

**SUBJECT: Preliminary Biological Assessment Green Tweener Thin timber sale: potential impacts to Drop Off northern spotted owl site.**

**TO:** Jerry Chetock

**FROM:** Rod Kraemer and Matt Gostin

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## **INTRODUCTION**

Purpose. The ODF has proposed Green Tweener Thin timber sale in the Santiam State Forest located in Marion County, Oregon. Green Tweener Thin timber sale is in the FY 2007 operations plan of the North Cascade District. Since Green Tweener Thin timber sale is located within the provincial home range of the Drop-Off northern spotted owl (NSO), a Biological Assessment (BA) is needed to evaluate impacts. The NSO is a state and federally listed 'threatened' species by the Oregon Fish and Wildlife Commission and the U.S. Fish and Wildlife Service (USFWS), respectively.

Policy Direction. The Northwest Oregon State Forests Management Plan provides management direction for all Board of Forestry Lands and Common School Forest Lands in northwest Oregon. The resource management goals and strategies are intended to achieve the greatest permanent value through a system of integrated resource management. This plan is guided by legal and policy mandates. The ODF's management activities are conducted in compliance with all state and federal environmental laws, including the state and federal Endangered Species Act (ESA), respectively. 'Take' of threatened or endangered species is prohibited under Section 9 of the federal ESA. The term 'take' means to harass, harm, pursue, hunt, shoot, wound, kill, trap, capture, or collect, or to attempt to engage in any such conduct. Such acts may include significant habitat modifications or degradation when it actually kills or injures wildlife by significantly impairing essential behavioral patterns including breeding, feeding, or sheltering. The policies and procedures for lands managed by the ODF in northwest Oregon are to avoid 'take' of NSO. 'Take' avoidance is accomplished on lands managed by ODF in the North Cascade District through the application of the rescinded USFWS take-avoidance guidelines (USFWS 1990).

The USFWS recommends the following stepwise approach to avoid or reduce the risk of incidental take:

1. Conduct NSO surveys during the breeding season and prior to any harvest activity according to protocols endorsed by the USFWS.
2. Avoid any harvest activity which results in less than 70 acres of the best available suitable owl habitat encompassing the NSO nest site and/or activity center of a pair of spotted owls.
3. Avoid any harvest activity which results in less than 500 acres of suitable NSO habitat within 0.7 mile radius (1000 acres) of a nest site and/or activity center.

The 500 acres may include the 70 acres in No. 2 above and should be as contiguous as possible.

4. Avoid any harvest activity which results in less than 40% coverage (1182 acres) by suitable owl habitat within a circle with a radius centered on a nest site and/or center of activity and as prescribed by physiographic provinces. The 40% may include the acreage required in No. 2 and No. 3 above.

The ODF biologists also assessed the 'risk' that the proposed operation may pose to the Drop-Off NSO. A number of factors in addition to the USFWS take-avoidance guidelines, including the proximity of the operation to the owl site, the prescription proposed, the size of the operation, the history of activity near the site, and other relevant factors were used to determine the 'risk assessment'.

## **BACKGROUND**

Survey Information. Kingfisher Ecological, Inc., conducted surveys for northern spotted owls in all potential NSO habitat in and around planned timber sales and known owl sites in the ODF Cascade District. Potential spotted owl habitat was surveyed in accordance with the protocol for surveying proposed management activities that may impact NSO (USFWS 1992). As a result of these surveys, the Drop-Off NSO site was located within 1.2 miles of the proposed timber sale (Figure 1).

Drop-Off Northern Spotted Owl Site Information. The Drop-Off NSO site was established in 2004. A sub-adult male was found once early in the season, and a pair was found late in the season. There were also several male and female night responses (Figure 1). The AC was placed at the April 29 male location (Figure 1). This location was used instead of the pair day location because it was earlier in the season, and was believed the pair had followed the surveyor the previous night. In 2005, a male was heard three times at night and found once during the day. The male was not banded and no females were heard. Status (pair) and AC remain the same (Kingfisher Ecological, Inc. 2005).

Timber Sale Area Information. The Green Tweener Thin timber sale consists of two units (Area 1 = 71 acres, Area 2 = 128 acres). Area 2 is located within the 1.2 miles of the Drop-Off NSO site (Figure 1). The current stand condition of Area 2 consists of a 50 year old stand currently classified as Understory (UDS). This stand type occurs after the stem exclusion stage has created small openings in the canopy, when enough light and nutrients become available to allow herbs, shrubs, and new trees to grow again in the understory. These stands have trees larger than sapling size. Tree canopies may range from a single species, single-layered, main canopy with associated dominate, codominate, and suppressed trees; to multiple species canopies. However, significant layering of tree crowns has not yet developed. The overstory consists of Douglas-fir with some scattered western hemlock. The stand in Area 2 has the following average stand characteristics: diameter breast height (DBH)=13, basal area (BA)=192, trees per acre (TPA)=201, and stand density index (SDI)=52. The understory consists of vine maple, Oregon grape, bear

grass, salal, and sword fern. There are four snags per acre; 100 cubic feet per acre of sound down wood; and 2700 cubic feet per acre of down wood in all decay classes.

The desired future condition for Area 2 is for a non-complex stand or general forest structure (GEN). The Douglas fir overstory will be encouraged to grow to a mature condition while maintaining stand vigor through thinning entries. Few species other than Douglas fir occur in the overstory, but those present will be favored in the residual stand. The anticipated pathway for Area 2 is: 1) light intensity, first entry, commercial thinning; some openings in the stand will occur; 2) In 3-5 years the stand will be a candidate for fertilization; 3) in 10-15 years the stand will be commercially thinned for the second time. This would be another light thinning, and some snags and downed wood might be developed; and 4) regeneration harvest to occur between overstory age 70-80 years.

The proposed management prescription for Area 2 is:

- Thin all trees greater than 8 inches DBH. After harvesting, Area 2 is expected to have the following average stand characteristics: DBH=14, BA=135, TPA=122, and SDI=35.
- No special efforts to protect understory trees, but many will survive.
- Maintain existing down and snags where possible.

## **ASSUMPTIONS**

Defining Drop-Off NSO Home Range. According to the procedures leading to ESA compliance for the NSO (USFWS 1990), the median home range size for spotted owls in the Oregon Cascades is 2500 acres, or the approximate equivalent of the area encompassed by a circle with a radius of 1.2 miles. Although NSO's generally do not have circular home home ranges, in the absence of more specific information about the home range of the Drop-Off NSO, it is assumed that a 1.2 mile radius circle around the nest or AC approximates the home range of the Drop-Off NSO site.

Defining Suitable Northern Spotted Owl Habitat. For the purposes of ESA compliance, the USFWS (1990) describes suitable NSO habitat as stands that exhibit the following characteristics:

- moderate to high canopy closure;
- a multi-layered, multi-species canopy dominated by large overstory trees
- a high incidence of large trees with large cavities, broken tops, and other indications of decadence;
- numerous large snags;
- heavy accumulations of logs and other woody debris on the forest floor; and
- considerable open space within and beneath the canopy.

These attributes are usually found in mature and old conifer forests, but are sometimes found in younger forests, especially those that contain remnant large trees or patches of large trees from earlier stands. It is important to note that the age of forests is not as

important a factor in determining habitat suitability as are vegetational and structural components (USFWS 1990). Forest stand structural attributes positively associated with foraging, roosting and nesting include vertical canopy layering, tree height or diameter diversity, canopy volume, canopy closure, snag diameter, snag basal area or volume, tree diameter and log volume (Courtney et al. 2004).

In ODF's experience, NSO also occur in some forest stands that are less than 80 years old. Several studies have investigated NSO home range and habitat use in young forests on ODF lands in western Oregon (Islam et al. 1997, Anthony et al. 2000, Tappeiner et al. 2000, Glenn et al. 2004). Islam et al. (1997) investigated the relationship between demography of NSO and habitat characteristics at the landscape level on ODF lands, and reported that the minimum diameter of the dominant conifer trees in stands of NSO habitat should be at least 18 inches and stands should also contain about three size classes and have variation in stem density within the stand. Anthony et al. examined habitat in owl home ranges on ODF lands in the Northern Coast Range (NCR) of Oregon and Elliott State Forest (ESF) in south-central Oregon Coast Range. Individual owls in the NCR study area selected mature forest and hardwood forest, and avoided young and pole stands. At ESF, owls selected mixed-age conifer, mature conifer, old conifer, and hardwood forest, and avoided young and pole. Owls were also found close to conifer-hardwood ecotones more often than expected in both study areas. At NCR, Tappeiner et al. 2000 reported that nest and forage sites had larger trees, lower tree densities, and more hardwood stems than low use sites, and that higher owl success (combination of site occupancy and reproduction indices) was positively correlated with average tree size and negatively correlated with tree density. Glenn et al. 2004 reported that individual owls on their study areas in the NCR and ESF varied greatly in habitat use patterns and appeared to be using different strategies for surviving in younger forests. In younger, or less structurally diverse landscapes, the use of hardwoods was more frequent than in landscapes dominated by older conifer forest. Hardwoods may contribute structural diversity and prey base than are otherwise in short supply in relatively young, homogenous landscapes lacking remnant old-forest structures.

Northern spotted owl habitat determinations within 1.2 miles of the Drop-Off northern spotted owl site were made by ODF wildlife biologists and foresters using results of NSO research on ODF lands, aerial photo interpretation, information about forest stand age and average stand diameter on ODF lands from the department's computerized forest inventory system databases (Figure 2), and ground-truthing. Based upon these findings, NSO habitat for this assessment was defined as:

- Forest stands greater than 18 inches average DBH provided suitable habitat for NSO.
- Forest stands between 12-17 inches average DBH provided suitable or non-suitable habitat for NSO depending on the presence/absence of structural characteristics needed to accommodate owls. ODF biologists, using professional judgment, determined the suitability of habitat for these stands by considering stand density, structural diversity, and tree diversity. Stands lacking in vertical and horizontal diversity and tree species diversity may provide poor habitat for prey species and/or few perching/hunting opportunities for spotted owls.

Extremely dense stands may preclude spotted owl use because of the difficulty for owls to maneuver through the stand.

- Forest stands less than 12 inches average DBH provided non-suitable habitat for NSO.

**IMPACT ASSESSMENT AND DISCUSSION**

Landscape Analysis. Approximately, 211 acres of suitable spotted owl habitat occurs within 0.7 miles, and 678 acres of suitable spotted owl habitat occurs within 1.2 miles of the Drop-Off NSO AC (Table 1)(Figure 3).

Table 1. Total acres of suitable and non-suitable northern spotted owl (NSO) habitat within 0.7 mile and 1.2 mile radii of Drop-Off NSO site.

<u>Landowner</u>	<u>0.7 mile radius</u>		<u>1.2 mile radius</u>	
	<u>Suitable</u>	<u>Non-suitable</u>	<u>Suitable</u>	<u>Non-suitable</u>
ODF	205	662	339	1698
USFS	0	2	140	189
Other	6	105	199	315
<b>TOTAL</b>	<b>211</b>	<b>769</b>	<b>678</b>	<b>2202</b>

Forest stands deficient in large trees and structural diversity appear to provide few nesting, roosting and foraging opportunities. Through 2005, 255 spotted owl locations have been documented on ODF lands in the North Cascades District. However, only 14% (n=35) of spotted owl responses were located in stands with an average stand diameter <14 inches DBH, and only 15% (n=37) of spotted owl responses were located in stands 50 years old or younger. Whereas, approximately 45-50% of ODF lands in the North Cascades District are 50 years old or younger. For stands aged 40-60 years old, only 9% (n=22) of spotted owl responses were located in this stand age class. Forest stands aged 40-60 years old comprise approximately 22% of ODF lands in the North Cascades District. Spotted owls appear to make use of forest stands with an average stand diameter >15 inches DBH with higher frequency. Approximately 54% (n=137) of spotted owl responses on ODF lands in the North Cascades District were located in forest stands with an average stand diameter 15-20 inches DBH, and approximately 41% (n=104) of spotted owl responses were located in stands aged 60-79 years old. Whereas, approximately 36% of ODF lands in the North Cascades District are 60-79 years old. The habitat features most consistently associated with nesting, foraging, and roosting stands are larger trees and snags, vertical canopy diversity, downed wood. The forest stand structure in Area 2 of the proposed timber sale is young, dense, and lacks structural diversity. Therefore, forest stand structure in Area 2 of the proposed timber sale was determined to be non-suitable NSO habitat.

The Green Tweener Thin timber sale will impact 9 acres of non-suitable spotted owl habitat within 0.7 miles and 118 acres of non-suitable spotted owl habitat within 1.2 miles of the Drop-Off NSO AC, respectively (Figure 3). The Green Tweener Thin timber sale will not impact any suitable spotted owl habitat within the provincial home range of the Drop-Off NSO. Thus, 211 acres of suitable spotted owl habitat will remain within 0.7 miles and 678 acres of suitable spotted owl habitat will remain within 1.2 miles of the Drop-Off NSO AC following administration and implementation of the Green Tweener Thin timber sale (Figure 3).

## **CONCLUSIONS AND RISK ASSESSMENT**

**Biological Risk.** The Green Tweener Thin timber sale poses a 'moderate' risk to the continued viability of the Drop-Off NSO site. The proposed timber sale area is predominately located 0.7-1.0 miles from the Drop-Off NSO site. Spotted owls consistently use mature/old forest disproportionately for natal dispersal, foraging, roosting and nesting compared to other cover types available (Courtney et al. 2004). While stands occupied by NSO's for nesting, roosting, and foraging generally exhibit more features of older forests than stands less used, vertical and horizontal diversity/complexity is a recurring feature of forest stand structure useful to spotted owls in many aspects of their life history and throughout their range. The proposed timber sale area and most of the provincial home range of the Drop-Off NSO is dominated by 50-year old Douglas fir stands. During the 1950's, a large forest fire burned the entire Sardine Creek watershed. The site was planted with off-site Douglas fir seedlings. Although the seedlings came from an off-site seed source, the trees are relatively healthy at this time. However, it is unclear if there will be long-term problems with the trees health and vigor because of their off-site origin. Overall, these stands are young, dense, lack structural diversity, and are generally not considered to be preferred by spotted owls. Forest habitats generally preferred by spotted owls for nesting, roosting, and foraging are not prevalent within the provincial home range of the Drop-Off NSO. Therefore, it is also unclear how spotted owls may be using forest stands in landscapes, such as the Sardine Creek watershed, which are dominated by extensive areas of younger forests.

The proposed action is likely to improve overall tree health and vigor, and is likely to improve habitat suitability for NSO's in 10-15 years. The proposed action is also consistent with management recommendations provided by several researchers investigating NSO on ODF lands. Anthony et al. 2000 recommended that habitat for NSO may be enhanced or created through active management, and suggested that carefully designed thinning operations developed after detailed site evaluations may accelerate the development of stands into forests with structural attributes more likely to accommodate NSO. Tappeiner et al. 2000 reported that low stand density, whether achieved naturally or created through management appeared to be important in the formation of stand structural characteristics associated with NSO use on ODF lands in the NCR and ESF.

**Compliance.** The total acres of suitable spotted owl habitat are significantly below USFWS recommendations to reduce potential risk of incidental 'take'; total acres of suitable habitat are 289 acres (-58%) lower than USFWS recommendations within 0.7

miles and are 504 acres (-43%) lower than USFWS recommendations within 1.2 miles of the Drop Off NSO AC, respectively. However, the proposed timber sale action will avoid any additional loss of suitable owl habitat within 0.7 miles and 1.2 miles of the Drop Off NSO AC. Specifically, the Green Tweener Thin timber sale will avoid timber harvest which:

- results in less than 70 acres of the best available suitable owl habitat encompassing the AC.
- results in any additional loss of suitable NSO habitat within a 0.7 mile radius of the AC; and
- results in any additional loss of suitable NSO habitat within a 1.2 mile radius of the AC.

## **CONSULTATION**

Oregon Department of Fish and Wildlife. Comments to be provided by Charlie Bruce

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