

## MEMORANDUM

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**DATE:** December 9, 2015

**TO:** Terrestrial Coordination Committee

**FROM:** Kendel Emmerson, PacifiCorp Wildlife Biologist

**SUBJECT:** Northern Goshawk Management on Lewis River Wildlife Habitat Management Lands

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### **Section 1: Purpose and Need**

The Lewis River Wildlife Habitat Management Plan (WHMP) has the following goal and objective to manage northern goshawk (*Accipiter gentilis*) on WHMP lands (PacifiCorp 2008):

**Goal:** Provide and protect habitat for, and minimize or avoid disturbance to, raptors, including bald eagles (*Haliaeetus leucocephalus*), buteos, ospreys (*Pandion haliaetus*), accipiters, and owls.

**Objective a:** Use protocol surveys in areas scheduled for road construction, heavy maintenance, or forestland management activities to identify specific raptors and their active and inactive nest sites and roost sites (including bald eagle winter roosts in suitable habitat), if possible, and implement appropriate measures to protect these sites.

To achieve this goal and objective the WHMP states (PacifiCorp 2008 section 14.4.1):

*“Protocol surveys will be conducted prior to implementing activities that would remove or modify nesting habitat, have the potential to disturb breeding raptors (e.g., road construction, heavy maintenance activities, and forestland management), and will be conducted during the breeding season. Currently, the northern spotted owl, northern goshawk, and peregrine falcons are the only breeding raptors that have protocol survey methods.”*

While finalizing the WHMP, the Terrestrial Coordination Committee (TCC) had considerable discussion on the appropriate northern goshawk survey method for WHMP lands. To better understand the survey methods and how it applies to WHMP lands, several TCC members participated in northern goshawk survey training with Steve Desimone (Washington Department of Fish and Wildlife) and Tracy Fleming (National Council for Air and Stream Improvement) on the proposed 2008 Unit 26 timber harvest area. During the training the following survey information was decided (PacifiCorp 2007):

*“Survey methods should be conducted according to Woodbridge and Hargis 2006 using the following methods:*

*Dawn Acoustical Surveys should be done at known sites to determine occupancy with two surveys per season to determine an unoccupied status. “If only one year of survey is used, this method may not identify nest stands that are unoccupied during the year of survey.” (Woodbridge and Hargis 2006 Page 3-8). According to Woodbridge and Hargis (2006 Page 3-6), the listening stations should be limited to about 150 m radius of all habitats to be surveys.*

*Intensive Search Surveys may be conducted within 1 nesting season during late June, July, and August with experienced observers. “A single Intensive Search Survey may be sufficient to determine goshawk presence within a habitat patch” (Woodbridge and Hargis 2006 Page 3-9).*

*Broadcast Acoustical Surveys should be conducted within 2 consecutive nesting seasons with two surveys per survey season.*

*The surveys should include habitat surrounding the area of impact for up to 400 m (1,312 ft.) for light activities and 800 m (2,624 ft.) for heavy activities (Woodbridge and Hargis 2006 page 3-13).*

*For projects involving significant modification of forest structure (e.g., commercial thinning), the survey should extend 800 m beyond the project boundary. This distance corresponds to the mean radius of the post fledging area (about 200 ha) and will allow for detection of territories that overlap the project area. For projects that involve minor modification of forest structure (under burning, light under thinning, and light salvage) surveys need extend only 400 m beyond the project boundary.”*

*The smaller size harvest area’s (less than 10.2 acres) and timber harvest begin after August 31 fall in between minor and significant modifications. Steve recommended that the proposed timber harvest areas surveys extend more than the minor modification extent and extend up to 2 survey stations distances, which is equal to 500 m. Kirk explained that in most cases PacifiCorp doesn’t own the lands beyond or up to 500 m (1641 ft.) of a timber harvest area and PacifiCorp can only survey up to their property line.”*

Although the purpose of this training was to determine a survey method to meet WHMP goal and objectives, it was specific to timber harvest activities and used the 2008 proposed timber harvest as a training example, which included 3 harvest areas within ¼ mile of each other totaling 29.2 acres (8.2 acres, 9.1 acres, and 11.9 acres in size). The training did not consider survey methods for non-timber harvest activities or projects that require vegetation removal in small areas. As a result since the implementation of the WHMP in 2008, PacifiCorp has had several projects requiring small areas of vegetation removal that as stated above would require 2 years of Broadcast Acoustical Surveys to the extent of 500-m beyond the project area boundaries. Due to

the presumably low number of nesting goshawks in western Washington and, in particular, the Lewis River Basin, this survey effort for small areas exceeds the potential to adversely affect northern goshawks. The purpose of this memo is to provide a decision matrix that assesses a project's potential effects to northern goshawks to the appropriate survey method.

In addition since 2008, the WHMP lands have expanded extensively to lands north of Swift Reservoir. Most of this area is currently clearcut and most remaining timber does not meet suitable goshawk habitat. This memo categorized existing WHMP cover types into suitable goshawk, unsuitable, and non-habitat categories. A table summarizing northern goshawk home range habitat characteristics has been included for conducting field verification for areas that may have marginal suitable habitat. Lastly, the memo also provides a method to complete a habitat analysis for a project and surrounding area to determine the extent of effect a project may have on suitable goshawk habitat.

## **Section 2: Presence of Northern Goshawk and WHMP Surveys in Lewis River**

Less than 1% of the recorded goshawk nests in Washington have been in the southwest portion of the state (Desimone and Hays 2004). The only recorded observations of goshawks in the Lewis River basin are from 1989 and 1995. Both observations were on United State Forest Service lands in the Drift Creek basin and are greater than 2 miles from WHMP lands.

PacifiCorp has been conducting goshawk surveys on PacifiCorp-owned lands since 1999. Between 1999 and 2007, the goshawk surveys were conducted using methods described in Joy et al. 1994, two surveys in a single nesting season, and include the timber harvest area and all suitable PacifiCorp-owned habitats within 1500 feet of the harvest area. In 2007, the Woodbridge and Hargis (2006) methods were adopted for planned harvest areas using the Broadcast Acoustical Survey method for two seasons and to include all PacifiCorp-owned lands within 500-meters of the planned harvest. To date, none of these survey efforts have detected a northern goshawk and PacifiCorp is not aware of any other goshawk monitoring efforts in the Lewis River basin.

## **Section 3: WHMP Cover Types and Northern Goshawk Habitat**

There are numerous sources from the southwest United States and western Washington that describe goshawks as typically associated with mature or old-growth forests (Desimone and Hays 2004, Finn et al. 2002, Reynolds 1992, and Bloxton 2002). A 2002 study of 30 northern goshawk nests in the Olympic Peninsula found that they consistently nested in conifer trees greater than 40 years old and the nest areas were predominately late-seral forest habitat [i.e., trees with average dbh (diameter at breast height)  $\geq 21$  inches] (Finn et al. 2002). An additional study on nesting goshawks on private industrial lands in western Washington documented nests in conifer trees that average 21.97 in. dbh (Bosakowski et al. 1999). Nest in deciduous trees are uncommon and not well understood, they are usually in a tree that is sub-canopy and isolated in coniferous stands or in a pure deciduous stand that is in proximity to mature conifer stands (PacifiCorp 2007 and Desimone and Hays 2004).

This variability in suitable goshawk habitat has made delineating WHMP cover types into suitable goshawk habitat challenging; however it is necessary to assess potential habitat impacts from a proposed project. Based on the cover type classifications and habitat features described in the attached table each cover type has been categorized into suitable, unsuitable, and non-habitat:

**Suitable habitat:** all forest cover types that have trees that average greater than 16 in. dbh. This includes the following cover types (PacifiCorp and Cowlitz PUD 2004):

**Cover Types that may meet Suitable Northern Goshawk Habitat Criteria**

<b>Cover type</b>	<b>Associated Cover Type Codes</b>
Lodgepole Pine <sup>2</sup>	LP
Mature conifer <sup>1</sup>	M or M-t
Mid-Successional Conifer	MS or MS-t
Oak Woodland <sup>2</sup>	OW
Old-growth Conifer <sup>1</sup>	OG or OG-t
Palustrine Forested Wetland <sup>2</sup>	PFO
Riparian Deciduous <sup>3</sup>	RD or RD-t
Riparian mixed <sup>3</sup>	RM or RM-t
Upland Deciduous <sup>3</sup>	UD or UD-t
Upland Mixed <sup>3</sup>	UM or UM-t

<sup>1</sup>OG and M cover groups include stands that have an average stand diameter that is  $\geq 21$  inches and are preferred habitat for northern goshawks.

<sup>2</sup>The LP, OW, and PFO cover types are not classified by an average stand diameter and therefore habitat suitability may be discretionary.

<sup>3</sup>The RD, RM, UD and UM cover groups have a minimum average stand diameter class of 10 inches therefore may require ground-truthing to confirm suitability.

**Unsuitable habitat:** all forest cover types with trees that average less than or equal to 16 in. dbh. This included the following cover types (PacifiCorp and Cowlitz PUD 2004):

**Cover Types that are Unsuitable Northern Goshawk Habitat**

<b>Cover type</b>	<b>Associated cover type codes</b>
New clearcut	SS1
Pole conifer	P
Seedling/sapling conifer forest	SS
Young riparian mixed	YRM
Young upland deciduous	YUD
Young upland mixed	YUM

**Non-habitat:** all other cover types that do not currently provide or have future potential to provide northern goshawk habitat (PacifiCorp and Cowlitz PUD 2004). This would include developed areas, meadows, agriculture, shrublands, wetlands etc. A habitat analysis table for McKee Meadows Timber Harvest Area (Attachment B) has all cover type categorized in to Suitable Habitat, Unsuitable Habitat, and Non-Habitat

## **Section 4: Decision Matrix**

The following table provides a decision matrix for each project to systematically determine the appropriate survey method. The questions were developed using a variety of resources and some assumptions based on WHMP lands

- Question 1: The 9.88 acres is the minimum size for small area surveys described in Woodbridge and Hargis 2006.
- Question 2: There are numerous sources from the southwest United States and western Washington that describe goshawks as typically associated with mature or old-growth forests (Desimone and Hays 2004, Finn et al. 2002, Reynolds 1992, and Bloxton 2002).
- Question 3: A nest area cluster is 177.8 acres which is a radius of 1570.6 ft. Therefore it is assumed that any project greater than 1570.6 ft. from a nest or preferred nesting habitat (i.e., OG or M) has a low probability of being within a nest area cluster.
- Question 4a: Adverse modification would be any action that would require the cover type to be changed to another cover type. M to M-t would not be an adverse modification, but changing from M to MS would be an adverse modification.
- Question 4b: Finn et al. 2002 recommends no timber harvest within 350 m of historical nest sites.
- Question 4c, 5b, and 5f: Average nest tree diameter is 21 in. dbh (Desimone and Hays 2004 and Finn et al. 2002)
- Question 5a: Reynolds et al. 1992 recommends patch cuts  $\leq 2$  acres within the PFA to create openings, therefore it assumed any project less than this size would have negligible effect on habitat.
- Question 5d: Finn et al. 2002 found that if more than 10% of the combined NAC and PFA were in conifer stands less than 7 years of age then occupancy rates declined. On WHMP lands this would be equivalent to 10% unsuitable habitat within the combined NAC and PFA
- Question 5e: It is assumed that if project does not reduce the percent of suitable habitat on WHMP lands within the combined NAC and PFA more than 1% then it is negligible effect on northern goshawk habitat.

<b>Northern Goshawk Survey Decision Matrix</b>		
1. Is the project $\geq$ 9.88 acres in size and includes suitable goshawk habitat cover types?	Yes	Broadcast Acoustical Survey
	No	Go to question 2
2. Does area include any portion of a M or OG cover type?	Yes	Go to 4
	No	Go to 3
3. Is the project within 1570.6 ft., and not separated by the reservoir, of a known goshawk nest tree <u>or</u> M or OG cover type?	Yes	Go to 4
	No	Go to 5
4. For projects that are potentially within a nest area cluster (NAC)		
a. Does the project require the removal or adverse modification of habitat in a M or OG cover type?	Yes	Broadcast Acoustical Survey
	No	Go to 4b.
b. Is the project $\geq$ than 350 m (1148.3 ft.) from a known goshawk nest tree or M or OG cover type?	Yes	Go to 4c.
	No	Broadcast Acoustical Survey
c. Does project require the removal of any conifer tree $\geq$ 21 in dbh?	Yes	Intensive Search Survey
	No	Go to 4d.
d. Will the activity be occurring between March 1 and August 31	Yes	Intensive Search Survey
	No	No survey required
5. For projects that are potentially within post-fledgling family area (PFA)		
a. Is habitat modification area $<$ 2 acres in size and 200 feet in width?	Yes	Go to 5b.
	No	Go to 5d.
b. Does project require the removal of any conifer tree greater than 21 in dbh?	Yes	Intensive Search Survey
	No	Go to 5c.
c. Will the activity be occurring between March 1 and August 31?	Yes	Intensive Search Survey
	No	No survey required
d. Complete habitat analysis as described below in Section 5. Will the WHMP lands within the combined NAC and PFA be $>$ 10% unsuitable habitat after the project is completed?	Yes	Go to 5e.
	No	Intensive Search Survey
e. After the project is complete will the percent of suitable habitat on WHMP lands within the combined NAC and PFA be decreased by more than 1%?	Yes	Go to 5f.
	No	Intensive Search Survey
f. Does project require the removal of any conifer trees greater than 21 in dbh?	Yes	Broadcast Acoustical Survey
	No	Intensive Search Survey

## **Section 5: Habitat Analysis Methods**

Determining the amount and quality of suitable northern goshawk habitat in proximity of a project is based on components of goshawks nesting home range nest area cluster (NAC), post-fledgling family area (PFA), and foraging area (FA) (Reynolds et al. 1996 and Desimone and Hays 2004). Because the purpose is to analyze habitat surrounding the project, the center of the project area will be used as center for the habitat analysis. From this center point a circle with a radius of 1570.6 ft. will represent the NAC's and be 177.8 acres. A second concentric circle will be 2879.3-ft from the center and will represent the PFA and be additional 420 acres. The cover typing for WHMP lands does not extend to the full extent of goshawk home range; therefore it is assumed that all WHMP lands have the potential of being within the NAC and/or PFA of a nesting goshawk. Attachment A is a map of the McKee Meadow Timber Harvest area NAC and PFA circle and Attachment B is the associated habitat analysis to be used as example. The green numbers in the bottom right corner represent the answer to 4 d and the red numbers represent the answer to 4e.

## **Section 6: Survey Methods (Woodbridge and Hargis 2006)**

### **Dawn Acoustical Survey:**

This survey method is based on detection of courtship vocalizations and flight displays of goshawks at their nest sites. It consists of establishing "listening stations" in close proximity to known nest stands or patches of suitable habitat and conducting 1½-hour listening periods at dawn during the early breeding season. The advantages can determine occupancy early in the nesting season and single survey for the year. Best suited for surveying historical nest and has high level of detection rate for occupied sites. The disadvantages are it will confirm occupancy/non-occupancy for that season, but does not confirm the presence of an inactive nest. This method is to be used to survey known goshawk nest sites, since there are no known nest sites on WHMP land this survey method is not currently used.

**Timing:** During the month preceding egg laying. March 15 to April 30

**Number of Surveys:** 2 surveys, unless determined occupied in a single survey

**Number of Seasons:** Single season prior to conducting activity.

**Survey Area:** Project Area

**Survey Stations:** Placed every 150 meters

### **Intensive Search Survey:**

A combination of visual searches for signs of goshawk presence (nest, white wash, prey remains, and molted feathers) along closely spaced transects with broadcast acoustical surveys. This method is best applied to smaller area (9.88 to 98.80 acres). The advantages are this method can detect inactive nests stands, survey may be conducted in a single survey in one season and provide high confidence that area searched does not contain a goshawk breeding site. Conclusions drawn from search conducted within a limited area during a single season, however, may not be applicable to surrounding habitat and can only detect nest within 200 m of a calling point.

**Timing:** Following hatch date. June 1 to August 31.

**Number of Seasons and Surveys:** 1 survey with a minimum of 3 surveyors

**Number of Seasons:** Single season prior to conducting activity

**Survey Area:** Project Area

**Survey Transects:** Transect width 20-30 m

### **Broadcast Acoustical Survey:**

Method is based on broadcast of taped goshawk calls at points along transect routes to elicit response from defensive territorial adult goshawks and their young. Primary advantages are efficient, standardized, and applicable to large areas. The disadvantage is its labor intensive and requires two seasons.

**Timing:** During the nestling and fledgling stages. June 1 to August 15.

**Number of Seasons and Surveys:** 1 survey with a minimum of 3 surveyors

**Number of Seasons:** 2 surveys for 2 consecutive seasons

**Survey Area:** Project Area plus all suitable habitat and PacifiCorp-owned lands within 500 meters.

**Survey Transects:** 250 m with a calling station every 200 m

### **Section 7: Documentation**

The Raptor Section of the Lewis River WHMP Annual Report will provide a discussion on proposed areas for vegetation removal. Each proposed area will use the Northern Goshawk Survey Decision Matrix to determine the appropriate goshawk survey method. If a proposed area will require a different survey method than determined by the matrix, then a rationale will be provided in the Annual Plan for TCC approval. Removing vegetation from an area may be proposed following the completion and approval of the Annual Plan, in this case the proposed area and decision matrix results will be presented to the TCC at the next scheduled meeting or if approval is needed sooner by email.

### **Section 8: References**

Bloxtton, T. 2002. Prey abundance, space use, demography, and foraging habitat of northern goshawks in western Washington. Thesis, University of Washington, Seattle, Washington, USA.

Bosakowski, T., B. McCullough, F.J. Lapsansky and M.E. Vaughn. 1999. Northern Goshawks Nesting on a Private Industrial Forest in Western Washington. *Journal of Raptor Research* 33(3):240-244.

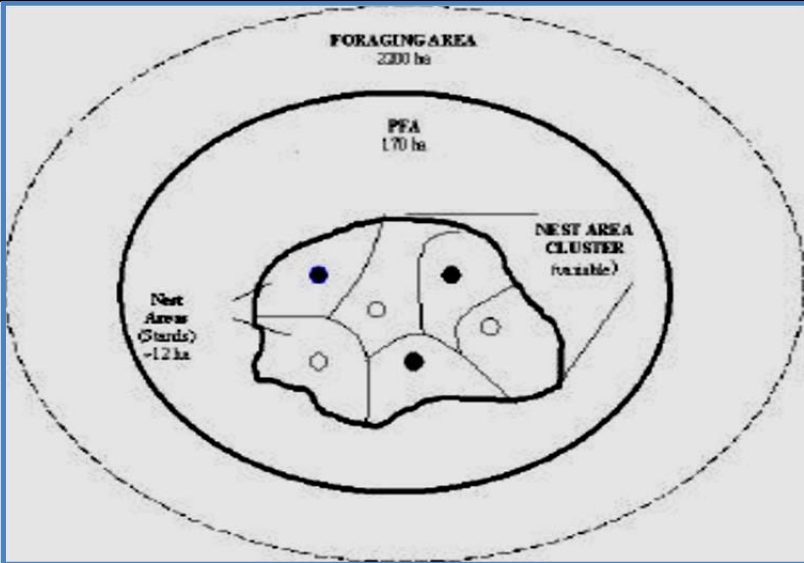
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Northern Goshawk Home Range Habitat Characteristics in the Western Washington					
Habitat Features	Breeding Home Range				Proposed Project
	Nest Area	Nest Area Cluster (NAC)	Post-Fledgling Family Area (PFA)	Foraging Area	
Description	Boundaries are defined by movement and behavior of the adults and newly fledged young and the locations of prey plucking posts surrounding the nest tree. <sup>1</sup>	Includes all stands that contain active, inactive, and alternate nest sites <sup>1</sup>	Contains the NAC and is an area of concentrated use by adult females and developing juveniles after fledgling and prior to natal dispersal.	Home range during the breeding season	
Area Size	12 ha (29.64 acres) in size <sup>1,3</sup>	Estimated 72 ha (177.8 acres) include at least 3 active nest sites and 3 replacement nest areas per home range. All nest areas are within 0.5 miles of active nest site <sup>1,3</sup>	420 ac in addition to and centered on active and alternate nest areas and include as much mature and old forests as possible.	Foraging area= 5998 acres= 5,400 ac+ 420 (PFA) ac+ 178 (NAC) ac= 6,032ac	
Tree Species	Often in Douglas-fir, with western hemlock used to a lesser extent. Nests in deciduous trees are uncommon. Deciduous trees used for nesting were generally found in the sub-canopy and isolated in coniferous forest stands comprised of less than 2% deciduous species. <sup>1,4</sup>		Varies	Varies	
Average dbh*	Average nest tree size in the Pacific Northwest is >53 cm (21 in) dbh (range: 25-172 cm [10-68 in]) <sup>1</sup> .	Average dominant and co dominate trees are 17-19 in. dbh and >89 ft. in height <sup>1</sup>	70% of the trees are >21 in dbh	Minimum 10-14 in QMD	
Density (TPA)	195 trees/acres <sup>1</sup>		Dense Forests	25 trees/acre= 20 in dbh.	
Average Stand Age*	Mature to old forest habitat. Stand characteristics begin at year 50 in western Washington. Prefer to manage areas to greater than 70 years. <sup>1</sup>		PFA should include as much mature and old forests as possible and should be <10% seedling or sapling <sup>1</sup>	> 30 years of age and mix of 20% mid-successional, 20% mature, and 20% old-growth with a preferred of 60% in mature to old-growth	
Structure*	Typically live trees, large (2-3 ft. diameter) bulky stick nest built close to bole of the tree and in the lower third of the canopy. <sup>1</sup>	More snags and down wood then surrounding areas.	Abundant number of snags and down logs	>3 snags > 18 in dbh/acre , > 5 logs >12 in. diameter >7 ft. in length/acre <sup>1</sup>	
Canopy closure	>50% <sup>1</sup>	60-65% <sup>1</sup>	>70% <sup>1</sup>	>60% <sup>1</sup>	

Northern Goshawk Home Range Habitat Characteristics in the Western Washington					
Habitat Features	Breeding Home Range				Proposed Project
	Nest Area (Site)	Nest Area Cluster (NAC)	Post-Fledgling Family Area (PFA)	Foraging Area	
Canopy structure	2 or more canopy layers, gaps with abundance of large diameter crown, and shade tolerant trees <sup>1</sup>	1-3 layers with poor developed understory vegetation <sup>1</sup>	No Information	Adequate space for flying 31 snags/acre=5 in. dbh <sup>1</sup>	
Nest tree spacing	Average 1759 ft. and pluck post typically within 100 ft. of nest tree <sup>1</sup>	No Information	No Information	No Information	
Minimum opening size	<ul style="list-style-type: none"> <li>• East of the Cascades an increase of 1% (0r 0.28 acres) in early successional habitat can decrease occupancy by 10%<sup>1</sup>.</li> <li>• No more than 2.94 acres within 300m (984 feet) of nest<sup>2</sup></li> <li>• No M or OG habitat harvested</li> </ul>		Recommends regeneration cuts up to 2 acres in mixed forest stands. Less than 200 feet in width and retain 3-5 mature trees with interlocking crowns <sup>3</sup>	Recommends regeneration cuts up to 4 acres in mixed forest stands. Less than 200 feet in width and retain 6 mature trees with interlocking crowns <sup>3</sup>	
Habitat threshold	Comprised of 67% (or 19.85 acres) of late seral (M or OG) <sup>2</sup>		<ul style="list-style-type: none"> <li>• No more than 10% (or 42 acres) in Unsuitable HaSS1</li> <li>• 72% (or 302 acres) in Mature coniferous forests and (10 % of the trees &gt;21 in dbh)<sup>1</sup></li> </ul>	Retain at least 60% (or 3,240 acres) of foraging habitat in mid-aged (20% or 1080 acres), mature (20% or 1080 acres), and old (20% or 1080 acres) forest successional classes <sup>1</sup>	



<sup>1</sup>Desimone, S.M., and David W. Hays. 2004. Northern Goshawk. Pages 6-1 through 6-16 in: Larsen, Eric M.; Jeffrey M. Azerrad and Noelle Nordstrom, Technical Editors. Management Recommendations for Washington's Priority Species: Volume IV: Birds. Washington Department of Fish and Wildlife. ix + 267 pp.

<sup>2</sup> Finn, S.P., J.M. Marzluff and D.E. Varland. 2002. Effects of Landscape and Local Habitat attributes on Northern Goshawk Site Occupancy in western Washington. Forest Sciences 48(2)2002: 427-436

<sup>3</sup> Reynolds, Richard T.; Graham, Russell T.; Reiser, M. Hildegard; and others. 1992. Management recommendations for the northern goshawk in the southwestern United States. Gen. Tech. Rep. RM-217, Ft. Collins, CO: U.S. Department of Agriculture, Forest Service, Rocky Mountain Forest and Range Experiment Station. 90 p.

<sup>4</sup> PacifiCorp. 2007. Northern Goshawk Survey Training and Proposed Timber Harvest Areas Habitat Assessment. June 25 and 26, 2007 North Fork Lewis River Washington. Unpublished Document.

\*These Habitat Features are priority indicators for northern goshawk habitat on WHMP lands.



**McKee Meadows Timber Harvest Area**  
(3.99 acres of UM and 0.24 acres of MD to be modified)

Habitat Type	Vegetation Cover Type	Vegetation Cover Type Abbreviation	Nest Area Center (NAC) Circle (1570.1-ft radius from center of project)						Post-Fledgling Family Area (PFA) Circle (Area between 1570.1 and 2879.3-ft radius from center of project)						Combined NAC and PFA Circle (2879.3-ft radius from center of project)									
			WHMP Land				Non-WHMP Lands		WHMP Lands				Non-WHMP Lands		WHMP Lands				Non-WHMP Lands		Combined WHMP and Non-WHMP			
			Pre-Harvest		Post-Harvest				Pre-harvest		Post-Harvest				Pre-harvest		Post-Harvest				Pre-harvest		Post-Harvest	
			Acres	Percent of Total Acres	Acres	Percent of Total Acres	Acres	Percent of Total Acres	Acres	Percent of Total Acres	Acres	Percent of Total Acres	Acres	Percent of Total Acres	Acres	Percent of Total Acres	Acres	Percent of Total Acres	Acres	Percent of Total Acres	Acres	Percent of Total Acres	Acres	Percent of Total Acres
Suitable Habitat	LOGDPOLE PINE	LP	0.00	0.00%	0.00	0.00%	0.00	0.00%	0.00	0.00%	0.00	0.00%	0.00	0.00%	0.00	0.00%	0.00	0.00%	0.00	0.00%	0.00	0.00%	0.00	0.00%
Suitable Habitat	MATURE CONIFER	M	0.00	0.00%	0.00	0.00%	0.00	0.00%	0.93	0.98%	0.93	0.98%	0.00	0.00%	0.93	0.48%	0.93	0.48%	0.00	0.00%	0.93	0.16%	0.93	0.16%
Suitable Habitat	MATURE CONIFER (thinned)	M-t	0.00	0.00%	0.00	0.00%	0.00	0.00%	0.00	0.00%	0.00	0.00%	0.00	0.00%	0.00	0.00%	0.00	0.00%	0.00	0.00%	0.00	0.00%	0.00	0.00%
Suitable Habitat	MID-SUCCESSIONAL CONIFER	MS	20.37	20.76%	20.37	20.76%	0.00	0.00%	19.75	20.71%	19.75	20.71%	3.06	0.94%	40.13	20.73%	40.13	20.73%	3.06	0.76%	43.19	7.22%	43.19	7.22%
Suitable Habitat	MID-SUCCESSIONAL CONIFER (THINNED)	MS-t	5.88	6.00%	5.88	6.00%	0.00	0.00%	13.12	13.75%	13.12	13.75%	0.00	0.00%	19.00	9.82%	19.00	9.82%	0.00	0.00%	19.00	3.18%	19.00	3.18%
Suitable Habitat	OAK WOODLAND	OW	0.00	0.00%	0.00	0.00%	0.00	0.00%	0.00	0.00%	0.00	0.00%	0.00	0.00%	0.00	0.00%	0.00	0.00%	0.00	0.00%	0.00	0.00%	0.00	0.00%
Suitable Habitat	OLD GROWTH	OG	0.00	0.00%	0.00	0.00%	0.00	0.00%	0.00	0.00%	0.00	0.00%	0.00	0.00%	0.00	0.00%	0.00	0.00%	0.00	0.00%	0.00	0.00%	0.00	0.00%
Suitable Habitat	OLD GROWTH (THINNED)	OG-T	0.00	0.00%	0.00	0.00%	0.00	0.00%	0.00	0.00%	0.00	0.00%	0.00	0.00%	0.00	0.00%	0.00	0.00%	0.00	0.00%	0.00	0.00%	0.00	0.00%
Suitable Habitat	PALUSTRINE FORESTED WETLAND	PFO	0.00	0.00%	0.00	0.00%	0.00	0.00%	0.00	0.00%	0.00	0.00%	0.00	0.00%	0.00	0.00%	0.00	0.00%	0.00	0.00%	0.00	0.00%	0.00	0.00%
Suitable Habitat	RIPARIAN DECIDUOUS	RD	0.00	0.00%	0.00	0.00%	0.00	0.00%	0.00	0.00%	0.00	0.00%	3.48	1.07%	0.00	0.00%	0.00	0.00%	3.48	0.86%	3.48	0.58%	3.48	0.58%
Suitable Habitat	RIPARIAN DECIDUOUS (THINNED)	RD-t	0.00	0.00%	0.00	0.00%	0.00	0.00%	0.00	0.00%	0.00	0.00%	0.00	0.00%	0.00	0.00%	0.00	0.00%	0.00	0.00%	0.00	0.00%	0.00	0.00%
Suitable Habitat	RIPARIAN MIXED	RM	4.72	4.81%	4.72	4.81%	0.74	0.93%	6.39	6.70%	6.39	6.70%	19.00	5.85%	11.11	5.74%	11.11	5.74%	19.74	4.88%	30.84	5.16%	30.84	5.16%
Suitable Habitat	RIPARIAN MIXED (THINNED)	RM-t	0.00	0.00%	0.00	0.00%	0.00	0.00%	0.00	0.00%	0.00	0.00%	0.00	0.00%	0.00	0.00%	0.00	0.00%	0.00	0.00%	0.00	0.00%	0.00	0.00%
Suitable Habitat	UPLAND DECIDUOUS	UD	9.82	10.00%	9.82	10.00%	1.57	1.97%	6.03	6.33%	6.03	6.33%	1.73	0.53%	15.85	8.19%	15.85	8.19%	3.30	0.82%	19.16	3.20%	19.16	3.20%
Suitable Habitat	UPLAND DECIDUOUS (THINNED)	UD-t	0.00	0.00%	0.00	0.00%	0.00	0.00%	0.00	0.00%	0.00	0.00%	0.00	0.00%	0.00	0.00%	0.00	0.00%	0.00	0.00%	0.00	0.00%	0.00	0.00%
Suitable Habitat	UPLAND MIXED	UM	23.82	24.27%	19.83	20.20%	4.63	5.81%	23.24	24.36%	23.24	24.36%	7.61	2.34%	47.06	24.31%	43.07	22.25%	12.24	3.03%	59.30	9.92%	55.31	9.25%
Suitable Habitat	UPLAND MIXED (THINNED)	UM-t	0.00	0.00%	0.00	0.00%	0.00	0.00%	0.00	0.00%	0.00	0.00%	0.00	0.00%	0.00	0.00%	0.00	0.00%	0.00	0.00%	0.00	0.00%	0.00	0.00%
Unsuitable Habitat	POLE CONIFER	P	0.00	0.00%	0.00	0.00%	0.00	0.00%	0.00	0.00%	0.00	0.00%	1.65	0.51%	0.00	0.00%	0.00	0.00%	1.65	0.41%	1.65	0.28%	1.65	0.28%
Unsuitable Habitat	POLE CONIFER (THINNED)	P-T	13.39	13.64%	13.39	13.64%	0.00	0.00%	0.00	0.00%	0.00	0.00%	0.00	0.00%	13.39	6.92%	13.39	6.92%	0.00	0.00%	13.39	2.24%	13.39	2.24%
Unsuitable Habitat	SEEDLING / SAPLING	SS	0.00	0.00%	0.00	0.00%	0.00	0.00%	13.34	13.99%	13.34	13.99%	0.00	0.00%	13.34	6.89%	13.34	6.89%	0.00	0.00%	13.34	2.23%	13.34	2.23%
Unsuitable Habitat	SEEDLING / SAPLING (NEW)	SS1	11.51	11.72%	15.74	16.03%	0.00	0.00%	0.16	0.17%	0.16	0.17%	0.00	0.00%	11.67	6.03%	15.90	8.22%	0.00	0.00%	11.67	1.95%	15.90	2.66%
Unsuitable Habitat	YOUNG RIPARIAN MIX	YRM	0.00	0.00%	0.00	0.00%	0.00	0.00%	0.00	0.00%	0.00	0.00%	0.00	0.00%	0.00	0.00%	0.00	0.00%	0.00	0.00%	0.00	0.00%	0.00	0.00%
Unsuitable Habitat	YOUNG UPLAND DECIDUOUS	YUD	0.37	0.38%	0.37	0.38%	0.00	0.00%	0.04	0.04%	0.04	0.04%	0.00	0.00%	0.41	0.21%	0.41	0.21%	0.00	0.00%	0.41	0.07%	0.41	0.07%
Unsuitable Habitat	YOUNG UPLAND MIX	YUM	0.00	0.00%	0.00	0.00%	0.00	0.00%	0.00	0.00%	0.00	0.00%	0.00	0.00%	0.00	0.00%	0.00	0.00%	0.00	0.00%	0.00	0.00%	0.00	0.00%
Non-Habitat	AGRICULTURE	AG	0.00	0.00%	0.00	0.00%	2.38	2.99%	0.00	0.00%	0.00	0.00%	69.25	21.32%	0.00	0.00%	0.00	0.00%	71.63	17.71%	71.63	11.98%	71.63	11.98%
Non-Habitat	DISTURBED	DI	0.00	0.00%	0.00	0.00%	0.00	0.00%	0.00	0.00%	0.00	0.00%	0.00	0.00%	0.00	0.00%	0.00	0.00%	0.00	0.00%	0.00	0.00%	0.00	0.00%
Non-Habitat	DEVELOPED	DV	0.00	0.00%	0.00	0.00%	0.00	0.00%	0.00	0.00%	0.00	0.00%	2.15	0.66%	0.00	0.00%	0.00	0.00%	2.15	0.53%	2.15	0.36%	2.15	0.36%
Non-Habitat	HIGHWAY		0.00	0.00%	0.00	0.00%	0.00	0.00%	0.00	0.00%	0.00	0.00%	0.00	0.00%	0.00	0.00%	0.00	0.00%	0.00	0.00%	0.00	0.00%	0.00	0.00%
Non-Habitat	LACUSTRINE UNCONSOLIDATED BOTTOM	LUB	0.00	0.00%	0.00	0.00%	0.00	0.00%	0.00	0.00%	0.00	0.00%	0.00	0.00%	0.00	0.00%	0.00	0.00%	0.00	0.00%	0.00	0.00%	0.00	0.00%
Non-Habitat	LACUSTRINE UNCONSOLIDATED SHORELINE	LUS	0.00	0.00%	0.00	0.00%	0.00	0.00%	0.00	0.00%	0.00	0.00%	0.00	0.00%	0.00	0.00%	0.00	0.00%	0.00	0.00%	0.00	0.00%	0.00	0.00%
Non-Habitat	MEADOW	MD	2.89	2.95%	2.65	2.70%	0.00	0.00%	1.58	1.65%	1.58	1.65%	0.00	0.00%	4.47	2.31%	4.23	2.18%	0.00	0.00%	4.47	0.75%	4.23	0.71%
Non-Habitat	No Vegetation Cover Type		0.00	0.00%	0.00	0.00%	0.00	0.00%	0.00	0.00%	0.00	0.00%	6.98	2.15%	0.00	0.00%	0.00	0.00%	6.98	1.72%	6.98	1.17%	6.98	1.17%
Non-Habitat	ORCHARDS	OR	0.00	0.00%	0.00	0.00%	0.00	0.00%	0.00	0.00%	0.00	0.00%	0.00	0.00%	0.00	0.00%	0.00	0.00%	0.00	0.00%	0.00	0.00%	0.00	0.00%
Non-Habitat	PACIFICORP FACILITY	PF	0.00	0.00%	0.00	0.00%	0.00	0.00%	0.00	0.00%	0.00	0.00%	0.00	0.00%	0.00	0.00%	0.00	0.00%	0.00	0.00%	0.00	0.00%	0.00	0.00%
Non-Habitat	PALUSTRINE AQUATIC BED	PAB	0.00	0.00%	0.00	0.00%	0.00	0.00%	0.00	0.00%	0.00	0.00%	0.00	0.00%	0.00	0.00%	0.00	0.00%	0.00	0.00%	0.00	0.00%	0.00	0.00%
Non-Habitat	PALUSTINED EMERGENT WETLAND	PEM	0.00	0.00%	0.00	0.00%	0.00	0.00%	0.00	0.00%	0.00	0.00%	0.00	0.00%	0.00	0.00%	0.00	0.00%	0.00	0.00%	0.00	0.00%	0.00	0.00%
Non-Habitat	PALUSTRINE SHRUB SCRUB WETLAND	PSS	0.00	0.00%	0.00	0.00%	0.00	0.00%	0.00	0.00%	0.00	0.00%	0.00	0.00%	0.00	0.00%	0.00	0.00%	0.00	0.00%	0.00	0.00%	0.00	0.00%
Non-Habitat	PALUSTRINE UNCONSOLIDATE BOTTOM	PUB	0.00	0.00%	0.00	0.00%	0.00	0.00%	0.00	0.00%	0.00	0.00%	0.00	0.00%	0.00	0.00%	0.00	0.00%	0.00	0.00%	0.00	0.00%	0.00	0.00%
Non-Habitat	PASTURE	PA	0.00	0.00%	0.00	0.00%	0.00	0.00%	0.00	0.00%	0.00	0.00%	0.00	0.00%	0.00	0.00%	0.00	0.00%	0.00	0.00%	0.00	0.00%	0.00	0.00%
Non-Habitat	RECREATIONAL	REC	0.00	0.00%	0.00	0.00%	0.00	0.00%	0.00	0.00%	0.00	0.00%	0.00	0.00%	0.00	0.00%	0.00	0.00%	0.00	0.00%	0.00	0.00%	0.00	0.00%
Non-Habitat	Reservoir		0.00	0.00%	0.00	0.00%	70.33	88.30%	0.00	0.00%	0.00	0.00%	195.78	60.29%	0.00	0.00%	0.00	0.00%	266.11	65.81%	266.11	44.51%	266.11	44.51%
Non-Habitat	RESIDENTIAL	RES	0.00	0.00%	0.00	0.00%	0.00	0.00%	0.00	0.00%	0.00	0.00%	14.05	4.33%	0.00	0.00%	0.00	0.00%	14.05	3.47%	14.05	2.35%	14.05	2.35%
Non-Habitat	RIGHT-OF-WAY	ROW	5.38	5.48%	5.38	5.48%	0.00	0.00%	7.59	7.96%	7.59	7.96%	0.00	0.00%	12.97	6.70%	12.97	6.70%	0.00	0.00%	12.97	2.17%	12.97	2.17%
Non-Habitat	RIPARIAN DECIDUOUS SHRUBLAND	RS	0.00	0.00%	0.00	0.00%	0.00	0.00%	0.00	0.00%	0.00	0.00%	0.00	0.00%	0.00	0.00%	0.00	0.00%	0.00	0.00%	0.00	0.00%	0.00	0.00%
Non-Habitat	RIPARIAN GRASSLAND	RG	0.00	0.00%	0.00	0.00%	0.00	0.00%	0.00	0.00%	0.00	0.00%	0.00	0.00%	0.00	0.00%	0.00	0.00%	0.00	0.00%	0.00	0.00%	0.00	0.00%
Non-Habitat	RIVERINE UNCONSOLIDATED BOTTOM	RUB	0.00	0.00%	0.00	0.00%	0.00	0.00%	0.00	0.00%	0.00	0.00%	0.00	0.00%	0.00	0.00%	0.00	0.00%	0.00	0.00%	0.00	0.00%	0.00	0.00%
Non-Habitat	RIVERINE UNCONSOLIDATED SHORE	RUS	0.00	0.00%	0.00	0.00%	0.00	0.00%	0.00	0.00%	0.00	0.00%	0.00	0.00%	0.00	0.00%	0.00	0.00%	0.00	0.00%	0.00	0.00%	0.00	0.00%
Non-Habitat	ROCK OUTCROP	RO	0.00	0.00%	0.00	0.00%	0.00	0.00%	0.00	0.00%	0.00	0.00%	0.00	0.00%	0.00	0.00%	0.00	0.00%	0.00	0.00%	0.00	0.00%	0.00	0.00%
Non-Habitat	SHRUB	SH	0.00	0.00%	0.00	0.00%	0.00	0.00%	3.20	3.36%	3.20	3.36%	0.00	0.00%	3.20	1.65%	3.20	1.65%	0.00	0.00%	3.20	0.54%	3.20	0.54%
Non-Habitat	UNVEGETATED	UV	0.00	0.00%	0.00	0.00%	0.00	0.00%	0.00	0.00%	0.00	0.00%	0.00	0.00%	0.00	0.00%	0.00	0.00%	0.00	0.00%	0.00	0.00%	0.00	0.00%
<b>Total Acres</b>			<b>98.14</b>	<b>100.00%</b>	<b>98.14</b>	<																		