

Project–Level Management Indicator Assemblages Report

Salt Timber Harvest and Fuels Hazard Reduction Project

South Fork Management Unit

Hayfork Ranger District

Shasta-Trinity National Forest

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Introduction

The purpose of this project-level report is to evaluate and disclose the impacts of the Salt Timber Harvest and Fuels Hazard Reduction Project on the habitat components of the wildlife management indicator assemblages as identified in the Shasta-Trinity National Forest Land and Resource Management Plan (LRMP).¹

This report documents the effects of project alternatives on the habitat components of selected assemblages. Detailed descriptions of the Salt Timber Harvest and Fuels Hazard Reduction Project alternatives are found in Chapter 2 of the Project Environmental Impact Statement.²

Requirements for Management Indicator Assemblages at the Project-Level

In the project level report, biologists relate project-level impacts to management indicator assemblage habitat trends at the Forest scale. In addition, habitat trends and impacts will be reviewed by decision-makers in light of known population trends of vertebrate and invertebrate species found on the Forest. In so doing, decision makers and their advisors attempt to determine the relationship between the habitat changes expected in the project proposal and the known population trends of species found on the Forest.

Analyzing project-level effects to management indicator assemblages involves the following steps:

- Identifying which management indicator assemblages have habitat that would be either directly or indirectly affected by the project alternatives; these assemblages are potentially affected by the project
- Disclosing the LRMP forest-level or bioregional-level monitoring requirements for this subset of forest management indicator assemblages
- Analyzing project-level effects on management indicator assemblage habitat components for this subset
- Discussing the forest scale habitat trends for this subset
- Relating project-level impacts on management indicator assemblage habitat to habitat at the forest scale

Project-level effects on management indicator assemblage habitats are analyzed and disclosed in this separate Project-Level Management Indicator Assemblage Habitat Report and reported out as part of environmental analysis under the National Environmental Policy Act (NEPA). Under NEPA, this involves the following:

- Documenting compliance with LRMP requirements for management indicator monitoring
- Reporting out the direct and indirect effects to Management Indicator Assemblage Habitats as documented in the project level report
- Determining the significance of those impacts of the proposed project alternatives on Management Indicator Assemblage Habitat and

¹ USDA, Forest Service. 1995. "Land and Resource Management Plan (LRMP) Shasta-Trinity National Forests." Shasta-Trinity National Forest.

² USDA Forest Service. 2009. "Salt Timber Harvest and Fuels Hazard Reduction Project Environmental Impact Statement." Shasta-Trinity National Forest.

- If significant (or if useful in the discussion of overall impacts) discussing how direct, indirect, and cumulative effects will change the quantity and/or quality of assemblage habitat on the Forest

If determined not significant relative to the larger trends, cumulative effects need not be analyzed. Monitoring programs are intended to measure directly the cumulative results of past decisions and are incorporated in the monitoring baseline.

Description of Proposed Project

A detailed description of the project is located in the Salt Timber Harvest and Fuels Hazard Reduction Environmental Impact Statement. The treatments proposed in Alternatives 2 and 3 within the Salt Timber Harvest and Fuels Hazard Reduction project are displayed in Table 1 below.

Table 1-Comparison of treatment activities by alternative

Timber Stand Activity	Alt. 2	Alt. 3
Proposed Vegetation Treatments		
Intermediate Thinning	963 acres	850 acres
Shelterwood Harvest – Green Tree Retention	31 acres	30 acres
Shaded Fuel Break Thin	103 acres	100 acres
Regeneration Harvest - Green Tree Retention	27 acres	0 acres
Hand Fuel Treatment	14 acres	14 acres
Precommercial Thin	481 acres	421 acres
Total Proposed Treatments	1,619 acres	1,415 acres
Yarding Systems (commercial saw-timber)		
Tractor Yarding	986 acres	877 acres
Helicopter Yarding	138 acres	134 acres
Sub-merchantable Fuel Treatment		
Treat on Site	1,306 acres	1,168 acres
Tractor Site Prep and Burn Piles	58 acres	30 acres
Handpile, Burn Piles	152 acres	148 acres
Tractor Jackpot Pile and Burn Piles	103 acres	100 acres
Tree Planting	27 acres	0 acres
Landings constructed (and existing)	38 (19)	9 (11)
Temporary Road Constructed (miles)	0.3 miles	0 miles
Estimated Biomass (dry tons)	15,073 tons	4,680 tons
Estimated Timber Harvest Volume (thousands of board feet, MBF)	9,365 MBF	3,305 MBF
Road Activities		
Roads constructed (miles)	0 miles	0 miles
Roads maintained (miles)	5.0 miles	5.0 miles
Roads reconstructed (miles)	17.1 miles	17.1 miles
Temporary roads constructed (miles)	0.3 miles	0.3 miles
Miles of road closed	0.4 miles	0.4 miles
Miles of roads decommissioned		
Unauthorized roads decommissioned	9.5 miles	9.5 miles
Classified roads decommissioned	4.3 miles	4.3 miles
Total Miles of Roads Decommissioned	13.8 miles	13.8 miles
Borrow pit expanded for road surfacing	1	1

Resource Protection Measures

The following section displays the wildlife resource protection measures for the Salt Timber Harvest and Fuels Hazard Reduction Project.

Wildlife

- Should a new goshawk territory be discovered prior to or during implementation, conferencing with a biologist will occur and a buffer zone and limited operating period will be established.

Snags and Downed Woody Debris

- Existing snags and down logs greater than 19 inches in diameter will be retained (unless there are safety concerns or the snag is within a skid trail, temporary road location, or landing site). An average of 1.5 snags per acre greater than 15 inches in diameter and 20 feet in height will be retained. Snags felled for safety reasons would be left on site.
- Maintain an average of 5 tons of logs per acre in contact with the soil surface. Desired logs are about 20 inches in diameter.
- Maintain an average of 5 tons of downed material per acre (or 10 tons of downed material per acre depending upon land management allocation) with a preference to have 4 to 6 logs per acre at the largest available diameter.
- Retain hardwoods that have a reasonable chance of surviving and thriving after stand treatments.

Riparian Reserves

- **Perennial and Non-perennial:** No treatment or equipment within any of the riparian reserves.
- **Perennial:** No thinning and no equipment in perennial stream riparian reserves. Riparian reserves for perennial streams for this project are 300 feet for fish bearing streams and 225 feet for non-fish bearing streams.
- **Non-Perennial Streams:** The non-perennial riparian reserve is defined for this project as a protection zone 150 feet wide measured along the slope from the high watermark up the hillslope.
- **Equipment Exclusion Zone:** No equipment and no thinning allowed within the equipment exclusion zone (EEZ). The EEZ is a portion of the riparian reserve defined for this project as the area that extends 50 feet (slope distance) from the high watermark on slopes greater than 30 percent, and extends 25 feet (slope distance) on slopes less than 30 percent OR extends to the inner gorge, which ever is greater.
- No new landings would be located inside of riparian reserves
- At least 60 percent of overstory canopy remains after thinning in riparian reserves
- Designate and approve Riparian reserve crossings in coordination with the fisheries biologist or hydrologist.
- Equipment will be excluded from operating on active or potentially active landslides and thinning will be prescribed by a geoscientist.
- Selective commercial thinning within riparian reserves, adjacent to equipment exclusion zones (EEZs), would be accomplished through a combination of mechanical operations and hand thinning.

- Hazard trees within riparian reserves must be dropped and retained on site if greater than 16 inches dbh. Handpiles of thinned fuels would be placed outside of EEZs and burned in the riparian reserve in a manner that leaves at least 50 percent of the localized area unburned at any given time. In addition, hand piles would be placed in a checkerboard pattern whenever possible (not one pile directly above another).
- When fuels treatments involve area ignition, use backing fire in riparian reserves. There would be no ignition within riparian reserves associated with understory burning; however, fire would be allowed to creep into riparian areas.

Wildlife Management Indicator Assemblages

The Shasta-Trinity Land and Resource Management Plan (1995) identifies nine wildlife assemblages selected as management indicators. Table 2 displays the nine wildlife assemblages and their habitat components.

Table 2-Shasta-Trinity NF Wildlife Management Indicator Assemblage Habitats and Components

Management Indicator Assemblage	Habitat Components for Analysis
Late-Seral	Tree stands with average crown diameter equal to or greater than 13' and having a crown density equal to or greater than 40% as represented in LRMP database (size class 3N and above).
Open- and Early-Seral	Meadows, openings, and tree stands with average crown diameter less than 13' or tree stands with average crown diameters between 13' and 24' with crown cover less than 40% as represented in LRMP database (size class 3P and below)..
Multi-Habitat	Appropriate combinations of the other assemblages as represented in the LRMP database.
Snag and Down Log	Forest types greater than or equal to 13" crown diameter, and greater than or equal to a 40% crown cover, containing snags and down logs (size class 3N and above) as represented on the LRMP database, including all hardwood stands.
Riparian	The presence of riparian classified vegetation components as mapped in the Forest LRMP data base.
Aquatic	Open bodies of water such as rivers, creeks, lakes, ponds, etc., as mapped on the Forest LRMP database.
Hardwood	Vegetation types containing significant proportions of hardwood trees as represented in the LRMP database.
Chaparral	Shrub dominated vegetation communities containing or dominated by chaparral species.
Cliffs, Caves, Talus and Rock Outcrops	The presence of cliffs, talus, and larger rock outcrops as mapped on the LRMP database or as identified by field personnel.

¹LRMP 90 & 93 vegetation type, size and Density Codes: **Vegetation Type Codes:** **Size class:** 0=seedlings; 1 = seedlings and saplings 0"-5" diameter at breast height (dbh); 2 = poles 6" - 12" dbh; 3 = Small-Medium 13" to 24" dbh; 4 = Medium to large 25" to 40" dbh ; 5 = Large trees ≥ 40" dbh; 6 = Sparse overstory of large conifers (size 4 or 5) with dense understory of conifer poles/saplings (size 1 or 2), multistoried stand. **Canopy Cover or Density:** G = Canopy cover (CC) ≥ 70%; N = CC 40% - 69%; P = CC 20% - 39%; S = CC 10% - 19%

The Shasta-Trinity National Forest LRMP (1995) also established three fisheries assemblages and five fisheries management indicator species selected to represent those assemblages.³ Fisheries assemblages and management indicator species are analyzed in a separate document.

Selection of Project-level Management Indicator Assemblages

The management indicator assemblages analyzed for the Salt Timber Harvest and Fuels Hazard Reduction Project were selected from the list of assemblages identified in the Shasta-Trinity Land and Resource Management Plan (see table 2 on page 4).

Map 1 in Appendix A displays the location of the assemblage types that occur in the project area. Table 3 displays the habitat assemblages and approximate acres of each that occur in the project area (overlap between assemblages occurs in the acreage figures).

Table 3-Acres of assemblage types in the project area

Assemblage Type	Acres
Late Seral	3,533
Open and Early	670
Riparian	1,054
Chaparral	48
Cliff, Cave, Talus, Rock Outcrops	28

The Aquatic habitat assemblage does not occur within the project area and will not be affected by project implementation. Therefore, the project will neither directly nor indirectly affect the habitat for this assemblage and will, therefore, have no impact on forest-level habitat or population trends. The Aquatic assemblage will not be further discussed in this report.

The Hardwood Assemblage is not represented separately within the project area. Hardwoods are present in the project area as a component of the mixed conifer stands. Effects of the Salt project on the hardwood component will be evaluated in this document.

The Snag and Down Log Habitat Assemblage also occurs within the project area. Stand exam data from 2008 shows that currently there is an average of 13 dead trees per acre across the project area. Six of the 13 dead trees are greater than 12 inches dbh. Three of the 13 dead trees per acre are larger than 16 inches dbh and on average there is one additional snag per acre between 14.1 and 16 inches dbh (Chapter 3.2.2). This is greater than the Forest Plan standard of 1.5 snags per acre over 15 inches dbh. (Petersen and Amell 2009).

Large woody debris ranges from 5 to 10 trees per acre for mixed conifer stands, from 3 to 8 trees per acre for tree/brush stands and 1 to 5 logs per acre for brush areas (Foss 2009). Downed woody material ranges from less than 7 tons per acre to over 68 tons per acre, with an overall average of approximately 37 tons per acre across most of the project area (Lewis 2009).

The Multi-habitat Wildlife Assemblage represents a variety of vegetated habitats, seral stages and special habitat components (S-T LRMP 1995). Effects of the Salt Timber Harvest and Fuels Hazard Reduction Project to the Multi-habitat Wildlife Assemblage will be analyzed as part of the other assemblages rather than separately.

³ LRMP pages 3-11

Chaparral and cliffs, caves, talus and rock outcrops assemblage habitats are present within the analysis area but are unlikely to be directly or indirectly affected by actions proposed in either Alternative 2 or Alternative 3. Therefore, the project will neither directly nor indirectly affect the habitat for these assemblages and will, as a result, have no impact on forest-level habitat or population trends. Chaparral and Cliffs, Caves, Talus and Rock Outcroppings Assemblages will not be discussed any further in this report.

Management Indicator Assemblages Evaluated for Effects

The assemblage habitats selected for project-level management indicator analysis for the Salt Timber Harvest and Fuels Hazard Reduction Project are: late-seral, openings and early-seral stage forest, snag and downed logs, hardwood, and riparian assemblages. These five assemblages are likely to be either directly or indirectly affected by Alternative 2 or Alternative 3 of the project. This analysis will evaluate the likely effects of Alternative 2 and Alternative 3 on these management assemblage habitats and relate these effects to potential Forest-scale impacts. These effects will be considered and disclosed under NEPA and, if determined to be significant, analyzed for their direct, indirect, and cumulative effects.

Project-level Effects Analysis on Selected Management Indicator Assemblages

Alternative 1 – No Action

Wildlife habitat assemblages present in the project area would not change.

Alternatives 2 and 3

Map 2 in Appendix A displays the habitat assemblages affected by treatments proposed in Alternative 2 and Alternative 3.

Table 4 displays the acres of habitat by assemblage that will be disturbed by actions proposed in the Salt Timber Harvest and Fuels Hazard Reduction Project. The acres disturbed will not shift to a different assemblage as a result of treatment.

Table 4-Acres of habitat by assemblage that would be disturbed by actions proposed in Alternative 2 and Alternative 3

Assemblage Type	Acres Treated (Disturbed)	
	Alternative 2	Alternative 3
Late-Seral	951	877
Open- and Early-Seral	148	138
Riparian		
Commercial thinning	80	
Pre-commercial thinning	62	0
Riparian Total	142	

There would be no change in the number of acres of late-seral, riparian and open- or early-seral habitat assemblages as a result of intermediate thinning proposed in either Alternative 2 or Alternative 3.

Thinning in the shaded fuel break proposed in Alternative 2 or Alternative 3 would result in no change in acres of existing late-seral and open- or early-seral habitat assemblages.

No thinning would occur within riparian reserves of perennial streams. There would be no change in the number of acres of riparian habitat assemblages as a result of the commercial and pre-commercial thinning treatments proposed in Alternative 2 or Alternative 3.

There would be no change in the number of acres of open- early-seral habitat assemblages as a result of the commercial and pre-commercial thinning treatments proposed in Alternative 2 or Alternative 3.

Regeneration harvest with green tree retention proposed in Alternative 2 would result in a loss of 14 acres of late-seral habitat and an increase of 14 acres of open- and early-seral habitat. No regeneration harvest with green tree retention is proposed in Alternative 3 so there would be no shift in late-seral habitat to open- or early-seral habitat.

Shelterwood harvest with green tree retention proposed in Alternative 2 would result in a 31 acre loss in late seral habitat. Open- and early-seral habitat would increase by 31 acres in Alternative 2. Shelterwood harvest with green tree retention proposed in Alternative 3 would result in a 30-acre loss in late seral habitat and an increase of 30 acres of open- or early-seral habitat.

The hardwood component that occurs within the mixed conifer stands would be indirectly affected by treatments proposed in Alternative 2 or Alternative 3. Hardwoods would not be treated, but some individual trees may be inadvertently damaged and subsequently lost as a result of thinning and logging operations. Damaged hardwoods would be left on site. Loss of hardwoods would not be expected to be significant across the project area. Resprouting of some hardwood species would also be expected.

There would be some loss of snags and down wood habitat assemblage in both Alternative 2 and Alternative 3. Some dead, dying and mistletoe infected trees would be removed. Removal of dying trees and those infected with mistletoe would reduce future snags and down woody debris. Some loss of snags less than 19 inches dbh and down woody material in the 3-inch to 20-inch class would also occur. However; resource protection measures will assure that existing snags and down logs greater than 19 inches in diameter will be retained, unless they are in a skid trail, landing site, or other exceptions. An average of 1.5 snags per acre greater than 15 inches in diameter and 20 feet in height will also be retained. Snags felled for safety reasons would be left on site. An average of 5 logs per acre will be retained. Additionally an average of 5 or 10 tons of downed material, depending on the unit's Forest Plan land allocation, will be retained on slopes less than 40% with a preference to have 4 to 6 logs per acre at the largest available diameter.

A few acres of existing assemblage habitat would be removed for the reconstruction and construction of temporary roads, landings and gravel pit expansion.

Habitat and Population Status and Trend at the Forest Scale

The Shasta-Trinity NF LRMP (1995) requires either appropriate indicator species or habitat components to represent the assemblages in forest monitoring; hence, the assemblage effects analysis for the Salt Timber Harvest and Fuels Hazard Reduction.

The sections below summarize the habitat status and trend data for the Forest. This information is drawn from the detailed information on habitat and population trends in the Shasta-Trinity National Forest Management Indicator Assemblage Report, which is hereby incorporated by

reference. ⁴ Please reference pages 13 to 17 in this document for background information about the management indicator program direction, monitoring and analysis on the Shasta-Trinity National Forest.

Habitat Status and Trend

Table 5 displays the changes in total assemblage habitat across the Shasta-Trinity National Forest between 1991 and 2005. This shift was a result of timber harvest and wildfires.

Table 5-Shifts in total assemblage habitat between 1991 and 2005 due to harvest and wildfire

Assemblage	Acres of Assemblage Type Habitat in 1991	Change in Acres due to Wildfire and Harvest Since 1991	Acres of Assemblage Type Habitat Remaining from 1991 amounts or shifted to early-seral
Late-seral	741,850	-52,878	688,972
Openings and Early Seral	901,460	94,662	996,122
Multihabitat	2,411,656	0	2,411,656
Snags and Downed Logs	1,519,469	-104,393	1,415,046
Riparian	6,047	-149	5,898
Aquatic	53,335	0	53,335
Hardwoods	190,909	-14,856	176,053
Chaparral	133,736	0	133,736
Cliffs, Caves, Talus and Rock Outcrops	53,865	0	53,865

Simultaneous accrual of late-seral assemblage habitat occurs through a normal process of tree growth and stand development. The Forest has gained late-seral assemblage habitat where accrual transitions a size class 2 forest to a size class 3, or where development transitions a size class 3 stand from a density below 40 percent canopy cover to a stand with 40 percent or above canopy cover.

Table 6 illustrates the accruals in late-seral habitat (and subsequent losses in open and early seral assemblage habitat) with the losses that occur in late-seral assemblage habitat through harvest and wildfire.

⁴ USDA Forest Service. 2007. Wildlife Management Indicator Assemblage Habitat Monitoring Report. Last Edited by Kelly Wolcott 9/13/2007

Table 6-Net shifts in late-seral and early-seral habitat assemblages including in-growth of openings and early-seral assemblage stands to late-seral assemblage stands

Assemblage	Acres of Assemblage Type Habitat in 1991	Change in Acres due to Wildfire and Harvest Since 1991	Forest Growth – Acres of Shift from Early-seral to Late-seral Assemblage Habitat Types	Acres of Net Shift in Habitat from Early-seral to Late-seral Assemblages
Late-seral	741,850	-52,878	252,409	941,381
Openings and Early-seral	901,460	94,662	-252,409	743,713

During the summer and fall of 2008 on the Shasta-Trinity National Forest, there were numerous wildfires. Changes to the Forest-wide habitat assemblage acres as a result of these wildfires were not yet available at the time this document was completed. The wildfires would cause shifts from the pre-wildfire habitat assemblages above to a mosaic of pre-wildfire assemblages and open- or early-seral habitat assemblages.

Habitat Assemblage Status and Trend

Since the writing and approval of the LRMP, the Forest has seen a net shift of management indicator assemblage habitat from openings and early seral assemblage type to late seral assemblage type. This results from the natural processes of forest in-growth where size class 2 forests accrue growth and transition into size class 3 forests or lower density forests. The net accrual of habitat into the late-seral assemblage partially reflects the reduction in timber harvesting since the early 1990s and the Forest-wide efforts to control wildfire. There are distinctions between “old-growth” as a seral category of interest and “late-seral assemblage” as a management indicator assemblage category. Accrual of growth from open and early seral assemblage stands to late-seral assemblage stands represents ingrowth at the smaller size classes of late-seral assemblage habitat. Changes to old growth conditions are generally analyzed separately within the NEPA or wildlife analysis.

Relationship of Project-Level Impacts to Forest-Scale Habitat and Population Trends for the species

Alternative 2 would result in a net shift of approximately 45 acres of late-seral and snag and down log assemblage habitat to open- and early-seral assemblage habitat. This shift would occur as a result of regeneration and shelterwood harvest with green tree retention treatments.

Alternative 3 would result in a net shift of approximately 30 acres of late-seral and snag and down log assemblage habitat to open- and early-seral assemblage habitat. This shift would occur as a result of shelterwood harvest with green tree retention treatment.

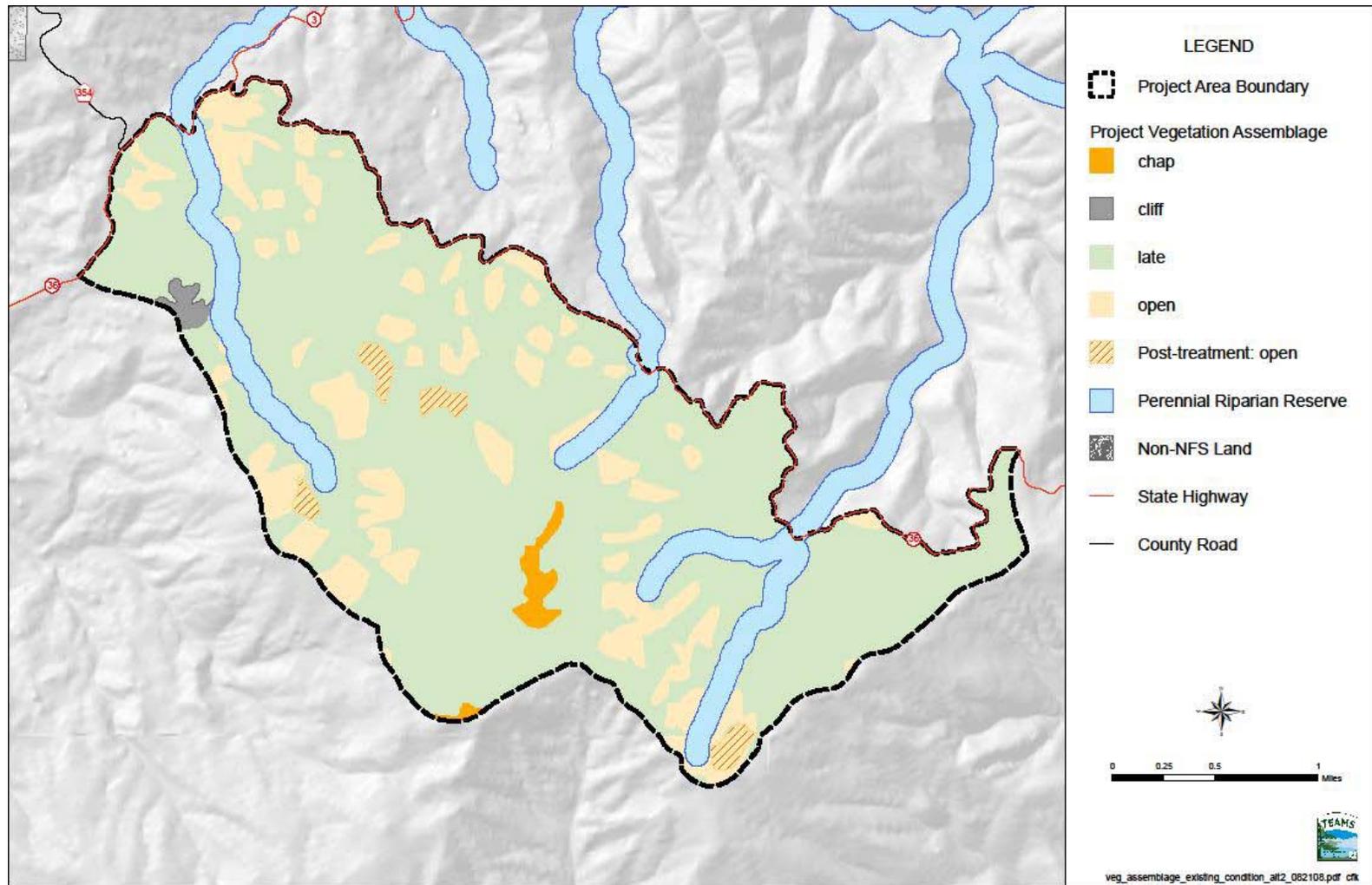
None of the other treatment types are intense enough to result in a significant shift of habitat assemblage type. All larger snags will be retained in this project treatment type; though we categorically exclude younger forest types from the snag and down log assemblage habitat in order to favor the consideration of larger snags as inherently more valuable for most wildlife species than the smaller ones.

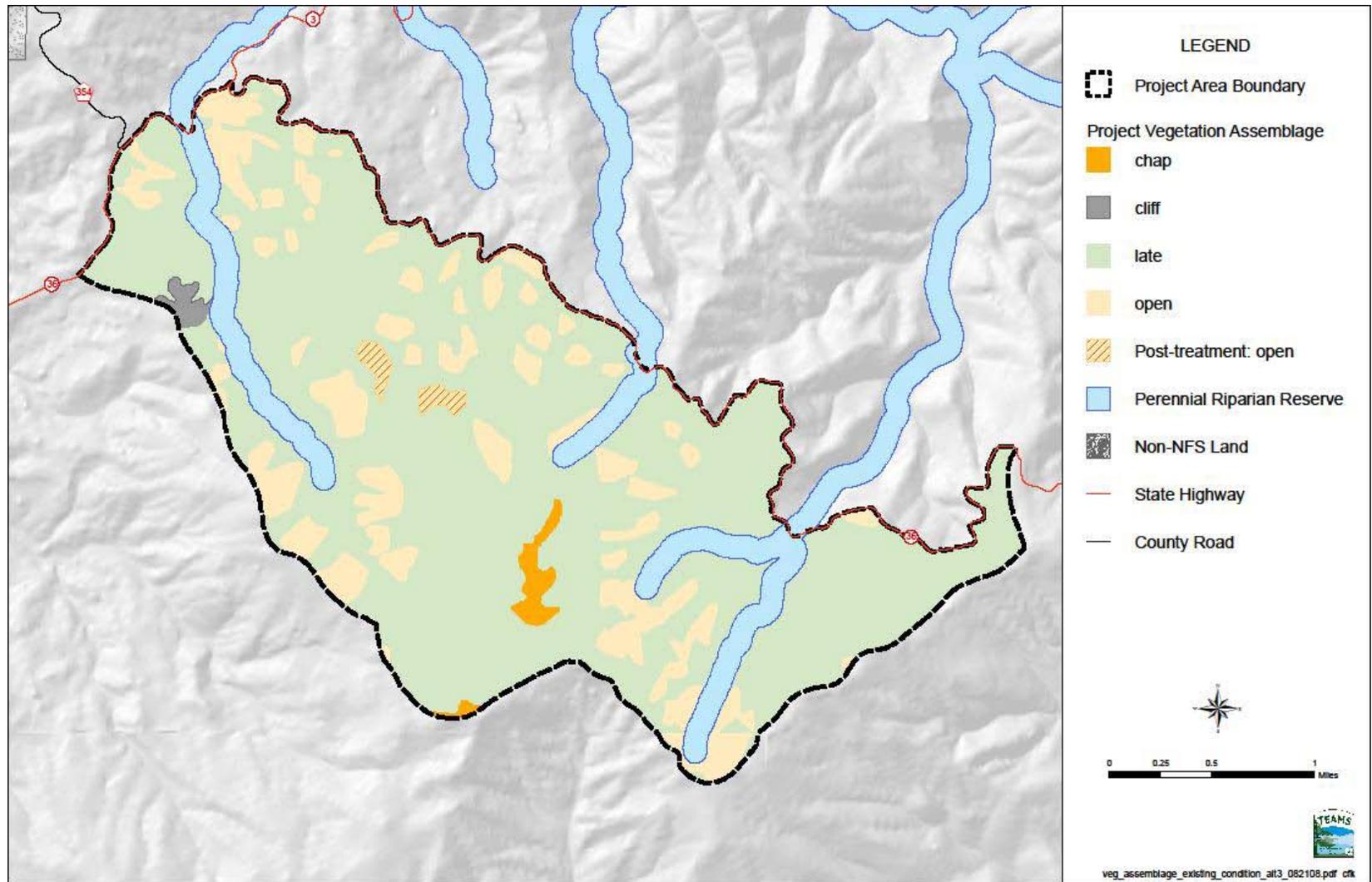
The small shift in acres of late-seral to open- or early-seral habitat in each Alternative is counter to the general accrual of late-seral assemblage habitat. The slight increase in the acres of open- and early-seral assemblage would maintain diversity in the project area and benefit those wildlife species dependent on this habitat type as well as the multi-habitat assemblage species.

The actions proposed in either Alternative 2 or Alternative 3 of the Salt Timber Harvest and Fuels Hazard Reduction Project would not have any affect on the current habitat trend on the Shasta-Trinity National Forest.

Appendix A: Vegetation Assemblage Maps

Map 1: Existing condition and alternative 2 vegetation assemblages





Map 2: Existing condition and Alternative 3 vegetation assemblages

References Cited

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