FINAL Meeting Notes
Lewis River License Implementation
Terrestrial Coordination Committee (TCC) Meeting
October 10, 2007
Conference Call

TCC Participants Present: (11)

Brock Applegate, WDFW
John Clapp, Citizens At-Large (9:15am – 9:40am)
Kendel Emmerson, PacifiCorp Energy
Diana Gritten-MacDonald, Cowlitz PUD
Eric Holman, WDFW
Mike Iyall, Cowlitz Indian Tribe
Lou Ellyn Jones, USFWS
Kimberly McCune, PacifiCorp Energy
Kirk Naylor, PacifiCorp Energy
Bob Nelson, RMEF
Todd Olson, PacifiCorp Energy

Calendar:

November 8, 2007	ACC Meeting	Merwin Hydro Facility
November 14, 2007	TCC Meeting	Cowlitz PUD

Assignments from October 10th Meeting:	**Status**
Emmerson: Revise the Classification of Vegetation Cover Types as Suitable Northern Spotted Owl Habitat - Lewis River Wildlife Habitat Management Area Memorandum and redistribute to the TCC as the final approved version.	**Complete – 10/10/07**
Emmerson: Revise Mink Habitat Suitability Index Memorandum and redistribute to the TCC as the final approved version.	**Complete – 10/10/07**

Assignments from September 12th Meeting:	**Status**
Naylor/Emmerson: Incorporate the following text into the Forest Management chapter of the WHMP, "*Prior to any harvest, the areas will be evaluated (ground truth) to determine whether or not the area qualifies as NSO habitat.*"	**In process**
McCune: Email Attachment C, Management Alternatives relating to HEP assumptions to the TCC for their review.	**Complete – 9/14/07**
Emmerson: Revise the NSO memorandum, distribute to the TCC and request final approval at the October 10, 2007 TCC meeting.	**Complete – 9/20/07**

Parking lot items from February 10th Meeting:	**Status**
PacifiCorp Wildlife Habitat Management Plan (WHMP) Budget (annual)	
Conservation Agreement – what is wanted?	**Ongoing – 4/28/06**

Review of Agenda

Kirk Naylor (PacifiCorp Energy) called the meeting to order at 9:00am. Naylor conducted a review of the agenda for the day and requested if the TCC had any additions to the agenda.

Diana Gritten-MacDonald (Cowlitz PUD) requested one addition to the agenda relating to the Dry Creek culvert repair.

Finalize Meeting Notes

Naylor reviewed the TCC Draft 9/12/07 meeting notes with the TCC attendees, updated the assignment portion and asked for any comments and/or additional changes. No additional changes were requested. The meeting notes were approved at 9:05am.

Lands Update Discussion

Naylor provided an update relating to interests in certain lands, however, this discussion is considered confidential and proprietary and not for public viewing.

Dry Creek Culvert Repair

Gritten-MacDonald informed the TCC attendees that the Dry Creek culvert immediately upstream of State Hwy 503 Spur is failing. The PUD is responding to the need by submitting a hydraulic permit for repair of the culvert. There are many concerns to be addressed such as the trees which have fallen into the creek, log jams, potential loss of the road and erosion which has caused bank failure on both sides of the culvert. The repair of placing steel plates on the culvert floor is considered a temporary fix; however, the goal of the PUD is to remove the culvert the summer of 2008.

Gritten-MacDonald wanted to inform the TCC attendees of this activity so they are well informed.

Mink Memorandum, Corrections for Mink Habitat Suitability Index Approval

Kendel Emmerson (PacifiCorp Energy) provided a memorandum dated September 25, 2007 for TCC review and approval titled, *Corrected Mink Habitat Suitability Index and Suitability Index Data and Mink Riparian Habitat Evaluation Procedures*, dated September 25, 2007 (Attachment A) for TCC approval.

General discussion took place to clarify the Riverine Unconsolidated Bottom (RUB) on WHMP lands, the habitat suitability index and suitability index values, habitat evaluation procedures, vegetation cover types adjacent to the riparian and restricting evaluation to WHMP lands.

The TCC attendees agreed to remove the word "original" from the last sentence of the Habitat Suitability Index and Suitability Index Values section and reformat Table 1.

Brock Applegate (WDFW) requested additional clarification of certain numbers in Table 1 so he will contact Emmerson to arrange a time to discuss in more detail.

Applegate continued that although he did not oppose the direction of the memo, he thought some inconsistencies existed between the memo and the Mink HSI model and the past SI data collection. He said that the Mink HSI model had no model (formula) for riparian habitats, specifically. For the Riverine (wetland) model, the model had less of a dependence on cover types and more of a dependence on the suitability of the abundance of woody vegetation within 100m of the water's edge, no matter what cover type. We could end up with several cover types within 100m of the water's edge. The cover types within the 100m may not be riparian. Applegate wondered how you could use this measurement across several cover types for the HSI calculations that apply to only one cover type at a time.

The proposed Mink Model SI data collection PacifiCorp also proposed to stay exclusively on WHMP lands. Applegate explained that the HEP calculation needed not to exclude all other areas within the original HEP boundary. PacifiCorp, although not required, should not reduce their SI data collection to WHMP lands until the TCC runs the HEP in Year 17, after the completion of purchase of all the WHMP lands. Before that time, we can collect SI data within the HEP boundary to create a HSI value for use in Year 17. In the past, we have collected the original baseline SI values data, outside the WHMP lands, but within the HEP boundary.

Emmerson will revise the Mink Habitat Suitability Index Memorandum and redistribute to the TCC as the final approved version.

Definition of Vegetation Cover types as NSO Suitable Habitat – Request for approval

Emmerson provided a memorandum dated September 25, 2007 for TCC review and approval titled, "*Classification of Vegetation Cover Types as Suitable Northern Spotted Owl Habitat - Lewis River Wildlife Habitat Management Area*" (Attachment B).

General discussion took place regarding roosting and foraging habitat, critical nesting period, USFWS BiOp vs. the content of the memorandum, and habitat structure removal.

The TCC attendees agreed to modify the last sentence of the first paragraph on page 1 to include Washington Forest Practices Act as a guide in determining suitable NSO habitat:

In general, mature forests provide the structure and characteristics required for suitable northern spotted owl (NSO) habitat. Because the specific age-class, species of trees, structure, area, and food sources vary throughout the range of the species, the suitable habitat specifications for the Lewis River Wildlife Habitat Management Area will be defined by the Terrestrial Coordinating Committee (TCC) and the utilities using definitions from Gifford Pinchot National Forest and in compliance with the State of Washington Forest Practices Act.

Upon review and further discussion, the TCC attendees agreed to remove the requested edits on pages 5 & 6 as submitted by WDFW on October 9, 2007. Those edits included:

- Within Suitable Nesting Habitat and any non-suitable nesting habitat in the LOP buffer, WDFW recommends avoiding management activities that causes disturbance during the critical nesting period [March 1 to July 15], to better protect spotted owls. Forest Practices Act considers all suitable spotted owl habitat structures within Spotted Owl Special Emphasis Areas as Critical Habitat (State) and describes the process for applying management actions.
- WDFW recommends no habitat structure removal during the April 1- August 15 migratory bird breeding season to protect birds and their nests.

Emmerson will revise the Classification of Vegetation Cover Types as Suitable Northern Spotted Owl Habitat - Lewis River Wildlife Habitat Management Area Memorandum and redistribute to the TCC as the final approved version.

New Topics/Issues

Todd Olson, PacifiCorp Energy informed the TCC attendees that they are welcome to dial in on the ACC meeting on 10/11/07 to participate in the following update from Skamania County:

10:30 a.m.	Skamania County – Commissioner Paul Pearce ➢ Discussion and update of the Swift Area Plan

Olson communicated to the TCC attendees that PacifiCorp has posted the Shoreline Management Plan (SMP) FERC boundary maps on the Lewis River website for public viewing. PacifiCorp is also working internally with the SMP consultants to create the allowable uses, categories and defining the categories for the shoreline. PacifiCorp will provide a draft version of the categories and allowable uses to the ACC and TCC for their review prior to release to the public.

In addition, Olson informed the TCC attendees that they are invited to attend the *Lewis River Public Meeting - Implementation of Settlement Agreement,* which will take place at the Lewis River Golf Course on Wednesday, October 17, 2007 at 7:00pm.

Next Meeting's Agenda

- Lands Update Discussion
- Public Meeting Update
- Review of WHMP Chapters

Meeting adjourned at 10:15am.

Next Scheduled Meetings

November 14, 2007	**December 12, 2007**
Cowlitz PUD	Merwin Hydro Facility
Longview, WA	Ariel, WA
9:00am – 3:00pm	9:00am – 3:00pm

Handouts

1. Agenda
2. Draft meeting notes from 9/12/07
3. Corrected Mink Habitat Suitability Index and Suitability Index Data and Mink Riparian Habitat Evaluation Procedures, dated September 25, 2007, Attachment A
4. Classification of Vegetation Cover Types as Suitable Northern Spotted Owl Habitat - Lewis River Wildlife Habitat Management Area, dated September 25, 2007, Attachment B

PACIFICORP ENERGY
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MEMORANDUM

DATE: September 25, 2007

TO: Terrestrial Coordination Committee

FROM: Kendel Emmerson

SUBJECT: Corrected Mink Habitat Suitability Index and Suitability Index Data and Mink Riparian Habitat Evaluation Procedures

The purpose of this memo is to provide corrections to the mink habitat suitability index (HSI) and suitability index (SI) values reported in the Habitat Evaluation Procedure (HEP) Study Table 5.2-6 (PacifiCorp and Cowlitz PUD 2004) and is to provide methods for assessing the mink HSI values for riparian vegetation cover types on Lewis River Wildlife Habitat Management Plan lands (WHMP lands).

Habitat Evaluation Procedures (HEP) is the standardized and collaborative process that was used to assess baseline wildlife habitat conditions on WHMP lands and to provide a framework for habitat management planning, implementation, and effectiveness monitoring. The Settlement Agreement (SA) Section 10.8.4.2 directs PacifiCorp and Cowlitz PUD to repeat the HEP for all WHMP lands in year 17 of the license using the same sampling density and methods as the original HEP to measure any changes in habitat (PacifiCorp et al. 2004). If the original HEP predictions are not met, the Lewis River Wildlife Habitat Management Plan (WHMP) will be modified to meet the habitat goals and objectives (PacifiCorp and Cowlitz PUD 2006).

To complete the HEP process, habitat suitability index (HSI) models developed by the United States Fish and Wildlife and Washington Department of Fish and Wildlife were used to estimate habitat quality for selected species. These models determine the HSI for each species by mathematically combining the quality of each habitat variable (suitability index [SI]) measured in the field.

Minks are associated with aquatic habitats; therefore the HSI model was applied to the Palustrine Forested (PFO), Palustrine Scrub-Shrub (PSS), Palustrine Emergent (PEM), Lacustrine Unconsolidated Bottom (LUB), and Riverine Unconsolidated Bottom (RUB) vegetation cover types. The palustrine wetland vegetation cover types (PEM, PFO, and PSS) are somewhat common on WHMP lands and were evaluated in each of the HEP analysis areas, except for PEM vegetation cover type which isn't on Eagle Island (PacifiCorp and Cowlitz PUD 2004 Table 5.2-3). The LUB cover type was evaluated at all three reservoirs, but only the shoreline surrounding Merwin Reservoir is considered to be LUB mink habitat. This is because Yale and Swift reservoirs water levels fluctuate too much to be suitable mink habitat (PacifiCorp and Cowlitz

County 2004 Table 5.2-2). The RUB habitat is limited on WHMP lands and was only evaluated in a few HEP Analysis Areas: Eagle Island, Merwin, and Swift Canal. The Swift Canal is not considered suitable mink habitat, therefore the only RUB habitat on WHMP lands is the area below Merwin Dam (PacifiCorp and Cowlitz County 2004 Appendix 1-3 November 22, 1999 Lewis River HEP Team Meeting Notes).

Habitat Suitability Index and Suitability Index Values

In PacifiCorp's development of the WHMP, it was discovered that Table 5.2-6 in the Lewis River Hydroelectric Projects Technical Report 5.2 TER 2 HEP Study (Report 5.2) incorrectly reported tree cover and tree/shrub cover <100m SI values, and omitted the emergent vegetation cover SI values (PacifiCorp and Cowlitz PUD 2004). This resulted in significant changes in the overall HSI values for PFO, PSS, and PEM vegetation cover types. In addition, the SI values for LUB and RUB vegetation cover types were not reported. Table 1 below compares the reported values in Report 5.2 Table 5.2-6 to the corrected values. Because the original HSI values reported in Report 5.2 will be used to determine the changes in habitat in year l7 of the license, the corrected values reported in the Table 1 below should be used as the mink HSI and SI values.

Mink Riparian Habitat Evaluation Procedures

The Lewis River Wildlife Habitat Management Plan Standards and Guidelines designate the mink as a HEP evaluation species for Riparian Habitat (PacifiCorp and Cowlitz PUD 2006). The mink HSI values were not assessed at streams during the original HEP study, so there is no baseline mink HSI data for the riparian vegetation cover types: (riparian deciduous [RD], riparian mixed [RM], riparian deciduous shrubland [RS], riparian grassland [RG], and young riparian mixed [YRM]).

To determine baseline information for riparian vegetation cover types, the mink HSI model will be applied to perennial fish bearing streams on WHMP lands (Allen 1986). The HSI values will only be assessed at perennial fish bearing streams that extend greater than 100 m (328 ft) onto WHMP lands. This is to avoid assessing streams that are only fish bearing at the mouth of the stream or that have such a small portion on WHMP lands that mink habitat management would have little benefit to the species habitat. Table 2 identifies all of the perennial fish bearing streams on WHMP lands that the HSI model would apply too. Only five streams are less than 100 m (328 ft) onto WHMP lands, which would remove a total of 301 m (988 ft) from the HEP study.

The streams will be assessed using the assumptions, equations, and SI values that apply to riverine cover type (i.e. percent of year with surface water present, percent shoreline cover within 1 m [3 ft] of water's edge, and percent canopy cover of trees and shrubs within 100 m [328 ft] of the stream's edge) in the mink HSI model (Allen 1986 [Figure 6]). The Settlement Agreement Section 10.8.4.1 directs PacifiCorp to determine HSI values for newly acquired lands whose habitats are new or different from other WHMP lands (PacifiCorp et al. 2004). The mink HSI model will be applied to existing WHMP lands at the same time the HEP study is conducted on newly acquired lands.

Table 1. Mink HSI and SI Values Reported Versus Corrected

Cover Type	Values		Eagle Island		Merwin		Yale		Swift		Swift Canal	
			Mean	C. I	Mean	C. I	Mean	C. I	Mean	C. I	Mean	C. I
Palustrine Emergent (PEM)	Mink HSI	Reported Value	--	--	0.66	--	0.69	0.65-0.70	0.63	--	0.45	--
		Correct Value	--	--	0.96	--	0.96	0.95-0.97	0.98	--	0.69	--
	Mink Shrub Cover (v3)	Reported Value	--	--	0.10	--	0.25	0.05-0.45	0.24	--	0.11	--
		Correct Value	--	--	0.10	--	0.25	0.05-0.46	0.24	--	0.11	
	Mink Emergent Vegetation (v4)	Reported Value	--	--	1.00	--	1.00	1.00-1.00	1.00	--	0.71	--
		Correct Value	--	--	1.00	--	1.00	--	1.00	--	0.71	--
	Mink Tree Cover (v2)	Reported Value	--	--	0.13	--	0.42	0.00-0.97	0.30	--	0.12	--
		Correct Value	--	--	0.14	--	0.40	0.00-0.97	0.27	--	0.10	--
	Mink Tree/Shrub Cover < 100m (v5)	Reported Value	--	--	0.63	--	0.63	--	0.70	--	0.50	--
		Correct Value	--	--	0.80	--	0.80	--	0.90	--	0.63	--
Palustrine Forested (PFO)	Mink HSI	Reported Value	0.47	--	0.51	0.43-0.58	0.46	0.43-0.49	0.52	--	0.38	--
		Correct Value	0.95	--	0.90	--	0.90	--	0.94	--	0.81	--
	Mink Shrub Cover (v3)	Reported Value	0.23	--	0.38	0.24-0.53	0.32	0.26-0.37	0.36	--	0.27	--
		Correct Value	0.23	--	0.38	0.24-0.53	0.35	0.26-0.37	0.35	--	0.27	--
	Mink Tree Cover (v2)	Reported Value	1.00	--	0.75	0.49-1.00	0.78	0.62-0.93	0.81	--	0.84	--
		Correct Value	1.00	--	0.80	0.52-1.00	0.85	0.73-0.97	0.76	--	0.87	--
	Mink Tree/Shrub Cover < 100m (v5)	Reported Value	0.70	--	0.63	0.63-0.63	0.63	--	0.70	--	0.50	--
		Correct Value	0.91	--	0.80	--	0.80	--	0.90	--	0.63	
	Mink Emergent Vegetation (v4)	Reported Value	None	None	None	None	None	None	None	None	None	None
		Correct Value	0.80	--	0.68	0.35-1.00	0.76	0.57-0.94	0.60	--	0.58	--

Table 1. Mink HSI and SI Values Reported Versus Corrected (Continued)

Cover Type	Values		Eagle Island		Merwin		Yale		Swift		Swift Canal	
			Mean	C. I	Mean	C. I	Mean	C. I	Mean	C. I	Mean	C. I
Palustrine Scrub Shrub (PSS)	Mink HSI	Reported Value	0.40	--	0.36	--	0.36	--	0.40	--	0.30	--
		Correct Value	0.95	--	0.90	--	0.90	--	0.95	--	0.81	--
	Mink Shrub Cover (v3)	Reported Value	0.40	--	0.76	--	0.53	--	0.91	--	0.63	--
		Correct Value	0.40	--	0.76	--	0.53	--	0.91	--	0.63	--
	Mink Tree Cover (v2)	Reported Value	0.50	--	0.71	--	0.32	--	0.71	--	0.50	--
		Correct Value	0.10	--	0.10	--	0.10	--	0.10	--	0.10	--
	Mink Tree/Shrub Cover < 100m (v5)	Reported Value	0.70	--	0.63	--	0.63	--	0.70	--	0.50	--
		Correct Value	0.91	--	0.80	--	0.80	--	0.90	--	0.63	--
	Mink Emergent Vegetation (v4)	Reported Value	None	None	None	None	None	None	None	None	None	None
		Correct Value	1.00	--	1.00	--	0.97	--	1.00	--	0.51	--
Lacustrine Unconsolidated Bottom (LUB)	Mink HSI	Reported Value	--	--	0.36	--	--	--	--	--	--	--
		Correct Value	--	--	0.45	--	0.46	--	0.47	--	--	--
	Mink Tree/Shrub Cover < 100m (v5)	Reported Value	None	None	None	None	None	None	None	None	None	None
		Correct Value	--	--	1.0	--	1.0	--	1.0	--	--	--
	Mink Shoreline (v6)	Reported Value	None	None	None	None	None	None	None	None	None	None
		Correct Value	--	--	0.20	--	0.21	--	0.22	--	--	--
Riverine Unconsolidated Bottom (RUB)	Mink HSI	Reported Value	--	--	0.63	--	--	--	--	--	--	--
		Correct Value	0.69	--	0.47	--	--	--	--	--	0.65	--
	Mink Tree/Shrub Cover < 100m (v5)	Reported Value	None	None	None	None	None	None	None	None	None	None
		Correct Value	0.81	--	0.58	--	--	--	--	--	0.58	--
	Mink Shoreline (v6)	Reported Value	None	None	None	None	None	None	None	None	None	None
		Correct Value	0.59	--	0.38	--	--	--	--	--	0.75	--

Table 2. Perennial Fish Bearing Streams on WHMP Lands			
Stream Identification	**WHMP Land Management Unit(s)**	**Total Length (meters [feet]) on WHMP lands**	**Apply HSI model**
Marble Creek	1 and 2	124 (406)	Yes
Cape Horn Creek	2	208 (684)	Yes
Unnamed Stream	2	405 (1329)	Yes
Unnamed Stream	2	303 (993)	Yes
Day Creek	3	625 (2050)	Yes
Indian George Creek	3	655 (2149)	Yes
Jim Creek	3	556 (1823)	Yes
Unnamed Stream	3	186 (610)	Yes
Unnamed Stream	4	76 (249)	No
Rock Creek	6	362 (1188)	Yes
Brooks Creek	7	75 (246)	No
Speelyai Creek	7	443 (1452)	Yes
Unnamed Stream	7	396 (1300)	Yes
Cresap Creek	8	509 (1671)	Yes
Unnamed Stream	8	140 (460)	Yes
Frasier Creek	9 and 10	1819 (5967)	Yes
Unnamed Stream	12	541 (1776)	Yes
Unnamed Stream	13	61 (201)	No
Buncombe Hollow Creek	15	503 (1650)	Yes
Speelyai Canal	17	1097 (3598)	Yes
Speelyai Creek	17	188 (618)	Yes
Speelyai Creek	17	1070 (3511)	Yes
Unnamed Stream	18	504 (1652)	Yes
Dog Creek	18 and 19	226 (740)	Yes
Cougar Creek	20	2355 (7726)	Yes
Panamaker Creek	20	4365 (14323)	Yes
Lost Creek	21	220 (723)	Yes
Unnamed Stream	22	499 (1636)	Yes
Unnamed Stream	22	265 (869)	Yes
Unnamed Stream	22	280 (920)	Yes
Unnamed Stream	22	62 (204)	No
Unnamed Stream	23	173 (569)	Yes
Unnamed Stream	25	377 (1238)	Yes

Table 2. Perennial Fish Bearing Streams on WHMP Lands (continued)			
Stream Identification	**WHMP Land Management Unit(s)**	**Total Length (meters [feet]) on WHMP lands**	**Apply HSI model**
Unnamed Stream	25	300 (984)	Yes
Unnamed Stream	29	431 (1414)	Yes
Unnamed Stream	31	27 (90)	No
Unnamed Stream	31	36 (118)	Yes
Total		**20, 462 (67, 136)**	

References

Allen, A.W. 1986. Habitat suitability index models: mink, revised. U.S.Fish Wildl. Serv. Biol. Rep. 82 (10.127). 23 PP. [First printed as: FWS/OBS-82/10.61, October 1983.]

PacifiCorp and Cowlitz PUD. 2004. Lewis River Hydroelectric Projects Technical Report 5.2 TER 2 Habitat Evaluation Procedures (HEP) Study. FERC Project Nos. 935, 2071, 2111, and 2213

PacifiCorp and Cowlitz PUD 2006. Lewis River Wildlife Habitat Management Plan Standards and Guidelines Document Version 4/28/06 – 06/14/06. Seattle, Washington. 67 pp.

PacifiCorp, Public Utility District No. 1 of Cowlitz County, National Marine Fisheries Service, National Park Service, Bureau of Land Management, U.S. Fish and Wildlife Service, USDA Forest Service, Confederated Tribes and Bands of the Yakama Nation, Washington Department of Fish and Wildlife, Washington Interagency Committee for Outdoor Recreation, Cowlitz County, Cowlitz-Skamania Fire District No. 7, North Country Emergency Medical Service, City of Woodland, Woodland Chamber of Commerce, Lewis River Community Council, Lewis River Citizens At-Large, American Rivers, Fish First, Rocky Mountain Elk Foundation, Trout Unlimited, and the Native Fish Society. 2004. Settlement Agreement Concerning the Relicensing of the Lewis River Hydroelectric Projects, FERC Project Nos. 935, 2071, 2111, and 2213, Cowlitz, Clark, and Skamania Counties, Washington. November 30, 2004.

PACIFICORP ENERGY
A MIDAMERICAN ENERGY HOLDINGS COMPANY

MEMORANDUM

DATE: September 25, 2007

TO: Terrestrial Coordination Committee

FROM: Kendel Emmerson

SUBJECT: Classification of Vegetation Cover Types as Suitable Northern Spotted Owl Habitat - Lewis River Wildlife Habitat Management Area

Suitable habitat for northern spotted owls is described as an "area of forest vegetation with the age-class, species of trees, structure, sufficient area, and adequate food source to meet some or all of the life needs [i.e., nesting, roosting, and foraging] of the spotted owl" (U.S. Fish and Wildlife Service 2007). In general, mature forests provide the structure and characteristics required for suitable northern spotted owl (NSO) habitat. Because the specific age-class, species of trees, structure, area, and food sources vary throughout the range of the species, suitable habitat specifications are generally developed by the local agencies and landowners as necessary.

Lewis River Wildlife Habitat Management Plan (WHMP) vegetation cover types were not developed in recognition of existing agencies definitions for suitable NSO habitat. Specifically, the cover type definitions did not specify the number of trees per acre, tree height, and understory layers that make definitions directly convertible. This has lead to confusion as to what vegetation cover types meet suitable NSO habitat. The Terrestrial Coordinating Committee (TCC) seeks to clarify and document which of the vegetation cover types meet suitable NSO habitat based on existing agency definitions.

This memo identifies the vegetation cover types that are considered to be suitable NSO habitat and further classifies cover types into nesting, roosting, foraging, and dispersal habitat. Both the Washington Department of Natural Resources (DNR) Forest Practice Act and the U.S.F.S. Gifford Pinchot National Forest suitable NSO habitat definitions have been used in determining which vegetation cover types meet suitable NSO habitat specifications. The goal of this classification is to provide a broad scale perspective and overall quantification of NSO habitat on WHMP lands. However prior to conducting habitat modifying activities, the proposed project areas will be field verified to confirm whether or not it is NSO habitat and to determine the overall habitat condition.

Vegetation Cover Type

In 2000 and 2001 all WHMP lands and adjacent areas had existing vegetation mapped as cover types using a classification system that was based upon the Integrated Landscape Management plan (WDFW 1998) and National Wetlands Inventory wetland/deepwater classification (Cowardin et al. 1979). The classification system was modified to meet the vegetation cover type needs for Habitat Evaluation Procedure target species and developed as a decision-making key to classify the vegetation cover types (Table 1.1).

Table 1.1 Cover Type Mapping Decision-making Key for the Lewis River Study Area[1]

Classification Description	Cover Type or Group	Cover Type Code
1a. Site characterized by upland vegetation types.	Upland	go to 2
[2]a. Greater than 10% forested (20 ft) canopy coverage.	Forested	go to 3
3a. Greater than 70% of canopy coverage is composed of conifer.	Conifer Forest	go to 4
4a. Site composed of Lodgepole Pine.	Lodgepole Pine	LP
4b. Site is not on lava flow; canopy composed of conifer species.	Mixed Species Conifer Forest	go to 5
5a. Avg. stand diameter > 26" dbh. Stands forming a multi-layered canopy with occasional small openings. Greater than 4 snags/acre > 20" dbh. Greater horizontal and vertical canopy structure than is generally found in mature conifer stands.	Old-Growth Conifer Forest	go to 6
6a Stand has not been thinned[2].	Old-Growth Conifer	OG
6b. Stand has been thinned since late 1980s.	Old-Growth Conifer--thinned	OG-T
5b. Avg. stand diameter 21"-26" dbh. Canopy structure has a relatively uniform vertical and horizontal texture.	Mature Conifer Forest	go to 7
7a Stand has not been thinned[2].	Mature Conifer	M
7b Stand has been thinned since late 1980s	Mature Conifer-thinned	M-t
5c. Avg. stand diameter 16"-20" dbh. Even-aged stands with relatively uniform structure.	Mid-Successional Conifer Forest	go to 8
8a. Stand has not been thinned[2].	Mid-Successional Conifer	MS
8b. Stand has been thinned since late 1980s.	Mid-Successional Conifer-thinned	MS-t
5d. Avg. stand diameter 8"-15" dbh. Even-aged stands with relatively uniform structure.	Pole Conifer Forest	go to 9
9a. Stand has not been thinned[2].	Pole Conifer	P
9b. Stand has been thinned since late 1980s.	Pole Conifer--thinned	P-t
5e. Avg. stand diameter < 8" dbh.	Seedling/Sapling Conifer Forest	SS
5f. Very recent clearcut with no more than seedlings.	New Clearcut	SS1
3b. Greater than 30% and less than 70% conifer or deciduous forest.	Mixed Conifer/Deciduous Forest	go to 10
10a. Mixed forest with trees > 10" dbh located outside of riparian zone[3].	Upland Mixed Conifer/Deciduous Forest	go to 11
11a. Stand has not been thinned[2].	Upland Mixed	UM
11b. Stand has been thinned since late 1980s.	Upland Mixed--thinned	UM-t
10b. Mixed forest with trees < 10" dbh located outside of riparian zone[3].	Young Upland Mixed Conifer/Deciduous Forest	YUM
10c. Mixed forest with trees > 10" located within riparian zone[3].	Riparian Mixed Conifer/Deciduous Forest	go to 12
12a. Stand has not been thinned[2].	Riparian Mixed	RM
12b. Stand has been thinned since late 1980s.	Riparian Mixed--thinned	RM-t
10d. Mixed forest with trees < 10" dbh located within riparian zone[3].	Young Riparian Mixed Conifer/Deciduous Forest	YRM
3c. Greater than 70% deciduous canopy coverage.	Deciduous Forest	go to 13
13a. Deciduous forest with trees > 10" dbh located outside of riparian zone[3]. Not oak dominated.	Upland Deciduous Forest	go to 14
14a. Stand has not been thinned[2].	Upland Deciduous	UD
14b. Stand has been thinned since late 1980s.	Upland Deciduous--thinned	UD-T
13b. Deciduous forest with trees < 10" dbh located outside of riparian zone[3]. Not oak dominated.	Young Upland Deciduous Forest	YUD
13c. Deciduous forest located within riparian zone[3].	Riparian Deciduous Forest	go to 15
15a. Stand has not been thinned[2].	Riparian Deciduous	RD
15b. Stand has been thinned since late 1980s.	Riparian Deciduous --thinned	RD-T
13d. Deciduous shrubs located within riparian zone[3].	Riparian Deciduous Shrubland	RS
13e. Upland site dominated by oak.	Oak Woodland	OW

Table 1.1 Cover Type Mapping Decision-making Key for the Lewis River Study Area (cont.) [1].		
Classification Description	**Cover Type or Group**	**Cover Type Code**
2b. Less than 10% forested canopy coverage.	Non-Forested	go to 16
16a. Comprised of >30% vegetation cover.	Vegetated	go to 17
17a. Ground cover consists of greater than 50% shrub species.	Shrubland	SH
17b. Ground cover consists of greater than 50% grass species.	Dry Meadow/Grassland	MD
17c. Riparian area dominated by forbs and grasses.	Riparian Grassland	RG
16b. Ground area is comprised of >70% exposed rock.	Non-Vegetated	go to 18
18a. Ground area consists of rock rubble.	Rock Talus	RT
18b. Ground area consists of solid rock cliffs and slopes	Rock Outcropping	RO
18c. Area is exposed bare ground due to natural disturbance events.	Unvegetated	UV
1b. Site characterized by open water or wetland vegetation, soils, and hydrology.	Wetland/Deepwater	go to 19
19a. Channel that contains moving water.	Riverine	go to 20
20a. Riverine habitat with unconsolidated substrate and < 30% vegetative cover.	Unconsolidated Bottom (open water)	RUB
20b. Riverine habitat intermittently flooded or exposed with unconsolidated substrate and < 30% vegetative cover, except pioneering plants	Unconsolidated Shore (gravel bars)	RUS
19b. Topographic depression exceeding 20 acres is size with less than 30% areal cover of trees, shrubs, and emergent vegetation.	Lacustrine	Go to 21
21a. Lacustrine habitat with unconsolidated substrate and < 30% vegetative cover.	Unconsolidated Bottom (lake-limnetic zone)	LUB
21b. Lacustrine habitat intermittently flooded or exposed with unconsolidated substrate and < 30% vegetative cover, except pioneering plants.	Unconsolidated Shore (lake-littoral zone)	LUS
21c. Wetlands dominated by submerged, trees, shrubs, and emergent vegetation or less than 20 acres in size.	Palustrine	go to 22
22a. Palustrine habitat with unconsolidated substrate and < 30% vegetative cover.	Unconsolidated Bottom (pond-open water)	PUB
22b. Palustrine habitat with > 30% submerged or floating-leaf hydrophyte cover.	Aquatic Bed	PAB
22c. Palustrine habitat with emergent herbaceous hydrophytes present throughout most of the growing season.	Emergent Wetland	PEM
22d. Palustrine habitat dominated by woody shrubs and stunted trees, less than 20 ft tall.	Scrub-Shrub Wetland	PSS
22e. Palustrine habitat dominated by woody vegetation greater than 20 ft tall.	Forested Wetland	PFO
1c. Site characterized by human disturbance, development, or modification.	Disturbed/Modified	go to 23
23a. Area is within the cleared transmission line right-of-way corridor. Type code is used as a modifier to other cover type categories.	Transmission Line ROW	ROW
23b. Within the boundary of recreation facility.	Recreational	REC
23c. Area is annually seeded or planted with row crops and harvested for commercial agricultural use.	Agriculture	AG
23d. Area is dominated by grasses and forbs and is managed as a pasture .	Pasture	PA
23e. Agricultural land composed of cultivated fruit trees.	Orchard	OR
23f. Developed with commercial buildings and/or facilities that are not PacifiCorp owned.	Developed	DV
23g. Developed with buildings and/or facilities that are part of project.	Project Facility	PF
23i. Exposed bare ground due to human caused activities or contains non-native invasive shrub species.	Disturbed	DI

[1] PacifiCorp and Cowlitz PUD 2004 (Figure 5.1-1)

[2] Thinned stands are those that have undergone a selected harvest of codominant or subdominant trees, resulting in a reduction in total tree canopy coverage.

[3] Riparian zone has variable width and contains elements of aquatic and terrestrial ecosystems which mutually influence each other (Knutson and Naef 1997).

The decision-making key grouped all areas that were greater than 10 percent forested based on canopy coverage and greater than 20 feet in height into forested habitat. The forested habitats were further grouped by the following criteria:

- Conifer Forest = greater than 70 percent of canopy coverage and is composed of conifer
- Mixed Conifer/Deciduous Forest = greater than 30 percent and less than 70 percent conifer or deciduous forest
- Deciduous Forests = greater than 70 percent deciduous canopy

Because northern spotted owls are strongly associated with coniferous forest, only the vegetation cover types that are within the Conifer Forest and Mixed Conifer/Deciduous Forest groups are considered potential suitable NSO habitat. The vegetation cover types and their associated spotted owl habitat are listed in Table 1.2.

Washington Department of Natural Resources Forest Practices Act

The DNR Forest Practices Act (FPA) regulates timber harvest activities on private lands throughout the state of Washington. The Washington Forest Practices Board is responsible for creating rules (Washington Administrative Codes [WAC]) to protect the state's public resources while maintaining a viable timber industry. WAC 222-16-085 Northern Spotted Owl Habitats describes the stand characteristics that provide nesting, roosting, foraging (i.e., suitable NSO habitat), and dispersal habitat for northern spotted owls. This description is in Table 1.2.

Gifford Pinchot National Forest

The Gifford Pinchot National Forest uses a nesting, roosting, and foraging habitat definition from the Judge Dwyer decision of March 29, 1993. This defines suitable NSO habitat as stands with a multi-layered canopy, numerous large snags and down wood, and a canopy closure that is greater than 40 percent (PacifiCorp and Cowlitz PUD 2006). Table 1.2 provides the specifications.

United States Fish and Wildlife Service

As part of relicensing, PacifiCorp consulted with the United States Fish and Wildlife Service (USFWS) under the Section 7 of the Endangered Species Act of 1973 on the actions required for relicensing of the Lewis River Hydroelectric Projects and the actions contained in the Settlement Agreement (PacifiCorp et al. 2004). This included consulting on the WHMP Standards and Guidelines Document (PacifiCorp and Cowlitz PUD 2006). Consultation on the WHMP's Forestlands Chapter required the utilities to identify the Conifer Forests and Mixed Conifer/Deciduous Forest cover types that meet suitable NSO habitat and dispersal habitat. These vegetation cover types are identified in Table 1.2.

Management of Suitable NSO Habitat per the Biological Opinion

As a result of the Section 7 consultation, the USFWS issued a Biological Opinion that determined that the level of incidental take is not likely to jeopardize the continued existence of the spotted owl (USFWS 2006). In complying with the Biological Opinion and implementing WHMP standards and guidelines, the utilities agree to comply with the

Washington's FPA and to protect identified NSO sites and suitable NSO habitat through the following conservation measures (USFWS 2006):

NSO Nesting Habitat (Old-growth Conifer [OG and OG- t] and Mature Conifer [M and M-t] Stands)

- The only forest management activity that would occur in NSO nesting habitat would be snag creation
- Snags would be created outside of the critical nesting period (March 1 to July 15) to prevent disturbance to nesting spotted owls.

NSO Roosting and Foraging Habitat (Old-growth Conifer [OG and OG- t], Mature Conifer [M and M-t], Mid-successional [MS and MS- t], Riparian Mixed [RM and RM-t], and Upland Mix [UM and UM- t] stands)

- To achieve the goals of promoting late-successional stand structure, snag creation may occur in all nesting, roosting and foraging cover types.
- Commercial thinning may occur in mid-successional, riparian mixed, and upland mixed cover types without degrading the habitat.
- To provide a mosaic of big game hiding cover and forage clearcut harvesting (10 to 30 ac in size) may be conducted in NSO roosting and foraging habitat, excluding old growth and mature conifer cover types. No more than 65 acres of mid-successional and upland mix vegetation may be harvested per year. This equates to 3,283 acres or 63 percent of the 5,238 acres of the extant of suitable NSO roosting and foraging habitat on PacifiCorp-owned lands being harvest over the next 50 years.
- To prevent disturbance to nesting spotted owl, the noise and smoke Limited Operating Periods (LOPs) would apply to these activities (USFWS 2006 Page 114 Objective G and PacifiCorp and Cowlitz PUD 2006 Page 56 Objective G).

NSO Dispersal Habitat (Old-growth Conifer [OG and OG- t], Mature Conifer [M and M-t], Mid-successional [MS and MS- t], Upland Mix [UM and UM- t], Riparian Mixed [RM and RM-t], and Pole Conifer [P and P- t] Stands)

- Commercial thinning and snag creation may occur in pole conifer cover type without degrading the dispersal habitat. Commercial thinning will improve the habitat's dispersal function by allowing greater flying space between the trees and promoting understory. Snag creation will increase the stand structure and promote habitat for prey.
- To provide a mosaic of big game hiding cover and forage, clearcut harvesting may occur in pole conifer cover type as long as the Utility-owned lands maintain at least 50 percent of dispersal habitat or better at any point of time.
- To prevent disturbance to nesting spotted owl, the noise and smoke Limited Operating Periods (LOPs) would apply to these activities (USFWS 2006 Page 114 Objective G and PacifiCorp and Cowlitz PUD 2006 Page 56 Objective G).

Table 1.2: A Comparison Between Washington Department of Natural Resources Forest Practice Act, Gifford Pinchot National Forests, and Lewis River Wildlife Habitat Management Plan Vegetation Cover Types for Northern Spotted Owl Suitable Habitat Definition

Washington Department of Natural Resource Forest Practices Act[1]

HABITAT TYPE	Suitable Habitat[2]	Habitat Type	Forestry Community	Canopy Closure	Tree Size, Density and Height	Snag and Cavity Trees	Down Wood
Old Forest Habitat	Yes	Nesting, Roosting Foraging, Dispersal	A layered, multispecies canopy	≥ 60%	≥ 50% of the canopy closure is provided by large overstory trees (typically, there should be at least 75 trees > 20 in. dbh per acre, or at least 35 trees ≥ 30 in. dbh per acre)	≥ 3 snags or trees ≥ 20 in. dbh and 16 ft. in height with various deformities (e.g. large cavities, broken tops, dwarf mistletoe infections, and other indications of decadence)	≥ 2 fallen trees ≥ 20 in. dbh per acre and other woody debris on the ground.
Sub-mature Habitat	Yes	Roosting, Foraging, Dispersal	Conifer-dominated or conifer-hardwood (≥ 30% conifer)	≥ 70%	115-280 trees/acre (≥ 4 in. dbh) with dominants/codominants ≥ to 85 ft. high or dominants/codominants ≥ 85 ft. high with 2 or more layers and 25-50% intermediate trees	≥ 3 snags or cavity trees/acre (≥ 20 in. dbh and 16 ft. in height)	–––
Young Forest Marginal Habitat	Yes	Roosting, Foraging, Dispersal	Conifer-dominated or conifer-hardwood (≥ 30% conifer)	≥ 70%	115-280 trees/acre (> 4 in. dbh) with dominants/codominants ≥ to 85 ft. high or dominants/codominants ≥ 85 ft. high with 2 or more layers and 25-50% intermediate trees	≥ 2 snags or cavity trees /acre (≥ 20 in. dbh and 16 ft. in height)[3]	≥ 10% of the ground covered with 4 in. diameter or larger wood with 25-60% shrub cover[3]
Dispersal Habitat	No	Dispersal	≥ 70% conifer species and a minimum of 20 ft. between the top of the understory vegetation and bottom of the live canopy, with boles relatively clear of dead limbs	≥ 70%	≤ 300 trees per acre, > 70% of conifer species are ≥ 6 in. dbh, ≥ 130 trees per acre with ≥ 10 in. dbh or a basal area of 100 ft^2 of ≥ 10 in. dbh	–––	–––

USDA-Forest Service Suitable Nesting Habitat Definition[4]

Habitat Type	Suitable Habitat[2]	Habitat Type	Forestry Community	Canopy Closure	Tree Size, Density and Height	Snags and Cavity Trees	Down Wood
Nesting, Roosting, and Foraging Habitat	Yes	Nesting, Roosting, Foraging, Dispersal	Multi-layered canopy	≥ 40%	Stands that are least 16 in. average dbh with at least 4 tree/acre that are ≥ 30 in. dbh or larger	Numerous large snags (typically > 2 per acre)	Numerous down logs (typically > 15 tons/acre
Dispersal	No	Dispersal	–––	≥ 40%	Average minimum stand dbh is 11 in.	–––	–––

Lewis River Wildlife Habitat Management Plan Vegetation Cover Type[5]

Habitat Type / Vegetation Cover Type			Suitable Habitat[2]	Habitat Type	Forestry Community	Canopy Closure	Tree Size, Density and Height	Snags and Cavity Trees	Down Wood
Group	Type	Code[5]							
Conifer Forest	Lodgepole Pine	LP	No	None	> 70% of the canopy is composed of conifer and site is composed of lodgepole pine	> 70%	–––	–––	–––
	Old-growth Conifer Forest	OG OG-t[6]	Yes[7]	Nesting, Roosting, Foraging, Dispersal	> 70% of the canopy is composed of conifer stands forming multi-layered canopy with occasional small openings. Greater horizontal and vertical canopy structure then is generally found in mature conifer stands.	> 70%	Average stand diameter >26 in. dbh.	> 4 snags/acre >20 in. dbh	–––
	Mature Conifer Forest	M M-t[6]	Yes[7]	Nesting, Roosting, Foraging, Dispersal	> 70% of the canopy is comprised of conifer Canopy structure has a relatively uniform vertical and horizontal texture.	> 70%	Average stand diameter 21 in. to 26 in. dbh.	–––	–––
	Mid-Successional Conifer Forest	MS MS-t[6]	Yes[7]	Roosting, Foraging, Dispersal	> 70% of the canopy is composed of conifer Even-aged stands with relative uniform structure.	> 70%	Average stand diameter 16 in. to 20 in. dbh.	–––	–––

Table 1.2: A Comparison Between Washington Department of Natural Resources Forest Practice Act, Gifford Pinchot National Forests, and Lewis River Wildlife Habitat Management Plan Vegetation Cover Types for Northern Spotted Owl Suitable Habitat Definition

Lewis River Wildlife Habitat Management Plan Vegetation Cover Type[4]									
Habitat Type			**Suitable Habitat[2]**	**Habitat Type**	**Forestry Community**	**Canopy Closure**	**Tree Size, Density and Height**	**Snags and Cavity Trees**	**Down Wood**
Vegetation Cover Type									
Group	Type	Code[5]							
Conifer Forest	Pole Conifer Forest	P P-t[6]	No	Dispersal	>70% of the canopy is composed of even-aged conifer stands with relative uniform structure.	> 70%	Average stand diameter 8 in. to 15 in. dbh.	----	----
	Seedling/Sapling Conifer Forest	SS	No	None	>70% of the canopy is composed of conifer	> 70%	Average stand diameter < 8 in. dbh	----	----
	New Clearcut	SS1	No	None	>70% of the canopy is composed of conifer. very recent clearcut with no more than seedlings	> 70%	----	----	----
Mixed Conifer/Deciduous Forest	Upland Mixed	UM UM-t[6]	Yes[7]	Roosting, Foraging, Dispersal	>30% and <70% mixed conifer and deciduous forest and located outside of riparian zone	> 30% and < 70%	Trees > 10 in. dbh	----	----
	Riparian Mixed	RM RM-t[6]	Yes	Roosting, Foraging, Dispersal	>30% and <70% mixed conifer and deciduous forest and located within riparian zone	> 30% and < 70%	Trees > 10 in. dbh	----	----
	Young Upland Mixed	YUM	No	None	>30% and <70% mixed conifer and deciduous forest and located outside of riparian zone	> 30% and < 70%	Trees < 10 in. dbh	----	----
	Young Riparian Mixed	YRM	No	None	>30% and <70% mixed conifer and deciduous forest and located within riparian zone	> 30% and < 70%	Trees < 10 in. dbh	----	----

[1] Source: Washington Administration Code WAC 222-16-085 Northern Spotted Owl Habitats
[2] Suitable habitat here is meant to be an area of forest vegetation with the age-class, species of trees, structure, sufficient area and adequate food source to meet some or all of the life needs of the spotted owl (U.S Fish and Wildlife Service 2007).
[3] Young Forest Marginal Habitat must meet either snag and cavity trees or down wood definitions, but not both.
[4] Source: PacifiCorp and Cowlitz PUD 2006
[5] Source: PacifiCorp and Cowlitz PUD 2004
[6] Code with a –t are areas that have been commercially thinned since the late 1980s.
[7] Source: U.S Fish and Wildlife Service 2006

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