The U.S. Department of Agriculture (USDA) prohibits discrimination in all its programs and activities on the basis of race, color, national origin, age, disability, and where applicable, sex, marital status, familial status, parental status, religion, sexual orientation, genetic information, political beliefs, reprisal, or because all or part of an individual's income is derived from any public assistance program. (Not all prohibited bases apply to all programs.) Persons with disabilities who require alternative means for communication of program information (Braille, large print, audiotape, etc.) should contact USDA's TARGET Center at (202) 720-2600 (voice and TDD). To file a complaint of discrimination, write to USDA, Director, Office of Civil Rights, 1400 Independence Avenue, S.W., Washington, D.C. 20250-9410, or call (800) 795-3272 (voice) or (202) 720-6382 (TDD). USDA is an equal opportunity provider and employer.
On March 15, 2006, the Eagle Ranch Timber Sale Environmental Assessment was posted on the Shasta-Trinity National Forest website. On March 16, 2006, an edit was made on page 44 which is Appendix B: Response to Comments.

The original comment #2 was:

| #2  | CC 11/11/05 | Comment: Page 1 of the EA states Alternative 2 will log 2.9 mmbf of timber. Page 5 states it will log 3.8 mmbf. The impacts from an additional 900 mbf would be significantly different. Response: Page 1 of the EA states that the Proposed Action includes 2.9 acres of Intermediate harvest plus 900 mbf of Regeneration harvest, which totals 3.8 mmbf. | This is a general comment regarding the clarity of the proposal. |

The revised #2 comment is as follows. The edited portion is in **bold, red, italic**.

| #2  | CC 11/11/05 | Comment: Page 1 of the EA states Alternative 2 will log 2.9 mmbf of timber. Page 5 states it will log 3.8 mmbf. The impacts from an additional 900 mbf would be significantly different. **Response:** Page 1 of the EA states that the Proposed Action includes 2.9 mmbf (**million board feet**) of Intermediate harvest plus 900 mbf (**thousand board feet**) of Regeneration harvest, which totals 3.8 mmbf. | This is a general comment regarding the clarity of the proposal. |
1. Purpose and Need for Action

A. Introduction and Location

The Eagle Ranch Timber Sale is being proposed as part of the Shasta-Trinity National Forest Timber Sale Program. The project area has had previous timber harvests including the most recent Forest Service timber sale in the 1980’s. The timber sale being proposed in this Environmental Assessment consists of second-growth mixed conifer stands that are dominated by Douglas-fir. Project designs specifically defer all silvicultural treatments within high-quality old growth habitat, retaining this entire vegetative component for wildlife habitat. This analysis covers the National Forest System land on the Big Bar Ranger District of Shasta-Trinity National Forest. Also, larger portions of land are considered for context purposes that vary with the affected resource (for example, the 53,000 acre Burnt Ranch 5th field watershed is used to evaluate cumulative effects for wildlife habitat analysis purposes). A Watershed Analysis (WA) was completed to identify project area riparian reserve protection needs and management activities that would benefit the resources within the affected watershed. Project proposals identified in this Environmental Assessment (EA) comply with key findings and management recommendations of the WA.

The project proposal area is in the Trinity River Management Area (Area 15) as identified in the Shasta-Trinity National Forest Land and Resource Management Plan (LRMP). The LRMP Land Allocation further identifies the proposal as being within Matrix lands of the Hayfork Adaptive Management Area identified in the Northwest Forest Plan, within a Management Prescription VIII area that emphasizes Commercial Wood Products. The project area is located approximately 5 air miles southeast of the community of Big Bar in Trinity County, CA., including the following legal locations: Township 33 North, Range 12 West, sections 1 and 12, Mt. Diablo Meridian; Township 33 North, Range 11 West, sections 6 and 7, Mt. Diablo Meridian.

B. Proposed Action

The USDA Forest Service, Shasta-Trinity National Forest, Trinity River Management Unit (TRMU) is proposing to harvest and sell timber in the Big Bar area. The timber sale would include National Forest timberland in the Eagle Creek and Sailor Bar Creek subwatersheds within the Burnt Ranch watershed. Key components of the project would include:

- Intermediate harvest: Thinning on approximately 59 acres (the thinning areas include the Riparian Reserve portion of the treatment area). The estimated timber harvest is 2.9 million board feet of timber.
- Regeneration harvest: Green tree retention (GTR) on approximately 58 acres outside of Riparian Reserve areas. The estimated harvest is 900 thousand board feet of timber.
- No new system roads would be constructed or reconstructed. However, culverts replacement and road surfacing will be done to improve water quality.
- No direct effect on old-growth habitat by omitting all old growth stands from being harvested in the project proposal.
• Tractor and cable yarding, log hauling, site preparation, fuel treatment, tree planting, precommercial thinning, and subsequent plantation management activities.

Project activities would begin as soon as the summer of 2005, be done within 3 years, and may be implemented under one or more contracts. A variety of fuels treatments would be applied to leave the area in a condition which would have a reduced fire hazard as compared to pre-project conditions. Fuelwood generated from the timber removal and fuel treatments would be available to the public through the fuelwood permit process. Other activities include providing buffers and retaining 60% crown closures around riparian reserves, maintaining snags and down logs for wildlife habitat, and protecting “other resources” such as soils, sensitive plants, and cultural resources.

The LRMP includes a standard and guideline (S&G) designed to provide for retention of old-growth fragments in watersheds where little remains. The proposed harvest units were located to specifically avoid areas that were identified by the project wildlife biologist as currently providing the highest quality late-successional and old-growth conifer habitat (LSOG) in the Burnt Ranch 5th Field Watershed. The proposed harvest units lie in early- to mid-mature conifer habitat that is common throughout the watershed and were also not identified by the biologist as high priority areas to meet the S&G. Additionally, the thinning prescriptions purposefully include recommendations from the biologist (e.g., retaining the largest available trees, snags and logs as well as all viable hardwoods) to encourage the development of LSOG attributes and increase future options for meeting the S&G.

For more detailed information regarding the proposed action, refer to the Alternatives section, Alternative 2, and the attached project map.

C. Purpose and Need

The purpose and need for the proposed project was developed by an interdisciplinary planning team from opportunities identified during reconnaissance of the project area, from public scoping, and from the project area Watershed Analysis. The purpose and need for the proposed project is to maintain and improve the health and vigor of forested areas and reduce the risk of stand replacing fires consistent with the ecosystem needs of other resources. The purpose and need is derived from direction in the Shasta-Trinity National Forest Land and Resource Management Plan (LRMP) as identified in Forest Goals #10 and #11 for Fire and Fuels and in goals #34, #35, and #36 for Timber (LRMP pages 4-4 and 4-5).

Specific resource needs identified by the interdisciplinary planning team to meet the project area goals for ecosystem management include the following:

• There is a need to remove excess tree numbers from young thrifty pole and small sawtimber size stands. The Forest Plan ecosystem objectives are to obtain stocking control (thinning) and minimize mortality (Forest Plan 4-67). These areas are approaching or are beyond their maximum carrying capacity, measured by the density of trees. The live crown ratio (lcr), an indicator of tree vigor, is decreasing and averages about 30-40% (considered minimum to maintain adequate tree growth and vigor). The high density of understory trees in the suppressed and intermediate crown positions are expected to result in tree mortality within
these positions, increasing the fuels available during a wildland fire. The thinning proposal is intended to maintain suitable stand growth, improve tree vigor over time by providing space for the trees retained to grow, provide merchantable wood removed as an economic offering, and reduce timber stand mortality from wildland fire.

- There is a need to obtain an optimum timber yield of wood fiber products from productive forest lands within the context of ecosystem management. The Forest Plan desired ecosystem objectives are to approach regulation through scheduled regeneration harvests over a period of time called the conversion period (Forest Plan Appendix C-3), to obtain a sustained yield of wood fiber products from productive lands, to include an economically feasible mixture of harvested stands, and to provide habitat for those wildlife species primarily dependent on early and mid-seral stages. Sustainability of timber stands is achieved with a more balanced age class distribution than exists currently. Stands not growing well or those that have matured are in greatest need for regeneration. This treatment is only an intermediate step towards achieving the desired age class distribution.

- There is a need to treat both natural fuels and activity fuels to reduce fire hazard. The existing fire hazard from natural fuels is moderate with a risk of losing key ecosystem components from wildfire. In addition, the high density of understory trees in the suppressed and intermediate crown positions is expected to result in tree mortality within these positions, increasing the fuels available during a wildland fire. Fuel treatments are expected to result in improved (lower) fire hazard conditions.

- There is a need to provide for retention of old-growth (wildlife habitat) fragments where little remains. In addition, there is a need to provide for snags and logs since these are important components of habitat for a large number of wildlife species.

- There is a need to provide suitable habitat to Federally Listed and Forest Service Sensitive wildlife species.

- There is a need to apply silvicultural practices within Riparian Reserves to control stocking, reestablish and manage stands, and acquire desired vegetation characteristics needed to attain Aquatic Conservation Strategy Objectives.

- There is a need to manage the soil resource to Soil Quality Standards as identified in the LRMP and Best Management Practices (BMPs).

- There is a need to protect historic properties and areas of cultural significance.

- There is a need to protect Sensitive plant species within the affected area to avoid a trend toward Federal listing.

- There is a need to avoid geologically sensitive areas to prevent adverse effects to slope stability.

D. Decision to be made

The decision to be made by the District Ranger is whether to implement the proposed action, modify the proposal to more fully address unresolved conflicts and disputes with the proposed action, or take no action at this time.
E. Public Involvement

A scoping letter for the proposed project was mailed March 19, 2004, to sixty-three individuals and organizations collectively that were expected to have interest in the Eagle Ranch Timber Sale Project. In addition, the notice was published in the newspaper of record, the Record Searchlight, and in the Trinity Journal – a local newspaper. The proposed project was also listed quarterly from May 1999 to July 2004 (21 quarters) in the Schedule of Proposed Environmental Actions, a Shasta-Trinity National Forest publication. The US Fish and Wildlife Service (USFWS) was consulted regarding the proposed action in the scoping process. In addition, members of the interdisciplinary planning team met directly with the National Marine Fisheries Service (NOAA Fisheries) and California Regional Water Quality Control Board (North Coast Region) and reviewed the proposed action. **Three responses were received during this scoping period. However, no significant issues resulted from these letters. Issues recognized as non-significant are not included within this EA, but are identified in the issue management section of the project file for tracking purposes with the rationale for dismissal/disposition of these being cited.**
2. Alternatives

A. Alternatives Considered

Alternative 1 (No Action)

The No Action alternative provides a point of reference from which to evaluate the action alternatives. This alternative would implement no activity at this time, allowing the existing conditions to remain unchanged. The existing vegetative condition of the areas considered (for timber harvest in the Proposed Action) includes about 120 acres of even-aged, 110-year-old conifer stands with species distributions of about 84% Douglas-fir, 12% ponderosa pine, and 4% sugar pine. Stand densities average over 300 square feet of basal area per acre with crown closures of 70-100%. Intertree competition for sun, water, and nutrients has resulted in decreased in tree diameter growth (from approximately 4 rings per inch in the 1980’s to 14 rings per inch currently) and decreased live crown ratios (from approximately 60% in the 1980’s to 30% currently).

This alternative does not meet the identified purpose and need to yield timber volume outputs and promote site potential growth within the timber stands.

Alternative 2 (Proposed Action)

The Proposed Action provides management activities to meet the identified project purpose and need. The emphasis of this alternative is to manage the timber resource in accordance with forest health objectives while maintaining late-successional and old growth habitat. This alternative thins 59 acres of forest stands to levels expected to maintain and enhance growth and yield of commercial timber species while leaving stand attributes such as snags and hardwoods for wildlife habitat needs. Trees targeted for removal would be the least vigorous individuals in the suppressed and intermediate crown positions. Trees in the codominant crown position would be removed where stand densities are excessive and removal is expected to contribute to the development of late successional conditions. Stand densities outside of riparian reserves would be thinned to a density that would sustain timber stand growth for approximately 30 years (no re-entry for harvest is anticipated for 30 years or more). Within riparian reserves, stand densities would be maintained at higher levels to retain a greater amount of crown cover (at least 60% where it exists).

Regeneration harvesting would be applied on 58 acres (and subsequently planted with conifers and providing vexar tubes on the planted seedlings for protection from deer browsing damage) with a minimum of 15% of the timber stand being retained to maintain biological diversity and ecosystem function.

Timber harvesting would be done by a combination of short-span cable yarding and tractor yarding. No road construction or reconstruction is proposed. Key components of Alternative 2 including design features and mitigation measures are identified in the following section. (Refer to Appendix A for additional Unit-specific information).
Key Components of Alternative 2

1. Regarding timber management:

- The timber management proposals include reducing the trees/acre of mature mixed conifer timber stands from approximately 300 trees/acre (individual trees from 8”-40” diameter breast height) to 40-50 trees/acre (individual trees remaining would be 16”-60” diameter breast height) on 59 acres within intermediate harvest units. The most vigorous predominant, dominant, and codominant trees will be left after stocking objectives are met. In addition, 58 acres of regeneration harvesting would be done in selected harvest units. The regeneration units would be planted with conifers after successful planting site preparation.

<table>
<thead>
<tr>
<th>Table 2-1: Timber Stand Activity</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>ALT. 2</strong></td>
</tr>
<tr>
<td>Intermediate Harvest (thin from below)</td>
</tr>
<tr>
<td>Tractor yarding</td>
</tr>
<tr>
<td>Cable yarding</td>
</tr>
<tr>
<td>Regeneration Harvest (&quot;Green Tree Retention&quot;, GTR ). In addition to the harvest acreage displayed, a minimum of 15% of the timber stand will be retained to maintain biological diversity and ecosystem function.</td>
</tr>
<tr>
<td>Tractor yarding</td>
</tr>
<tr>
<td>Cable yarding</td>
</tr>
<tr>
<td>Total timber volume proposed for harvest in millions of board feet (mmbf)</td>
</tr>
</tbody>
</table>

- Unit 5 would be tractor yared to Unit 4D, crossing the drainage separating these two units with the use of a skidder bridge. Timber harvested from these two units will be skyline yared to road 33N45D.

- Approximately 23 miles of existing system roads in the area would be used for hauling logs from the proposed timber sale harvest units. No new system roads would be constructed or reconstructed. However, a temporary road is planned to access the lower portion of Unit 1; this road will be obliterated when log hauling is completed.
Table 2-2: Affected Transportation System (Roads)

<table>
<thead>
<tr>
<th>ALT. 1</th>
<th>ALT. 2</th>
</tr>
</thead>
<tbody>
<tr>
<td>(closure status)</td>
<td>Maintained, no change in status</td>
</tr>
<tr>
<td>4N16 (12.8 mi.)</td>
<td>Open</td>
</tr>
<tr>
<td>33N45.1 (8.1 mi.)</td>
<td>Open/Restricted</td>
</tr>
<tr>
<td>33N45.2 (0.46 mi.)</td>
<td>Closed</td>
</tr>
<tr>
<td>33N45D (0.05 mi.)</td>
<td>Closed</td>
</tr>
<tr>
<td>33N45E.1 (0.65 mi.)</td>
<td>Open</td>
</tr>
<tr>
<td>33N45E.2 (1.00 mi.)</td>
<td>Open</td>
</tr>
<tr>
<td>U33N45EA (0.34 mi.)</td>
<td>Open</td>
</tr>
</tbody>
</table>

2. Regarding fuels management:
- A combination of fuels treatments would be applied on a unit-by-unit basis to reduce fuel loading and/or fuel continuity. A specific burn plan would be developed (and approved by the Forest Supervisor) prior to initiating any burning to minimize the potential for adverse affects to personnel involved in burning, to the public, and to the forest resources. This plan would include prescribed fire prescriptions, firing/ignition procedures, smoke management & air quality requirements, holding procedures, signing, traffic controls, and an escape fire contingency plan. The following table summarizes the proposed fuel treatment acreages.

Table 2-3: Treatment of Activity Fuels Within Timber Harvest Areas

<table>
<thead>
<tr>
<th>ALT. 2</th>
</tr>
</thead>
<tbody>
<tr>
<td>Hand Pile</td>
</tr>
<tr>
<td>Fall Small Diameter and Damaged</td>
</tr>
<tr>
<td>Lop and Scatter</td>
</tr>
<tr>
<td>Tractor Pile</td>
</tr>
<tr>
<td>Pile Burn</td>
</tr>
<tr>
<td>Burn Concentrations</td>
</tr>
<tr>
<td>Broadcast Burn</td>
</tr>
<tr>
<td>Hand Line Construction</td>
</tr>
</tbody>
</table>

3. Regarding wildlife and wildlife habitat:
- Existing snags and down logs would remain. Snags felled for safety reasons would be left on site as a log.
- Limited Operating Periods (LOPs) would be implemented to avoid direct adverse impacts to the northern spotted owl. From February 1 through July 10, all noise- and smoke-generating activities will be prohibited within ¼ mile of suitable nesting/roosting habitat (all harvest areas are in this category). In addition, all vegetation removal/cutting/burning will be prohibited.
through September 15 in nesting/roosting owl habitat (only Unit 6 is not in nesting/roosting owl habitat). These LOPs may be lifted if surveys using currently accepted protocols indicate specific areas are not occupied by breeding owls or with the mutual consent of the U.S. Fish and Wildlife Service and the U.S. Forest Service.

- Maintain an average of 5 tons of logs per acre with a preference to have 4 to 6 logs per acre at the largest available diameter.
- Retain all hardwoods that have a reasonable chance of surviving and thriving after stand treatments.

4. Regarding project designs to protect and enhance Riparian Reserves:

- Riparian Reserves of intermittent and ephemeral streams that display evidence of annual scour will have a minimum 180 foot Riparian Reserve.
- Thinning will occur in the Riparian Reserves (but not within the inner gorge, or within 50 feet from the defined channel if no inner gorge exists) for the purpose of enhancing Riparian Reserve timber stand health and treating hazardous fuels. Thinning and fuels treatment will not reduce crown cover to less than 60% (where it currently exists) within Riparian Reserves.
- A wet weather limited operating period (LOP) will be in effect from October 15 to May 15. Activities may occur in dry conditions with approval of the district Fishery Biologist or Hydrologist.

5. Regarding management of the soil resource:

- Dedicate no more than 15% of a harvest unit to primary skid trails and landings.
- Minimize soil erosion by water-barring all skid trails, mulching with straw or fine slash (achieve 75%+ cover) the last 50 feet of all skid trails where they enter landings or roads.
- Minimize soil compaction by using existing skid trails and landings.
- Contour rip (6 inches deep), seed and mulch (straw) all landings that are not considered part of a road prism.
- Endline logs on slopes over 35%.
- Prevent road runoff from draining onto landings and skid trails.
- Retain existing down coarse woody debris (CWD) and/or increase CWD whenever possible providing the amount of logs meets fuel management objectives.
- Aggressively meet all applicable Best Management Practices by following the project Erosion Control Plan (included in the Hydrology/CWE section of the project file).
- Tractor piling would be limited to <30% with dry soils.
- Fuel reduction activities should retain 30-50% of the existing duff mat.
- Post-treatment total soil cover should be between 51 and 70% with at least 50% cover as fine slash (<3 inch material).
- Spread slash material (50% soil cover) on primary skid trails when they occur on >35% slopes (applies to all tractor-yarded units).
6. Regarding protection of historic properties:

- Archaeologists have conducted archaeological surveys and identified historic properties within the Eagle Ranch project area. Identified historic properties will be avoided from management activities. Therefore, Alternative 2 would proceed in full compliance with Section 106 of the National Historic Preservation Act (NHPA).

7. Regarding project design to Protect Plants and Reduce Noxious Weeds:

- Contract Provision C6.25 will be included in all timber sale contracts for this proposed project. This provision extends protection to any sensitive plants listed on the Regional Forester's Sensitive Species List and provides for halting operations in the vicinity of newly discovered populations after completion of the Biological Evaluation or Environmental Assessment.
- Contract Provision C6.35 will be included in all timber sale contracts to reduce the possibility of introducing new noxious weeds into the project area. This provision requires all purchasers to clean off-road equipment prior to entrance into the project area.
- A population of bug-on-a-stick in Unit 6 will be flagged for exclusion from all treatment activities.
- No pesticides will be sprayed to control weeds or other vegetation.
- Heavily disturbed soils will be seeded with native grass seed to discourage occupation by noxious weeds.

8. Regarding geologically sensitive areas:

- Areas of an ancient landslide adjacent to Units 2A and 2B will be excluded from project activities. In addition, a 180-foot riparian reserve area between these units will exclude ground-disturbing equipment to minimize impacts to slope stability.
- An area in the northeast portion of Unit 3 will be excluded from project activities to avoid an active earthflow.
- An area between Units 4 and 5 will be excluded from project activities to avoid a dormant earthflow and an ephemeral creek.
B. Comparison of Alternatives

This section summarizes the impacts and outputs of each alternative. The differences between alternatives can be found by comparing the impacts and outputs shown in the following table:

<table>
<thead>
<tr>
<th>Table 2-4: Comparison of Impacts &amp; Outputs</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
</tr>
<tr>
<td><strong>Timber</strong></td>
</tr>
<tr>
<td>Acreage affected by managing stand density</td>
</tr>
<tr>
<td>Acreage improved by regeneration harvest</td>
</tr>
<tr>
<td>Timber volume (in million board feet)</td>
</tr>
<tr>
<td><strong>Economic Effects</strong></td>
</tr>
<tr>
<td>Value of timber harvested</td>
</tr>
<tr>
<td>Yarding costs</td>
</tr>
<tr>
<td>Financial Present Net Value (PNV)</td>
</tr>
<tr>
<td><strong>Road System</strong></td>
</tr>
<tr>
<td>Miles of roads Constructed</td>
</tr>
<tr>
<td>Miles of roads reconstructed</td>
</tr>
<tr>
<td>Miles of temporary roads constructed &amp; obliterated</td>
</tr>
<tr>
<td><strong>Forest Fuel Conditions</strong></td>
</tr>
<tr>
<td>Fire rate of spread</td>
</tr>
<tr>
<td>Flame lengths</td>
</tr>
<tr>
<td>Fire Regime Condition Class</td>
</tr>
<tr>
<td>Predicted tree mortality (12&quot; dbh DF trees) indicated</td>
</tr>
<tr>
<td><strong>Wildlife</strong></td>
</tr>
<tr>
<td>Effects on Old Growth habitat</td>
</tr>
<tr>
<td>Effects to snags and logs habitat components</td>
</tr>
<tr>
<td>TE&amp;S species</td>
</tr>
<tr>
<td><strong>Fisheries</strong></td>
</tr>
<tr>
<td>Effects to Anadromous Fishes</td>
</tr>
<tr>
<td>Effects to Aquatic Habitat &amp; Riparian Reserves</td>
</tr>
<tr>
<td><strong>Hydrology &amp; Cumulative Watershed Effects</strong></td>
</tr>
<tr>
<td>% ERA for Eagle Creek (TOC is 14%)</td>
</tr>
<tr>
<td><strong>Soils</strong></td>
</tr>
<tr>
<td>Probability of meeting soil quality objectives</td>
</tr>
<tr>
<td><strong>Heritage Resources</strong></td>
</tr>
<tr>
<td>Effects to heritage sites</td>
</tr>
<tr>
<td><strong>Botany</strong></td>
</tr>
<tr>
<td>Effect on Sensitive Plant and Fungi species</td>
</tr>
<tr>
<td>Effect on Noxious Weeds</td>
</tr>
<tr>
<td><strong>Geology</strong></td>
</tr>
<tr>
<td>Effect on slope stability</td>
</tr>
</tbody>
</table>
3. Environmental Consequences

The environmental effects of implementing each of the alternatives are discussed in relation to the resources affected to determine the significance of impacts expected. Individual resource reports (including Biological Evaluations) specific to the topics identified in this section are incorporated by reference and are available as part of the project file for this EA.

A. Effects Relative to Resources Affected

1. Timber

The desired future condition of the timber resource as identified in the LRMP for the project area is an even-aged forest with ingrowth and understory vegetation treatment to enhance timber stand growth and yield, improve forest stand health and forest protection from stand-destroying wildfires. The management objectives for NF lands included in the proposed project are:

- To obtain an optimum timber yield of wood fiber products from productive forest lands within the context of forest management. The Forest Plan (page 4-67) emphasizes intensive timber management and fuels reduction.
- To manage for rotation lengths from 70 to 140 years, averaging about 110 years depending on site and species.

The areas proposed for timber harvest are approaching or are beyond the desired carrying capacity, measured by the density of trees. The live crown ratio (lcr), an indicator of tree vigor, is decreasing and averages about 25-40% (considered minimum to maintain adequate tree growth and vigor). The high density of understory trees in the suppressed and intermediate crown positions are expected to result in tree mortality within these positions, increasing the fuels available during a wildland fire. The thinning proposal is intended to increase the growth rates of the remaining trees, improve tree vigor over time by providing space for the trees retained to grow, provide merchantable wood removed as an economic offering, and reduce timber stand mortality from wildland fire. The regeneration harvest proposal is intended to replace stands that have culminated in terms of growth over time with new conifer stands managed to optimize timber stand growth and yield.

The environmental consequences of implementing the alternatives considered on the timber resource have been evaluated for the stands included in the project area. The results of that evaluation are included in this (Timber Management) section.
Table 3-1: Timber Management Consequences

<table>
<thead>
<tr>
<th></th>
<th>ALT. 1</th>
<th>ALT. 2</th>
</tr>
</thead>
<tbody>
<tr>
<td>Acreage improved by managing density (thinning the smaller trees within stands)</td>
<td>0 acres</td>
<td>59 acres</td>
</tr>
<tr>
<td>Timber stand density (basal area/acre average) of 100-140 year old stands</td>
<td>140-380 sq. ft.</td>
<td>80-160 sq. ft.</td>
</tr>
<tr>
<td>Average number of trees/acre remaining</td>
<td>200-400 trees/acre</td>
<td>40-50 trees/acre</td>
</tr>
<tr>
<td>Acreage of GTR harvest and regenerated with planted trees</td>
<td>0 acres</td>
<td>58 acres</td>
</tr>
<tr>
<td>Timber volume removed</td>
<td>0 mmbf</td>
<td>3.8 mmbf</td>
</tr>
<tr>
<td>Skyline yarding volume</td>
<td>0 mmbf</td>
<td>1.6 mmbf</td>
</tr>
<tr>
<td>Tractor yarding volume</td>
<td>0 mmbf</td>
<td>2.2 mmbf</td>
</tr>
</tbody>
</table>

**a. Direct Effects on Forest Stands**

Forest stand densities in the project area are to be managed to maintain and enhance growth and yield to improve and protect forest health and vigor (LRMP, page 4-142). The existing stand densities vary from site to site within the project area, averaging 280 square feet per acre over the areas proposed for timber harvest. Existing conditions observed through stand examinations indicate that the selected stands are experiencing inhibited individual tree growth due to inter-tree competition, mortality in many trees that occur in the intermediate and suppressed crown positions, and substantial fuel loads and fuel ladders that are expected to increase the probability of high timber stand mortality should a wildfire occur. Pockets of mortality from endemic levels of insect or disease activity are apparent in portions of the proposed harvest areas – a condition that is exacerbated by the dense tree stocking and results in stress in individual trees from root competition for available water. Alternative 1 would result in neither a change in existing stand densities nor any improvements in stands identified as having excessive fuel loadings. Therefore, Alternative 1 would forego opportunities for improvements to timber stand health and fire protection at this time. In addition, no timber volume (yield) would be provided toward sustained yield objectives.

The direct effect of the implementation of Alternative 2 would be the removal of approximately 50 commercial-sized (over 8”dbh) trees per acre (many smaller suppressed trees with diameters of less than 8” will also be removed) over the acreage proposed for thinning. The timber harvesting would reduce stand density which is expected to provide for increased growth and yield of residual trees and a reduced fire hazard to the resultant timber stands. Therefore, Alternative 2 would provide a benefit to timber stand growth and yield and it would also provide protection to the residual timber stands from the threat of a stand-replacing wildfire.

Regeneration harvest areas included in Alternative 2 are expected to yield about 40 thousand board feet of timber per acre and add an element of age diversity to the project area following successful reforestation. The regeneration harvested stands are expected to be planted and intensively managed to produce an optimum yield of timber to contribute to sustained yield objectives.
A sustained level of forest (wood) products from suitable AMA lands is part of the desired future condition of the project area (LRMP, page 4-142). Timber volume harvest is a direct effect of Alternatives 2, whereas Alternative 1 would provide no wood products.

b. Indirect Effects on Forest Stands

As young-growth conifer stands age, the number of trees per acre decreases as inter-tree competition occurs. The basal area tends to constantly increase up to a point where the maximum basal area that the site can support is attained. In the absence of harvest, this trend would continue at a rate of 1% to 2% per year. For example, an 80-year-old mixed conifer stand would, on average, experience about an 8% reduction in trees per acre (Dunning 1933). For stands that average 100 years of age, it is anticipated that about 40% of the trees/acre would die by the time the stand reaches 150 years of age (Dunning 1933). Alternative 1 would result in this amount of mortality on public lands over the 50 years. In addition, if a wildfire occurred, stand densities would be dramatically changed in areas of high or moderate burn intensity. Many areas would result in stands being entirely eliminated, while a few stands would have a low density of surviving trees. Alternative 1 would not contribute to LRMP objectives for managing stand densities to maintain and enhance growth and yield or improve forest health and vigor.

Alternative 2 would result in increased growth and yield over time on the 117 treated acres based on thinning prescriptions and regeneration harvesting completed for other projects. Residual trees in thinned units would grow in an environment with reduced stress, mortality would decline, and post-harvest tree numbers (per acre) would vary little over the next 30 years (assuming in-growth of conifer seedlings is not significant). Inter-tree competition in these thinned units would not become a significant factor for approximately 30 years. In addition, the harvested stands would be more resilient to mortality (with planned intensive management within created plantations) should a wildfire occur due to the reduction of fuel loading and fuel ladders. Therefore, Alternative 2 would be consistent with management objectives for the project area as identified in the LRMP.

c. Cumulative Effects on Forest Stands

As previously described Alternative 1 would result in high stand densities and increasing tree mortality. In the absence of wildfire, the stands within the project area would continue to produce less than desired growth and yield within managed timber stands while providing increased fire hazard conditions which may lead to stand replacement and/or increased fire risk to adjacent forested lands. Long-term timber product outputs would be less than could be achieved with active stand management. Shasta-Trinity Forest goals (Forest Goals # 34 and #35, LRMP page 4-5) for managing timber stands and providing timber and other wood products would not be achieved within the project area with implementation of Alternative 1 – contributing to a Forest-wide departure from LRMP resource goals. Alternative 2 would contribute toward meeting LRMP resource goals.
2. Economics

The environmental consequences of implementing the alternatives considered on economic effects have been evaluated. The result of the Forest Service Short-Term economic analysis considers evaluation is as follows:

Table 3-2: Timber Management Economic Consequences

<table>
<thead>
<tr>
<th></th>
<th>ALT. 1</th>
<th>ALT. 2</th>
</tr>
</thead>
<tbody>
<tr>
<td>Value of timber harvested</td>
<td>0</td>
<td>$1,577,900</td>
</tr>
<tr>
<td>Yarding costs</td>
<td>0</td>
<td>542,000</td>
</tr>
<tr>
<td>Fuels treatment costs</td>
<td>0</td>
<td>70,100</td>
</tr>
<tr>
<td>Road costs, including haul cost</td>
<td>0</td>
<td>232,000</td>
</tr>
<tr>
<td>Reforestation costs</td>
<td>0</td>
<td>41,500</td>
</tr>
<tr>
<td>Other administrative costs</td>
<td>0</td>
<td>267,200</td>
</tr>
<tr>
<td>Present Net Value (PNV)</td>
<td>0</td>
<td>$ + 425,100</td>
</tr>
</tbody>
</table>

The values and costs shown on Table 3-2 are estimates intended to capture the economic value of implementing the “timber sale related” portion of the alternatives considered. The PNV has been calculated using the estimated selling value of the timber as the revenue value of resource outputs and using the associated activity costs (yarding, fuels treatment, roads, and reforestation) and administrative costs (harvest administration, sale preparation, analysis & documentation, and other resource support) as discounted financial costs. Itemized revenues and costs are included on page 7 of the Timber/Economics Evaluation included in the project file. Alternative 1 would have no financial revenue generated. No financial costs would be invested, and no opportunities to achieve management objectives would occur.

Alternative 2 would result in a timber sale removing merchantable timber from the area. The value of the timber would pay for the fuels treatments which are intended to help develop low relative risk fire class conditions within the project area. The values of resource protection and firefighter safety are not reflected in the PNV analysis. Alternative 2 is expected to offer a favorable PNV (contributing $425,100 to the US Treasury) using the current timber values from the Western Wood Products Association index and the road work identified on Table 2-2.

3. Fire/Fuels

The environmental consequences of implementing the alternatives considered on fire and fuels have been evaluated in terms of expected fire behavior, fire regime condition class, and fire severity. The result of this evaluation is as follows:

a. Fire Behavior

Wildland fire behavior is described as the way in which fuels ignite, flames develop, and fire spreads. Weather, topography, and fuel conditions are variables of the fire environment which influence fire
behavior within any given ecosystem. Weather and topography are unmanageable factors; however, fuels may be altered to reduce flame lengths, fire intensities, and fire spread rates.

1. Direct effects on Fire Behavior

Table 3-3: Comparison of fire behavior by alternative in the season following treatment within the project area. (Utilizing the Fuels Management Analysis Plus version 1.2.38 [FMA+] computer software program).

<table>
<thead>
<tr>
<th>Fire Behavior</th>
<th>ALT. 1</th>
<th>ALT. 2</th>
</tr>
</thead>
<tbody>
<tr>
<td>Flame Length (feet)</td>
<td>3.9</td>
<td>0.7</td>
</tr>
<tr>
<td>Rate of Spread (ch/hr)</td>
<td>5.5</td>
<td>1.0</td>
</tr>
<tr>
<td>Fireline Intensity (btu/ft/sec)</td>
<td>109</td>
<td>3</td>
</tr>
</tbody>
</table>

Alternative 1 predicts flame lengths at or below 4-feet. Direct attack by fire suppression personnel may be feasible without mechanical and aerial equipment. Flame lengths 4-feet and less would allow engine crews to direct attack a fire with water. However, flame lengths may increase as ladder and jackpot fuels are consumed, necessitating indirect attack.

Rate of spread would be low due to the horizontal fuels structure, which would enable fire suppression crews to slow or possibly stop a fire. Fire intensities may be greater than what the model predicts since the project area includes high amounts of fuels greater than 20-inches in diameter.

In skyline-yarded units, Alternative 2 would include whole tree harvesting with broadcast and/or under burning. Tractor units would be tractor piled and burned. The resulting fire behavior would be substantially decreased from the current condition (Table 3-3). Removing the forest canopy may increase surface fuel heating in treated areas, thus lowering fuel moistures. However, the reduction in activity and natural fuels will offset the reduction in fuel moisture.

2. Indirect effects on Fire Behavior

Alternative 1 is predicted to result in an increase in fire behavior over the next 10 years within the proposed project area. Dead and downed fuel loadings would increase. Rate of spread, flame length, and fire intensity are each estimated to increase. Predicted flame lengths greater than 4-feet would occur and require aerial and/or mechanical support. Firefighter safety would decrease due to increased hazards such as crown fire initiation and the necessity of indirect attack methods. Flame lengths would exceed the 4-foot threshold within the next 5 years. Resource damage and suppression costs would increase.

Alternative 2 would result in a desired fuel condition of approximately 8-10 tons/acre in thinning units and 1-3 tons/acre in GTR units. The representative fuel model would be an 8A, which yields fire behavior conducive to firefighter safety, and resource protection. Suppression tactics would be by direct attack, and slow rates of spread would help firefighters to slow or even stop a fire. This condition is estimated to be maintained for approximately 10 years - at which point additional fuel treatments would be needed to maintain desired fuel conditions.
3. Cumulative effects on Fire Behavior

Table 3-4: A comparison of fire behavior for the year 2024.

<table>
<thead>
<tr>
<th>Fire Behavior</th>
<th>ALT. 1</th>
<th>ALT. 2</th>
</tr>
</thead>
<tbody>
<tr>
<td>Flame Length (feet)</td>
<td>6.9</td>
<td>3.9</td>
</tr>
<tr>
<td>Rate of Spread (ch/hr)</td>
<td>10.2</td>
<td>5.5</td>
</tr>
<tr>
<td>Fireline Intensity (btu/ft/sec)</td>
<td>381</td>
<td>109</td>
</tr>
</tbody>
</table>

**Alternative 1** is predicted to result in an increase of future fire behavior. Because the local climate allows for slow decomposition rates, fuel loads are estimated to increase approximately 7 tons/acre or more by 2024. This would change the current fuel model from a 10A (low) to a 10Z (high), provided no fire, wind events, or bug infestations occur (Table 3-4). The extreme fire behavior resulting from this condition would jeopardize firefighter and public safety. Suppression tactics would require indirect attack and aerial and mechanical support, raising the costs of suppression and resource damages.

**Alternative 2** would result with no increase in future fire behavior from that of the current condition provided no wind events or bug infestations occur. It is predicted to take approximately 20-30 years for the post harvest area to return to its current fuel model of 10A (Table 3-4). At that time future fuel treatments would need to occur to prevent fire behavior from increasing.

b. Fire Regime Condition Class (FRCC)

Three Condition Classes have been developed to classify the current state of vegetation with respect to each of the five Historic Fire Regime Groups (Cohesive Strategy 2000). Table 3-5 lists the descriptions of each condition class, the fire regime associated with it, and an example of management options. Condition Class 3 ecosystems contain stands littered with substantial amounts of dead material and are choked with hundreds of small trees that reach into the canopy of the larger, older-age forest above (Cohesive Strategy 2000). These ecosystems are at relatively high risk for damage from wildfires.
Table 3-5: Current condition class attributes as described in the Cohesive Strategy (2000).

<table>
<thead>
<tr>
<th>Condition Class</th>
<th>Fire Regime</th>
<th>Example of Management Options</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Condition Class 1</strong></td>
<td>Fire regimes are within an historical range and the risk of losing key ecosystem components is low. Vegetation attributes have been moderately altered from their historical range.</td>
<td>Where appropriate, these areas can be maintained within the historical fire regime by treatments such as fire use.</td>
</tr>
<tr>
<td><strong>Condition Class 2</strong></td>
<td>Fire regimes have been moderately altered from their historical range; the risk of losing key ecosystem components is moderate. Fire frequencies have departed from historical frequencies by one of more return intervals (either increased or decreased). This results in moderate changes to one or more of the following: fire size, intensity and severity, and landscape patterns. Vegetation attributes have been moderately altered from their historical range.</td>
<td>Where appropriate, these areas may need moderate levels of restoration treatments, such as fire use and hand or mechanical treatments, to be restored to the historical fire regime.</td>
</tr>
<tr>
<td><strong>Condition Class 3</strong></td>
<td>Fire regimes have been significantly altered from their historical range. The risk of losing key ecosystem components is high. Fire frequencies have departed from historical frequencies by multiple return intervals. This results in dramatic changes to one or more of the following: fire size, intensity, severity, and landscape patterns. Vegetation attributes have been significantly altered from their historical range.</td>
<td>Where appropriate, these areas may need high levels of restoration treatments, such as hand or mechanical treatments, before fire can be used to restore the historical fire regime.</td>
</tr>
</tbody>
</table>

1. Direct effects on Fire Regime Condition Class

**Alternative 1** would keep the current condition class rating of 2 and 3. This would not meet the desired condition as identified in the Cohesive Strategy, putting this area at high risk for damage from wildfires.

**Alternative 2** would move towards lowering the FRCC rating from its current condition, which would be consistent with direction from the Cohesive Strategy. In condition class 3 and some class 2 situations, the strategy promotes mechanical thinning of small trees, brush, and shrubs to reduce fire intensities. **Alternative 2** would remove smaller trees (8-12 dbh) from the area, reducing crown canopy and ladder fuels. In addition, as a result of treating activity fuels, natural fuels would be reduced through burning. The residual stand would consist of mostly tall, large diameter trees, which are less susceptible to fire damage.

2. Indirect effects on Fire Regime Condition Class

**Alternative 1** would allow the current FRCC to rise over time by allowing fuel accumulations and vegetative growth to increase. Class 2 areas would increase to a 3 in an estimated 5-10 years, and Class 3 areas would continue to deteriorate.

---

1 Current conditions are a function of the degree of departure from historical fire regimes resulting in alterations of key ecosystem components such as species composition, structural stage, stand age, and canopy closure. One or more of the following activities may have caused this departure: fire suppression, timber harvesting, grazing, introduction and establishment of exotic plant species, insects or disease (introduced or native), or other past management activities.
Alternative 2 would help to promote condition Class 1 conditions for 5-10 years. For thinned units, some brush and tree regeneration would grow in canopy gaps, therefore providing more ladder fuels for crown fire initiation. However, the taller trees would aid in shading out new vegetation, and surface fuels would be minimal due to post harvesting treatments. GTR units would be replanted and would not create a fire hazard until approximately 5-10 years old. At this point, thinning and pruning would need to take place to reduce tree density and crown base heights. If no treatments were to take place, the fire behavior would be similar to what would occur in a brush field (Fuel Model 6).

3. Cumulative effects on Fire Regime Condition Class

Past projects within the project area include logging, grazing, and fire exclusion; all have influenced the historic fire regime. Since grazing ceased several years ago, grass, brush and conifer encroachment is increasing within open meadow areas. Past logging in the 1980’s left some activity fuels in timbered stands; however, not enough to make a significant impact on fire hazard. Most of the surface fuels present are from natural biomass accretion and wind events.

Alternative 1 would move this area towards a higher condition class rating. An increase in condition class would leave this area at high risk to damage from wildfire.

Alternative 2 would help to restore the natural fire regime for the proposed project area. If a wildfire moved into this area within the next 10-20 years, damage to resources would be minimal. By reducing surface and ladder fuels, the stand would become more resistant to wildfire effects. However, eventually the stand would move back toward a condition Class 3 unless maintenance occurred.

C. Fire Severity

Fire severity is the degree to which a site has been altered or disrupted by fire; loosely, a product of fire intensity and residence time (NWCG 1996). Since the proposed Eagle Ranch project area falls within Group I of the Five Historic Natural Fire Regime Groups, resulting fire severities for conifer stands should be low. However, since the current condition class rating for this area is a 2 or 3, a wildfire would be more severe than that of historical periods.

Table 3-6: Percent mortality for Douglas-fir between 8-13 inches dbh for the proposed Eagle Ranch project area.

<table>
<thead>
<tr>
<th>DBH</th>
<th>ALT. 1</th>
<th>ALT. 2</th>
</tr>
</thead>
<tbody>
<tr>
<td>8</td>
<td>34%</td>
<td>17%</td>
</tr>
<tr>
<td>9</td>
<td>29%</td>
<td>15%</td>
</tr>
<tr>
<td>10</td>
<td>24%</td>
<td>12%</td>
</tr>
<tr>
<td>11</td>
<td>21%</td>
<td>11%</td>
</tr>
<tr>
<td>12</td>
<td>19%</td>
<td>10%</td>
</tr>
<tr>
<td>13</td>
<td>16%</td>
<td>8%</td>
</tr>
</tbody>
</table>

Probability of tree mortality was calculated by the FMA+ fuels model based on 4-feet flame lengths and 90th percentile weather data.
1. Direct effects on Fire Severity

Alternative 1 would result with fire-related mortality rates ranging from 16-34% (Table 3-6) in trees of 8-13” diameter. Smaller diameter trees (2-12 inches dbh) are generally more susceptible to mortality due to their thin bark and low base crowns.

Alternative 2 would have less overall mortality due to the decrease of 1,000 hour fuels and the accompanying decrease in fire severity. Tree mortality outputs were adjusted since the model cannot accurately predict post harvest fuels conditions. This is because it assumes a continuous fire, resulting from continuous fuels; rather than patchy fuels. Acre estimates of mortality (computed by the model) were adjusted by multiplying them by the estimated proportion of area burned (50%) (Reinhardt 2004). Predicted fire behavior and mortality was determined using the Fuels Management Analysis Plus (FMA +) software program; mortality should be <2% in the 13” dbh range to <10% in the 8” dbh range.

2. Indirect effects on Fire Severity

Alternative 1 would result in increased fire-related mortality within the stand. Current mortality rates would remain for a short period of time (5-10 years). As trees and brush grow, biomass increases, adding to fuel loadings and ladder fuels. Consequently, fire intensity and flame lengths would increase - increasing mortality rates in all species size classes. Scorch heights would reach higher up trees damaging the crowns, and fire intensity would be greater at boles damaging the cambium layer.

Alternative 2 would result with a decrease in mortality to remaining trees. As a result of treating surface fuels, flame length and fire intensity would be reduced if a wildfire occurred within the next 5-10 years. In addition, this alternative would remove small diameter trees that are more susceptible to tree mortality, subsequently reducing ladder fuels as well.

3. Cumulative effects on Fire Severity

Table 3-7: A comparison of alternatives on mortality rates for the Proposed Eagle Ranch project area.

<table>
<thead>
<tr>
<th>DBH</th>
<th>ALT. 1 2004</th>
<th>2024</th>
<th>ALT. 2 2004</th>
<th>2024</th>
</tr>
</thead>
<tbody>
<tr>
<td>8</td>
<td>34%</td>
<td>99%</td>
<td>17%</td>
<td>34%</td>
</tr>
<tr>
<td>9</td>
<td>29%</td>
<td>99%</td>
<td>15%</td>
<td>29%</td>
</tr>
<tr>
<td>10</td>
<td>24%</td>
<td>90%</td>
<td>12%</td>
<td>24%</td>
</tr>
<tr>
<td>11</td>
<td>21%</td>
<td>97%</td>
<td>11%</td>
<td>21%</td>
</tr>
<tr>
<td>12</td>
<td>19%</td>
<td>71%</td>
<td>10%</td>
<td>19%</td>
</tr>
<tr>
<td>13</td>
<td>16%</td>
<td>60%</td>
<td>8%</td>
<td>16%</td>
</tr>
</tbody>
</table>

Alternative 1 is estimated to result in an increase of fire severity effects to vegetation in the future. In approximately 2024, mortality rates for Douglas-fir trees 8-13 inches dbh are predicted to be higher than its current condition (Table 3-7).
Alternative 2 is expected to result in less fire severity effects (as compared to Alternative 1) for the first 5-10 years after treatment. The number of trees in the 8-13 inch size class would have been significantly reduced by thinning (as compared to Alternative 1) and competition from large tree retention. Even though vegetative growth and biomass accretion would occur, mortality rates would not significantly increase since fuel loadings would only increase by an estimated 5 tons/acre. GTR units would be planted and maintained to promote both growth and fire resistance. Thinning, pruning, and fuel treatments within the plantations and the reduction 1,000 hour fuels would keep the stands mortality rate at a lower level than the thinned units at the end of the 20 year cycle. Mortality in 2024 would be far less under Alternative 2 than Alternative 1 (e.g. 24% of the 10” dbh trees would not survive in Alternative 2; whereas 90% of the 10” dbh trees would not survive in Alternative 1).

4. Wildlife

The Eagle Ranch Timber Sale Biological Assessment (BA; analyzing likely effects to federally listed species), Eagle Ranch Timber Sale Biological Evaluation (BE; analyzing likely effects to Forest Service Sensitive species) and Management Indicator Species Report (MIS Report) have been completed for this project (available in the project file). The findings identified in these reports include the expected effects of the alternatives considered relative to LRMP objectives, species recovery, and habitat management strategies. This analysis uses the federally listed (threatened) Northern spotted owl as a Management Indicator Species (MIS) for effects to the late seral (late-successional and old-growth forest habitat; LSOG) and snag/down log assemblages such as the Forest Service Sensitive Pacific fisher, American marten and Northern goshawk. See Wildlife BA Attachment 1 for habitat definitions.

a. Old-Growth (MIS: Northern Spotted Owl)

Alternative 2 would not affect old-growth habitat; only younger late-successional stands would be affected. There is a clear distinction between old-growth and late-successional habitat. Late-successional is defined simply as conifer stands at least 80 years old regardless of other stand attributes such as level of decadence or canopy closure. Old-growth is a subset of late-successional and is defined as a forest stand usually at least 180-220 years old with moderate to high canopy closure; a multilayered, a multi-species canopy dominated by large overstory trees; a high incidence of large trees, some with broken tops and other indications of old and decaying wood (decadence); numerous large snags; and heavy accumulations of wood, including large logs on the ground (ROD page F-4). Old-growth provides “high quality” nesting/roosting habitat for the spotted owl. Younger dense to moderate canopied late-successional stands provide “moderate” quality nesting/roosting habitat and foraging habitat respectively (see BA Attachment 1 for habitat code descriptions).

The “Provide for Retention of Old-Growth Fragments Where Little Remains” standard and guideline (S&G) is stated on page C-44 of the Record of Decision for the Northwest Forest Plan (ROD). The intent is “to protect ecologically significant patches and fragments of old-growth habitat that provide refugia for old-growth associated species” (memorandum from the Regional Ecosystem Office dated October 24, 1997). The threshold of concern with this S&G is the retention of old-
growth at 15 percent of federal forest land with a 5th field watershed. Younger stands may be used to meet this level if there is an ecologically based rational for doing so. BA Attachment 1 (included in the project file) presents an analysis and recommendations for meeting this S&G within the Burnt Ranch 5th Field Watershed (within which the project area lies); all old-growth stands were recommended for retention. **Alternative 2** is consistent with these recommendations.

### 1. Direct Effects on Old-Growth Fragments

**Alternative 1** would result in no direct effects to any forest habitat.

**Alternative 2** would have no direct effect on old-growth (high quality late-successional old growth, LSOG) habitat; all old-growth stands that were originally proposed for harvest were dropped from consideration during the project planning process. Regeneration prescriptions would remove approximately 58 acres of moderate quality LSOG (i.e., late-successional). Thinning prescriptions would somewhat reduce habitat quality in 59 acres of moderate to low quality LSOG by temporarily reducing canopy closure in the short-term (25-30 years) (BA Table 2); the stands would still function as LSOG. The moderate quality LSOG provides foraging habitat for the spotted owl and moderate to marginal capability habitat for the fisher, marten and goshawk. The low quality LSOG provides connectivity (dispersal) habitat for the owl and marginal capability habitat for the fisher, marten and goshawk. Larger snags/logs and understory hardwoods would remain essentially untouched to maintain a decadent component and a more complex vertical structure associated with old-growth. Moderate and low quality LSOG habitat dominates federal land in the Burnt Ranch 5th Field Watershed (BA Attachment 1 and Map 1); all old-growth (high quality LSOG) would remain.

A part of the overall purpose of the proposed thinning prescriptions is to accelerate the development of old-growth conditions. In the long-term (>25-30 years), **Alternative 2** would develop larger, more fire resistant conifers with larger, fuller crowns having larger lateral branches (and ultimately producing larger snags and logs) and an improved probability of maintaining understory hardwoods to increase vertical structure complexity and increase our options for future stand development. The prescriptions are similar to those employed on similar projects to develop and enhance old-growth conditions within Late-Successional Reserves.

### 2. Indirect Effects on Old-Growth Fragments

**Alternative 1** would result in LSOG habitat conditions remaining roughly the same as current conditions over the next 25-30 years. There would be a slight decrease in vertical structural complexity due to understory hardwoods dropping out of the stands and an increase in smaller diameter snags/logs due to competition-induced mortality among the smaller, less thrifty conifers.

**Alternative 2** would result in an overall net increase of 59 acres in forest stands with old-growth characteristics (BA Table 2). Within approximately 25-30 years, the thinned stands would have recovered their original canopy closure (59 acres). The conifers would have developed larger, fuller crowns with larger lateral branches. These trees would ultimately provide recruitment for larger snags and logs. Small diameter (<19” dbh) snags and logs would be rare because of the past removal of smaller diameter recruitment trees. Understory hardwoods would have persisted in the stands adding
to vertical structural complexity. Most of the pre-existing large snags and logs would be present. Within approximately 70-80 years, the regenerated stands would have grown to low to moderate quality LS/OG.

b. Snags and Logs (MIS: Northern Spotted Owl)

Snags and logs are important components of habitat for a large number of wildlife species; specifically those associated with late-successional or old-growth conifer forests. Snags provide nesting or denning sites for the spotted owl, fisher, and marten and provide prey species habitat for these species as well as for the goshawk. Goshawks also use snags as plucking and feeding stations. Ultimately, snags fall and provide logs (another important component of LS/OG habitat).

1. Direct Effects on Snags and Logs

Alternative 1 would result in no direct effect to existing snags or logs.

Alternative 2 would remove a small number of existing large (>19” diameter at breast height) snags due to the need to provide a safe working environment to forest workers involved in the logging operation; these snags would be left on site as logs available for wildlife. Over the majority of the project, existing larger snags and logs would remain essentially untouched. Snag and log recruitment will depend upon the 15 percent retention within the regeneration units (58 acres). Within the thinning units, smaller diameter (<19” diameter at breast height) recruitment snags and logs (live trees that will provide for snags and logs into the future) would be reduced over approximately 59 acres. Estimates based upon field reviews indicate that the LRMP S&G of 1.5 snags and 5 tons of course woody material (i.e., logs) would be met at a 40-acre average.

2. Indirect Effects on Snags and Logs

Alternative 1 would result in an increase in smaller diameter (<19” diameter at breast height) snags and logs in 20-25 years due to competition-induced mortality among the less thrifty conifers.

The conifer thinning resulting from Alternative 2 (58 acres) would increase the growth and vigor of the remaining trees leading to faster development of larger recruitment snags and logs. Smaller recruitment snags would be reduced. Snag recruitment within the regenerated stands would occur within the 15 percent (within unit) retention areas.

c. TE&S Species

A Biological Assessment (BA, for federally listed species) and Biological Evaluation (BE, for Forest Service sensitive species) have been completed for this project to determine the likely effects on the various wildlife species, habitats, and habitat components. The findings identified in the project BA, BE and the Wildlife Management Indicator Species report are summarized in the following table:
Table 3-8: A synopsis of the determinations and effects of Alternative 2 to TE&S species from the BA/BE.

<table>
<thead>
<tr>
<th>Determination from the BA/BE</th>
<th>Federally Listed Threatened or Endangered (TE) or Forest Service Sensitive (FS) species.</th>
<th>Comments</th>
</tr>
</thead>
<tbody>
<tr>
<td>No Effect</td>
<td>TE-Shasta crayfish, bald eagle, marbled murrelet, valley elderberry longhorn beetle, vernal pool fairy shrimp, California red-legged frog. FS- California wolverine, pallid bat, Western red bat, Townsend's big-eared bat, peregrine falcon, willow flycatcher, Western pond turtle, Cascade frog, foothill yellow-legged frog, Southern torrent salamander, California floater, topaz juga, montane peaclam, Shasta sideband snail, Wintu sideband snail, Shasta chaparral snail, Tehama chaparral snail, Pressley hesperian snail, Shasta hesperian snail, Nugget pebble snail.</td>
<td>The project area is either outside the known or expected range, suitable habitat conditions do not occur or would not be affected. Terrestrial snail surveys revealed no FS snails in the project area.</td>
</tr>
<tr>
<td>May affect and likely to adversely affect.</td>
<td>TE-Northern spotted owl Management Indicator Species (MIS) for late seral and snag/log assemblages.</td>
<td>There would be a short-term (&lt;25 years) reduction in habitat quality and a long-term (25-30 years) net increase in habitat quality. Actions are consistent with the Draft Recovery Plan.</td>
</tr>
<tr>
<td>May impact individuals but would not cause a trend towards federal listing or a loss of viability.</td>
<td>FS-Pacific fisher, American marten, Northern goshawk</td>
<td>There would be a short-term (&lt;25 years) net reduction in habitat quality and a long-term (25-30 years) net increase in habitat quality. Actions are consistent with the LRMP habitat management strategy for these species.</td>
</tr>
</tbody>
</table>

1. Direct Effects on TE&S Species

**Alternative 1** would result in no direct effects (i.e., physical harm, mortality or disturbance of breeding activity) to the Northern spotted owl.

**Alternative 2** includes a limited operating period for the Northern spotted owl and would avoid physical harm, mortality or disturbance of breeding activity for not only the owl but also the fisher, marten and goshawk. Other TES do not likely occur in the project area.

2. Indirect Effects on TE&S Species (habitat alteration)

**Alternative 1** would result in habitat conditions for TE&S species remaining largely unchanged over the next 25-30 years.

**Alternative 2** actions are consistent with the management strategies and standards & guidelines associated with TE&S species and their habitats. Connectivity between areas managed of LSOG related species would remain adequate (BA page 9 and Maps 1 & 3). In 20-25 years, regenerated stands would function as at least marginal connectivity habitat (see BA page 6 for definition) for species associated with LSOG and in roughly 80 years would function as at least moderate quality LSOG. In 25-30 years, within the thinning units, habitat conditions for species associated with LSOG habitat would be improved.
The habitat alteration from **Alternative 2** would impact one known pair of spotted owls (BA Tables 1 and 2). There would be a net increase in high quality owl habitat within 25-30 years (BA pages 7, 10 & 11 and Table 2). Franklin et al (1999) reported a declining population trend (a 3.9 percent decline for territorial females from 1985 to 1998) for the Northern spotted owl throughout its range including northern California. However, population declines were anticipated in the FEMAT Report (USDA 1993), the Northwest Forest Plan and the Draft Final Recovery Plan for the Northern Spotted Owl (USDI Fish and Wildlife Service 1992) until a new, stable equilibrium is reached.

d. **Cumulative Effects on Wildlife and Wildlife Habitat**

**Alternative 1** would meet management objectives for wildlife and wildlife habitat for the foreseeable future. However, the proposed actions included in **Alternative 2** would have the long-term effect of producing a net increase of 59 acres of high quality LSOG in the project area (BA Table 2).

Both Alternatives (barring future large-scale stand-replacing fires) would continue to fulfill the watershed’s assigned biological role in the overall strategy for maintaining viable populations of species associated with late-successional and old-growth forest ecosystems (as described in the FSEIS, the subsequent ROD, and the Forest Plan) by providing connectivity between large areas set aside for these species while maintaining at least 15 percent of federal forest land in LSOG conditions.

The Shasta-Trinity National Forest has no foreseeable forest management activities planned within the Burnt Ranch 5th Field Watershed. Private property comprises roughly 11 percent of the 53,000-acre Burnt Ranch 5th Field Watershed (BA Map 2). Much of this property is residential or continues to be intensely managed for timber. LSOG habitat will likely be restricted to Forest Service land in the watershed.

5. Fisheries

a. Anadromous Fishes

The alternatives have been evaluated for their projected effects on Southern Oregon Northern California Coast (SONCC) Coho Salmon (*Oncorhynchus kisutch*), a Federally Threatened species and Winter-Run Steelhead (*Oncorhynchus mykiss*), a Management Indicator Species (MIS). Population estimates for Winter Run Steelhead have been completed annually since 1988 (refer to Appendix A of the Fisheries Report), and the results of these surveys have been considered in the anadromous fisheries analysis.

1. Direct effects on Anadromous Fishes

**Alternative 1** would have no direct effects on anadromous fishes because no activity would occur. **Alternative 2** would have no direct effects on anadromous fishes because anadromous fishes do not occur within the project area.

2. Indirect effects on Anadromous Fishes

**Alternative 1** would have no indirect effects on anadromous fishes because no activity would occur. **Alternative 2** would have insignificant indirect effects on anadromous fishes. The closest possible
anadromous fish would be about 1.4 stream miles away in Eagle Creek and 2 stream miles away in Sailor Bar Creek. Proper implementation of project design features and Best Management Practices would limit downstream effects to levels that cannot be meaningfully measured or detected. Eagle Creek and Sailor Bar Creek are too small to have any measurable influence on the Trinity River downstream of the project area.

3. Cumulative effects on Anadromous Fishes

Alternative 1 would not result in any cumulative effects on anadromous fishes. Alternative 2 would not result in any measurable cumulative effects to anadromous fishes. The greatest influence on anadromous fishes near the sale area will continue to be flow releases from the Trinity River Project.

b. Aquatic Habitat and Riparian Reserves

1. Direct effects on Aquatic Habitat and Riparian Reserves

Alternative 1 would have no direct effects to aquatic habitat and Riparian Reserves. Alternative 2 would directly affect a small intermittent tributary to Eagle Creek near Unit 5 where the skidder bridge would cross the creek. It is likely that a small amount of soil would be displaced during installation, use, and removal of the bridge resulting in localized sediment in the creek. It is expected that effects to Eagle Creek would not reach a level that could be meaningfully measured or detected. Riparian Reserves would be directly affected near units 2, 4, 16, and 17 where thinning of the timber stand would occur within the Riparian Reserve. Thinning in the Riparian Reserve would have a direct affect on the canopy cover and would reduce the canopy cover from an average of about 90% to about 70% (and not lower than 60% where the canopy cover is currently 60%+).

2. Indirect effects on Aquatic Habitat and Riparian Reserves

Alternative 1 would have no indirect effects on aquatic habitat and Riparian Reserves. Alternative 2 would have some ground disturbance from tractor and cable yarding of trees, tractor piling of fuels, and landing construction and use. Leaving an undisturbed buffer area near stream channels of 50 feet or to the top of the inner gorge (whichever is greatest) would limit the amount of sediment in stream channels to less than measurable levels.

3. Cumulative effects on Aquatic Habitat and Riparian Reserves

Alternative 1 would have no cumulative effects on aquatic habitat and Riparian Reserves. Alternative 2 would result in no measurable cumulative effects on aquatic habitat or Riparian Reserves. The Eagle Ranch timber sale would impact a very small area of aquatic habitat and improve a small area of Riparian Reserve. There has been little timber harvest or road building in either the Sailor Bar or the Eagle Creek watershed.
6. Hydrology/Cumulative Watershed Effects (CWEs)

The environmental consequences of implementing the alternatives have been evaluated using the Cumulative Watershed Effects (CWE) analysis process. This analysis considers the potential impacts from timber harvest and fuels treatments. The LRMP established the Threshold of concern (TOC) for 5th field watersheds and defines Watershed Condition Class (WCC) (USDA Forest Service, 1994). The WCCs are defined as follows:

**Class I Condition.** Equivalent Roaded Acres (ERA) are less than 40 percent of TOC. Watersheds exhibit high geomorphic, hydrologic, and biotic integrity relative to their natural potential condition. The drainage network is generally stable. Physical, chemical, and biologic conditions suggest that soil, aquatic, and riparian systems are predominantly functional in terms of supporting beneficial uses.

**Class II Condition.** ERA impacts are between 40 and 80 percent of TOC. Watersheds exhibit moderate geomorphic, hydrologic, and biotic integrity relative to their natural potential condition. Portions of the watershed may exhibit an unstable drainage network. Physical, chemical, and biologic conditions suggest that soil, aquatic, and riparian systems are at risk in being able to support beneficial uses.

**Class III Condition.** ERA impacts are greater than 80 percent of TOC. Watersheds exhibit low geomorphic, hydrologic, and biotic integrity relative to their natural potential condition. A majority of the drainage network may be unstable. Physical, chemical, and biologic conditions suggest that soil, riparian, and aquatic systems do not support beneficial uses.

Based on the results of the existing condition CWE analysis, the majority of the streams draining the project area are in a stable to semi-stable condition and are supporting beneficial uses. With implementation of **Alternative 1** the WCC would be a Class I.

**Alternative 2** would not further degrade the water quality or quantity of Eagle Creek or the Trinity River. Based on the results of the proposed action CWE analysis, the WCC rating would increase in Eagle Creek from a I to a II. The ERA would increase from 5 percent to 11 percent – which is still below the 14% TOC for Eagle Creek. This alternative is designed to mitigate risks to soil, water, and riparian systems while maintaining the watershed condition for the long-term. Unit layout, designed to avoid unstable areas, should offset the impacts of the proposed timber harvest.

Within the next 10 years the potential impacts from peak flood flows and fine/coarse sediment yield will not be significant.

7. Soils

a. Effects of implementing the “No Action” alternative

Alternative 1 would result in no new soil disturbances. The level of existing detrimental soil disturbance within the project area would remain unchanged. Nutrient cycling would be maintained as fine organic matter increases as duff/litter layers. Soil fertility will slowly increase in managed stands due to the increased organic matter on the soil surface and cycling into the soil.
Alternative 1 would result in a gradual decrease in existing detrimental soil compaction as natural soil biological processes reduce the compaction to less than Forest/Regional threshold guidelines.

However, Alternative 1 would have increased potential for soil erosion due to wildfires as the fuels build up to levels exceeding Forest fuel management objectives and the risk of a major wildfire increases. If a catastrophic fire were to occur in the Eagle Creek drainage, severe erosion would occur and dormant landslides could be reactivated causing massive deposition into Eagle Creek and into the main fork of the Trinity River. Catastrophic fire would remove soil cover and cause organic matter destruction in the topsoil. These factors would cause rill and gully erosion in the soils and possible reactivation of rotational slumps. Erosion rates would be excessive, thus necessitating the need for a fuel reduction program in these areas to protect the resources.

b. Direct and Indirect Effects of the Proposed Action

Overall, Alternative 2 has a high probability of meeting the soil resource evaluation criteria and therefore maintaining long-term soil productivity. The main area of concern is mechanical ground disturbance. Tractor logging can result in soil compaction that exceeds Soil Quality Standards (SQS) - but this only occurs on highly used main skid trails. Impacts to these highly used skid trails would be mitigated by limiting main skid trails to below 15% of the harvest unit area with the prescribed implementation of Alternative 2.

Alternative 2 would meet the LRMP and SQS guidelines for soil cover, porosity, soil organic matter content, surface organic matter levels, soil moisture regime, soil hydrologic function, buffering capacity, and maintain a well functioning soil biological system. Overall, this alternative will not significantly decrease short or long-term soil productivity.

c. Cumulative Effects of the Proposed Action

Alternative 2 has a high probability of meeting the soil resource evaluation criteria to maintain short and long-term soil productivity. The reuse of existing skid trails will minimize areas of new compaction and minimize the cumulative effects of multi-harvest entries over time. New logging disturbances combined with existing detrimental disturbances will not exceed the SQS threshold for detrimental disturbance (15% of the project acres). The cumulative effects of prescribed fires, harvesting, and underburning would not significantly decrease short or long-term soil productivity. Overall, this alternative would meet the LRMP and SQS guidelines for maintaining long-term soil productivity.

8. Cultural/Heritage

The forest archaeologist has approved the archaeological reconnaissance report for the Browns Integrated Project, ARR #05-14-437/2. The project proposals are in accordance with provision III (D) (3) of the Programmatic Agreement for Compliance with Section 106 of the National Historic Preservation Act (PA). As indicated in the Archaeological Reconnaissance report, seven sites are located in or adjacent to proposed activities. The environmental consequences of implementing any
one of these alternatives will have “no effect” to historic properties. Historic properties will be protected utilizing standard protections measures.

9. Botany

a. Sensitive Plant and Fungi Species

A biological evaluation (BE) has been prepared to evaluate the alternatives considered in sufficient detail to determine if the effects of implementation would result in a trend toward Federal listing of any Sensitive plant or fungi species, as designated by the June 10, 1998 Region 5 sensitive plant list and an interim update dated April 21, 2004.

The proposed project area contains almost entirely mixed conifer habitat dominated by Douglas-fir and with a minor component of hardwoods. Small isolated wet seeps are found intermittently throughout, but all perennial streams have been excluded from the project. No serpentine soils are present. Suitable habitat is present within the project area for bug-on-a-stick (bryophyte), branched collybia (fungus), Brownie lady’s-slipper, mountain lady’s-slipper, Pacific fuzzwort (bryophyte), Canyon Creek stonecrop, and orange-peel fungus.

Based on the information collected during the pre-field review, field surveys were conducted on in 1999 on 319 acres. During those surveys, two populations of bug-on-a-stick were identified. All proposed harvest units were surveyed at that time. The current proposal of 117 acres has been refined and many areas eliminated from the proposed action because of resource concerns.

1. Direct effects to Sensitive Plant and Fungi species

Alternative 1 would result in no direct effects to sensitive plant and fungi species.

Alternative 2 would result in no direct effects to sensitive plant species. However, this alternative may cause direct effects on fungi species habitat. There may be a disruption of mycelial networks where tractors used in thinning, temporary road construction, and machine piling churn up soil. Sixty-six acres would be harvested or treated for fuels by tractors, resulting in potential moderate to heavy degradation of habitat for branched collybia or orange-peel fungus. Fungi will not be present above ground during any periods that treatments are occurring and therefore should receive no direct impacts other than soil churning.

2. Indirect effects to Sensitive Plant and Fungi species

Alternative 1 would result in no indirect effects to sensitive plant and fungi species.

Alternative 2 would result in removal of mature overstory trees, disrupting host tree connections and increasing sunlight to the forest floor. No effect would occur to sensitive plants, but adverse impact to fungi species habitat would occur. Removal of the largest trees within a stand will remove the source of specific fungal networks that are necessary to regenerate the same fungi after project activities are complete, resulting in a loss of fungal diversity. Some or all of the fungi provided by the largest trees in a stand are necessary to inoculate newly planted seedlings or natural regeneration post-treatment. This could slow conifer regeneration.
Fifty-eight acres would have a regeneration cut (GTR) with 15% retention, resulting in overstory removal and higher amounts of sunlight to the forest floor outside of the retention areas. Degradation to fungi species habitat occurs with removal of the tree canopy, disruption of the underground fungal mass, and compaction of soil. Removal of tree canopy results in a loss of shade and accelerated soil drying.

Many suitable host trees for fungi species will remain within the 59 acres of thinned stands. The largest trees will not be removed and additional trees that provide suitable late-seral type fungal inoculants will be retained. The overstory will be somewhat open where canopy is thinned to 40-50% canopy cover, but will still maintain moderate shade to the forest floor; which will in turn allow for soil moisture retention. Impacts to branch collybia and orange-peel fungus should be lightest in units 6 and 17, and parts of units 2 and 16 where a skyline cable system will be used and trees are thinned from below. Much larger areas of litter and duff will be maintained, the underground fungal mass will not be impacted greatly and larger host trees will be retained on the site to provide a source for fungal reinoculation after treatments. Any branched collybia or orange-peel fungus populations that may be in these units will likely recover over time to their original size and density.

3. Cumulative effects to Sensitive Plant and Fungi species

There have been only a small amount of ground-disturbing impacts from management activities and little alteration to habitat for Sensitive plants or fungi within the project area. There are no reasonably foreseeable actions planned near the project area or within the Burnt Ranch watershed.

**Alternative 1** would result in no cumulative effects to sensitive plant and fungi species.

**Alternative 2** would result in no cumulative effects to sensitive plants. Only 2 of the 117 acres proposed for timber harvest in **Alternative 2** are considered to be suitable habitat for branched collybia or orange-peel fungus, using vegetation characteristics of conifer forest that has a crown diameter of 25-40 feet or larger (vegetation size) and a crown cover of 40% or higher (vegetation density) (GIS database). Within the entire Burnt Ranch watershed there are 4,648 of suitable habitat for fungi, assuming the same habitat characteristics. At 2 acres, the proposed project would affect less than 1/10 of 1% of all suitable habitat for branched collybia and orange-peel fungus within the watershed.

4. Determination of effects to Sensitive Plant and Fungi species

The project botanist has determined that:

a. Based on lack of individuals, the Eagle Ranch Timber Sale Project will not affect *Cypripedium fasciculatum*, *Cypripedium montanum*, *Ptilidium californicum*, and *Sedum paradisum*.

b. Based on the exclusion of activities within the known population, the Eagle Ranch Timber Sale Project will not affect *Buxbaumia viridis*.

c. Based on the lack of field surveys, incorporation of mitigating project designs, and low scope of impacts, the Eagle Ranch Timber Sale Project may affect individuals, but is not
likely to result in a trend toward Federal listing or loss of viability for *Collybia racemosa* and *Sowerbyella rhenana*.

**b. Noxious Weeds**

The project area was inventoried for the presence of noxious weeds during field visits to the site. There were no weed species of significant concern found within the proposed project area. Isolated populations of Klamath weed (*Hypericum perforatum*) and bull thistle (*Cirsium vulgare*) are present, but no populations were dense enough to warrant concern. Himalayan blackberry (*Rubus ursinus*) is present in an open area near the central part of the project area, but is shade intolerant and is not expected to increase into areas with good tree canopy. It is possible that it will spread to some degree along roads in the regeneration cuts.

**Alternative 1** would result in a continuation of current weed habitat conditions. Within forest stands, suitable habitat for weeds would diminish as canopy cover increases and litter and duff layers accumulate. Where stand densities are high and the chance of high intensity wildfire is greater, total canopy loss could occur, creating abundant suitable habitat for noxious weeds. Where forest stand densities are not overstocked, implementation of **Alternative 1** would contribute towards a reduction of suitable habitat for noxious weeds as disturbance is minimized, canopies close, and litter and duff layers accumulate (suppressing weed germination and establishment).

**Alternative 2** would result in soil disturbance as a result of yarding, temporary road construction/obliteration, landing use, machine piling, and pile burning. Tractor disturbance would create suitable habitat for noxious weeds; removal of canopy would perpetuate habitat until the canopy closes over again.

A Weed Risk Analysis is presented in Appendix D of the Supplementary Botanical Report in the project file. This analysis concludes that implementation of **Alternative 2** would result in a low risk of spreading weeds because of the small amounts of disturbance and incorporated mitigation measures to reduce the spread of weeds.

**10. Geology**

The environmental consequences of implementing the alternatives on the geologic resource have been evaluated in terms of initiating mass wasting conditions. **Alternative 1** implements no activity at this time and leaves the proposed sale area in its present condition, there would be no potential for geologic impacts associated with land management activities under this proposal. Therefore, there are no direct, indirect, or cumulative effects expected to result from implementation of **Alternative 1**.

**Alternative 2** would not create foreseeable adverse direct, indirect, or cumulative impacts due to exclusion mitigations of potentially hazardous zones. Timber harvest units have been designed to avoid areas of slope instability.
B. Consequences of the Proposed Action Relative to Significant Elements

In 1978 the Council of Environmental Quality (CEQ) promulgated regulations for implementing the National Environmental Policy Act (NEPA). These regulations (40 CFR Parts 1500-1508) include a definition of “significantly” as used in NEPA. The elements of this definition have been considered in identifying the significance of impacts resulting from the intensity of the actions considered. The following elements have been considered in evaluating significance:

1. Beneficial and adverse impacts

Both beneficial and adverse effects have been taken into consideration and displayed within the Environmental Consequences section. Beneficial effects have not been used to offset or compensate for potential adverse effects. Singly and collectively, the resources affected by both alternatives are not expected to result in significant adverse impacts. The short-term adverse impacts of the removal of vegetation, fuel manipulations, and subsequent burning in Alternative 2 would be minimal. The long-term beneficial effect of Alternative 2 would include increased wildfire protection for natural resources.

2. The degree to which the proposed action affects public health or safety

Public health and safety would not be adversely affected by the alternatives considered. During implementation of Alternative 2, forest visitors would experience the short-term impact of minor traffic delays and temporary closure of some roads during tree felling/removal and/or prescribed burning activities to ensure safe public travel. Smoke resulting from prescribed burning would be evident; however, project design would mitigate this impact to acceptable levels by allowing burning within an airshed only as approved by the North Coast Unified Air Quality Management District.

3. Unique characteristics of the geographic area

Project proposals have been designed to protect the historic properties and watershed impacts. There are no unique characteristics to the area. The proposed action would be unlikely to adversely affect human uses and values and no significant impacts are expected.

4. The degree to which the effects on the human environment are likely to be highly controversial

The interdisciplinary planning team (IDT) did not find that the effects to the human environment were highly controversial. Also, the IDT found the proposed action would be consistent with all applicable land management standards and guidelines.
5. The degree to which the possible effects on the human environment are highly uncertain or involve unique or unknown risks

Commercially thinning and regeneration harvesting conifer stands, modifying forest vegetation for fuels treatment, and applying prescribed burns to forested areas are all activities that have been practiced for many decades. The effects associated with these activities are repeatable and predictable. There is no uncertainty involved in evaluating the effects.

6. The degree to which the action may establish a precedent for future actions with significant effects or represents a decision in principle about a future consideration

The alternatives considered do not set a precedent for future decisions. However, Alternative 2 would facilitate the implementation of additional fuels reduction projects for additional resource protection. A separate NEPA decision would be necessary to determine significance of effects before implementation of future actions.

7. Whether the action is related to other actions with individually insignificant but cumulatively significant impacts

The alternatives considered are not components of any larger action. The conclusions reached in the CWE analysis (within the Hydrology/CWE Report in the project file) identify no significant impacts expected. In addition, the BE/BAAs for botany, fisheries, and wildlife concluded that both alternatives considered would have no significant impact and that any related foreseeable actions within the context of the analysis area would require future NEPA analysis before an action could be initiated.

8. The degree to which the action may adversely affect districts, sites, highways, structures, or objects listed in or eligible for listing in The National Register of Historic Places, or may cause loss or destruction of significant scientific, cultural, or historic resources

The project area has been inventoried for heritage resources. Known sites will be protected to ensure there are no adverse effects. The consequences of implementing Alternative 2 are not expected to alter any of the characteristics of the historic properties that qualify for the National Register.

9. The degree to which the action may adversely affect an endangered or threatened species or its habitat that has been determined to be critical under the Endangered Species Act (ESA) of 1973

In compliance with requirements of ESA, The Forest Service prepared a Wildlife Biological Assessment (BA) of this project’s possible impacts on the endangered or threatened species (northern spotted owl) within the affected area. The Wildlife BA concluded that Alternative 2 would result in a short-term (<25 years) reduction in habitat quality and a long-term (25-30 years) net increase in
habitat quality. Biological evaluations completed for botany and fisheries reports concluded that no threatened or endangered plants or fish exist within the project area. Therefore no adverse effects to botanical and fish species or habitat would occur with implementation of Alternative 2.

10. Whether the action threatens a violation of federal, state, or local law or other requirements imposed for the protection of the environment

Neither of the alternatives considered would threaten a violation of Federal, State, or local law or requirements imposed for the protection of the environment. The alternatives considered in this analysis are fully consistent with NFMA and the Shasta-Trinity National Forest LRMP.
4. Agencies and Persons Consulted

The following were consulted in the planning process for the Eagle Ranch Timber Sale Project:

- **Danielle Chi** representing US Fish and Wildlife Service
- **Heidi Crowell** representing US Fish and Wildlife Service
- **Douglas M. Cushman** representing California Regional Water Quality Control Board
5. Interdisciplinary Planning Team

Thomas Quinn - Wildlife Biologist
Susan Erwin - Botanist
Steve Graves - Fuels Management Specialist
Lara Ridley - Fuels Management Specialist
Sherry Chilcott - Zone Archaeologist
Sam Frink - Forester, Writer/Editor, ID Team Leader
Loren Everest - Fishery Biologist
Brad Rust - Soil Scientist
Abel Jasso - Geologist
Jim Fitzgerald - Hydrologist
Dale Stanley - Transportation Planner
Joyce Andersen - District Ranger
Appendix A: Unit Summary

<table>
<thead>
<tr>
<th>Unit</th>
<th>Acres</th>
<th>Retention Acres</th>
<th>Yarding System</th>
<th>Alt</th>
<th>Rx</th>
<th>Treatment or Mitigation Proposed</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>9.9</td>
<td>2.12</td>
<td>TRACTOR</td>
<td>2</td>
<td>GTR</td>
<td>TP, FSD, TV, TR</td>
</tr>
<tr>
<td>2A</td>
<td>13.7</td>
<td></td>
<td>TRACTOR</td>
<td>2</td>
<td>THIN</td>
<td>DL, TP, FSD, R2</td>
</tr>
<tr>
<td>2B</td>
<td>3.4</td>
<td></td>
<td>TRACTOR</td>
<td>2</td>
<td>THIN</td>
<td>DL, TP, FSD, R2</td>
</tr>
<tr>
<td>2C</td>
<td>1.1</td>
<td></td>
<td>SKYLINE</td>
<td>2</td>
<td>THIN</td>
<td>WTY, FSD, LS, PC, HL, BC, R2</td>
</tr>
<tr>
<td>3</td>
<td>8.4</td>
<td>1.85</td>
<td>TRACTOR</td>
<td>2</td>
<td>GTR</td>
<td>TP, FSD, TV</td>
</tr>
<tr>
<td>4A</td>
<td>2.5</td>
<td></td>
<td>TRACTOR</td>
<td>2</td>
<td>THIN</td>
<td>DL, TP, FSD</td>
</tr>
<tr>
<td>4B</td>
<td>3.0</td>
<td></td>
<td>SKYLINE</td>
<td>2</td>
<td>THIN</td>
<td>WTY, FSD, LS, PC, HL, BC</td>
</tr>
<tr>
<td>4C</td>
<td>2.1</td>
<td></td>
<td>SKYLINE</td>
<td>2</td>
<td>THIN</td>
<td>WTY, FSD, LS, PC, HL, BC</td>
</tr>
<tr>
<td>4D</td>
<td>1.5</td>
<td></td>
<td>TRACTOR</td>
<td>2</td>
<td>THIN</td>
<td>DL, TP, FSD, R2</td>
</tr>
<tr>
<td>5</td>
<td>2.8</td>
<td>1.78</td>
<td>TRACTOR</td>
<td>2</td>
<td>GTR</td>
<td>TP, FSD, TV</td>
</tr>
<tr>
<td>6</td>
<td>10.1</td>
<td></td>
<td>SKYLINE</td>
<td>2</td>
<td></td>
<td>HP, FSD, HL, BV</td>
</tr>
<tr>
<td>7</td>
<td>7.7</td>
<td></td>
<td>TRACTOR</td>
<td>2</td>
<td>THIN</td>
<td>DL, TP, FSD, R2</td>
</tr>
<tr>
<td>15A</td>
<td>6.0</td>
<td>2.72*</td>
<td>SKYLINE</td>
<td>2</td>
<td>GTR</td>
<td>WTY, FSD, LS, HL, BB, TV</td>
</tr>
<tr>
<td>15B</td>
<td>5.5</td>
<td>*</td>
<td>TRACTOR</td>
<td>2</td>
<td>GTR</td>
<td>TP, FSD, TV, TR</td>
</tr>
<tr>
<td>15C</td>
<td>4.8</td>
<td>*</td>
<td>SKYLINE</td>
<td>2</td>
<td>GTR</td>
<td>WTY, FSD, LS, HL, BB, TV</td>
</tr>
<tr>
<td>15D</td>
<td>1.9</td>
<td>*</td>
<td>TRACTOR</td>
<td>2</td>
<td>GTR</td>
<td>TP, FSD, TV, TR</td>
</tr>
<tr>
<td>16A</td>
<td>2.3</td>
<td></td>
<td>SKYLINE</td>
<td>2</td>
<td></td>
<td>WTY, FSD, LS, PC, HL, BC</td>
</tr>
<tr>
<td>16B</td>
<td>1.5</td>
<td></td>
<td>TRACTOR</td>
<td>2</td>
<td></td>
<td>DL, TP, FSD, R2</td>
</tr>
<tr>
<td>17</td>
<td>9.6</td>
<td></td>
<td>SKYLINE</td>
<td>2</td>
<td></td>
<td>WTY, FSD, LS, PC, HL, BC, R2</td>
</tr>
<tr>
<td>18</td>
<td>9.7</td>
<td>3.39</td>
<td>SKYLINE</td>
<td>2</td>
<td>GTR</td>
<td>WTY, FSD, LS, HL, BB, TV</td>
</tr>
<tr>
<td>19A</td>
<td>6.9</td>
<td>1.67*</td>
<td>TRACTOR</td>
<td>2</td>
<td>GTR</td>
<td>TP, FSD, TV</td>
</tr>
<tr>
<td>19B</td>
<td>2.7</td>
<td>*</td>
<td>SKYLINE</td>
<td>2</td>
<td>GTR</td>
<td>WTY, FSD, LS, HL, BB, TV</td>
</tr>
<tr>
<td>Total</td>
<td>117.0</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

* Units 15A-D and 19A-B “share” the retention acres

**FUELS**
- **WTY:** Whole Tree Yard
- **FSD:** Fall Small Diameter damaged trees
- **BC:** Burn Concentrations
- **TP:** Tractor Pile/Burn
- **BB:** Broadcast Burn
- **HL:** Hand Line unit and residual trees
- **DL:** Dozer Line
- **LS:** Lop and Scatter 18” away from residual trees
- **HP:** Hand Pile entire unit/Burn
- **PC:** Pile Concentrations 10% of are

**BOTANY**
- **BV:** Exclude treatment in a known site for bug-on-a-stick

**RIPARIAN RESERVES**
- **R2:** Protect Riparian Reserve area (includes equipment exclusion) as prescribed for stream channels that are not fish-bearing.

**TIMBER**
- **TV:** Install vexar tubes on planted trees for deer protection
- **TR:** Retain individual “largest, oldest” trees within the harvest area
Appendix B: Response to Comments

Publication Date: October, 19 2005
End of Comment Period: November 18, 2005

Introduction

This chapter presents the comments on the Preliminary EA and the Forest Service’s responses. The Forest received 2 comment letters on the Preliminary EA; one letter was from an environment group and the other was from the California Regional Water Board, a state agency.

Comments have been identified directly as submitted. Whenever possible, the response includes a reference to the location in the documents where the reader may find changes or supporting information. The numbers in the first column can be used to identify comments. Identification of the group who commented is included at the end of this introduction. Scanned copies of the state agency comment letter follows the numbered list.

Possible responses to comments include the following (40 CFR 1503.4):

1. Modify alternatives including the proposed action.
2. Develop and evaluate alternatives not previously given serious consideration by the agency.
3. Supplement, improve, or modify its analyses.
5. Explain why the comments do not warrant further agency response.

36 CFR 215.6 (a) (3) Requirements. Individuals and organizations wishing to be eligible to appeal must have provided the following: (i) Name and address. (ii) Title of the proposed action. (iii) Specific substantive comments (215.2) on the proposed action, along with supporting reasons that the Responsible Official should consider in reaching a decision. (iv) Signature or other verification of identity upon request; identification of the individual or organization who authored the comment(s) is necessary for appeal eligibility.

This chapter presents the comments on the Draft EIS and the Forest Service’s responses. The comments received are herein identified as either being a “Substantive Comment” or not. To meet the definition of being a “Substantive Comment”, the comment must meet the following two criteria: 1), the comment must be within the scope of the proposed action, specific to the proposed action, and have a direct relationship to the proposed action; and 2), the comment must include supporting reasons for the Responsible Official to consider.

Comments were received from (2 participants):

1. Denise Boggs, representing the Conservation Congress (aka CC).
2. Thomas R. Williams, representing North Coast Region of California Water Quality Control Board (aka Regional Water Board- RWB)
<table>
<thead>
<tr>
<th>Comment By/Date Received</th>
<th>Comment and Responsible Official's Consideration of Comment (Response)</th>
<th>Substantive Comment?</th>
</tr>
</thead>
</table>
| #1 CC 11/11/05           | **Comment**: This EA does not include any discussion of the logging that went forward until stopped by the judge.  
**Response**: No logging proposed in the EA has commenced. | This is a general comment and is not relevant to the proposal. |
| #2 CC 11/11/05           | **Comment**: Page 1 of the EA states Alternative 2 will log 2.9 mmbf of timber. Page 5 states it will log 3.8 mmbf. The impacts from an additional 900 mbf would be significantly different.  
**Response**: Page 1 of the EA states that the Proposed Action includes 2.9 mmbf (million board feet) of Intermediate harvest plus 900 mbf (thousand board feet) of Regeneration harvest, which totals 3.8 mmbf. | This is a general comment regarding the clarity of the proposal. |
| #3 CC 11/11/05           | **Comment**: Page 1 states there will be no new road construction or reconstruction and page 5 states a temporary road is planned to access Unit 1.  
**Response**: Page 1 states that no new system roads would be constructed or reconstructed. A “system” road is a road which will be maintained and treated under a maintenance schedule. A “temporary” road is proposed for the project activities to avoid long log skidding distances – a landing serviced by a temporary road and providing access to a log hauling truck is proposed over the option of log skidding over several hundred yards. | This is a general comment regarding the clarity of the proposal. |
| #4 CC 11/11/05           | **Comment**: The EA states the temporary road will be obliterated when log hauling is completed but that would be at least 3 years, thereby adding to the overall open road density standard.  
**Response**: This comment is correct. The Forest Service planning team recognizes that the open road density will be temporarily affected and environmental analysis was completed in consideration of the temporary road being open for 3 years. | Not a substantive comment because there are no supporting reasons to consider regarding why road density is problematic. |
| #5 CC 11/11/05           | **Comment**: Page 4 states there will be no re-entry for harvest for 30 years or more; page 15 states that after Alt. 2 is completed, the condition is estimated to be maintained for approximately 10 years “at which point additional fuel treatments would be needed to maintain desired fuel conditions”.  
**Response**: This comment is correct. The fuels treatments to maintain desired fuel conditions expected 10 years after Alt. 2 is completed are not expected to involve timber harvest. | This is a general comment regarding the clarity of the proposal. |
| #6 CC 11/11/05           | **Comment**: Page 18 states that GTR units would create a fire hazard in approximately 5-10 years and at that point thinning would need to take place; page 18 continues on that maintenance will need to occur to maintain conditions; page 24 states there are no foreseeable forest management activities planned within the Burnt Ranch 5th Field watershed that is the area used for the cumulative effects analysis for this project; and page 29 states there are no reasonably foreseeable actions planned near the project area or within the Burnt Ranch watershed. These statements vary from no foreseeable entry, to entry in 30 years, to entry in as few as 5 years making the entire analysis arbitrary and capricious.  
**Response**: On page 18, the planning team recognizes that the project area will need thinning and pruning to maintain the benefits of condition Class 1 conditions. However, the thinning and pruning of 5-10 year old conifer stands is not expected to be a foreseeable forest management activity that would have measurable consequences to wildlife (as referenced on page 24) and botanical species (as referenced on page 29) due to the very low level of impacts associated with this activity. That is to say, the planning team considered stand maintenance as a forest management activity that would not affect the cumulative effects analysis. | This is a general comment. It is the intent of the EA to adequately disclose and analyze measurable effects within the foreseeable future. |
<table>
<thead>
<tr>
<th>Comment By/Date Received</th>
<th>Comment and Responsible Official’s Consideration of Comment (Response)</th>
<th>Substantive Comment?</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Activities which would require subsequent NEPA decisions are not planned at this time.</td>
<td></td>
</tr>
</tbody>
</table>

### Range of Alternatives - Related Comments

**#7 CC 11/11/05**

**Comment:** This EA has two alternatives – the no action required by NEPA as a baseline and the preferred alternative that is the only action alternative. This is a clear violation of NEPA.

**Response:** Alternative 1 (No Action) provides a baseline to describe the existing condition within the project area. Alternative 2 was designed by an interdisciplinary team to best meet the purpose and need identified for the Eagle Ranch Timber Sale project. No additional alternatives were recommended by the interdisciplinary team and no significant issues were received in public scoping that recommended or warranted the development of additional alternatives.

Comment to the documentation adequacy on the alternatives considered, not a comment on the PA.

### Mitigation - Related Comments

**#8 CC 11/11/05**

**Comment:** The EA lists 31 mitigation measures and design criteria that will supposedly lessen impacts and lead to a FONSI. There is no discussion of when these measures will be implemented or how they will be funded, or even if the funding is available to see they are implemented.

**Response:** The mitigation measures and design criteria identified as part of the proposed action would be implemented concurrently with timber sale activities. Post-sale fuel treatments will be completed within two years following the completion of the closure of the timber sale.

Comment to the documentation adequacy. This is not a substantive comment to the PA.

### Northern Spotted Owl - Related Comments

**#9a CC 11/11/05**

**Comment:** The proposed action will “likely to adversely affect” the Northern Spotted Owl (p. 23). Page 25 asserts that virtually all LSOG habitat will likely be restricted to FS land in the watershed. How will the NSO ever recover with management that guarantees declining habitat needed for recovery?

**Response:** The project area lies in the Hayfork Adaptive Management area (EA page 1). Timber harvest and production in this area is allowed and recognized as part of the overall management strategy and recovery of the NSO and the proposed action is consistent spotted owl management strategies (EA page 23 Table 3-8 and page 24). The U.S. Fish and Wildlife Service (FWS) determined that the proposed action is in accordance with the Endangered Species Act of 1973 and is not likely to jeopardize the continued existence of the northern spotted owl (FWS Biological Opinion, September 1, 2004).

This is a substantive comment.

**#9b CC 11/11/05**

**Comment:** The EA makes the claim that the “proposed thinning prescriptions (would) accelerate the development of old growth conditions.” Alternative 1 would best meet the needs of the NSO, fisher, marten and goshawk as exhibited by the chart on page 10.

**Response:** The EA discloses short-term negative impacts along with longer-term benefits to these species with the proposed action (EA page 10 Table 2-4 and page 23 Table 2-8). That is to say, Alternative 1 better meets the needs of these species in the short-term while the proposed action meets the needs in the long-term by producing a decrease in lower quality habitat along with an increase in acreage with old-growth habitat conditions.

This is a general comment.

**#9c CC 11/11/05**

**Comment:** Pages 12 & 13 state regenerated stands are expected to be planted and intensively managed to produce an optimum yield of timber as part of the DFC in the LRMP. This is in direct conflict with NSO management and clearly requires a Forest Plan amendment. NSO takes precedence over arbitrary DFC in the LRMP.

**Response:** The proposed action is not in direct conflict with NSO management nor does the NSO take precedence in all project-level

This is a substantive comment.
<table>
<thead>
<tr>
<th>Comment By/Date Received</th>
<th>Comment and Responsible Official's Consideration of Comment (Response)</th>
<th>Substantive Comment?</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>management decisions (see response to #9a) in areas outside of land allocations designated specifically to be managed primarily for species associated with LSOG habitat (e.g., Late-successional Reserves).</td>
<td></td>
</tr>
<tr>
<td><strong>Timber Harvest - Related Comments</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>#10 CC 11/11/05</td>
<td><strong>Comment:</strong> Alt. 2 includes 58 acres of GTR harvest. As previously mentioned in our July 16, 2004 comments, the Trinity side of the STNF currently has approximately 140,000 acres of plantations overdue for thinning, yet this project plans to add another 58 acres by removing green trees and replanting. <strong>Response:</strong> The Forest Service agrees that there is a need to thin many acres of plantations that currently exist within the Trinity side of the STNF. However, the proposal for GTR harvest is consistent with management direction identified for Management Area # 15 in the Shasta-Trinity National Forest Land and Resource Management Plan.</td>
<td>This is not a substantive comment because it is beyond the scope of this project.</td>
</tr>
<tr>
<td>#11 CC 11/11/05</td>
<td><strong>Comment:</strong> We were astonished to read on page 13 “for stands that average 100 years of age, it is anticipated that about 40% of the trees/per acre would die by the time the stand reaches 150 years of age.” This advice is based on Dunning’s 1933 work. I emphasize 1933. The Redwoods National Park nearby demonstrates this advice is patently wrong. Douglas-fir lives for hundreds of years before dying and is known for its longevity, and the very same data can be found on the Shasta-Trinity NF. Citing a paper from 1933 is a bogus attempt to justify logging of LSOG habitat. It also fails to use the best available scientific information in violation of the NEPA. <strong>Response:</strong> It is true that individual Douglas fir trees can live for hundreds of years; however, Dunning’s 1933 work is a peer-reviewed technical paper that is based on stands, not individual trees. The year of publication is irrelevant to the results of the findings in the work cited.</td>
<td>This is a general comment regarding the literature cited. It is the intent of the EA to use well established reports to estimate and disclose measurable effects.</td>
</tr>
<tr>
<td><strong>Fire Severity - Related Comments</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>#12a CC 11/11/05</td>
<td><strong>Comment:</strong> The entire discussion on fire fails to mention that Ponderosa pine is dependent on fire and is considered to be a fire-resistant species. In addition, Douglas-fir is also a fire adapted species and is notoriously long-lived. <strong>Response:</strong> Ponderosa pine is not dependent on fire; however, it is considered a fire-adapted species. This was discussed in the Affected Environment section of the Eagle Ranch, Fire and Fuels Specialist Report (pg. 11- Fire Ecology of the Klamath Mountains). However, both tree species can burn under the right conditions; such as during dry weather, coupled with heavy fuel loadings, and excessive ladder fuels.</td>
<td>Comment to the documentation adequacy. This is not a substantive comment to the PA.</td>
</tr>
<tr>
<td>#12b CC 11/11/05</td>
<td><strong>Comment:</strong> Page 19 includes a table of tree mortality percentage for Douglas-fir by Alternatives. A percentage is listed for all DBH classes between 8 and 13 inches for Alternative 1 – the no action alternative. For Alt. 2 the table states “No model is currently available.” In the discussion below the table it further states there is currently no predictive model available for GTR and tractor thinning units…. And skyline thin units also have no models that represent stand mortality after treatment.” <strong>Response:</strong> Mortality rates were not discussed for ponderosa pine due to its small distribution within the stands. Sixty-one trees were chosen (Eagle Ranch Fire and Fuels Specialist Report- Appendix B), from Forest Service stand data to enter into the fire behavior prediction model FMA +, of which only three were ponderosa pine. In addition, tree mortality was based on diameters ranging from 8 to 13 inches. There were no pine trees, within that range of diameters, entered into the program; therefore, mortality was not determined. Furthermore, Douglas-fir and ponderosa pine have similar mortality rates for the same DBH, height, and crown ratio. For example, the First Order Fire Effects (FOFEM 5.11) model predicts a</td>
<td>Comment to the documentation adequacy. This is not a substantive comment to the PA.</td>
</tr>
<tr>
<td>Comment By/Date Received</td>
<td>Comment and Responsible Official’s Consideration of Comment (Response)</td>
<td>Substantive Comment?</td>
</tr>
<tr>
<td>--------------------------</td>
<td>--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------</td>
<td>----------------------</td>
</tr>
</tbody>
</table>
| #12c CC 11/11/05        | **Comment:** Page 19 further states the entire fire behavior analysis in the EA is based on “personal observations.”  
**Response:** The entire fire behavior analysis is not based on personal observations alone. This was misstated and will be corrected in the final EA. Predicted fire behavior and mortality was determined using the Fuels Management Analysis Plus (FMA +) software program (Eagle Ranch, Fire and Fuels Specialist Report, Environmental Consequences, pages. 14-15; 17-19). However, mortality rates had to be adjusted since the model over-predicts post treatment fuels conditions. This adjustment is in accordance with scientific literature for using the tree-mortality prediction model and is discussed in the Eagle Ranch Specialist report under Affected Environment-Fire Severity. | This is not a substantive comment to the PA. |
|                          |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       |                      |
| #13 CC 11/11/05         | **Comment:** The EA asserts there will be no impacts to fish because they don’t occur in the project area. It concedes indirect effects to Eagle Creek and Sailor Bar Creek downstream. Page 26 states that after implementation of Alt. 2 Eagle Creek will go from a Class I Condition watershed to a Class II Condition. That is a significant increase in impacts that will have effects on fish. Page 25 states the greatest influence on anadromous fish near the sale area will continue to be flow releases from the Trinity River Project. There is zero analysis of what this “influence” is and how it relates to the Eagle Ranch project.  
**Response:** The EA asserts that there will be no impact to anadromous fishes. There are no fish within the project area and there are natural barriers in Eagle and Sailor Bar Creeks that prevent anadromous fishes from using them at all. Since there are no anadromous fishes in Eagle Creek a change in watershed condition class will not affect them. See the Eagle Ranch Timber Sale Biological Assessment / Biological Evaluation for a full analysis of effects to listed fishes. | This is a substantive comment. |
|                          |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       |                      |
| #14 CC 11/11/05         | **Comment:** The EA on page 27 states that new logging disturbances combined with existing detrimental disturbances will not exceed the SQS threshold for detrimental disturbance (15% of the project acres). Of the 234 acres in the project area, 66 will be tractor logged causing the greatest disturbance to soils. 15% of the project area is 35 acres yet 66 acres will be tractor logged. “Tractor logging can result in soil compaction that exceeds SQS.” “The main area of concern is mechanical ground disturbance.” The EA claims there is a high “probability” of meeting SQS. Considering almost double the amount of recommended tractor logging will occur, we would allege there is a “low” probability of meeting SQS.  
**Response:** Past research (Sustaining Site Productivity on Forestlands, Powers 1983; Monitoring Impacts of Ground-Based Thinning on Soil Quality, Young 2005) has shown that tractor logging if conducted on wet or moist fine textured soils can compact soils to detrimental levels. Only one fine textured soil (Holland, occupies about 30 acres) in the proposed sale area has a severe compaction rating and rest of the soils have high rock fragments making them less susceptible to compaction (Soil Compaction Monitoring – Professor Thin Timber Sale, Rust 2005). Holland soils located on the flatter areas will be logged when the soils are dry (after June) with designated slash-covered skid trails. Low-pressure mechanical harvesters will do the logging on the ground less than 35% slopes (Holland soil areas). Compaction levels will be well below threshold on less than 15% of the area by using modern logging techniques (Best Management Practices 1-10, 5-6; see Soils report pg. 18; Issue of Compaction, Rust 2004). | This is a substantive comment. |

Anadromous Fish - Related Comments

Soils - Related Comments
### Sensitive Plant and Fungi Species- Related Comments

<table>
<thead>
<tr>
<th>Comment By/Date Received</th>
<th>Comment and Responsible Official's Consideration of Comment (Response)</th>
<th>Substantive Comment?</th>
</tr>
</thead>
</table>
| #15 CC 11/11/05          | **Comment:** Page 28 states that field surveys were last conducted in 1999 – at least 6 years ago. We are not assured exactly where these surveys were conducted so they may not be within the actual project area. Alt. 2 will cause "direct effects on fungi species habitat." (and) "... moderate to heavy degradation of habitat for branched collybia or orange-peel fungus." Page 29 goes on to discuss loss of fungal diversity and removal of specific fungal networks necessary to regenerate the fungi. Page 30 asserts that due in part to "lack of field surveys" the project may affect individuals. 
**Response:** Page 10 of the Biological Evaluation for Sensitive Plants and Fungi (August 2, 2004) specifies that field surveys for Sensitive plants were conducted in all units proposed for treatments. The determination of effects for Sensitive fungal species is correct. Because of the lack of field surveys for Sensitive fungi, presence of suitable habitat, and ground-disturbing activities proposed, there may be potential direct and indirect effects on these species. These effects were described in detail with an assessment of the degree of those impacts on pg. 7-10 of the Biological Evaluation. While little research exists on specific effects to the Sensitive fungi species addressed in this project, research results on the effects of treatment activities proposed in this project and the mitigation measures employed to lessen potential impacts were considered in the analysis of impacts to Sensitive fungi. Citations for these research results were not included in the Biological Evaluation for Plants and Fungi, but have since been added to the project file and are available for viewing at this time. Consideration of the potential effects, proposed mitigations, and project design features led to the determination given in the Biological Evaluation. | The EA intends to disclose proposed activities and effects to plants and fungi. |

| #16 CC 11/11/05          | **Comment:** The FS has a responsibility to ensure that sensitive species populations do not worsen to the point of needing federal listing. Impacting individuals project by project has a deleterious impact that is consistently overlooked by the FS. 
**Response:** Two populations of Sensitive species were identified during field surveys; both are in proposed units that were dropped from treatments and both now lie well outside of any potential area of impact. Mitigation measures and project design features described on page 8 of the EA for plants will ensure that potential impacts to Sensitive fungi are minimized. Cumulatively, the proposed treatments could potentially negatively impact Sensitive fungi on 2 acres or less of suitable habitat and less than 1/10th of 1% of the suitable habitat within the watershed. Retaining over 99% of potential suitable habitat for Sensitive fungi in the cumulative impacts analysis area (5th field watershed) will help insure that any potential impacts from this project do not contribute to overall impacts of future activities planned in the area, and insure the viability of all three Sensitive fungi species is maintained. | This is a substantive comment. |

### Noxious Weeds - Related Comments

<table>
<thead>
<tr>
<th>Comment By/Date Received</th>
<th>Comment and Responsible Official's Consideration of Comment (Response)</th>
<th>Substantive Comment?</th>
</tr>
</thead>
</table>
| #17 CC 11/11/05          | **Comment:** According to the Chief of the FS noxious weeds on FS lands is one of the top 4 priority issues the FS needs to deal with. Alt. 2 "would create suitable habitat for noxious weeds." (p. 30). Alt. 1 would not. 
**Response:** This is correct. Soil disturbance and canopy reduction from project treatments will create suitable habitat for noxious weeds. Mitigation measures identified on pages 16 and 17 of the Biological Evaluation for Sensitive Plants and Supplemental Botany Report are specified to reduce the risk of weed introduction and accelerate establishment of native species. These measures include cleaning equipment prior to entry into the sale area, reseeding with native grass seed after completion of treatments, and year-round restricted access to | This is a substantive comment. |
<table>
<thead>
<tr>
<th>Comment By/Date Received</th>
<th>Comment and Responsible Official’s Consideration of Comment (Response)</th>
<th>Substantive Comment?</th>
</tr>
</thead>
<tbody>
<tr>
<td>cc</td>
<td>vehicles that may import weeds in from outside areas.</td>
<td></td>
</tr>
</tbody>
</table>

**Geology - Related Comments**

#18 CC 11/11/05  
**Comment**: Mass wasting features are found throughout the project area. Logging and the various logging methods proposed in Alternative 2 may accelerate these processes.  
**Response**: The project geologist identified mass wasting features and mapped, located, and stratified each feature according to its potential to be activated by proposed actions. Factors evaluated and used in the analysis included: (1), location of harvest units related to hazard zones; (2), potentially disturbed area in acres; and (3), harvest methods. Units that demonstrated a potential during this initial review were field evaluated. These units were either entirely eliminated from further consideration or mitigated through boundary modification. Alternative 2 would not create foreseeable adverse impacts due to these exclusion mitigations of potentially hazardous zones.  
This is a substantive comment.

**Cumulative Effects Analysis - Related Comments**

#19 CC 11/11/05  
**Comment**: Other than a brief paragraph for each issue, there wasn’t a CEA in the EA. The EA mentioned past logging but failed to tell us how much logging, where it was, what the effects to the resources were from the logging, etc. It didn’t mention any other land use activities at all. This is a clear violation of NEPA.  
**Response**: A cumulative watershed effects analysis was completed for this project that quantified the past, present, and future watershed condition. The analysis used the Shasta-Trinity National Forest Cumulative Watershed Effects Process and quantified the impacts from timber harvest, roads, and cattle grazing. Extensive field inventories and modeling were completed to reduce the probability of negative cumulative effects.  
The comment letter received from the California Regional Water Quality Control Board concurred with the Forest Service CWE analysis, stating that their review concludes “that Alternative 2 would not significantly impact the beneficial uses of waters of the State.”  
Comment to the documentation adequacy. This is not a substantive comment to the PA.