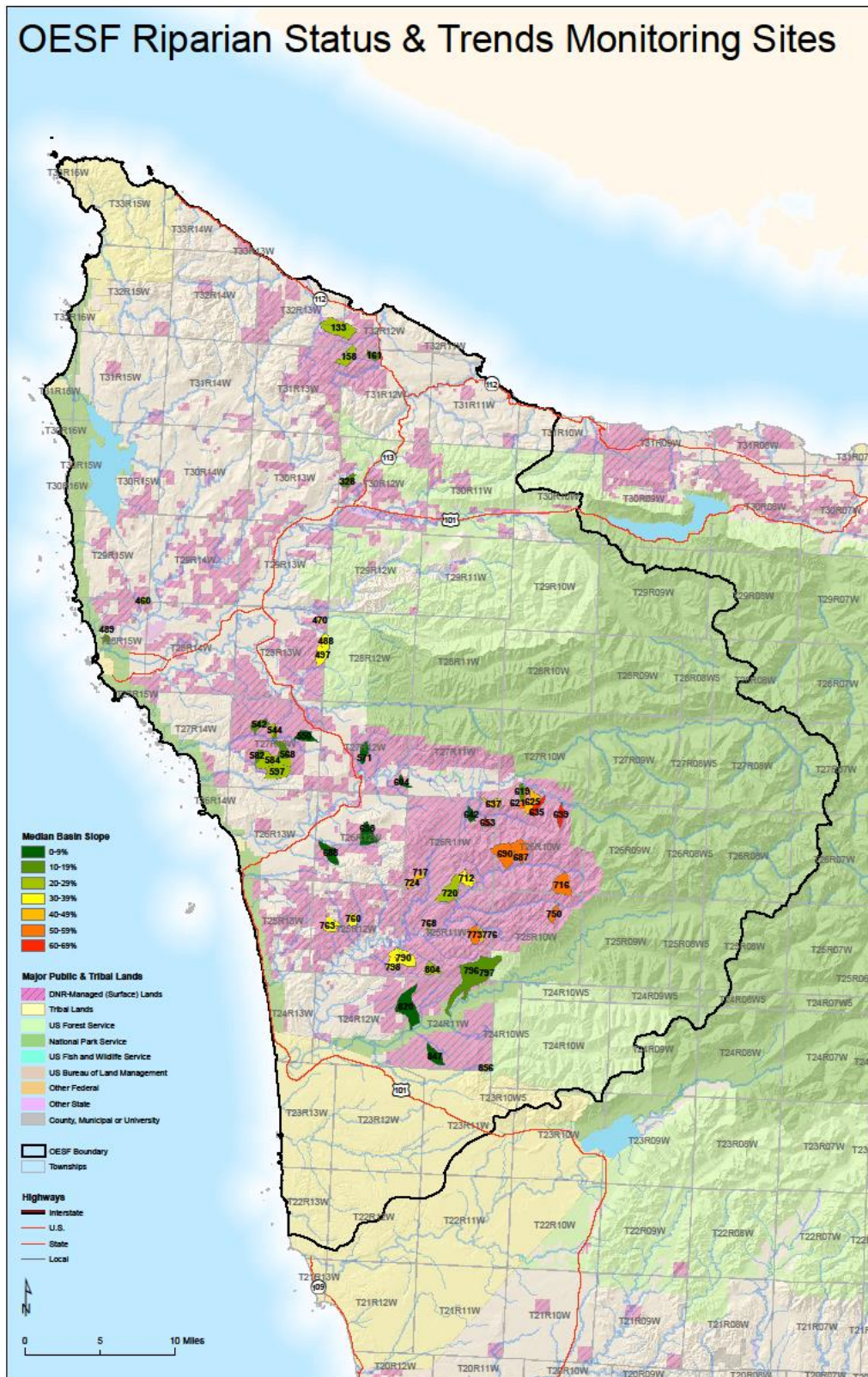
Map

This appendix contains a map of riparian status and trends monitoring sites



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Map C-1. OESF Riparian Status & Trends Monitoring Sites



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