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Region

Shasta-Trinity
National Forest

South Fork
Management Unit

April 2008



East Fork II Environmental Assessment



This photo was taken in fall 2007 from an original, already completed, East Fork Project unit. It shows biomass processing (chipping) operations at a landing near Pine Root Saddle, along the northern boundary of the assessment area.

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East Fork II Project

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Conservation Congress

East Fork II Environmental Assessment

April 2008

Section 1: Purpose and Need for Action _____

Project Area Location

The East Fork Project assessment area is on the Yolla Bolla Ranger District of the Shasta-Trinity National Forest (STNF) located in Township 29N, Range 11W sections 5 and 32, and T28N, R11W section 3-5, 7-11, 13-17, 21, 22-26, 35, and 36, Mount Diablo Meridian. The assessment area for the project is defined by the boundary of the East Fork South Fork Trinity River Watershed (see maps, Appendix A). The project is located an estimated six air miles south of Wildwood, California and is comprised of 38 treatment units, shown in the project map (Appendix A).

A total of 24,593 acres are contained within the boundary of the assessment area, including 24,436 acres of National Forest System land and 160 acres of private land.

Existing Condition

In general, areas proposed for thinning are single-storied, dense mixed conifer stands¹ primarily composed of Douglas fir, white fir and ponderosa pine that have had previous timber harvest. Stands are currently in a well-stocked to over-stocked condition, with substantial ground fuels. Project field reviews along with silvicultural analysis of the existing condition shows that stands are beyond site capacity to maintain a healthy, vigorous forest condition. Hardwood tree species, including canyon live-oak, California black oak and Pacific madrone, are common but are generally minor second-layer components. California black oak was once well represented in the area, but due to fire suppression and timber harvest practices, conifers such as Douglas fir have had a competitive advantage and are contributing to the decline of hardwoods as a viable stand component. More detailed existing condition information follows in *Section 3 Fire and Fuels*.

Desired Condition

Desired conditions for each management area are identified in chapter 4 of the STNF Land and Resource Management Plan (LRMP, pgs 4-161 through 4-164).² The LRMP directs that forest stands in the project area are to be managed at levels that maintain and enhance growth and yield to improve and protect forest health and vigor, recognizing the natural role of fire, insects, and disease and other components that have key roles in the ecosystem.³ The project is located within key watershed, as designated by the LRMP. Key watersheds contribute to the conservation of at-risk anadromous and resident salmonids (rainbow trout, coho and Chinook salmon). Key watersheds are intended to

¹ Size class 2 and 3, LRMP Appendix D-3

² The Shasta-Trinity National Forest LRMP can be accessed online at <http://www.fs.fed.us/r5/shastatrinity/publications/forest-plan.shtml>

³ LRMP, pg 4-162

provide high quality fish habitat; in key watershed areas where habitat is currently of lower quality, there is high potential for habitat improvements as part of watershed restoration programs.⁴

The contrast between existing conditions (overstocked stands, high fire risk) and desired conditions (healthy vigorous stands, resilient to wildfire effects) determines the need for action in the assessment area.

Purpose and Need for Action

The project is needed to develop and maintain vigorous and healthy mixed conifer stands that will be resilient to natural disturbances, the most influential of which is wildfire. With no action, the probability of stand-replacing wildfire in the assessment area will continue to increase unabated by management action. Management direction provided in the LRMP states that forests in the assessment area should be managed to maintain and protect forest health and vigor while supporting watershed and wildlife-related goals.⁵ Forest health, watershed, and wildlife-related objectives can be achieved by implementing silvicultural thinning from below (largest, most healthy trees retained). Designing the project to be consistent with standards and guidelines in the LRMP ensures that silvicultural objectives are achieved in the context of sustainable ecosystem management including compliance with the National Forest Management Act (NFMA). The NFMA requires that projects are consistent with forest plan direction, which provides specific standards and guidelines for each land allocation. The specific forest plan direction for each land allocation proposed for treatment is summarized below, and under *Management Direction*.

Matrix

The LRMP directs that timber stands in areas designated as Matrix be managed to obtain optimum growth and yields using cultural practices which control competing vegetation, obtain stocking control, and minimize mortality within the context of Matrix standards and guidelines.⁶ Areas proposed for thinning are approaching or are beyond the maximum carrying capacity, measured by the density of trees. The live crown ratio, an indicator of tree vigor, is decreasing and averages about 30-40% in the assessment area. Desirable live crown ratios, for achieving desired conditions, are greater than 30%. Currently the high density of understory trees in the suppressed and intermediate crown positions are a fuel ladder hazard, posing a threat of stand losses to crown fire. The project is intended to maintain suitable stand growth, improve tree vigor by providing space for remaining trees to grow, and to increase the likelihood that forested stands will remain over time by reducing the risk of loss due to wildfire. The project would remove understory trees from pole and small sawtimber size stands.⁷ The project would also remove some individual larger trees (over 30 inches DBH), if they show signs that mortality is likely within 10 years.

⁴ LRMP, pg 4-58

⁵ see discussion of key watershed and Late Successional Reserves

⁶ Listed below under *Management Direction* section

⁷ Pole-sized trees are approximately 6-12 inches DBH (size class 2) and small are 13-24 inches DBH (size class 3). Size classes are further described in the LRMP, Appendix D-3.

Consistent with the LRMP (and Northwest Forest Plan), ecosystem management on suitable lands in the project area is intended to yield commercial wood products and biomass.

Riparian Reserve

Management activities may occur in RR when they are in support of, or do not adversely affect, the maintenance of riparian-dependent resources (i.e., fish, wildlife, water). The assessment area (East Fork South Fork Trinity River) is within the Upper South Fork Trinity River watershed, which is designated as key watershed by the LRMP. One of the primary components of the Aquatic Conservation Strategy (ACS) is key watersheds.⁸ The LRMP directs for key watershed that forest health and fire risk is reduced through vegetation manipulation and underburning.⁹

Forest stands proposed for thinning within RR contain pole to small sawtimber size classes. These areas are generally overstocked with high densities of understory trees that are a hazard as fuel ladders for crown fire spread. The purpose of thinning these stands in RR is to reduce the risk of spreading crown fire by reducing understory tree density, and to encourage stand growth toward late-successional conditions by giving individual trees more room to grow. Current site-specific conditions in project units, and proposed treatments, are consistent with the general discussion in the East Fork/Smoky Creek Watershed Analysis (1998) and East Fork Watershed Analysis iteration in 2002, which identified management opportunities for density management treatments within RR in the project area.

Late Successional Reserve

In areas designated as Late Successional Reserve and/or Northern spotted owl suitable habitat, the project is needed to encourage accelerated development of late successional habitat and to reduce the risk of stand-replacing wildfire. Stands proposed for treatment in LSR are currently overstocked with high densities of understory trees that are a hazard as a fuel ladder for crown fire spread. Although some stands proposed for treatment currently provide late successional habitat (shown as spotted owl habitat in Appendix F map), trees proposed for harvest are the understory smaller trees.

Site-specific conditions in the LSR areas proposed for treatment are consistent with the discussion of the South Fork LSR in the STNF Forest-wide LSR Assessment (1999).¹⁰ This assessment identified the increasing risk for large, high intensity wildfire in the LSR and also the need for density management treatments to reduce the risk of stand-replacing fire. The purpose of the proposed thinning in the South Fork LSR is to reduce the probability of stand-replacing wildfire by reducing understory tree density, and to encourage growth toward late-successional conditions by giving individual trees more room to grow. Treatment prescriptions in LSR were designed to maintain all snags and large woody debris, retain 60-70% canopy closure, and to improve conditions for mature hardwoods to become and/or remain a viable stand component. To minimize short-term impacts, the project will retain suitable canopy closure and habitat elements (snags and downed logs)

⁸ see LRMP, pg 4-58 through 4-60

⁹ see LRMP, pg 4-162

¹⁰ Available online at <http://www.fs.fed.us/r5/shastatrinity/publications/>

in all areas currently providing habitat for Northern spotted owl (and other late-successional dependent species).

Management Direction

The STNF Land and Resource Management Plan (LRMP), issued in 1995, provides programmatic management direction for site-specific projects. Direction from the LRMP, along with results of data collection/analysis and field review in the assessment area, were used to develop the proposed action.

The assessment area is within the South Fork Mountain Management Area.¹¹ The management area desired future condition, supplemental management direction, and applicable standards and guidelines from the LRMP provided guidance for development of the proposed action and alternatives. Additionally, the East Fork/Smoky Creek Watershed Analysis (March 1998),¹² EFSF Watershed Analysis Iteration (June 2002), the Shasta-Trinity Forest-wide Late Successional Reserve Assessment (September 1999), and East Fork Roads Analysis Process (June 2002) also contributed to project development.

The following Forest-wide standards and guidelines summarize the multi-resource objectives of the LRMP. Consideration of this management direction guided the development of the proposed action (and alternatives).

- Implement practices designed to maintain or improve the health and vigor of **timber** stands, consistent with ecosystem needs of other resources; Provide a sustained yield of timber and other wood products to help support the economic structure of local communities and to supply regional and national needs (pg 4-5)
- Integrate multiple resource management on a landscape level to provide and maintain **biological diversity** and quality of habitats that support viable populations of plants, fish, and wildlife (pg 4-4)
- Achieve a balance of fire suppression capability and **fuels management** investments that are cost effective and able to meet ecosystem objectives and protection responsibilities (pg 4-4)
- Monitor and protect habitat for federally-listed **threatened or endangered species**. Assist in recovery efforts for T&E species
- Maintain or improve **riparian** habitat
- Maintain or improve **water quality** and quantity to meet fish habitat requirements and domestic use needs (pg 4-6)

Activities are proposed primarily on lands designated by the LRMP as Matrix, and a small portion of activities are proposed within Late Successional Reserve (about 50 acres) and Riparian Reserve (about 75 acres) land allocation areas. The proposed action was further refined by considering specific LRMP management direction for each land allocation within the project area and conducting site-specific field review.

¹¹ LRMP, pg 4-161

¹² Available online at <http://www.fs.fed.us/r5/shastatrinity/publications/>

Matrix lands

The majority of project activities (approximately 1,000 acres) are proposed on lands designated by the LRMP as Matrix, Commercial Wood Products Emphasis management prescriptions.¹³ About 25% of the entire STNF is scheduled to produce some level of timber outputs (Matrix), and 13% of the STNF is designated as Matrix, Commercial Wood Products Emphasis.¹⁴ Primary LRMP Matrix standards and guidelines are:

1. Provide specified amounts of coarse woody debris
2. Emphasize green-tree and snag retention
3. Provide additional protection for roost sites for bats
4. Modify site treatment practices, particularly the use of fire and pesticides, and modify harvest methods to minimize soil and litter disturbance
5. Provide for retention of old-growth fragments in watersheds where little remains

Riparian Reserve lands

The LRMP designated Riparian Reserves (RR) on lands adjacent to permanent and intermittent/ephemeral water bodies. In the project area, RR are located along permanent and seasonally-flowing mountain streams, although RR associated with perennial and/or fish-bearing streams are not proposed for treatment. LRMP objectives for RR includes to provide functional aquatic habitat and connecting travel corridors for terrestrial wildlife, particularly for late-successional habitat dependent species. RR prescriptions emphasize retention and/or enhancement of old-growth vegetation.¹⁵ Protective standards and guidelines apply to management activities in RR and key watersheds, those relevant to the project are summarized below:

- Outside roadless area – reduce existing system and non system road mileage, and there will be no net increase in watershed road mileage
- Watershed analysis is required prior to management activity and/or timber harvest
- Management activities within RR must be consistent with the Aquatic Conservation Strategy¹⁶
- Apply silvicultural practices to control stocking, reestablish and manage stands, and acquire vegetation characteristics needed to attain ACS objectives
- Minimize road and landing locations in RR, and minimize sediment delivery to streams from roads
- Provide and maintain fish passage at all road crossings of fish-bearing streams
- Develop and implement a road management plan that meets ACS objectives
- Design fuel treatments to meet ACS objectives, and to minimize disturbance of riparian ground cover and vegetation

¹³ LRMP pg 4-67

¹⁴ ROD for the LRMP Final Environmental Impact Statement, pg 18

¹⁵ see LRMP, pg 4-59

¹⁶ see Appendix E for the Aquatic Conservation Strategy analysis for the project

Late Successional Reserve lands

LSRs are to be managed to protect and enhance late-successional and old-growth forest structures which serve as habitat for late-successional/old-growth dependent species.¹⁷ About 25% of the STNF, over 530,000 acres, is designated as LSR.¹⁸ Over 70% of the total STNF landbase is assigned to allocations that allow the forest to cycle naturally, without scheduled timber harvest (i.e. LSR, wilderness, wild and scenic river designations). “Scheduled” timber harvest refers to projects that are undertaken with the primary purpose of commodity production aimed at optimizing growth and yield. Although ‘scheduled’ timber harvest is not allowed in LSRs, vegetation management activities are encouraged when they are designed to enhance the management goals and purposes of the LSR. For example, thinnings (harvest) of smaller, understory trees that crowd larger, more vigorous trees, reduces the competition and accelerates the development of late-successional conditions while making the future stand less susceptible to natural disturbances.

A small portion of the project lies within the South Fork LSR (about 50 acres in Unit 197).

Proposed Action

The STNF proposes to harvest timber by thinning from below on approximately 1,059 forested acres in the East Fork South Fork Trinity River Watershed (see maps in Appendix A). Most areas would be thinned to 50 to 60% canopy closure post-project. The thinning prescriptions within LSR and Northern spotted owl suitable habitat areas (total of approximately 90 acres) are designed to maintain more canopy closure (60-70% post-project) and all late successional habitat components (mature hardwoods, snags, downed logs). Post-harvest fuels reduction treatments will be applied to all units, as described in this EA *Section 2 – Alternatives*. Both action alternatives (Alts 2 and 3) involve about 2 miles of road work (see *Section 2 Table 2*), and use of an existing rock pit. The proposed road work involves reconstructing 2 road segments, using them for the project, and decommissioning within the same season.

Decision to be made

The scope of the decision to be made is whether to implement the project as described in the proposed action, or an alternative, or to take no action at this time. This decision does not include any amendment to the Shasta-Trinity Land and Resource Management Plan (LRMP).

Public Involvement

Public scoping for the original East Fork Project was completed from February 2003 through February 2004. About 50 individuals commented on the original East Fork EA that was circulated in March 2003.

The East Fork Project was litigated in the U.S. District Court for the Eastern District of California in June 2005 and the Ninth Circuit Court of Appeals in May 2007. In order to comply with the

¹⁷ LRMP pg 4-37

¹⁸ ROD for the LRMP Final Environmental Impact Statement, pg 16

resulting May 2007 court order, the STNF initiated public scoping for the East Fork II Project in September 2007. An advertisement describing the project printed in the Redding Record Searchlight on September 5, and a scoping letter was mailed on September 10, 2007 to interested parties. The East Fork II proposed action was first listed in the STNF Schedule of Proposed Actions (SOPA) in the October – December 2007 quarter. Public responses to scoping were reviewed, issue dispensation documented, and scoping comments are specifically responded to in Appendix B. The issue management process is documented and included in the planning record for this project.

Project History

Approximately 45% of the original East Fork Project (decision in 2004) was completed when the court injunction halted activities in summer 2007. The new proposed action, as described in this EA, is for the remainder of activities proposed in the original East Fork EA. The project map (Appendix A) displays the units that have already received timber harvest, and therefore not part of the East Fork II proposed action, as “completed”. Final processing of biomass material (chipping) may be on-going at identified landings within the project area. Most of the road work proposed in the original East Fork EA was also completed along with appropriate BMPs and resource protection measures, implemented to ensure protection of local water quality. The remaining 2 miles of road work is included in East Fork II.

Project specialists in wildlife, timber, fuels, soils, geology, and hydrology performed field review and monitoring in completed East Fork units during September-November 2007. They examined post-project conditions and reevaluated original analyses for the project to determine if the estimates of project effects, presented in the original EA, was accurate in reflecting on-the-ground conditions. Results of this effects monitoring are discussed by resource area within *Section 3*.

Interagency Involvement

The United States Department of the Interior (USDI) Fish and Wildlife Service and the United States Department of Commerce (USDC) National Marine Fisheries Service have provided input to the design of the proposed action throughout the planning process for the original East Fork EA. Informal consultation was completed to analyze/document the effects of the proposed action on Federally-listed wildlife and fish species, in compliance with the Endangered Species Act (ESA). Consultation with both the Fish and Wildlife Service and National Marine Fisheries Service resulted in the issuance of Letters of Concurrence (LOC), which are included in the planning record for this project. The STNF reviewed all ESA-related documentation from the original East Fork Project, and conducted the appropriate interagency involvement to ensure that the East Fork II Project is compliant with the ESA. The North Coast Regional Water Quality Control Board, and the California Department of Forestry, provided input to the design of the proposed action.

Section 2: Alternatives

Alternative 1 (No Action)

The no action alternative implements no activities within the project area at this time. Analysis of the no action alternative establishes a baseline against which effects of the alternatives may be compared. Taking no action on this proposal would not preclude a future analysis that could lead to initiation of a future proposed action. Any future proposals would require separate environmental analysis and documentation in compliance with the National Environmental Policy Act (NEPA).

Alternative 2 (Proposed Action)

This alternative was designed to meet land management objectives, as identified in the LRMP and the *Section 1 - Purpose and Need* section of this document. The project was designed by an interdisciplinary team (IDT) to implement LRMP standards and guidelines, goals and objectives while complying with all federal, state, and local requirements. Alternative 2 proposes to reduce stocking on an estimated 1,059 acres of overstocked forest stands within Matrix, RR, and LSR land allocation areas.

Both action alternatives (Alts 2 and 3) include post-harvest fuels treatment within units. Post-harvest fuels treatment is essential to treat slash generated during harvest activities. Fuels treatment proposed for all tractor harvest units (885 acres) is “treat on site” (TOS). This includes biomass removal in the form of whole-tree yarding, mastication, chipping, or concentration for burning. Post-harvest fuels treatment for the helicopter units (157 acres) will be accomplished by handpiling fuels and burning.

Matrix

Within the Matrix allocation, thinning from below is proposed in mixed conifer and ponderosa pine stands on an estimated 1,000 acres. The harvest prescription applied to all treatment units favors dominant tree(s) within each group, and removes the smaller, more suppressed competitors. On proposed Matrix lands, canopy closure would be reduced from an estimated 60 to 90%, to an estimated 50 to 60%. Prescriptions emphasize retention of coarse woody debris and snags; all snags and a minimum of 15 tons of unburned dead/down material per acre, with a preference for larger size materials, are identified for retention.

Riparian Reserve

Selected RR land allocation areas would also be treated with implementation of Alternative 2 (about 75 acres total, within Matrix or LSR). The RR proposed for treatment, all of which are associated with seasonally-flowing or intermittent streams, are managed to maintain and restore riparian function as described in the 9 Aquatic Conservation Strategy (ACS) objectives.¹⁹ Currently, representative

¹⁹ Northwest Forest Plan ROD pg B-11

conditions within RR selected for treatment include uniform structural condition, low tree species diversity, and heavy stocking.²⁰

The project includes thinning from below, as described above for Matrix lands, in mixed conifer and ponderosa pine stands on approximately 75 acres of RR. No thinning activities are proposed within RR associated with perennial streams, or within 50 feet slope distance from intermittent/ephemeral stream channels. Treatments will not occur in inner gorge or other geologically unstable areas. Canopy closure would be reduced from an estimated 60 to 90%, to an estimated 50 to 60% in areas proposed for treatment which are in the outer portions of RR (most upland from channels).

Late Successional Reserve

The proposed action includes treatment in selected Late-Successional Reserve (LSR) land allocation areas (about 50 acres). LSR is to be managed to protect and enhance conditions of late-successional forest ecosystems.²¹ Currently, representative conditions within LSR areas selected for treatment include uniform structural condition, low tree species diversity, heavy stocking, and a loss of the native hardwood stand component. The project proposes application of silvicultural practices to control stocking, and acquire desired vegetative and fuels characteristics necessary to attain LSR objectives.

The project involves thinning from below in mixed conifer and ponderosa pine stands on approximately 100 acres identified as either LSR or suitable habitat for the Northern spotted owl (about 50 of these acres are LSR and the rest Matrix). Canopy closure in these areas (within units 138, 193, 197) would be reduced from an estimated 60 to 90%, to an estimated 60 to 70%. Prescriptions are designed to retain all snags and mature hardwoods, within safety guidelines, and to additionally reduce the competition of intermediate and immature conifers with the large, mature oaks and conifers.

²⁰ EFSF Watershed Analysis, June 2002

²¹ LRMP pg 4-37

Table 1a. Proposed Action, helicopter units

Unit	Acres	RR treatment in unit	LSR or owl habitat in unit
110	12		
129a	13		
129b	15	Yes	
129c	7	Yes	
138	14		Yes
139	23	Yes	
158b	13	Yes	
168	29		
173	17		
190	14		
Total	157 Acres	Helicopter	

Table 1b. Proposed action, tractor units

Unit	Acres	RR treatment in unit	LSR or owl habitat in unit
118	17	Yes	
122	24		
130	17	Yes	
140a	24		
140b	8		
140c	28	Yes	
140d	21	Yes	
141	43	Yes	
143	33	Yes	
144	11		
145	12		
147	7		
149	28	Yes	
180	17		
181b	120	Yes	
182	28		
183	18		
184	15	Yes	
185	16	Yes	
186	21	Yes	
187	9		
193	27	Yes	Yes
194	12		

Unit	Acres	RR treatment in unit	LSR or owl habitat in unit
197	128	Yes	Yes
205	17		
206	161	Yes	
211	26		
213	14	Yes	
Total	902 Acres	Tractor	

Connected Actions

Landings

Approximately 45 landings would be constructed or reconstructed for project use; mechanized equipment may be utilized. New landing construction would affect a total of approximately 8 acres. New landings will not be constructed within RR. Landings that currently exist in RR will be reused where reuse constitutes less ground disturbance than new construction. Landings will be rehabilitated to minimize potential localized impacts to water quality, appropriate Best Management Practices (BMPs) will be implemented (see BMPs in Appendix C). Landings will be located in previously disturbed areas whenever possible, and landings shall meet Occupational Health and Safety Administration (OSHA) standards.

Road and Rock Pit Activities

Alternatives 2 and 3 include about 2 miles of temporary road reconstruction on existing roadbeds. These temporary roads are currently closed. The segments identified in Table 2 would be re-opened for project use then decommissioned in the same operating season.

Table 2. Proposed Road Work

Road	Miles	Proposed Activity
28N26G	0.7	Remove tank trap and reconstruct (road prism exists), use as temporary road, and decommission in same season.
28N26F	1.1	
Total	1.8	

The project includes use of two existing rock pits to provide source material for proposed road activities. Existing rock source pits used during implementation would be rehabilitated, mechanized equipment may be used.

Implementation of the project would probably be in the form of two or more sales and/or service contracts, and grouped together into reasonable and economical packages using criteria such as required road activities, unit location, logging system(s) required, volume per acre, total unit volume, mitigation measures, and industry/local needs.

Alternative 3 (Diameter Limits)

The Interdisciplinary Team designed this alternative to respond to issues raised during public scoping (see Appendix B), as well as the May 2007 Ninth Circuit Court order pertaining to the original East Fork Project. During scoping, public comments were received that expressed concern and disagreement over the environmental impacts of the project. Comments were received that expressed concern over the removal of any “large trees,” “legacy trees” or “large fire-resistant trees” from the assessment area; also the ground disturbance resulting from proposed thinning was a concern. The same comment letters also addressed concern over proposed thinning in RR, and urged the STNF to consider alternatives to the proposed action with diameter limits for timber harvest and/or reduced disturbance associated with commercial timber harvest in RR. Comments were also received from public representing the timber industry (i.e., Trinity River Lumber Company, American Forest Resource Council and California Forestry Association). These comments centered on concern over arbitrary diameter limits for proposed thinning, and urged the STNF to prepare an economically-viable timber harvest proposal.

The May 2007 Ninth Circuit Court decision on the original East Fork Project summarizes public involvement during the original project, and provides direction for alternative development in East Fork II. With respect to the range of alternatives, the court found that the STNF failed to consider a reasonable range of alternatives and that the purpose and need for the project was defined too narrowly so that the proposed action was the only alternative that would serve the objectives.²² The Ninth Circuit Court decision enjoined the project until the STNF completes a new environmental assessment consistent with the May 2007 disposition.

In order to facilitate communication with the public about more project-specific details, the interdisciplinary team used a size of 30 inches diameter at breast height (DBH) to describe a “large tree” during public involvement for the original East Fork EA. Based on field reviews of proposed harvest units, trees of 30 inches DBH are estimated to be approximately 120 years old. The team identified the 30 inches DBH size in an attempt to represent the public’s general perception of a “large tree,” and thereby developed an alternative that limits the maximum size of trees harvested (which also decreases overall ground disturbance), while still providing some level of economic opportunity on suitable lands as directed by the multi-resource objectives of the LRMP. The project is proposed primarily on lands designated as Matrix, which the Northwest Forest Plan allocated to programmed timber harvest.

Under Alternative 3 no trees greater than 30 inches DBH would be removed from any of the proposed treatment units. In addition no trees greater than 12 inches DBH would be removed from RR and LSR lands, and at least 10 fewer acres in RR would be treated. Fewer acres are treated because diameter limits would restrict access to some areas of dense forest, therefore untreated pockets of vegetation would remain in units post-project. Because of the DBH limit in RR and LSR lands, fewer RR and LSR allocation lands would be treated, resulting in less overall ground

²² Ninth Circuit Court disposition of the original East Fork Project, pg 5

disturbance and more areas of dense forest (especially in understory) remaining.²³ This alternative also involves less helicopter-treated thinning (Unit 138 is dropped).

Alternatives Considered but Eliminated from Detailed Study

One other alternative was developed for the East Fork II Project, but eliminated from detailed study (Alternative 4, fire only). The alternative proposed using prescribed fire, and not commercial harvest, to accomplish the purpose and need. In general RR areas would not be treated due to the unacceptable risk associated with burning in dense, overstocked drainages. The rationale for eliminating Alternative 4 is that it is not consistent with LRMP management direction for Matrix lands in assessment area (optimize growth and yield and maintain forest health), and because burning without pre-treating fuels would be dangerous and may cause unacceptable resource damage. Since many untreated areas would be left, this alternative would have much reduced effectiveness in preventing stand-replacing wildfire.

Resource Protection Measures (Alt 2 & 3)

Standard Pacific Southwest Region Forest Service timber sale harvest management requirements and mitigation measures, as required by the Forest Service Manual, applicable Forest Service Handbooks, and the timber sale contract, are incorporated by reference into this EA for those alternatives proposing harvest activities. More discussion of Best Management Practices applicable to the project is in Appendix C.

If additional Threatened, Endangered, or Sensitive species, cultural resource sites, or any Sensitive or watch list plant species are discovered within the assessment area, the appropriate protection actions will be taken.

Erosion Control

Limit primary skid roads, trails, and landings to occupy no more than 15% of the treatment unit. The objective is to design a skidding pattern that best fits the terrain, and limits soil impact. Pre-designated skid trails, felling to the lead, and end lining are methods to be used to achieve this. Skid trails shall be outskloped, and not located in swales, where water barring is not possible or requires deep cuts. Re-use existing skid trails and landings whenever available and practical. (BMPs 1-10, 1-12, 1-13, 1-16).

To minimize potential for erosion, the last 200 ft. to landings of primary skid trails and temporary roads used shall be subsoiled to a depth of 18", straw mulched, or respread with slash and seeded. Subsoiling activities shall be performed when the soils are slightly moist. Water barring and outskloping of subsoiled areas is not necessary, as the intent of this action is to loosen the soil and attain a permeable soil condition so that runoff from precipitation or snowmelt would not occur.

²³ Alternative 3 would retain more dense stands and untreated areas within units (due to 12 inch DBH limit). Overstory canopy closure would be similar for both action alternatives because they both propose thinning from below.

Wing subsoil, to an estimated 18 inches in depth, mulch, or use available organic material, all temporary roads used in timber-harvest activities. Prevent road runoff from draining onto skid trails and landings.

To reduce potential erosion and soil disturbance, downhill ground-based operations shall be limited to <35% slopes, and uphill ground-based operations shall be limited to <25% unless the leading end is suspended. Skidding equipment (track-laying or rubber-tired) shall be generally restricted to slopes <35%. Track-mounted harvesters and masticators may operate on slopes <45%.

Water-bar and mulch-seed, or use available organic material, the final 50 feet of all skid trails entering landings or roads. Provide for a minimum 50% ground cover post-treatment.

Post-treatment total soil ground-cover shall range from 60-80%, when available. Provide for a minimum of 50% of the ground-cover as fine organic matter, of generally <3 inch in size, if available. Ground-cover is defined as any combination of duff mat, litter, fine organic materials (<3 in. dia.), coarse organic materials (>3 in. dia.), live vegetation in contact with the soil, and rock fragments (>3/4 in. dia). The post-treatment groundcover objective is 90%+ of prescribed soil cover for each treatment unit, as measured prior to the fall rainy season (late October).

Noxious Weeds

Contract Provision C6.35 [Equipment Cleaning 7/01] or most recent version of this contract provision would be incorporated into the timber sale contract as a protection measure to prevent the spread of invasive weeds. This provision requires the Purchaser to certify that all equipment is free of noxious weed seed prior to entering the assessment area.

A population of spotted knapweed (California List A noxious weed) is located just south of Hackney Spring, outside of the project area but bordering a haul route that would be used for the project. This weed is isolated to 2 known populations in the county, is a high priority for control and removal, and is being actively being removed by hand annually. A controlled area has been designated for exclusion of any project activities in the area within and surrounding the knapweed population. All vehicles associated with project activities would be prohibited from stopping or pulling off the road in this area.

Landings, skid trails and temporary roads may be seeded after completion of project activities where needed to prevent soil erosion or reduce the introduction and establishment of noxious weeds. Native seed will be used, with a mix that is recommended for soils in this area. Mix species will be one or more of the following native species: *Elymus glaucus*, *Bromus carinatus*, *Festuca californica*, *Lupinus succulentus*, or *Lotus crassifolius*. Other native species appropriate to the site may be used when available.

Landings

Rehabilitate landings after completion of harvest activities. Rip (using wing subsoiler to 18" deep) and mulch with appropriate materials. For landings retained on the landscape, scarify to 6" and mulch (rice straw or wood chips). Provide for a minimum 50% ground cover post-treatment through mulching with rice straw (at a rate of 2 tons per acre), or with wood chips (at a rate of 0.5-0.75 tons

per acre). Retain larger diameter (>18") down woody cull material on mid to upper slope, placed on the contour, on landing fill slopes to help capture sediment, when available. Straw wattles may be used in lieu of down woody cull material, as needed, as an erosion control measure. Additionally, for landings located within RR, wing subsoil, seed, and mulch after completion of harvest activities.

Fuels Reduction

Mechanical piling for fuels reduction treatment should be limited to $\leq 25\%$ slopes. (BMP 1-9).

Mechanical operation shall be suspended by the contract administrator when soil conditions become too wet, and there is potential for soil compaction that would reduce soil hydrologic function (BMPs 1-10, 5-2, 5-6, 1-13.)

Wildlife

Conduct three visit protocol surveys of suitable nesting/roosting habitat and all activity centers located within $\frac{1}{4}$ mile of project units annually. Units affected are: 118, 122, 138, 139, 140B, 140C, 149, 187, 190, 193, 197, 205, 206, and 213. If suitable habitat is unoccupied for that breeding season, the Limited Operating Period (LOP) is lifted to allow treatment of that stand or others adjacent. If breeding owls are found, a $\frac{1}{4}$ mile LOP limiting noise disturbance and habitat modification for areas surrounding their nesting/roosting site will be established and will extend through September 15. If the site is occupied by a single owl prior to July 10, non-reproduction cannot be assumed. Additional surveys may be required, or an LOP will be established with a $\frac{1}{4}$ mile disturbance buffer which will be extended through September 15. If the site is occupied with a non-breeding pair, a July 10th LOP will be established with a $\frac{1}{4}$ mile buffer. No habitat modification will occur within occupied nest groves during February 1- September 15. If suitable habitat is not surveyed, and is bordered by unsuitable or foraging habitat, a $\frac{1}{4}$ mile disturbance LOP of February 1-July 10, will be established. No habitat modification will take place in unsurveyed suitable habitat during February 1- September 15.

Streamcourse Protection Zones

No mechanical equipment or harvesting will occur within 50 feet upland of the high-water mark, or within the inner gorge, or as otherwise designated on the ground by flagging or signing. Streamcourse protection zones are interrupted at approved designated crossings. Within designated stream course protection zones, skid trail grade crossings shall not exceed 20%, and shall be located so as to minimize ground and vegetative disturbance. Remove timber-sale created sediment and crossing material (culvert or logs), reshape stream banks, and water bar skid trail adjacent to channel. Mulch-seed or use available organic material, resulting in a minimum 50% ground cover post-treatment, the disturbed area within the stream protection zone within 50 feet (slope distance) of defined channel limits.

Where skid trails are located within buffered Riparian Reserves, as designated on the ground by flagging or signing, water bar the skid trail, and mulch-seed or use available organic material, resulting in a minimum 50% ground cover post-treatment.

Provide for no primary ignition within streamcourse protection zones. Implement recommendations in the Prescribed Fire Program Programmatic Biological Assessment (February 1998). Provide for minimal-intensity prescribed fire conditions to attain desired prescription burn treatment objectives. Hand cut, hand pile and burn piles where feasible in lieu of broadcast burning within streamcourse protection areas. As a general rule, burn piles should not be larger than 5 feet high and 10 feet in diameter, on average.

Transportation

If timber hauling is performed outside the normal operating season, the placement of aggregate base course may be required to provide a stable running surface and prevent rutting and potential erosion. Snow berms will be removed or drains installed to avoid channelization of melt water to minimize potential for damage to the road and to protect water quality. If the road surface is damaged, lost surface material shall be replaced, and damaged structures repaired. (BMPs 2-23, 2-24 and 2-25.)

Purchaser-utilized roads rutted or otherwise damaged by Purchaser operations shall be spot-rocked or otherwise suitably repaired. Drainage structures shall be protected or repaired as necessary. The road surface shall be outsloped, if possible, during maintenance operations. Road surfaces in areas crossing serpentinitic soils should be rocked to prevent roadbed deformation (rutting) during wet conditions.

Seasonal Road Closure (28N48 road) – Where continuing public and administrative access is necessary, but soils are seasonally-saturated and road use would cause rutting, soil compaction, or disturbance during critical periods, roads shall be closed October 30 – May 1. During the open period, regular road maintenance activities occur.

Year-round Road Closure (28N22A, 28N27B, 28N51, 25N51A, 28N65, 28N65S, 29N30A, and 29N30C) – In areas where continuing administrative access is necessary, but soils are seasonally-saturated and road use would cause rutting and/or compaction, roads shall be closed year around with gate or earth-berm closure.

Do not conduct harvest, yarding or hauling activity during wet weather conditions. Generally, from October 15- May 15 activities will occur only when soil conditions allow for these activities to occur without deleterious effects on watershed resources.

Unit Specific Mitigation Requirements

- **Unit 206:** no harvest or treatment within mapped landslide prone areas as identified by flagging
- Adjacent to Forest Road 28N26C within Unit 206, place woody debris instream to help mitigate designated crossing to store and meter sediment
- **Unit 140C and 140D:** no harvest or treatment within mapped landslide prone areas as identified by flagging
- **Unit 181B:** no harvest or treatment within mapped landslide prone areas as identified by flagging

Comparison of Alternatives

The following section discusses relevant comparison information for effects of the action alternatives (Alts 2 and 3) and no action (Alt 1). The primary differences in expected effects between the action alternatives are summarized below, and in the following tables.

Because Alternative 3 would result in less thinning of forested stands (especially in RR and LSR), and retention of all trees over 30 inches DBH there would be:

- Reduction in ground disturbance and sediment-related impacts for Alternative 3 (Table 3)
- Areas of untreated vegetation within units post-project with Alternative 3 (mostly in RR and LSR), totaling about 10 acres
- Less wildlife habitat disturbance, although both alternatives are not likely to result in adverse effects to Threatened, Endangered, or Sensitive wildlife species
- Both alternatives are not likely to result in measurable adverse effects to Threatened, Endangered, or Sensitive fisheries resources
- Reduction in the project’s efficacy to decrease the probability of stand-replacing wildfire (severe fires negatively impact all resources), both alternatives provide some level of benefits for hazardous fuels reduction and future wildfire suppression
- Reduction in benefits to forest health and resiliency (especially in RR and LSR), both alternatives would encourage improvements but less acres are treated with Alternative 3
- Alternative 3 provides a lower level of economic opportunity, although both alternatives contribute to LRMP goals and objectives

Table 3. Watershed effects

		Equivalent Roaded Area			Alternative 2				Alternative 3			
Hydro unit	Drainage Area (acres)	Forest Plan TOC (%)	Existing ERA (acres)	Existing ERA (%)	Post Project ERA (acres)	Post Project (%)	5 years Post Project ERA (acres)	5 years Post Project (%)	Post Project ERA (acres)	Post Project (%)	5 years Post Project ERA (acres)	5 years Post Project (%)
WF Prospect	2698	14	249	9	273	10	262	10	270	10	259	10
EF Prospect	1920	14	160	8	168	9	164	9	167	9	163	9
TX Chow	2395	14	141	6	189	8	167	7	181	8	162	7
Prospect	1481	14	98	7	157	11	131	9	148	10	124	8
Dark Canyon	1846	14	80	4	110	6	96	5	105	6	93	5

Table 4. Summary of Behave fuels modeling (complete output in Appendix D)

Alternative	% Tree Mortality (100' tree height)	Flame Lengths (ft)	Rates of spread (chains per hour)	Final Fire Size (acres)
1	85	11	34	426
2	3	5	16	92
3	3	5	16	92

Table 5. Total estimated harvest volume in thousand board feet (mbf) by harvest system

Activity	Alternative 1	Alternative 2	Alternative 3
Skyline/Cable	0	0	0
Helicopter	0	751	737
Mechanical	0	4,122	3,939
Total	0	4,783	4,676

Table 6. Estimated Economic Effects

Activity	Alternative 1	Alternative 2	Alternative 3
Estimate Person-Years of Direct (Logging and Milling Employment Resulting from Harvest Activities)	0	19-34	19-34
Estimate Person-Years of Indirect Employment Resulting from Harvest Activities	0	34-43	34-43
Present Net Value (\$)	0	430,511	418,030
Benefit: Cost Ratio	0	2.37:1.00	2.37:1.00

Section 3: Environmental Consequences

This section discloses the direct, indirect and cumulative environmental consequences of implementing each alternative.

Some minor differences in acreages and timber volumes reported in this section may exist between other sections, text documents, appendix reports and reference documents due to rounding and/or differences in resource analysis areas and methodologies employed by specialists for assessing impacts to various resource areas. Such minor differences do not in any way invalidate the analysis or conclusions. Unless otherwise defined the terms assessment area, analysis area, and project area all refer to the East Fork South Fork Trinity River watershed (shown as Assessment Area in Appendix A).

For cumulative effects, “past actions” are those actions which occurred within the last 20 years, which include road construction, timber harvest, site preparation and reforestation activities, precommercial thinning, fuel break construction, and wildland fires, again unless otherwise defined. “Foreseeable Actions” are those anticipated future actions including precommercial thinning, watershed restoration activities, and prescribed burning, again unless as otherwise defined. A summary of relevant past and future foreseeable actions for the project is in Appendix E (cumulative actions table).

Cultural Resources

Alternative 1

No cultural resources would be affected by this alternative.

Alternative 2 and 3

No cultural resources would be affected by either action alternative. Archaeological sites have been identified and excluded from treatment.

Proposed activities within the assessment area would result in no effect to heritage properties. Under the Programmatic Agreement, the State Historic Preservation Officer would not be consulted for this project. A report has been completed documenting findings, which has been reviewed in Redding and concurred with, by the Forest Archaeologist. Copies of the report have been filed at the Yolla Bolla Ranger District Office and the Supervisor’s Office in Redding, CA.

No adverse environmental consequences from proposed activities would occur to heritage properties, therefore there will be no cumulative effects.

Economics

The economic consequences are primarily a measure of the overall value of the alternatives under consideration for managing the assessment area. The level and mix of goods and services available to the public varies by alternative, which creates impacts on the social and economic environment. The impacts discussed in this section include estimated government expenditures and revenues, as well as

monetary impacts upon local communities. Also displayed are the estimated direct and indirect job opportunities associated with implementation of proposed action alternatives.

In general, the monetary value of an alternative is a function of the timber harvest method employed, the amount of road construction proposed, and the number of acres treated for fuels reduction. This analysis does not include monetary values assigned to resource outputs such as wildlife, watershed, soils, recreation, visual and fisheries. It is intended only as a relative measure of differences between alternatives based on those direct costs/values used. Other values are discussed in scientific and/or ecological terms in appropriate sections of this EA.

Net Revenue to the Government

Net revenue is the difference between the revenues generated by an alternative and the costs required to implement it. In this analysis, revenues come from harvest of timber. Management costs include costs associated with timber sales, including sale preparation, administration, slash disposal, road construction, and mitigation of timber sale activities, as well as costs for resource measures other than those associated with timber sales.

The factors affecting costs are primarily road construction costs, slash disposal costs, kind of treatment prescribed and access, and management requirements and mitigation measures costs.

Employment

Direct and indirect employment levels are somewhat difficult to estimate because of the relationship between output levels from the assessment area and output levels from the rest of the Shasta-Trinity National Forest.

Table 7. Summary of project economic effects

Alternative	Present Net Value (\$)	Timber Volume (MMBF)	Biomass (BDT)	Employment (person years)	
				Direct	Indirect
1	0	0	0	0	0
2	430,511	4.8	9,020	19-34	34-43
3	418,030	4.7	9,020	19-34	34-43

Effects by Alternative

Alternative 1

Alternative 1 has no receipts or costs. There would be no management activities in the assessment area that would generate revenues or costs. No direct or indirect employment would result from this alternative.

Alternative 2

Under Alternative 2, an estimated present net value of \$430,511 would be generated from harvest of an estimated 4.8 MMBF of sawtimber, and an estimated 9,020 tons (BDT) of biomass. An estimated

19-34 person-years of direct employment and an estimated 34-43 person-years of indirect employment opportunities would be created with implementation of Alternative 2.

Alternative 3

Under Alternative 3, an estimated present net value of \$418,030 would be generated from harvest of an estimated 4.7 MMBF of sawtimber, and an estimated 9,020 tons (BDT) of biomass. An estimated 19-34 person years of direct employment and an estimated 34-43 person years of indirect employment opportunities would be created with implementation of Alternative 2. Alternative 2 proposes removing a small amount of trees that are 30-33 inches DBH in Matrix areas, only if they show signs that mortality is likely within 10 years. The reduction of present value for Alternative 3 is attributable to the loss of the opportunity to recover high risk trees of greater than or equal to 30 inches DBH, and the overall reduction in thinning acres due to constraints of diameter limits.

Fire and Fuels

Existing Vegetation

A random sampling method, using the Photo Series for Quantifying Natural Forest Residues in Common Vegetation Types of the Pacific Northwest GTR-PNW-105,²⁴ was used to inventory fuel loadings within the project area. Representative photos of existing fuels in project units, as well as post-project pictures of completed East Fork Project units, are included in Appendix D. Overall average fuel loading for the area is in excess of 70 tons-per-acre, with most of the tonnage in the smaller size classes. Fire and fuels managers consider fuel loadings in these ranges to be high, with the potential to produce large, destructive wildfires that are dangerous, difficult, and extremely costly to suppress. Catastrophic or high severity fire was identified as a primary threat to the critical and unique resources of the watershed.

Fire Regimes and Fire History

A century of fire exclusion through successful fire suppression has altered the historical fire regime from frequent low-intensity fires to one of infrequent moderate-to-high intensity stand replacement fires. A fire history study was conducted on the Hayfork Ranger District in the Jud-Rusch Creek area.²⁵ Data collected from tree rings indicated the average time between fires for all sites in the study area was 2 years. Since a fire suppression policy was adapted on Forest Reserves in 1905, fire rotation length (the time it takes for fire to burn the overall area) in the study area is 12 to 15 times longer than anytime in the previous three centuries. The Jud-Rusch Creek fire history site is approximately 16 air miles northwest of the project site, and fire rotational lengths and fire regimes would be similar in the assessment area.²⁶

²⁴ Maxwell & Ward, 1980

²⁵ Taylor & Skinner 2003

²⁶ personal communication with Carl Skinner, Forest Service Pacific Southwest Research Station Scientist

In California's Mediterranean climate, decomposition rates are generally low, and are limited by temperature. Neither historically, nor presently has decomposition been the primary remover of biomass in a mixed-conifer forest. Frequent, low-severity fire plays an important role in regulating fuel accumulations in forested stands of the Klamath Mountains. By excluding the frequent low-intensity type fires through years of successful fire control, biomass has accumulated to abnormally high levels throughout the landscape.

Fire records for the East Fork Watershed document the occurrence of 77 fire starts within the watershed from 1910 until the present. Lightning fires have the highest rate of occurrence, with 68 separate fires being recorded; the remaining 9 were human caused fire starts. In 1988 the 7,600 acre Hermit Fire burned in the South Fork drainage southwest of the watershed, this was a stand-replacing fire. Topography within the northern half of the watershed lends itself to severe wildfire effects, having aspects primarily of south and south/west; these aspects are known to have the highest fire occurrence, and effects. Major ridgelines surround the watershed and create a "bowl" effect.

Fire Condition Class

The National Fire Management Plan (NFMP) has three different Condition Class descriptions that represent 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.²⁷

Condition Class 1 areas have fire regimes that are within an historical range and the risk of losing key ecosystem components is **low**. Vegetation attributes (species composition and structure) are intact and functioning within their historical range, especially at a landscape level. Condition Class 1 typically represents desired future condition for the landscape. Condition Class 2 has fire regimes that have been moderately altered from historic range. The risk of losing key ecosystem components has increased to **moderate**, and fire frequencies have departed (decreased or increased) from historical frequencies by more than one return interval. Condition Class 3 is characterized by fire frequencies that have departed from historical frequencies by multiple return intervals, there is a **high** risk of losing key ecosystem components.

The NFMP priority areas for fuel treatments are frequent and mixed severity fire regimes; Condition Class 2 and 3. Condition Class 3 best represents the project area and surrounding landscape currently.

Hazards and Values at Risk

The Fuels Analysis and Strategy portion of the Shasta-Trinity National Forest Fire Management Plan (FMP, Issued & updated annually) identifies on a Forest-wide scale: Hazards, Values at Risk, and Risk of Future Fire Occurrence for the forest. Hazard as defined by the FMP, means fire behavior potential, possible resource damage, and fire suppression capability. Risk is defined as the probability of a fire occurring based on local fire history. Value refers to the monetary, ecological, or political worth of a definable area. Hazard, Risk, and Value are identified as low, moderate, or high. The FMP rates the project area as having a high fire hazard, moderate risk, and moderate to high values at risk.

²⁷ More fire regime condition class information at <http://frames.nbii.gov/portal/server.pt>

Consequences Specific to Each Alternative

Alternative 1

With Alternative 1, fuels will continue to accumulate as wildfires continue to be suppressed, the area will remain in Condition Class 3. Existing surface fuel loadings, dense understory vegetation, ladder fuels, and high crown bulk densities present the threat of stand replacement type crown fires developing and spreading throughout the watershed. Currently if a wildfire developed within the project area during 90th percentile and above weather conditions over 90% of the existing stands would be destroyed.

Catastrophic, or high intensity wildfire, is a primary threat to the natural resources within the East Fork South Fork Trinity River Watershed. High intensity wildfires would have substantial negative effects on forest land including private lands, smoke impacts to the Yolla Bolly-Middle Eel Wilderness, air quality in general, soil erosion impacts to the South Fork of the Trinity River, timber, wildlife habitat, visual quality, and recreational uses.

Alternatives 2 and 3

The project would remove excess biomass accumulations in overstocked conifer stands through thinning. Thinning the proposed stands will break up the existing horizontal and vertical continuity of fuel and fuel ladders, raise crown base heights, and reduce crown bulk densities which reduces crown fire potential. Proposed thinning will lower overstocked conifer stand densities, thereby reducing moisture competition for residual trees, increasing their resistance to insects, pathogens, diseases, and wildfire effects. Implementation of Alternative 2 or 3 would move lands in project units toward fuels conditions described as Condition Class 1, but Alternative 3 would be less effective at achieving fuels reduction goals.

Alternative 3 would reduce fuels to a lesser extent because less area would be thinned (14 less acres in Alternative 3), and pockets of untreated areas would remain in project units. Diameter limits on timber harvest constrain implementation of vegetation management projects due to difficulties in accessing dense forested areas. Since no trees greater than 12 inches DBH would be harvested in RR and LSR, access to some areas of proposed units will not be possible and therefore thinning and fuels reduction would be restricted. Implementation of Alternative 3 would result in denser, less resilient stands and overall lead to more pervasive fuels accumulations in RR and LSR areas. Fire and fuels modeling as described below was used to predict the effects of the project on future fire behavior. This model performs too coarse analysis of fuels conditions to accurately predict the difference in future fire effects between the action alternatives. The effect of untreated areas of increasing overall fire intensity and behavior is described from the Angora Fire in South Lake Tahoe.²⁸ Similar effects as reported in that post-fire assessment of fuels treatment effects on fire behavior are expected with Alternative 3; during a future wildfire, pockets of untreated dense vegetation would cause fire to spread between tree crowns and increase in size and intensity. Treated areas would help bring fire

²⁸ Murphy et al. 2007

intensity down and back to the ground, although the influence of untreated areas with dense fuels would extend to some degree into treated areas. Implementation of Alternative 3 may compromise the ability of proposed thinning treatments to effectively reduce the probability of stand-replacing wildfire.

Managing tree density and species composition with a mix of thinning, surface fuel treatments, and prescribed fire maybe the best approach to minimizing wildfire damage to forest stands.²⁹ Fire effects monitoring from the Angora Fire (South Lake Tahoe), also supports the widely-held belief among fuels specialists that fuels reduction treatments, like those proposed in this project, are effective in reducing the likelihood of spreading crown fires.

Cumulative Effects

The appropriate geographic extent for the cumulative effects analysis was determined by assessing probable fire start and behavior information and the maximum spotting range for a wildfire originating within, or adjacent to, the assessment area. The assessment area is an appropriate boundary for analysis because fires in this area are likely to be most active in the northern upper reaches of the watershed (portion of the watershed where most project units are) because of aspect and slope considerations. An existing fuel break between the assessment area north ridge and the adjacent watershed is a likely control point for fires originating, or spreading, to the north. Wildfires starting, or occurring, within the southern portions of the assessment area are not likely to be as active (north-facing slopes, less early seral vegetation), and have high probability of being contained at the watershed (assessment area) boundary. Only a small portion of the assessment area contains private land (about 160 acres).

Timber harvest (mostly partial cutting) has occurred on about 90% of Matrix lands in the assessment area. Most vegetation management in the area occurred in Matrix, which comprises most of the northern half of the EFSF Watershed (assessment area). According to Forest Service data, over the last 20 years there has been about 208 acres of clear-cut harvest, 200 acres of overstory removal, 103 acres of salvage (post-fire) harvest, and 1,103 acres of commercial thinning in the assessment area. About 995 acres of timber planting has occurred (plantation management). Fuels reduction activities include about 1,233 acres pre-commercial thinning, about 100 acres of broadcast burning, 1,018 acres of whole tree yarding, and 92 acres of burning piles for fuels. The effect of these actions primarily influences existing vegetation and fuels on lands within, and surrounding, project units. The southern portion of the assessment area is LSR, Roadless Area, or Wilderness, and has been mostly unaffected by timber and fuels management (except for overall wildfire suppression effects).

Due to continued wildfire suppression, dense understories (ladder fuels) and ground fuels continue to accumulate in the assessment area. Past actions have resulted in patches of early and mid seral vegetation, and areas of reduced fire risk due to past fuels reduction projects. The project (Alternatives 2 and 3), along with continued influence of past fuels reduction (pre-commercial and commercial thinning), decreases the probability that future wildfires in the assessment area would be

²⁹ Graham et al. 1999

stand-replacing and increase the probability that prescribed fire could be used in the future to maintain healthy, resilient stands.

Fire Behavior Modeling

The Behave Fire Prediction Program (Version 4.4) was used to further describe possible fire effects between the no action and action alternatives for the East Fork II project area. The modeling uses 90th percentile weather for the Yolla Bolla Ranger District. Fire behavior analyses commonly use 90th percentile weather conditions and above for prediction of wildfire effects. The 90th percentile represents the worst average weather conditions that exist approximately 10% of the time from May through October. The Fire Family Plus program was used to obtain 10 years of historical weather data from the Yolla Bolla remote automated weather station, which is located approximately 2.5 miles north of the project site. Specific data used included the 10 year averages of 1, 10, and 100 hour fuels moistures, live woody fuel moistures, and wind speeds.

Compared are the differences between fire effects for the following indicators

- Percent tree mortality
- Flame lengths
- Rates of spread
- Final estimated fire size

Alternative 1

A Fire Behavior Fuel model 10 was used to best represent current vegetative conditions within the East Fork II assessment area (see Appendix D photos). Fuel Model 10 may represent any forest type in which heavy-down materials are present. Examples include insect or disease-affected stands, wind-thrown stands, over-mature situations with deadfall, and aged light thinning or partial cut slash. Fire spreads through high loadings of dead, down woody fuel beneath over-mature timber stands. Shrub understory or tree reproduction may be present. Much of the woody material is over three inches in diameter. Table 8 summarizes the modeled predictions of fire behavior in the units for the no action alternative.

Table 8. Summary of Behave modeling results for Alternative 1

Post Treatment	Flame Lengths	Rates-of-Spread	Fire Sizes (acres)	Tree Heights (feet)	% Mortality
Fuel Model 10	Average 10' 6"	Average 34 chains-hour	1 Hr = 27	20	99%
			2 Hr = 106	40	96%
			3 Hr = 240	60	96%
			4 Hr = 426	80	96%
				100	85%
				110	85%
				120	82%

Average flame lengths of over 10 feet cannot be frontal attacked by ground-based fire suppression resources. With no action, a wildfire occurring during 90th percentile and above weather conditions is predicted to be a stand-replacement type fire.

Alternatives 2 & 3

Post project fuels conditions within project units are best represented as a mix of Fuel Models #8 and #11. Table 9 summarizes the results of modeling for fire behavior in the units post-project.

Table 9. Summary of Behave modeling results for Alternatives 2 & 3

Post Treatment	Flame Lengths	Rates-of-Spread	Fire Sizes (acres)	Tree Heights (feet)	% Mortality
Combined Fuel Models 8 & 11	Average 4' 2"	Average 16 chains-hour	1 Hr = 5.8	20	62%
			2 Hr = 23	40	10%
			3 Hr = 52	60	10%
			4 Hr = 92	80	10%
				100	3%
				110	3%
				120	3%

Average flame lengths of 4 feet can be direct attacked by ground-based fire suppression resources. Fire behavior is expected to improve for percent mortality, flame lengths, rates of spread, and final fire size. Table 10 summarizes the modeled fire behavior within units post-project (Alt 2 and 3), complete fire modeling output is in Appendix D.

Table 10. Summary of Behave modeling

Alternative	% Tree Mortality (100' tree height)	Flame Lengths (feet)	Rates of spread (chains per hour)	Final Fire Size (acres)
1	85	11	34	426
2	3	5	16	92
3	3	5	16	92

Table 11. Summary of expected fire suppression capabilities by flame length

Flame length (feet)	Fireline Intensity (Btu/ft/s)	Interpretations
< 4	< 100	Fires can generally be attacked at the head or flanks by persons using hand tools. Hand line should hold the fire
4 – 8	100 – 500	Fires are too intense for direct attack on the head by persons using hand tools. Hand line cannot be relied on to hold fire. Equipment such as dozers, engines, and retardant planes can be effective.
8 – 11	500 – 1,000	Fires may present serious control problems torching out, crowning, and spotting. Control efforts at the fire head will probably be ineffective.
> 11	> 1,000	Crowning, spotting, and major fire runs are probable. Control efforts at the head of the fire are ineffective.

Based on: Roussopoulos, Peter J.; Johnson, Von J. Help in making fuel management decisions; 1975

Hydrology and Water Quality

Cumulative Watershed Effects

This Cumulative Watershed Effects (CWE) analysis shows that implementation of the East Fork II proposed action or Alternative 3 would not negatively impact the water quantity or quality of the East Fork South Fork Trinity River, Prospect, Texas Chow, or Dark Canyon Creeks.

CWE analysis evaluates the environmental consequences of alternatives in the context of existing hydrology, geology, and water quality. The CWE approach is used to characterize the natural condition, document the existing condition, and predict the risk of adverse cumulative impacts to water quantity and quality. *Appendix E – Cumulative Actions Table* summarizes the known past actions that were used to estimate existing condition for the CWE analysis. The comprehensive description of CWE methods and results is detailed in the Hydrology Report in the project record.

CWE Limiting Factor Analysis

Limiting factor analysis identifies the factor most critical to beneficial uses and water quality for a given location. Coarse sediment yield, and associated impact on residual pool volume of the East Fork South Fork Trinity River and channel stability of Prospect Creek, Texas Chow Creek, and Dark Canyon Creek, is the limiting factor for this analysis. Existing studies show that most of the project area does not have a high risk of surface erosion and fine sediment production (detailed in Hydrology Report).

Within the context of the limiting factor, the equivalent roaded area (ERA) analysis is used to evaluate how this project would affect the relationship between rainfall runoff, coarse sediment transport, and channel stability. The sediment budget is used to evaluate how this project would affect coarse sediment flux and yield. These analyses evaluate the magnitude, geographic extent, and duration of impacts from wildland and prescribed fire, timber harvest, plantation management, and roads on coarse sediment sources, delivery, and yield.

This analysis considers the direct effects on individual watersheds within the assessment area as well as indirect effects on the East Fork South Fork Trinity River. It also attempts to account for the spatial and temporal variability of climate, land disturbance, runoff processes, and sediment yield. Some of the disturbance causing variables of this system cannot be forecast with any certainty to predict the effects on the impacted variables. Therefore, a risk analysis is used to predict the past, present, and future condition and was used to develop project-specific mitigation measures and monitoring requirements.

CWE Analysis

The limiting factor analysis focuses the CWE analysis on the aspects of watershed function most critical to fisheries and aquatic habitat. Because coarse sediment is the limiting factor, a sediment source inventory is used to identify the major sediment sources and sediment delivery points.

Surface erosion and mass wasting sources were inventoried and included in the sediment budget. Unstable areas were mapped on the ground by the project geologist and hydrologist. These unstable areas are flagged and avoided in the context of timber harvest, fuels treatments, and roads.

The direct, indirect, and cumulative environmental consequences of implementing either no action, or one of the action alternatives of the East Fork II Project have been evaluated using the CWE analysis process described in the Hydrology Report. This analysis quantifies the present watershed condition relative to background or pre-human disturbance conditions and known land use disturbances caused by timber harvest activities, road construction and use, mine operations, and wildland fire/fuel treatments. The future watershed condition is estimated by factoring the potential impacts from the proposed action, connected actions (e.g., fuels treatments), and foreseeable actions (e.g., road restoration).

Alternative 1

Based on the results of the CWE analysis, the present CWE risk for Alternative 1 is “two.” This means that background sediment levels are somewhat elevated and no negative impacts on fish or water quality are expected. Existing sediment-related impacts are minor locally and result in minimal offsite impacts and are short-term. This conclusion is based on the presumption that plantation management, fuels management, and road maintenance and restoration would continue independent of this project.

The present average Equivalent Road Area (ERA) is 7% for the entire project area and ranges from 4% to 9% with Prospect Creek having the highest existing ERA (Table 12). The established Threshold of Concern (TOC) for the project area is 14% ERA. All of the subwatersheds are currently in Watershed Condition Class (WCC) II or I. Watershed Condition Class is explained further in the hydrology report and *Section 3 Fisheries*; to summarize, WCC I is considered optimal and WCC III is degraded. The existing timber ERA would continue to decrease with time as harvest areas from past activities continue to recover, thereby reducing the future risk of cumulative watershed effects. In addition, future road maintenance and restoration would aid in reducing ERA levels, thereby further reducing the watershed impact. The reduction in ERA will be achieved by eliminating the risk of stream-road crossing failure and disconnecting the roads from streams through proper drainage design.

Table 12. Summary of project CWE analysis

Hydro unit	Drainage Area (acres)	Equivalent Roaded Area			Alternative 2				Alternative 3			
		Forest Plan TOC (%)	Existing ERA (acres)	Existing ERA (%)	Post Project ERA (acres)	Post Project (%)	5 Years Post Project ERA (acres)	5 Years Post Project (%)	Post Project ERA (acres)	Post Project (%)	5 Years Post Project ERA (acres)	5 Years Post Project (%)
1477	2698	14	249	9	273	10	262	10	270	10	259	10
1483	1920	14	160	8	168	9	164	9	167	9	163	9
1491	2395	14	141	6	189	8	167	7	181	8	162	7
1498	1481	14	98	7	157	11	131	9	148	10	124	8
1504	1846	14	80	4	110	6	96	5	105	6	93	5

When high severity burning and large flooding occur coincidentally in time, significant cumulative effects can occur at the watershed scale altering the form and function of a fluvial system.³⁰ The present fuel loading within the project area is such that severe burning is more than likely to occur. If 40% or more of the project area were to burn severely, watershed-scale cumulative effects would be likely. The result would be increased runoff, surface erosion, and reduced channel stability. Because naturally-occurring wildfire has been suppressed for over 100 years, if no action is taken to reduce current fuel loading, future fires in the project area are likely to cause severe watershed-related effects.

The present sediment budget is 11% above background for the entire project area and ranges from 8 to 15% with Prospect Creek having the highest percentage (Table 12).

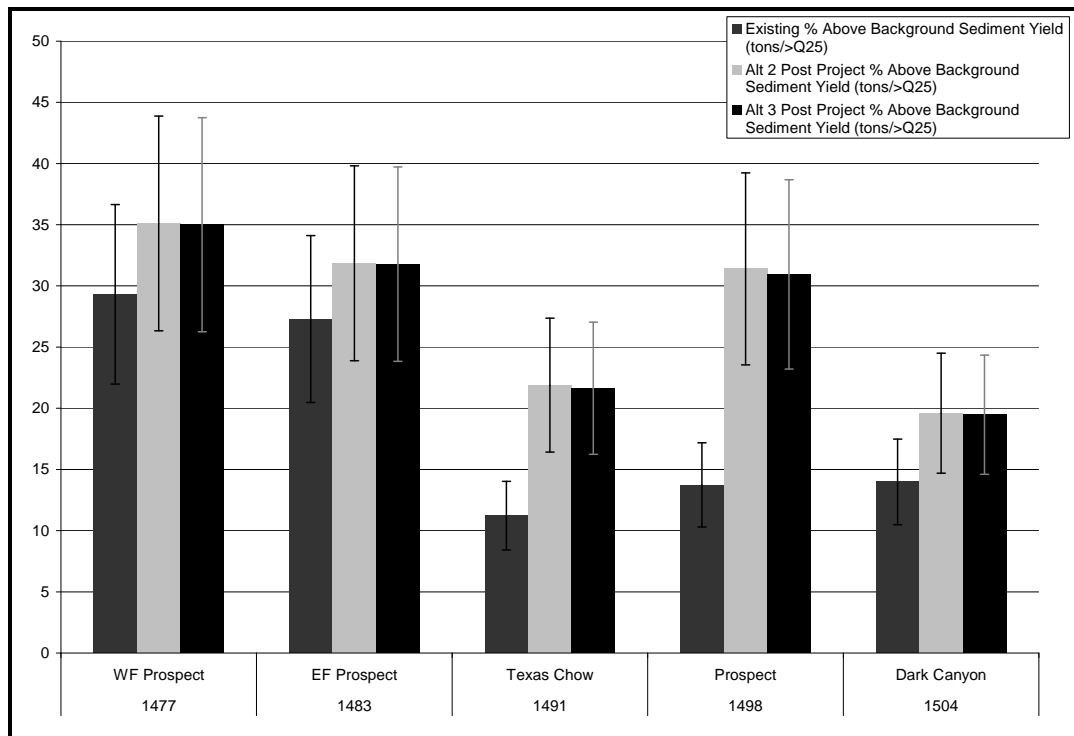


Figure 1. Sediment budget percent above background sediment yield by subwatershed

³⁰ Benda et al. 1999

Alternatives 2 and 3

These alternatives are given a CWE risk of “three,” meaning the potential impacts from sediment are moderate and immediately offsite but do not translate to watershed scale impacts (more details in Hydrology Report, available in project record). The ERA model results for both action alternatives show that there would likely be a moderate increase in fine and coarse sediment that could cause non-lethal stress to fish. The predicted impacts would be minor locally, and insignificant at the watershed scale. The effects of action alternatives would not exceed the TOC, or percent above background sediment yield, in the long-term to a point where the risk of cumulative watershed effects is unacceptable (Table 12 and Figure 1). A post-project CWE risk of “three” and the fact that activities are proposed within key watershed triggered development of site-specific resource protection measures (described in Section 2). Resource protection measures and BMPs (Appendix C) reduce the risk of short and long-term impacts to water quantity and quality to discountable levels.

These alternatives would increase the average ERA for the entire assessment area from 7% to 9%. The increase varies by subwatershed with a maximum of 10% for Prospect Creek (Table 12). Of the total, the majority of the ERA increases result from proposed ground-based timber harvest and fuel treatment activities. The increases are classified as minor and highly suggest that the project has very little risk of causing significant negative impacts to water quality or fisheries. Unacceptable coarse sediment erosion and delivery will be prevented through standard BMPs and unit and road-specific protection measures.

Immediately after project implementation, Alternative 2 would result in an ERA of 9%, which is less than 75% of the TOC. Within five years of project implementation, the ERA is reduced to 8% with a maximum of 10% for Prospect Creek (Table 12). As shown in Table 12, Alternative 3 is likely to result in slightly less sediment-related impacts for all subwatersheds. Only in Prospect Creek is the difference between action alternatives noticeable 5 years post-project using ERA calculations, for Alternative 3 the 5-year post-project ERA is 8% and its 9% with Alternative 2.

Implementation of Alternative 2 would increase the sediment yield from 11% to 28% above background for the entire project area, as measured with the sediment budget. The percent increase ranges from 19% to 35% with Prospect Creek having the highest percentage increase (Figure 1). Fine sediment inputs would decrease to estimated pre-project levels within five years of project implementation. However, coarse sediment inputs are not expected to recover as rapidly. Resource protection measures are designed to prevent new coarse sediment sources (e.g., flag and avoid unstable areas) and maintain/reduce existing coarse sediment sources (e.g., decommissioning unstable roads) to within acceptable levels. Including the effects of future foreseeable road decommissioning (Appendix E) with the fuels reduction and road-related project effects, this project contributes to reducing the risk of future cumulative watershed effects in the area.

Foreseeable actions within the watershed include precommercial thinning, watershed restoration, and fuels treatments (see Appendix E). None of these actions are expected to further increase the risk of cumulative watershed effects. Rather, these actions would likely reduce runoff, erosion, and increase channel stability in the long-term. Road decommissioning would continue to be implemented

within the project area reducing stream diversion potential, crossing failure, surface erosion, and mass wasting; all beneficial watershed effects.

Although the project is likely to cause localized short-term impacts, it contributes to overall improvements in watershed condition and resiliency of the East Fork South Fork Watershed.

Fisheries

Project units are located well upstream of habitat accessible to anadromous fish. Prospect Creek and its major tributary, Texas Chow Creek are both largely resident trout streams. A natural barrier occurs on Prospect Creek (a 15-meter falls downstream of the confluence with Texas Chow Creek) approximately 0.5 mile upstream of the confluence with the East Fork South Fork Trinity River. These falls are a complete fish migration barrier and also mark the upper limit of anadromous fish distribution. Chinook salmon and steelhead occur in the East Fork South Fork Trinity River, downstream of the Prospect Creek falls. Coho salmon are known to occur in the South Fork Trinity River, over 40 miles downstream of the project. The STNF conservatively considers the aforementioned falls on Prospect Creek to mark the upstream extent of coho salmon Critical Habitat because habitat up to this point is accessible to anadromous fish in most years.

Alternative 1

Because no management would be implemented, there are no project effects or cumulative effects associated with Alternative 1. Alternative 1 would not address the issues related to currently overstocked stands, reduce fuel ladders or decrease the negative impacts a catastrophic fire would have on the landscape. Indirectly, fire could greatly reduce riparian vegetation and increase long-term stream temperatures as a result of increased area exposed to direct solar radiation (versus the strategic removal of some riparian vegetation, so that fire danger is reduced with little to no increase in solar radiation).

Alternative 2

Direct Effects

Project activities are not in close proximity to fish or perennial stream habitat. The project would have no direct effects on fish, or their habitat.

Indirect Effects

Indirect effects are those effects, which manifest themselves downstream from the project and/or later in time. The project does not propose activity within riparian vegetation. Only outer portions of RR associated with ephemeral or intermittent channels would receive treatment, and no riparian vegetation would be affected by the project. Most RR in the watershed would be unaffected, and no RR associated with perennial streams would be affected. Within the assessment area, there are approximately 44 miles of perennial streams and 3,200 acres of associated RR, all of which will be left undisturbed. Approximately 16,600 acres (about 26 square miles) of the assessment area has

intermittent and ephemeral streams, with associated RR, that will also remain undisturbed (this estimate includes all land designations, not only RR acres). Only a small proportion of the watershed would be exposed to effects from the project.

Some localized changes in erosion and coarse sediment delivery to streams directly off-site is likely during the first year after project implementation (as described in Hydrology section). Although resident fish (trout and speckled dace) may be exposed to localized elevated turbidity, effects would be non-life threatening and sediment-related effects of the project would not have any measurable impact on fisheries habitat. Detectable inputs of fine sediment downstream from the project are not expected as a result of Alternatives 2 or 3. Based on adherence to BMP's, resource protection measures (described in Section 2), implementation of proposed road restoration, and natural recovery of activity areas; project effects to fish, other aquatic organisms and aquatic habitat downstream are expected to be immeasurable and discountable.

There would be no measurable effect to coho salmon Critical Habitat in the East Fork South Fork Trinity River. Post-project field review of completed East Fork Project units was conducted by a professional geologist, hydrologist, and soils scientist. Results indicated that ground disturbance associated with the original project is within an acceptable range, in compliance with ACS standards and guidelines and the Clean Water Act.

Alternative 3

The major difference between Alternatives 2 and 3, from an aquatic perspective, is centered on the 12-inch DBH limit for treatments within RR. Of the 74 net RR acres that would be treated under Alternative 2, approximately 63 acres would still be treated in Alternative 3 (with a 12-inch DBH limit). The remaining 11 acres of RR would not be treated at all, as portions of these cannot be accessed due to the 12-inch DBH limit. Implementing Alternative 3 would result in a relative reduction in the possible moderate increases in sediment delivery associated with the implementation of Alternative 2.

Based on adherence to BMPs (Appendix C), resource protection measures (Section 2), implementation of proposed road restoration, and natural recovery of activity areas; effects to fish, other aquatic organisms and aquatic habitat downstream of the project area are expected to be immeasurable and discountable.

Large fires have impacted many areas within the South Fork and Mainstem Trinity River Basins in the recent past, these events have illustrated the risk of wildfire having severe impacts on large areas of riparian and fish habitat. While limiting treatment activities in RR (i.e. limiting treatment activities to 12-inch DBH in some areas and removing some RR treatments altogether) may yield a relative reduction in the possible moderate increases in coarse and fine sediment, that reduction is not likely to translate into meaningful effects to fish and it may increase the likelihood of future widespread negative watershed-related impacts resulting from wildfire.

Cumulative Effects

Bounding the Effects

Geographic Boundary – Cumulative effects to ESA-listed and MIS fish, fish habitat and RR are addressed by 7th field subwatershed. Five 7th field subwatersheds are included in this analysis: West Fork Prospect, East Fork Prospect, Texas Chow, Prospect and Dark Canyon subwatersheds. The 7th field subwatershed scale is the most appropriate to analyze effects to fish, fish habitat and RR because smaller subwatersheds (i.e. 8th field or smaller) are often too small to support fish at the population level and larger watersheds (i.e. 6th field or larger) are often so large that localized project effects are diluted to the point they can no longer be effectively analyzed.

Spatial Boundary/Time Frame – Impacts from the East Fork II project are expected to last as long as 15 or fewer years in areas where thinning treatments will occur. Following disturbance, stream habitat recovery often lags 5-10 years behind vegetation recovery. Therefore, the maximum time frame considered in this analysis is 20-25 years.

Past Activities

Timber harvest, and associated management activities, has occurred within most of the Matrix lands in the assessment area. As described in *Section 3 Fire and Fuels*, these areas subject to past management activities are mostly within the northern portion of the assessment area; and overlapping the five subwatersheds analyzed for this project. The hydrologic effects of past management are evaluated by subwatershed using ERA calculations, as described in *Section 3 Hydrology and Water Quality*. Table 12 compares the existing ERA for each project subwatershed to the Threshold of Concern (TOC) established in the LRMP; all are well below TOC which indicates relatively low risk of adverse watershed effects (from past disturbances). West Fork Prospect Creek and East Fork Prospect Creek have the highest current ERA, indicating that quality fisheries habitat would be most limited, or at risk, due to lingering effects of past management in this drainage. As shown in the project map in Appendix A, most of the original East Fork units, already completed, are within the Prospect Creek Subwatershed. The CWE analysis applies relatively high coefficients to account for disturbance in areas of recent timber harvest, therefore existing condition ERA in Prospect Creek subwatersheds are highest.

Alternatives 2 & 3

The unit of measure to analyze cumulative effects for ESA-listed fish, MIS fish, fish habitat and RR is the proper functioning condition of subwatersheds based on Watershed Condition Class (WCC). The condition of individual watersheds is highly indicative of the instream (fish and fish habitat) and near stream conditions that exist within that watershed. The WCC score (which ranges from I to III, with I representing a “properly functioning” condition, II representing a “functioning at risk” condition and III representing a “not properly functioning” condition) is a derivative of the CWE modeling/analysis that is completed during the hydrologic project-level analysis. Site visit and

instream survey results have been used to validate the CWE model, all project subwatersheds are currently classified as WCC II except Dark Canyon, classified as WCC I.

Dark Canyon is the only subwatershed where WCC is expected to change, and this is due to the additive effect of this project with recent private timber harvest in the subwatershed. Existing WCC for Dark Canyon is I (most pristine), and post-project WCC is changed to II. The post-project condition still constitutes functioning aquatic and riparian habitat, and WCC scores in this subwatershed would return to pre-project levels in less than 5 years following the completion of project activities. There are no other future foreseeable activities in Dark Canyon Subwatershed.

Post-project field reviews of the original East Fork Project by hydrologists found that effects were at, or less than, those predicted within the original project analysis. The CWE analysis, and post-project monitoring show that the effects of the project are not likely to result in measurable sediment-related impacts in the East Fork South Fork Trinity River or downstream. Localized impacts upstream (Prospect Creek) will be short term (first year post project), and do not translate into watershed-level impacts. Minor amounts of excess sediment movement, caused by the project, will be transported quickly through the high gradient channels of the assessment area.

Foreseeable actions within the watershed include precommercial thinning, watershed restoration, and fuels treatments (see cumulative actions table in Appendix E). Effects of the project are minor and not expected to be additive with the effects of these other actions, or to further increase the risk of cumulative watershed effects. Due to the minor and temporary nature of expected effects, there would be no cumulative impacts to fish or fisheries habitat from the project (Alternatives 2 and 3).

The East Fork South Fork Trinity River Watershed is in a continued natural process of recovery/improvement in previously disturbed areas. The East Fork II Project would contribute to the long-term improvements in water quality expected for the East Fork South Fork Trinity River system, which would ultimately benefit all fish species.

Soils

The effects of each alternative on the soil resource were assessed using Region 5 Soil Quality Standards (SQS)³¹ and the Shasta-Trinity National Forest LRMP standards and guidelines. Five evaluation criteria, which were developed from LRMP standards and guidelines, were used to evaluate each alternative and are listed below. The soils-related resource protection measures that were developed to ensure that the project would meet these evaluation criteria are listed in parentheses in the list below. The Soils Report in the project planning record contains a comprehensive analysis of environmental effects relating to soils.

1. Maintain soil productivity by retaining organic matter on the soil surface and by retaining organic matter in the upper 12 inches of the soil profile.³² (Minimize skid trails, compaction, erosion and meet soil cover recommendations).

³¹ USDA-FS 1995

³² Soil Quality Standards 1a, 1c

2. Minimize negative changes in a site's ability to cycle nutrients and maintain site productivity.³³ (Minimize compaction, maintain 30-50% duff mat, and maintain 50% fine organic matter on soil surface).
3. Retain coarse woody debris (CWD) and protect existing CWD.³⁴ (Protect existing CWD, increase where low or maintain sufficient large diameter trees on site for future CWD needs).
4. Minimize soil and litter disturbances resulting from yarding and heavy equipment. (Minimize ground disturbance, maintain recommended soil cover).
5. Prescribed fires should be planned to minimize the consumption of litter and CWD.³⁵ (Meet recommended soil cover amounts, retain existing CWD and meet 50% fine organic matter (duff, litter, slash <3" guideline).

Consequences Specific to Each Alternative

Alternative 1

Currently, existing soil cover (88-99% cover) exceeds LRMP guidelines. The degree of soil disturbance observed in the assessment area ranges from 0 to 38%. Estimated detrimental disturbance, which is disturbance that exceeds Regional and Forest SQS, currently ranges from 0 to 14%, and averages 6.5%. Overall, this existing disturbance meets the SQS 15% aerial threshold. Existing coarse woody debris (CWD) is highly variable, ranging from 0 to 14.4 logs/acre, averaging 5.4 logs/acre for logs \geq 20 inches in diameter. Due to the high level of soil cover, current soil erosion is minimal (averages 0.5 tons per acre), and meets SQS guidelines. Soil replacement (due to natural processes) averages 1 ton per acre.

Direct and Indirect Effects

With no action taken, there would be no effects to soils and a gradual decrease in existing legacy soil compaction as natural soil biological processes increase soil porosity. Coarse woody debris would increase over time as snags and green trees fall by natural means. Fine organic materials would continue to buildup on the forest floor. Nutrient cycling, fertility and soil productivity would be maintained or slightly increased as fine organic matter increases in the duff/litter layers and areas with impaired soil porosity (existing compacted skid trails) slowly recover their functionality (productivity). The areas that currently exceed SQS soil porosity standards (6.5% average) would recover that impaired soil productivity over the next 40-50 years.

The potential for increased soil erosion, complete loss of habitat conditions, nutrient cycling, significant changes in soil biological functioning and site productivity as a result of future wildfires would increase as fuels continue to build up to levels exceeding Forest fuel management objectives.

³³ Soil Quality Standards 1a-1c

³⁴ Soil Quality Standards 2b

³⁵ Soil Quality Standards 1a, 1c (2a), 1c (2b)

Alternative 2

Alternative 2 would result in new soil disturbance (skid trails), causing changes in soil porosity (compaction), soil cover and nutrient cycling on approximately 1,059 acres within an analysis area of 24,593 acres. The level of compaction on new skid trails will not exceed SQS threshold levels as shown in soil disturbance monitoring done on original East Fork Project. Monitoring showed feller buncher with rubber grapple skidding system resulted in 52% undisturbed, 15% disturbed, and 33% skid-trails; with maximum decrease in soil porosity by 8.2% (secondary skid-trails) when soil moisture was less than 15% (dry summer-fall operations). Severely impacted areas (exceed SQS compaction threshold) main skid trails (last 200 feet into landing) and landings are expected to be approximately 45 acres which represents approximately 5.0% of the tractor logged acres and 0.2% of the analysis area. This level of severely impacted areas is within SQS guidelines, and does not adversely impact overall soil productivity.

Direct and Indirect Effects

Ground-based mechanical yarding (902 acres) using traditional systems, feller buncher with rubber tired grapple skidders, or cut to length systems with rubber tired grapple skidders, would result in increased soil disturbance and reduced soil porosity. With proper layout of the skid trail system, detrimental disturbance, which is disturbance that exceeds SQS, would be within allowable limits (15% of each unit). Reusing existing skid trails and landings ensures that increases in skid trails would be minimized.

Soil disturbance monitoring on the completed East Fork Project units (as stated above) showed feller buncher with rubber grapple skidding system resulted in 52% undisturbed, 15% disturbed, and 33% skid-trails; with maximum decrease in soil porosity by 8.2% when soil moisture was less 15% (summer-fall operations). This is a moderate decrease in soil porosity that has no meaningful effect on ecosystem health. Studies have shown that when porosity decreases more than 10% there is a significant decrease in soil ecosystem health (Powers & Avers 1995). For this project, operations on fine textured soils will be limited to the dry summer operating period (June-October) when soils are dry (less than 15% soil moisture). This minimizes the potential for adverse decreases in soil porosity in vulnerable soils.

It is estimated that this alternative may increase detrimental disturbance (greater than 10% decrease in soil porosity) to 10% of the forested area within project units. Logging when the soils are dry down to 12 inches has a high probability of avoiding soil compaction that exceeds SQS standards (as shown in recent monitoring of the original East Fork Project). Long-term soil productivity would be maintained by this alternative because resource protection measures (listed in Section 2) ensure that SQS guidelines would be met.

There is likely to be a slight loss of soil fertility/growth on the acres of skid trails and landings due to soil compaction (reduced soil porosity) and/or loss of soil organic matter in the upper 12 inches of the soil. This localized loss of site productivity is typical with tractor harvesting and meets the applicable SQS due to implementation of resource protection measures (described in Section 2). Forestlands in project units, excluding skid trails and landings, will maintain soil productivity post-

project. Due to stand thinning residual trees will respond with more rapid growth, increased root mass and soil organic matter. Therefore, thinning is likely to contribute to an overall increase of soil fertility. On-site mastication of sub-merchantable biomass would increase the fine organic matter, maintain nutrient cycling and have a positive effect on soil productivity.

Monitoring of the completed East Fork Project units showed more than sufficient ground cover post harvest due to recent needle-fall from thinned stands. However, slightly elevated rates of erosion for the first year after this project are still expected due to reductions in ground cover (see Hydrology/CWE effects section). The rate of soil erosion will remain low because at least 50 to 70% soil cover will be retained in most areas. Erosion rates are expected to increase from 0.5 tons per acre to approximately 0.7 tons per acre for the first year post-project; after that time erosion rates are expected to return to near pre-project levels.

Alternative 3

Direct and Indirect Effects

The effects of this alternative would be of the same nature as those described above for the proposed action. Alternative 3 would result in less soil disturbance than Alternative 2; therefore there would be fewer changes in soil porosity (compaction), and fewer changes in soil cover and nutrient cycling. There is likely to be no measurable difference in soils-related effects resulting from the action alternatives.

The project is likely to result in slight increases in erosion for the first year post-project due to reduction in ground cover; also a slight decrease in porosity is expected in localized areas which are not expected to have any meaningful effect on ecosystem health. No measurable effects to soil fertility are expected from either action alternative. For both action alternatives, these direct and indirect effects to soils will be localized and minor. Since some areas would not be thinned under Alternative 3, these minor effects will occur over less acreage. However, Alternative 3 does less to reduce hazardous fuels accumulation which is a significant threat to the soils resource.

Cumulative Effects

The direct and indirect effects of implementing the alternatives considered have been disclosed in the previous section. This cumulative effects analysis identifies any overlap of the expected direct and indirect effects of the alternatives, with the effects of past and foreseeable future actions within the soils resource bounding area (listed in Appendix E).

The soils analysis is bound by the proposed treatment units only. Soil Quality Standards apply to the affected soils in regards to erosion, compaction, and fertility of past, present and future planned activities within the project area units. Past activities within the soils bounding area are healed in regards to erosion, adequate soil cover, and restored hydrologic function (legacy compaction). Monitoring from past projects on similar soils and mechanical harvesting systems has shown secondary skid trails range from 17 to 33% with compaction levels below SQS threshold. These conclusions are supported by soil quality monitoring for various projects on Shasta-Trinity National Forest, conducted and documented by Brad Rust (Forest Soils Scientist) during 2004-2007.

The project is likely to cause only slight short-term increases in erosion (within the first year post-project); after this time the rates drop to pre-project levels (due to falling leaves, braches, needles, grass and forbs). The project was designed to retain sufficient soil cover to minimize soil erosion, maintain nutrient cycling, maintain soil fertility, and therefore maintain short-term and long-term soil productivity. The direct and indirect effects of the proposed action are expected to be minimal and negligible. This analysis considered the direct and indirect effects of the project in addition to other past, present, and reasonably foreseeable actions in the soils bounding area, and has concluded that there will be no cumulative effects to soil resources for Alternative 2 or Alternative 3. Complete documentation of the soils analysis is located in the project record.

Vegetation - Timber

Alternative 1

With Alternative 1 the opportunity to improve stand vigor, and resistance to insect/disease impacts would not be realized within the identified stands (project units). Increased competition for sunlight, nutrients, and soil moisture would decrease stand vigor, increase stand mortality, and increase susceptibility to primary and secondary insect and disease effects. Stand vertical structural diversity would not be maintained or improved. Understory stand components, including hardwood species, would not remain a viable stand component, with increasing overstory crown competition. The opportunity for treated stands to respond to release, and respond to future release, would not be realized. The ability of trees to withstand future drought conditions, especially for drought-sensitive species such as white fir, would be decreased. There would be an increased risk of widespread insect attack in the project area – specifically from the western pine beetle, fir-engraver beetle, and turpentine beetle. Project field reviews throughout the life of this project show that current levels of insect-related mortality (mostly pine beetles) in stands of the assessment area are elevated over expected baseline conditions.

Alternative 2

An estimated 4.8 MMBF of merchantable timber, and an estimated 9,020 bone dry tons (BDT) of biomass would be removed from the assessment area. Medium-sized young growth mixed conifer and ponderosa pine stands³⁶ on an estimated 1,059 acres of suitable lands would be thinned. The opportunity to improve stand vigor, resistance to insect/disease impacts, and board foot growth would be realized within these stands. Such thinning in the assessment area generally reduces basal area to approximately 120-160 ft²/acre, residual canopy cover to approximately 50-60%, and stand density index (SDI) to approximately 300. Stand density index³⁷ provides a measure of conifer stand stocking levels, and an indicator of general stand health and risk. Stand development benchmarks or stocking thresholds can be expressed as a percentage of maximum density. For the California mixed conifer type, common to the assessment area, the maximum density is 750. The upper limit of the

³⁶ Stands proposed for treatment contain primarily timber size classes 2 and 3

³⁷ as described in Reineke, L. H. 1933

management zone for the California mixed conifer type is 450, and the lower limit of the management zone is 300. Ideal management objectives would be to maintain the SDI from 300 to 450 to maintain stand health and to minimize mortality.

The opportunity to improve stand vigor, and resistance to insect/disease impacts would be realized within these stands. Decreased competition for sunlight, nutrients, and soil moisture by a reduction in crown closure from an estimated 60-90% to an estimated 50-60% would improve stand vigor, reduce stand mortality, and reduce susceptibility to primary and secondary insect and disease effects. Understory stand components, including hardwood species, would remain a viable stand component, with reduced overstory crown competition. The opportunity for treated stands to respond to release, and respond to future release, would be realized. Thinning at this level reduces competition for limited moisture and improves the ability of trees to withstand future drought conditions, especially for drought-sensitive species such as white fir. There would be a low risk of widespread insect attack in the project area – specifically from the fir-engraver beetle, western pine beetle and turpentine beetle.

Alternative 3

There would be the harvest of an estimated 4.7 MMBF of merchantable timber, and an estimated 9,020 bone dry tons (BDT) of biomass from within the assessment area during this planning period. The benefits to treated stands would be comparable to those disclosed for Alternative 2, however at a lesser level because of fewer acres treated.

Proposed diameter limits would apply constraints on timber harvest implementation such that some existing areas of dense forest in RR and LSR would not be accessible (thus not treated). Occurrence of trees larger than stated diameter limits in proposed temporary access routes would result in areas of untreated vegetation within units post-project. Because fewer RR and LSR acres would be treated, the opportunity (based on LRMP direction) to improve stand vigor, reduce stand mortality, and reduce susceptibility to primary and secondary insect and disease would not be met in these areas. Retention of all trees of greater than or equal to 30 inches DBH³⁸ would result in slightly elevated levels of insect and disease centers when contrasted with Alternative 2. Alternative 2 provides more benefits than Alternative 3 in terms of improving forest health and vigor in the assessment area.

Cumulative Effects

Relevant past timber and fuels management activities in the assessment area are discussed above in *Section 3 – Fire and Fuels*. The project is of small scale, but still contributes to forest health improvements, and reduces probability for stand-replacing wildfire in the assessment area. Future foreseeable actions in the area (shown in Appendix E) have either neutral (some watershed restoration activities) or beneficial effects (precommercial thinning) to timber resources. More benefits to forest

³⁸ The only trees of this size proposed for removal under Alternative 2 currently show signs that mortality is likely within the next 10 years.

health, along with increases in growth and vigor of timber stands, would be likely if future timber harvest were deemed appropriate in the assessment area.

Vegetation - Botany

The botanical analysis for the project considered the following categories of plants: Sensitive plant and fungi species, Forest Plan Endemics, Survey and Manage species, and noxious weeds. Sensitive plants, Forest Plan Endemics and Survey and Manage species would not be affected by the project, and therefore are not discussed here in detail. Sensitive fungi species could be impacted and potential effects are discussed below. The comprehensive botany analysis is in the project record.

Sensitive Fungi

Based on habitat descriptions, there is suitable habitat five fungi species, branched collybia (*Dendrocollybia racemosa*), *Cudonia monticola*, olive phaeocollybia (*Phaeocollybia olivacea*), orange-peel fungus (*Sowerbyella rhenana*). Because fungi surveys were not completed and suitable habitat is present, occupancy is assumed for these 5 species.

Alternative 1 – No Action

No impacts would occur to branched collybia, *Cudonia monticola*, olive phaeocollybia, and orange-peel fungus from Alternative 1. Late-seral forest would continue to provide adequate shade to the forest floor, encouraging soil moisture retention and duff/litter accumulation that will ultimately provide nutrients and moisture necessary for survival and growth of these species.

Alternative 2

The silvicultural prescription in Unit 197 is to commercially thin from below, retaining 60-70% canopy closure. Potential impacts from tractor thinning include disruption of the duff/litter layer resulting in lost of fungal connections, increased loss of soil moisture from increased sunlight to the forest floor, reduction in ability to transfer nutrients within a fungal population, and potential loss of host trees for nutrient transfer (olive phaeocollybia and red-pored bolete). Only large diameter trees that are diseased or have significant physical defects will be harvested. No treatment activities will occur in perennial riparian reserves.

Machine piling would occur in Unit 197 to reduce concentrations of slash generated from harvest activities. Machine piling will disrupt the duff and litter layer and the network of fungal mycelium in and below the duff. The fungal network is critical to nutrient and water transport which is necessary for survival and regeneration. Disruption of the duff layer will also result in accelerated drying of this layer.

There will be no less than 60% canopy in Unit 197 after treatments. This will result in some increased drying of surface organic layers, but will retain enough shade to the forest floor shaded most of the day. Tractor movement in the unit will disrupt the fungal mat, but because the thinning prescription is fairly light, disturbance is unlikely to reach adverse amounts seen with thinning prescriptions that reduce canopy below 40%, considered the threshold for short to normal fungal

population recovery periods. Planned retention of 60-70% of the tree canopy (with thinning from below), including all healthy large diameter conifers, will also help insure residual large diameter host trees for any potential olive phaeocollybia populations. Light thinning will also reduce residence time for tractors and machine piling work, which will result in less disruption of organic layers and the fungal mycelium, and less loss of nutrient exchange and moisture retention capabilities.

The best habitat for red-pored bolete, branched collybia, *Cudonia monticola*, olive phaeocollybia, and orange-peel fungus in the East Fork project area is found within perennial riparian reserves, which will be excluded from all treatment activities. This will insure no impacts to these species in their best habitat.

Alternative 3

This alternative will differ from Alternative 2 by retaining all trees greater than 12 inches DBH in intermittent RR and by not removing diseased or damaged conifers over 30". All other prescription details remain the same. Impacts from tractor logging in Unit 197 are the same as described under Alternative 2.

Under Alternative 3, fewer large diameter conifers³⁹ would be removed (important for fungi habitat). Large diameter trees are an important component of fungi habitat because they contribute to shade and regular deposition of organic matter, necessary for nutrient supply. Indirectly, large forest stands that have a significant component of large diameter trees also have high above and belowground diversity which is also important for nutrient exchange, water retention and reproduction, all important for long term survival and viability. The very limited number of diseased or damaged large-diameter trees that will be removed under Alternative 2, but not under Alternative 3 do not currently contribute to a significant amount of forest floor shade for organic matter moisture retention. But under Alternative 3 they potentially contribute to additional host trees for olive phaeocollybia and recruitment of future decomposed large woody debris, important as a nutrient source and source of regeneration spores.

Cumulative Effects

The assessment area is defined by the boundary of the East Fork South Fork Watershed. Historical actions that have contributed to potential impacts to Sensitive fungi or their habitat include timber harvest, with associated activities (road building, site prep). As discussed in *Section 3 Fire and Fuels* most timber harvest activities occurred in the northern portion of the watershed, within and adjacent to project units. Other activities that have occurred in the assessment area include mining, livestock grazing, wildfire, but none of these types of activities would have lingering impacts to late-seral forests that provide habitat for Sensitive fungi.

The most suitable fungi habitat is found in perennial riparian areas and in uplands within large blocks of late-seral forest community (128 acres in unit 197). Since project activities are not near perennial water, the highest quality fungi habitat in the area will be unaffected. Approximately 3-5 large-

³⁹ For this project, defined as greater than 30 inches DBH

diameter trees that could contribute to fungi habitat would be removed under Alternative 2, but the majority of large-diameter trees would remain on site. No large-diameter trees would be removed under Alternative 3. The additional number of large diameter trees remaining under Alternative 3 is not enough to result in a significant or noticeable difference between the two action alternatives in relation to Sensitive fungi. All healthy and undamaged large-diameter trees would be retained under either alternative, retaining the best host trees for red-pored bolete and olive phaeocollybia and retaining necessary shade to the forest floor for duff layer moisture retention for all five Sensitive fungi species. Well over 1000 acres of late-seral forest habitat will remain undisturbed in the assessment area just adjacent to project units (within South Fork LSR).

This additional impact on 128 acres of suitable fungi habitat under the proposed action will result in an insignificant addition of impacts to habitat in the watershed, relative to what has occurred historically. Perennial riparian areas provide the greatest amount of habitat for red-pored bolete, branched collybia, *Cudonia monticola*, olive phaeocollybia, and orange-peel fungus. Because perennial riparian areas will be excluded from any project activities, project impacts are expected to be minor and are not likely to be additive in terms of cumulative impacts to fungi.

Effects to noxious weeds

No herbicides would be used for any noxious control or vegetation management in this project.

The most common noxious weed of concern within the project area is yellow starthistle (*Centaurea solstitialis*). It is most common along roadsides and in openings adjacent to roads in the southern portion of the project area, in the general vicinity of Texas Chow Creek. This species is a California Department of Food and Agriculture List C weed, meaning the species is a significant noxious weed, but is too widespread to control spread effectively. This species is extremely common throughout Trinity County and continues to increase in distribution because there is no effective control approved for widespread use. Site-specific environmental analysis for herbicide treatment would be required for management to have any impact on yellow starthistle populations, but that has not been completed.

A population of spotted knapweed (*Centaurea maculosa*) is located just south of Hackney Spring, approximately one mile north and outside of the project area. Although the population is not within the assessment area, it borders a haul route that would be used for harvest-associated activities. This weed is a California State List A weed that is isolated to two known populations within Trinity County. It is a high priority for control and removal in Trinity County and is being actively being removed by hand on an annual basis. The population covers approximately 1-2 acres, including large turnout areas along the Wild-Mad Road. This weed spreads aggressively by windborne seed and is easily transported on vehicles passing through a population. The Wild-Mad Road is paved and there is no threat of disturbance to this population from possible road maintenance activities, but spread could occur if service vehicles associated with the project pull over or stop at the pullouts or if yarding and landing activities occur there. Spotted knapweed is capable of establishing in serpentine soils in the surrounding area that are occupied by several endemic and Sensitive plant species. Resource protection measures were identified to minimize potential of the project contributing to dispersal of

knapweed in this location (see Section 2). Without protection measures, knapweed seed dispersal could impact Sensitive species.

Proposed timber harvest, fuels reduction, road and landing construction or reconstruction, and road obliteration activities will cause soil disturbance that can encourage growth of yellow starthistle populations. Starthistle populations are fairly restricted to roadsides and are not common within proposed treatment units, so work within treatment units should not contribute to spread or increased density of starthistle. Equipment cleaning contract provisions minimize or eliminate the introduction of noxious weeds from outside the assessment area. Vehicle exclusion in and around the spotted knapweed population will avoid spread or exportation of that species outside the project area.

Project activities would occur in mid to late summer after seed formation has occurred. A controlled area would be designated for exclusion of any project activities in the area within and surrounding the knapweed population. All vehicles associated with project activities would be prohibited from stopping or pulling off the road in this area; this protective measure is expected to effectively minimize the spread of spotted knapweed from this area.

Wildlife

This section summarizes the analysis of project effects to wildlife species, including those listed under the Federal Endangered Species Act (ESA) and those designated by the Forest Service as Sensitive species. The comprehensive analysis of species occurrence, habitat, and effects are included in the following documents:

- The East Fork Biological Assessment/Evaluation (BAE; Carrothers 2002)
- the East Fork 2 Timber Sale Wildlife Report (Crumpton 2007)
- the Pacific Fisher Addendum to East Fork 2 Wildlife Report and Biological Assessment/Evaluation (Crumpton 2007)
- the Sensitive Species Biological Evaluation Addendum (Crumpton 2007)
- the Shasta-Trinity National Forest Wildlife Management Indicator Assemblage Monitoring Report (Wolcott 2007)
- the East Fork II project-level Management Indicator Assemblage report (Wolcott 2007)

These documents are part of the project administrative record and used by the decision-maker in the consideration of the alternatives.

Alternative 1

This alternative is not associated with any direct, indirect, or cumulative effects because no action is proposed. The forested stands within the South Fork LSR (LSR RC-330) currently provide adequate connectivity within the LSR.⁴⁰ Connectivity to the nearby Yolla Bolly Wilderness and Chanchellulla LSR is also maintained by this LSR. The 5,000-acre Jones Burn is located just over the ridge to the northeast. Reforestation of the burned stands began in 1960 and continued through 1965. Plantation maintenance is ongoing for these stands, but they do not yet meet habitat requirements for

⁴⁰ See Forest-wide LSR assessment, pg 2-26

nesting/roosting or foraging spotted owls. Ridges and drainages within the Jones Burn area have sufficiently reforested within the past 40 years and currently provide adequate dispersal corridors for migratory and wide ranging species.

Alternatives 2 & 3

Threatened and Endangered Species

The only species listed under the Federal ESA, and present in the project area is the Northern spotted owl. The location of existing spotted owl habitat, and designated Critical Habitat, in the assessment area is in Appendix F maps. Suitable spotted owl habitat in the assessment area was identified using Forest Service data (developed for LRMP), along with site-specific field review to verify or correct the Forest-level data. Field reviews focused on the northern portions of the assessment area, where project activities are proposed. The Northern spotted owl and its habitat may be affected by the project, as summarized below, but adverse effects are not likely.

Direct

Annual surveys for Northern spotted owls, within ¼ mile of proposed activities, will continue and limited operating periods will be implemented as described in *Section 2- resource protection measures*. If breeding owls are located, limited operating periods will eliminate the potential for direct disturbance. No habitat modification will occur in unsurveyed suitable habitat from February 1 through September 15. Therefore, the project will have no direct effect on Northern spotted owls.

The project will not affect any existing old growth habitat, but will affect younger late-successional stands designated as Northern spotted owl Critical Habitat (CH, approximately 65 acres). The highest quality spotted owl habitat that would be treated is classified as M3G. This refers to mixed conifer stands with trees averaging 13-24 feet in crown diameter or 13 to 24 inches DBH with densities between 40 and 100 percent crown cover. The proposed treatments encourage their development into M4G stands (trees averaging 25 inches dbh and greater).⁴¹ The proposed thinning is designed to retain key spotted owl habitat components, such as large trees, hardwoods, snags and downed logs, and to encourage the development of old growth forest structures, while maintaining treated stands at or above spotted owl habitat suitability thresholds.⁴² Key habitat components of high quality spotted owl nesting habitat, or old growth habitat, include mature hardwoods, multi-storied and relatively dense canopy, and large snags and downed logs (LWD). Retention of these components, while thinning from below to accelerate growth and reduce risk of loss to wildfire, contributes to the development and sustainability of high quality old growth habitats. Proposed thinning is consistent with guidelines for the recovery of the Northern spotted owl. The project is not

⁴¹ Timber strata (size and density classes) are described in LRMP, pg D-3

⁴² Suitability thresholds are primarily determined by overall canopy closure. The threshold for nesting/roosting habitat is overall canopy closure of 60% or greater, and for foraging and dispersal habitat at least 40%.

likely to adversely affect the primary constituent elements of designated Northern spotted owl Critical Habitat.⁴³

Indirect

Northern spotted owls may be indirectly affected by proposed thinning in nesting/roosting (106 acres) and foraging (490 acres) habitat. The scale of the project effects is small, less than one percent of the East Fork South Fork Trinity River Watershed (EFSF) will be exposed to project activities. Currently within the EFSF there are approximately 12,500 acres of suitable owl habitat (about 6,700 acres nesting, the remaining 5,800 acres are foraging habitat). The project would affect about 596 acres, or roughly 5%, of the currently suitable spotted owl habitat in the EFSF. The intensity of effects is also small because key components of owl habitat will be retained (all large hardwoods, snags and downed material), canopy closure in currently suitable owl habitat will be maintained at 60-70%, and disturbance to breeding owls is not likely. The project will maintain currently suitable spotted owl habitat, and is likely to encourage the development, and sustainability of, more high quality nesting/roosting habitat in the assessment area.

Using timber cruise estimates, Alternative 2 would remove about 21 trees that measure over 30 inches DBH,⁴⁴ within spotted owl nesting/roosting habitat. All trees of this size proposed for removal currently show signs that mortality is likely within 10 years. Under Alternative 3, all trees over 30 inches DBH will be retained resulting in more snags and trees with decadent characteristics (cavities, broken tops) remaining in the project units. Even though most treated areas are not currently suitable for spotted owl nesting and roosting, retention of all trees over 30 inches DBH may increase the quality of future spotted owl habitat. Since no trees greater than 12 inches DBH would be harvested in RR and LSR, denser understories and greater ground fuels accumulations would remain in these areas. Due to problems with accessibility, an estimated 10 acres of LSR and RR would remain untreated. Leaving these pockets of untreated areas within project units may be beneficial to spotted owls because they may provide diverse foraging opportunities. Overall, Alternative 3 would affect 14 less acres of potential nesting/roosting habitat when compared to Alternative 2 (10 less acres in RR/LSR and 4 acres less due to dropping unit 138).

The project wildlife analysis, including interagency ESA consultation with the U.S. Fish and Wildlife Service, concluded that the project (Alternative 2) is not likely to adversely affect Northern spotted owls or their Critical Habitat. The comprehensive analysis of project effects to the Northern spotted owl is in the Wildlife BA, BE and addendum, available in the project administrative record.

Connectivity

'Connectivity' generally refers to a measure of the extent to which forests maintain sufficient continuity of forest cover that species such as the northern spotted owl are provided habitat for breeding, feeding, dispersal and cover for protection from predators. Specifically related to northern

⁴³ Wildlife Biological Assessment determined that the project is not likely to affect CH and the U.S. Fish and Wildlife Service provided a Letter of Concurrence for the determination

⁴⁴ Timber cruise data from the original East Fork Project estimates that about 187 trees, total, over 30 inches DBH are proposed for removal (proposed action)

spotted owls, the Forest Ecosystem Management Report (USDA-FS 1993) defined adequate connectivity in landscapes where 50% of the landscape was covered in forest areas with a minimum of 11 inch DBH trees at a minimum of 40% cover, or '50-11-40.'

The East Fork/Smoky Creek Watershed Analysis recommended specific dispersal corridors as key to maintaining connectivity for wildlife travel.⁴⁵ One corridor lies within the assessment area, but is outside of the proposed units. The project will have no impact on the effectiveness of this corridor. Additionally Prospect, Texas Chow and Dark Canyon Creeks currently provide opportunities for dispersal and protected travel within the analysis area. Natural travelways along the interior drainage systems, and within all RR associated with perennial streams, would be maintained and not subject to disturbance. Canopy cover, hiding cover, and thermal cover levels would change within treatment units because overall canopy closure would be reduced, although areas proposed for treatment are not primary riparian corridors they are in upland portions of RR associated with intermittent drainages. Treatments proposed in RR are designed to enhance late successional riparian components consistent with Aquatic Conservation Strategy objectives. Disturbance within these areas would be localized and of small scale, and would occur outside key dispersal areas and times for most wildlife species. During times of disturbance, many alternate suitable corridors in the near vicinity would be available. The proposed action may have minimal short-term impacts on wildlife travel, but should maintain or enhance the existing connectivity of this area in the long term. The thin-from-below prescriptions would not cause forest stand fragmentation since substantial openings would not be created.

Although Alternative 2 would retain fewer large trees and provide relatively fewer acres for connectivity, all units maintain over 40% canopy cover. Alternative 3 would retain denser pockets of trees in untreated areas, and denser understories and higher fuels accumulations in RR and LSR. These conditions may be somewhat beneficial for some wildlife. Denser conditions provide additional canopy cover, hiding and thermal cover, and provides some protection from greater levels of disturbance that may occur in more open areas. These denser canopy and understory conditions can maintain a slightly moister and cooler microclimate as well. However, the denser cover of trees draws more heavily on the water table over time and can reduce water availability. Retaining these pockets of denser understory vegetation also increases the hazard and risk of wildfire.⁴⁶ Although moister understory conditions can marginally reduce the probability of a wildfire catching and progressing, the dense understories provide fuels that allow ground fires to spread to the tree crown causing greater mortality and providing additional fuel for hotter, faster wildfires. If too dense, these pockets may even impede the ability of some species such as the Northern spotted owl, from effectively foraging in the understory.

Sensitive species

Several Sensitive wildlife species are known or assumed to occur in the project area, and the following summarizes how each may be affected by the project.

⁴⁵ See East Fork/Smokey Creek WA, pg 6-4

⁴⁶ Graham et al. 2004

Northern goshawk – There are no known goshawk nest sites within the assessment area. Suitable habitat does occur in the assessment area and the species may occur there. Nesting in the assessment area is likely to be restricted to the south where more suitable nesting habitat occurs (within South Fork LSR and Wilderness/Roadless Areas). Due to the distant proximity of suitable nesting habitat, the project is not likely to disturb breeding goshawks. Direct effects of the project include potential disturbance to foraging/dispersing goshawks, during project implementation. Existing habitat within project units was identified using the LRMP which describes low, moderate, and high capability goshawk habitat.⁴⁷ Virtually all areas proposed for treatment can be classified as either moderate (655 acres) or low (401 acres) capability goshawk habitat; there would be no high capability habitat affected. Proposed thinning from below would modify goshawk habitat by reducing canopy closure and ground fuels, although the project retains sufficient canopy to maintain existing habitat suitability thresholds. The project decreases the likelihood that treated stands will function as goshawk nesting habitat within 10-20 years, due to the reduction in overall canopy closure. However, the project is expected to increase goshawk foraging effectiveness by removing understory trees while maintaining overstory canopy and plucking posts (large downed logs). Alternative 3 would affect less moderate capability habitat (641 acres) and the same amount of low capability habitat as Alternative 2. Since Alternative 3 would retain all trees over 30 inches DBH and dense pockets of untreated vegetation in RR and LSR, it would provide more forest structure for goshawk nesting, but may decrease foraging effectiveness within project units because of decreased flight maneuverability (dense understory and pockets of untreated vegetation).

Peregrine falcon – This species is not designated a Forest Service Sensitive species, although it is often evaluated as one because it was formerly listed by the Federal ESA and is currently still a state-listed species. The nearest eyrie is located in suitable nesting habitat about 9.5 miles northeast of the assessment area. Due to the distance from nesting habitat, the project is not likely to directly affect peregrine falcons. Nesting habitat is close enough for resident peregrines to use the assessment area for foraging, although the area comprises a small portion of the potential foraging territory for this pair of peregrines. Use of an area for foraging by peregrines is a function of opportunity and available prey base, along with distance to the eyrie. Proposed treatments would have slight, immeasurable effects on prey species availability for the peregrine falcon within project units. These localized changes will have no meaningful impact to peregrine falcons. Proposed thinning is designed to enhance late seral stand conditions, including those associated with riparian corridors. No treatments are proposed in riparian areas along flowing streams including the East Fork South Fork Trinity River, the primary connector between the closest eyrie and the project.

Townsend's big-eared bats are not known to occur in the area but have the potential to utilize project units for foraging and roosting. Proposed actions are far from typical maternity sites: cliffs, caves, and historic mining locations; thus reducing the likelihood of direct effects to this species. Roost sites include caves/cliffs, trees, and rock outcrops. Townsend's big-eared bats are extremely sensitive to disturbance; therefore direct effects include potential for disturbance to roosts or unknown

⁴⁷ LRMP, pg G-6

maternity sites during proposed harvest and haul. Thinning may remove individual trees that are used for roosting, and would have slight immeasurable effects to localized prey species availability. Potential prey species impacts would not be sufficient to have any meaningful affect on Townsend's big-eared bats. Because proposed thinning retains the largest healthiest trees and all snags, effects to roosting habitat would be minor and localized. Due to diameter limits and reduced thinning acres, Alternative 3 retains more trees that may be available for roosting structures and causes less disturbance to this species.

Western red bat typically occurs in perennial riparian and edge habitats near forest openings. Reproduction is typically solitary, with individuals roosting primarily in the foliage of riparian trees or shrubs (Bolster 2005). Thinning may remove individual trees used for roosting; although because the project does not remove any riparian vegetation and does not propose any activity within RR associated with perennial streams, effects would be minor and discountable. Also, snags which may be used for roosting will be retained. Modifications of forest canopy would have effects to localized prey densities and distribution. These changes would be immeasurable, and would not impact bats. Harvest and haul related dust and noise could indirectly impact unknown roosting populations. Compared to the proposed action, Alternative 3 has a diameter limit of 12 inch DBH in RR which would retain dense pockets of trees along with 10 more acres of riparian reserves that are not harvested. Therefore Alternative 3 provides less disturbance, more roost sites, and more conifer canopy cover to shelter riparian vegetation and moist microclimate conditions.

Southern torrent salamanders typically occur in perennial stream habitat, including springs and seeps. They seldom occur away from saturated streamside areas, preferring a relatively narrow range of physical and microclimatic conditions. The species is associated with cold and clear headwaters to low-order streams with loose rocky substrate and low sedimentation. They occur in humid forest habitats with large conifers, abundant moss, and greater than 80% canopy closure (Welsh and Lind 1996). The project is not in close proximity to perennial water and does not impact canopy closure over perennial streams; there is low probability of direct effects to this species. Because of upland ground disturbance, the project is likely to cause some localized elevated turbidity during the first year after implementation (described in *Section 3 Soils and Section 3 Hydrology*). These sediment-related impacts would not be measurable in the East Fork South Fork Trinity River, but may affect individual salamanders in perennial water upstream. Effects would not be life-threatening due to the low intensity of predicted water quality effects. The small scale of effects (less than 1% of watershed treated) further reduces the likelihood that breeding populations of southern torrent salamanders would be affected by the project. Alternative 3 would cause slightly less sediment-related impacts (see Table 3), thus less of an effect on this species. With more trees being retain in riparian reserves, retention 10 more acres of riparian reserves, Alternative 3 provides less ground disturbance near riparian areas and more conifer canopy cover to shelter aquatic habitat and riparian microclimate conditions.

American marten may occur within the project area, although there is no high or moderate capability habitat⁴⁸ proposed for treatment. Because of lower elevations (preferred habitat is over 5,000 feet) and lack of old growth habitat characteristics, there is limited habitat potential for this species within project units. Thinning actions are in low capability habitat and would not diminish or improve the capability level because although key habitat components (similar to spotted owl and fisher) will be retained, overall habitat suitability for this species is limited by elevation. Habitat stratification appears to occur where marten occupy higher elevations than the Pacific fisher, due to their subnivean (below snow level) hunting strategy. The project may result in disturbance to individual marten during implementation. The disturbance effect to wildlife would be less for Alternative 3 versus Alternative 2, although the difference may compromise achieving fuels objectives which are designed to reduce the probability of extreme disturbance and habitat modification due to wildfire.

Pacific fisher sightings (at least 17 records) are distributed throughout the assessment area; observations were from 1980 to 1996. On the Shasta-Trinity National Forest over 550 fisher sightings have been recorded from 1941 to 2005 through monitoring (track plates or camera stations), trapping, incidental sightings, and fisher research results. Fisher are likely to occur with the project area, and localized disturbance to the species and their habitat may occur during project implementation. Using home range calculations developed by Zielinski et al (2004), the number of fisher that the assessment area is likely to support is 1 male and 3.5 females. Using Yeager (2005) calculations, the assessment area would support 1.4 males and 2.2 females. Home range estimations vary widely amongst research projects due to variability in habitat, resource distribution and ecological conditions. The most appropriate home range estimation for this area is likely to be Yeager's due to the proximity of the study area (Trinity County, Shasta-Trinity National Forest as opposed to Humboldt County, Six Rivers National Forest for Zielinski's data) and the greater similarity of habitat types.

Habitat

About two-thirds (706 acres) of thinning unit acres are classified as capable fisher habitat. The LRMP describes how fisher habitat capability is determined,⁴⁹ and Table 13 summarizes existing fisher habitat capability within project units.

Table 13. Existing fisher habitat capability within project units

East Fork 2 Unit #	East Fork 2 Unit Acres	Fisher High Capability Acres	Fisher Moderate Capability Acres
110	12	0	10
129A	13	0	3
129B	15	0	15
129C	7	0	7
130	17	0	5
138	14	12	2

⁴⁸ See LRMP, pg G-11

⁴⁹ See LRMP, pg G-5

East Fork 2 Unit #	East Fork 2 Unit Acres	Fisher High Capability Acres	Fisher Moderate Capability Acres
139	23	0	20
140A	24	0	20
140B	8	0	2
140C	28	0	25
140D	21	0	13
143	33	0	28
144	11	0	11
145	12	0	10
147	7	0	7
158B	13	0	2
173	17	1	10
180	17	0	15
181B	120	0	100
182	28	0	20
183	18	0	15
184	15	0	14
185	16	0	12
186	21	0	19
187	9	0	8
190	14	0	12
193	27	6	9
194	12	0	10
197	128	60	60
205	17	1	11
206	161	7	124
213	14	0	3
	Sum	87 acres	622 acres

Outside of project units, in the rest of the assessment area, over 12,300 acres are capable fisher habitat. Most fisher habitat in the assessment area will not be affected by the project, about 95% of the existing suitable habitat would be unaffected. Fisher habitat within project units will be modified, as described below, but current habitat capability levels (as displayed in Table 13) will not change because key habitat components will be retained (sufficient canopy closure, LWD, and hardwoods).

Fisher occur in a broad range of habitats due to their opportunistic foraging habits. Existing habitat in project units may be suitable for foraging fisher, although most areas classify as only moderate capability due to the overall lack of old-growth characteristics (multi-storied canopy, large hardwoods and down logs). Although fisher may occur foraging in virtually all forest types, they are more selective for resting and denning habitat. For resting, fisher often use riparian areas that provide concentrations of rest site elements, such as broken-top trees, snags, and large woody debris (Yeager 2005). Most rest sites are likely to be within 500 feet of water, and to occur in the largest trees within a given area (Self & Kerns 2001). Fisher are highly mobile and opportunistic; they do not restrict

themselves to a few central locations, instead they use multiple distributed rest structures and only occasionally re-use structures (Zielinski et al. 2006). Because proposed thinning retains the largest trees, individual fisher rest sites are not likely to be removed. The project will not disturb perennial riparian areas, or riparian hardwoods, which are primary rest sites.

Fisher use natal and maternal dens for reproduction. They den until kits become independent of their mother for food which most likely occurs during early to mid summer in the assessment area.⁵⁰ Den cavities are often high up in live trees, utilizing heartwood hollows, knot holes, and narrow cracks in tree boles; also in tree butts or in logs beside snags or live trees (Aubry & Raley 2006). Fisher research from northern California found that trees containing dens averaged 45 inches DBH for conifers, and 25 inches DBH for hardwoods (Truex et al 1998). Most fisher dens found on the Shasta-Trinity National Forest were in cavities of hardwood trees or snags, hardwoods are an important source of suitable den habitat in California (Yeager 2005). Proposed thinning is designed to retain and support native hardwoods as a viable stand component, which benefits fisher habitat availability and quality. Thinning prescriptions retain the largest conifer trees, all hardwoods, and large snags therefore effects to existing rest/den structures would be minor.

Disturbance

The project may cause disturbance to fisher denning in the project area during implementation. The probability of causing disturbance that would adversely affect fisher reproduction is low because the distant proximity of the project to perennial water reduces the likelihood that maternal dens occur in project units, and if dens occur in project units, most trees that would provide structures for dens would be retained (all hardwoods and the largest trees in a stand are retained). Direct effects of the project include temporary and minor changes in fisher travel and foraging patterns in the assessment area. Because fisher are highly mobile, the project is of small scale and not proposed in primary travel corridors (less than 1% of the watershed disturbed, no treatment near perennial streams), and the occurrence of suitable habitat surrounding project units, disturbance-related effects are likely to be minor. The project would not compromise the functionality of existing connectivity habitat (see spotted owl discussion), which would continue to be suitable for fisher during and immediately after the project.

Prey

Squirrel and chipmunks are primary prey for the fisher; other animals such as reptiles, amphibians, insects, and birds are also consumed frequently in the Klamath region which includes the assessment area. Effects of the project upon prey are due to temporary disturbance and modification of prey species habitat during project implementation. The project would have temporary and minor effects to fisher food sources, with fisher having the ability to consume the wide variety of prey species in the area. Effects to prey species populations would be localized, small, and immeasurable; these effects would not have any meaningful effect on fisher.

⁵⁰ Determined using data from Aubry & Raley (2006), collected in southern Oregon

Completed East Fork units

Post-project field reviews were conducted to monitor/evaluate project effects in completed East Fork Project units. There were roughly 4-27 hardwoods per acre remaining in the units post-project. Remaining snags were from 20 to 24 inches in diameter, decay condition class 1 or 2, and density of 0.8 to 1.4 snags per acre. The average tree size retained was either size class 3 or 4 (the larger of the size classes proposed for treatment).⁵¹ Post-project, sufficient large trees, hardwoods and snags were retained to provide adequate fisher den and rest structures as well as high quality food sources for prey species. Field reviews of completed East Fork Project units confirm that fisher habitat capability will be maintained in the current proposed action. Post-project canopy closure and key habitat components will be retained, and existing fisher habitat quantity and quality in the assessment area will not be compromised by the project.

Cumulative Effects (Threatened & Endangered and Sensitive species)

The analysis is bounded by the East Fork South Fork Trinity River Watershed (EFSF), or assessment area. Appendix E summarizes all recorded past actions in the assessment area, and *Section 3 Fire and Fuels* describes vegetation management activities that have occurred within the past 20 years. Most past activity occurred within the northern half of the assessment area, the southern half has been mostly unaffected by management activities and is now designated as LSR, Roadless Area, or Wilderness. Because project-associated reductions in canopy closure would persist for 10-20 years, the cumulative effects analysis considers the influence past actions and those likely effects of future foreseeable actions (regardless of who takes action) within the next 20 years, and examines if any significant impacts are likely to occur to any wildlife species when/if additive effects are identified.

The EFSF is predominately public lands managed by Shasta-Trinity National Forest (97.4); with a very small portion (2.6%) as small in-holdings of private ownership. Past management activities occurred in the northern part of the watershed, within and adjacent to, project units; these past timber harvest activities along with continued wildfire suppression have resulted in primarily early and mid seral vegetation (with scattered individual larger trees remaining), and dense understory vegetation. As shown in Appendix F maps, currently there is some late successional habitat available for wildlife in project units (NSO foraging habitat) but most high quality habitat for late-successional dependent species (NSO nesting/roosting habitat) is in southern portions of the assessment area within LSR and Wilderness. The project has been designed by educated and experienced resource managers to improve forest health and reduce the risk of stand-replacing wildfire; the project is likely to accelerate the development of more resilient forest stands with large diameter trees because thinning treatments result in more nutrients, water, and space to grow for residual trees.

Proposed actions include localized and short term entries into identified units for thinning (timber removal) and associated fuels reduction. The project is likely to cause temporary disturbance to wildlife, although due to the small scale of effects (about 1% of the watershed treated, and highest quality habitat not disturbed) and implementation of surveys and limited operating periods for breeding spotted owls, disturbance effects are not likely to affect breeding populations of wildlife.

⁵¹ Size class 3 is approximately 13-24 inches DBH and size class 4 is greater than 25 inches DBH

Because project activities will not occur near perennial water, will not remove any riparian vegetation, and have been designed to minimize impacts to wildlife by retaining important habitat structures (snags, hardwoods, large downed logs and trees), and cover (post-project canopy closure greater than 60% in areas currently providing late successional habitat) the effects of the project to wildlife habitat would be temporary and minor. As described in *Section 3 Hydrology and Section 3 Fisheries*, project effects to water quality and quantity have been evaluated along with the effects of past and future foreseeable actions, and the analysis concluded that the project (with resource protection measures and BMPs) would have no measurable impact on water resources in the East Fork South Fork Trinity River. The beneficial effects of fuels reduction treatments and decreases in the risk of stand-replacing wildfire are difficult to predict and quantify. Considering the natural fire regime, and current departure from that regime (as explained in *Section 3 Fire and Fuels*), taking action to reduce the likely extent and severity of future wildfire is a clear positive effect of the project to wildlife resources.

There are no known, or reasonably foreseeable, future commercial timber harvest at this time for any lands in the assessment area. Reasonably foreseeable future actions within the project area could include small scale timber harvest on private lands; because private lands have already received past timber harvest lands in these areas don't currently provide suitable habitat for late-successional wildlife species. Other likely federal projects or activities planned in the assessment area include ongoing pre-commercial thinning in existing plantations, road decommissioning, grazing, and dispersed recreation. These activities would not result in effects that, when added to effects of this project, would have significant effects to wildlife species or their habitat.

Survey and Manage

Per the Survey and Manage Record of Decision (ROD), January 2001, all proposed treatment units have been surveyed to protocol for terrestrial mollusks. Following the *Survey Protocol for Terrestrial Mollusk Species from the Northwest Forest Plan October 29, 1997*, Survey & Manage protocol surveys were done in year 2000 for the East Fork project area and its vicinity. On the Yolla Bolla Ranger District, only one species of terrestrial mollusk remains in the category which requires predisturbance surveys; this species was not found in East Fork II units or assessment area.

Several bat species are protected under survey and manage LRMP guidelines. No caves, mines, and/or abandoned wooden bridges and buildings are proposed for treatment under project actions. Therefore implementation of the project is in compliance with this standard and guideline. In addition, many bats roost in large exposed snags, in cavities of live and dead trees, and within foliage of live trees. Dedicated attempts would be made to retain all large exposed snags, large live and dead oaks and other deciduous species. Potential exists for impact to individuals, but protection and persistence of key roost components would greatly minimize the significance of any impacts on overall populations.

Management Indicator Analysis

Proposed changes to Management Indicator Assemblages were analyzed in the project-level Management Indicator Assemblage Report included in the project record. As smaller, understory trees are thinned out, the overall average DBH in stands increases, shifting about 100 acres of assemblage habitat from the Open and Early Seral Habitat Assemblage category into the Late-Seral Assemblage Habitat category. The acres for the Late Seral Assemblage and Snag and Downed Log Assemblage habitat would increase to 765 acres, as these dense stands of pole-sized Douglas-fir trees are thinned out. The acres of Openings and Early Seral Assemblage habitat decreases to 294 acres for both action alternatives. The remaining seven management indicator assemblage habitat categories will not show any meaningful change.

The Forest-level Management Indicator Assemblage Report shows that Opening and Early Seral Assemblage habitat is declining on the Forest as young stands and plantations grow into the Late-Seral Habitat Assemblage type. This is consistent with the decline in timber harvesting since the beginning of the monitoring period (1994) and continuing wildfire suppression. The scale of the project is not sufficient to change the general habitat trends discussed in the Forest-level report. Within the context of general trends on the Forest, the changes in quantity and distribution of the assemblage habitats are not significant. The intensity of the project is not great enough to measurably alter the current Forest-level trends.

Migratory Bird Analysis

The Forest-level Migratory and Residential Bird Report documents trend information for over 200 native species of birds that occur on the STNF. This report reviews trend information for migratory and residential birds that occur in the area of the project. After consideration of habitat alterations occurring during implementation, migratory bird trends are reviewed in order to better identify which species might be most adversely affected by the project.

As stated before, the project would affect forest habitat, potentially disturbing behaviors such as nesting, foraging, temperature regulation and predator avoidance of forest-dwelling species. Of the 14 species with statistically credible population increases or decreases between 1966 and 2005, that occur within the Sierra Nevada BBS⁵² strata (the strata in which the project is located), 13 are decreasing and 1 is increasing. Of those 13 species in decline, 9 of the species are associated with Opening and Early Successional Assemblage habitat. Three species, the white-headed woodpecker, the Olive sided flycatcher and the mountain chickadee are associated with Late-seral Assemblage habitat. Of those three, the white-headed woodpecker population is increasing and the other two populations are decreasing.

More aggressive timber harvest policies prior to 1994 created larger amounts of open and early seral habitat and correspondingly decreased the amount of Late-seral Assemblage habitat. Decreasing harvest levels have allowed the large quantity of Open and Early seral forests to grow into Late-seral

⁵² The Forest contributes to collection of Breeding Bird Survey (BBS) data, and utilizes this data to evaluate management impacts on migratory birds. More information on BBS is online at <http://www.mbr-pwrc.usgs.gov/bbs/>

Assemblage habitat. Declines of species associated with the open and early seral assemblage may reflect this decline of available habitat.

Proposed thinning may have the following effects on resident and migratory birds:

- Thinning may increase the risk and occurrence of predation, impacting mortality rates, reproduction success and foraging patterns⁵³
- Although unlikely to extirpate birds from the project area,⁵⁴ thinning is likely to disfavor some species and favor others, decreasing local occurrence in some and increasing local occurrence in others
- Project activities, in those areas not restricted from operations during the breeding season by a limited operations period, may impact breeding birds, displacing nests of shrub and tree nesting species, possibly killing nestlings still bound to the nest
- Migratory birds would be temporarily displaced from activities such as foraging in the immediate vicinity of the operations due to disturbance
- Disturbance in operational areas may create a short term flush of available prey to some raptors, as prey species could be temporarily disoriented by habitat changes

Project effects to migratory birds are local and for the most part, short-term. Although there may be some level of local nesting failure, and increased predation for some species, others will find the changes beneficial and are likely to respond well to the project.⁵⁵ The scale of the proposed project is well within the general scale of natural disturbance regimes in the Klamath province. These smaller, patch effects are similar in nature to the small blowdowns, short-term lightning fires and other disturbance events common in the area. None of the birds listed as decreasing are endemic to the area, and all have extensive ranges and are able to respond to disturbance events such as these by shifting their activities. Within the context of the STNF and the bioregion, the intensity of this project is not likely to significantly or measurably affect the population trends of these birds.

Preliminary Finding of No Significant Impact

The following is a summary of the project analysis for significance, as defined by NEPA (40CFR 1508.27). “Significantly” as used in NEPA requires consideration of both context and intensity of the expected project effects.

Context means that the significance of an action must be analyzed in several contexts (i.e. local, regional, worldwide), and over short and long time frames. For site-specific actions, significance usually depends upon the effects in the locale rather than in the world as a whole. Silvicultural thinning (with associated landing and road activities) are proposed on approximately 1,000 acres of Matrix designated lands⁵⁶ within East Fork South Fork Trinity River Watershed (about 24,000 acres). This watershed is designated by the LRMP as key watershed⁵⁷ for maintenance/restoration of

⁵³ Gomez et al. 2005

⁵⁴ Hayes et al. 2003

⁵⁵ See Hayes et al.1997, for a list of species and their individual effects

⁵⁶ Matrix lands were designated by the Northwest Forest Plan and STNF LRMP for programmed timber harvest in the context of ecosystem management

⁵⁷ LRMP, pg 4-58

fisheries habitat. Although this thinning project would result in short-term environmental effects (as described in EA Section 3), these effects are likely to be minor and discountable for all resources affected and the project is not likely to negatively affect any fisheries habitat. The project includes specific resource protection measures (EA Section 2 and Appendix C), and these measures ensure that potential sediment-related effects of the project will be adequately minimized. The fisheries BA concluded that the project would not adversely affect coho salmon, or their designated Critical Habitat. In context, the effects of the project are not “significant” as described in NEPA.

Intensity refers to the severity of expected project impacts. The following factors were considered to evaluate intensity.

1. Beneficial and adverse impacts

Both beneficial and adverse effects have been taken into consideration and displayed in this EA. Beneficial effects have not been used to offset or compensate for potential adverse effects. Singularly and collectively, the resources affected by all alternatives are not expected to experience significant impacts. The adverse impacts associated with the project include localized soil disturbance and changes in erosion for the first several years post-project (see Soils and Hydrology effects discussions). These short-term watershed-related effects are expected to be minor and localized, and the project would not have significant effects to water quality or species that depend upon it. The long-term beneficial effects of the action alternatives are increased stand health and vigor. The project contributes to an overall management goal of increasing stand resiliency to natural disturbances (drought, insects, wildfire), and encouraging the development of late successional habitat (particularly in LSR).

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 may experience minor traffic delays and temporary closure of some roads during project activities to ensure safe public travel. Smoke resulting from prescribed burning could be an adverse impact to public health; however, the project proposes to mitigate this impact to acceptable levels by allowing burning within an air shed only as approved by the North Coast Unified Air Quality Management District.

3. Unique characteristics of the geographic area

The characteristics of the project area do not make it uniquely sensitive to the effects of the project. The project area is within key watershed, as designated by the LRMP (about 474,000 acres on the STNF is key watershed). All key watershed areas are not “ecologically critical areas,”⁵⁸ and habitat accessible to fish in key watersheds varies from high quality habitat to inaccessible or degraded conditions. Most stream habitat in the assessment area is not accessible to anadromous fish, only the East Fork South Fork Trinity River and lowest reach of Prospect Creek are accessible due to a natural barrier. Designated Critical Habitat for ESA-listed coho salmon is greater than one mile downstream

⁵⁸ As defined in NEPA (40 CFR 1508.27)

of the project, and currently coho salmon are known to occur about 40 miles downstream. Management activities in key watersheds are restricted to support the maintenance and/or restoration of fisheries habitat, and the project supports attainment of these objectives. Most of the project area does not have high risk of surface erosion or fine sediment production. Areas identified as having geologically unstable characteristics have been eliminated from project units, and soils and water resources in the area will be adequately protected by project-specific resource protection measures (EA Section 2), and BMPs (Appendix C).

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

The effects of the project are not likely to be highly controversial among professional experts. Timber sale projects have been implemented in this area for most of this century, and commercial thinning projects have comprised the majority of Forest Service timber-related projects within the last 10 years. The East Fork II Environmental Assessment incorporates practices and procedures technically accepted by experts and commonly practiced to protect the environment (See resource protection measures in Section 2 and BMPs in Appendix C).

5. The degree to which the possible effects on the human environment are highly uncertain or involve unique or unknown risks

Implementation of the project does not represent unique or unknown risks and are not considered highly uncertain. This project is common to other vegetation management projects involving commercial thinning and harvest of dead, dying, and diseased trees. Similar projects, having similar environmental effects, have occurred elsewhere on the Shasta-Trinity National Forest and on other public and private lands in Northern California, with effects that are known and studied. Field review of completed East Fork Project units by resource professionals (soils, geology, hydrology, and fuels specialists) found that effects were at, or less than, those predicted in the original East Fork EA.

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

This decision does not set a precedent for future decisions. Any future decisions will need to consider all relevant scientific and site-specific information available at that time. Specifically, the decision to implement the project does not imply approval of other future timber sales. There is some concern that establishing a maximum size (DBH) of trees to be harvested on Matrix lands (Alt 3), without a scientific rationale for why a specific size is identified, could set a precedent for future timber management that is not consistent with the direction set forth by the LRMP. The LRMP directs that a portion of the STNF landbase (about 13%) is designated as Matrix lands, Commercial Wood Products Emphasis (see EA Section 1). On these lands timber stands are to be managed to obtain optimum growth and yield, in the context of ecosystem management.⁵⁹ The rationale for analyzing a diameter limit for timber harvest on this project relates to the public involvement and court direction for this

⁵⁹ LRMP, pg 4-67

specific project.⁶⁰ The STNF recognizes that implementing diameter limits for timber harvest on Matrix lands may depart from the multi-resource objectives of the LRMP, and therefore alternatives developed for this project should not be considered precedent-setting for future actions.

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

The comprehensive environmental analysis summarized in this EA supports the conclusion that the project is not likely to result in any cumulative adverse impacts when considered in combination with other past or reasonably foreseeable actions (shown in Appendix E). The only actions on National Forest lands within the watershed other than this action that are reasonably foreseeable are low impact treatments including activities such as precommercial thinning, fuels reduction treatments, and watershed restoration. Past actions, when considered with the effects of this project, are not expected to have adverse cumulative effects on any resource. Cumulative effects were analyzed for each resource affected; the results are summarized in this EA, Section 3.

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 resource

The project area has been inventoried for cultural resources. Known sites will be avoided to ensure there are no adverse effects. The approved actions may be implemented without any further consultation or review in accordance with the Programmatic Agreement for Compliance with Section 106 of the National Historic Preservation Act, Pacific Southwest Region.

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

The project wildlife biological assessment/evaluation (BAE), available in the project record and summarized in Section 3 and Appendix D of this EA, determined that the project **may affect, but is not likely to adversely affect** the bald eagle and Northern spotted owl (Federal ESA-listed species). The project is not likely to result in adverse impacts to any threatened or endangered species. Because actions proposed are of small scale, would retain key habitat components in compliance with Forest standards, and are likely to accelerate development toward late-successional old growth conditions within treated stands that have existing habitat, the Wildlife BAE determined that the proposed action **would not adversely affect** Northern spotted owl Critical Habitat. The USFWS provided a letter of concurrence to validate determinations in the wildlife BAE.

The fisheries Biological Assessment (BA) concluded with a determination of **may affect, but is not likely to adversely affect** coho salmon and coho salmon Critical Habitat (Federal ESA-listed species). Implementation of project BMPs (Appendix C) and resource protection measures (EA Section 2) is critical for protecting local water quality and fisheries resources. The project promotes

⁶⁰ See Section 2 for more information about alternative development for Alternative 4

long-term improvements in water quality by taking action to reduce the probability of future stand-replacing wildfire. The National Marine Fisheries Service provided a letter of concurrence to validate determinations of no adverse effects in the fisheries BAE.

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

Implementation of the project does not 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 the National Forest Management Act (NFMA), Endangered Species Act (ESA), Clean Water Act (CWA), and the Shasta Trinity National Forest LRMP.

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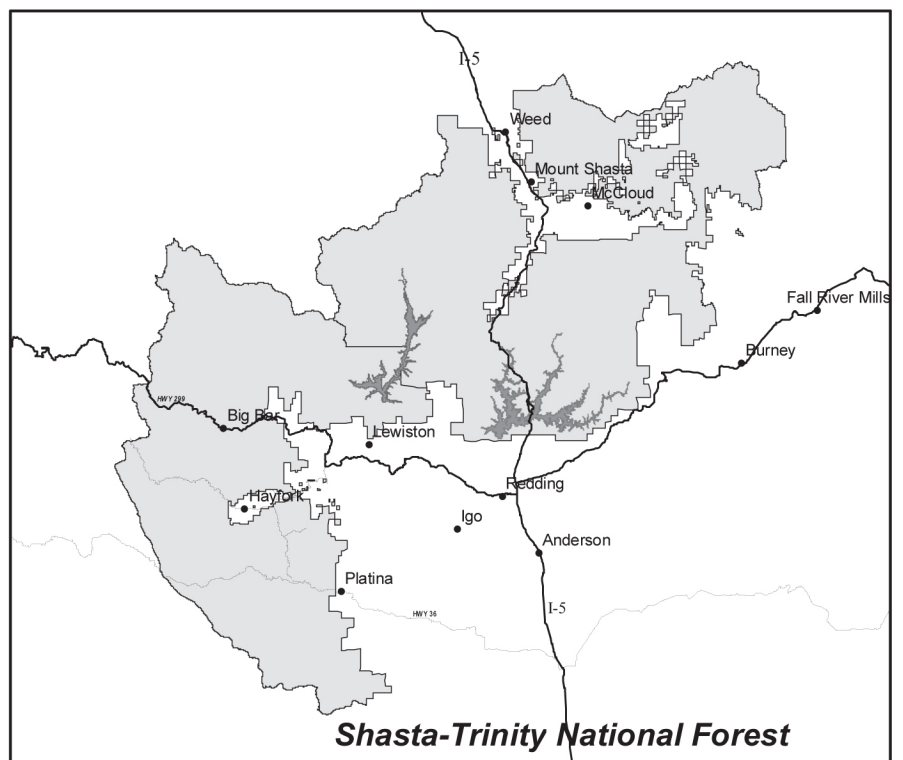
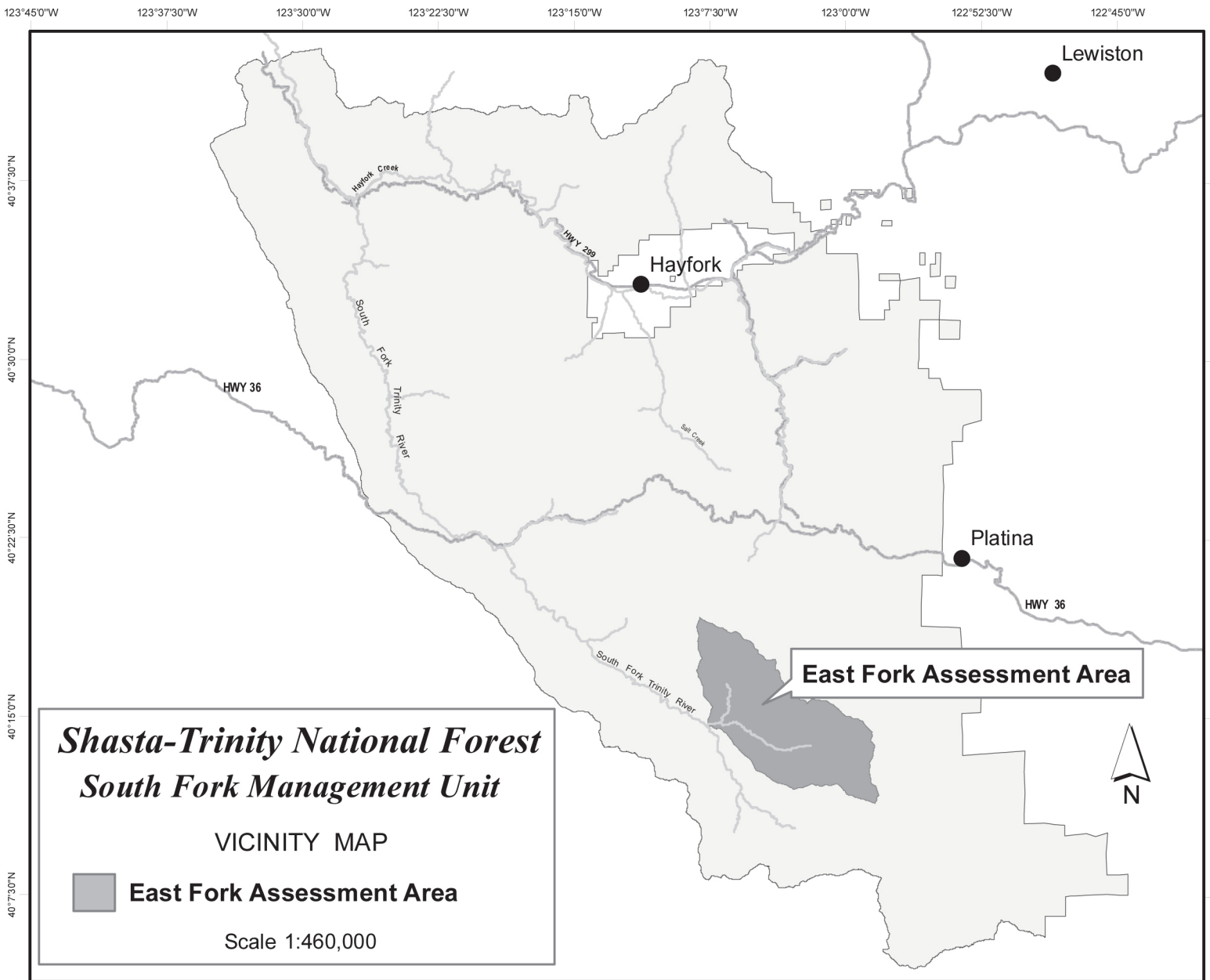
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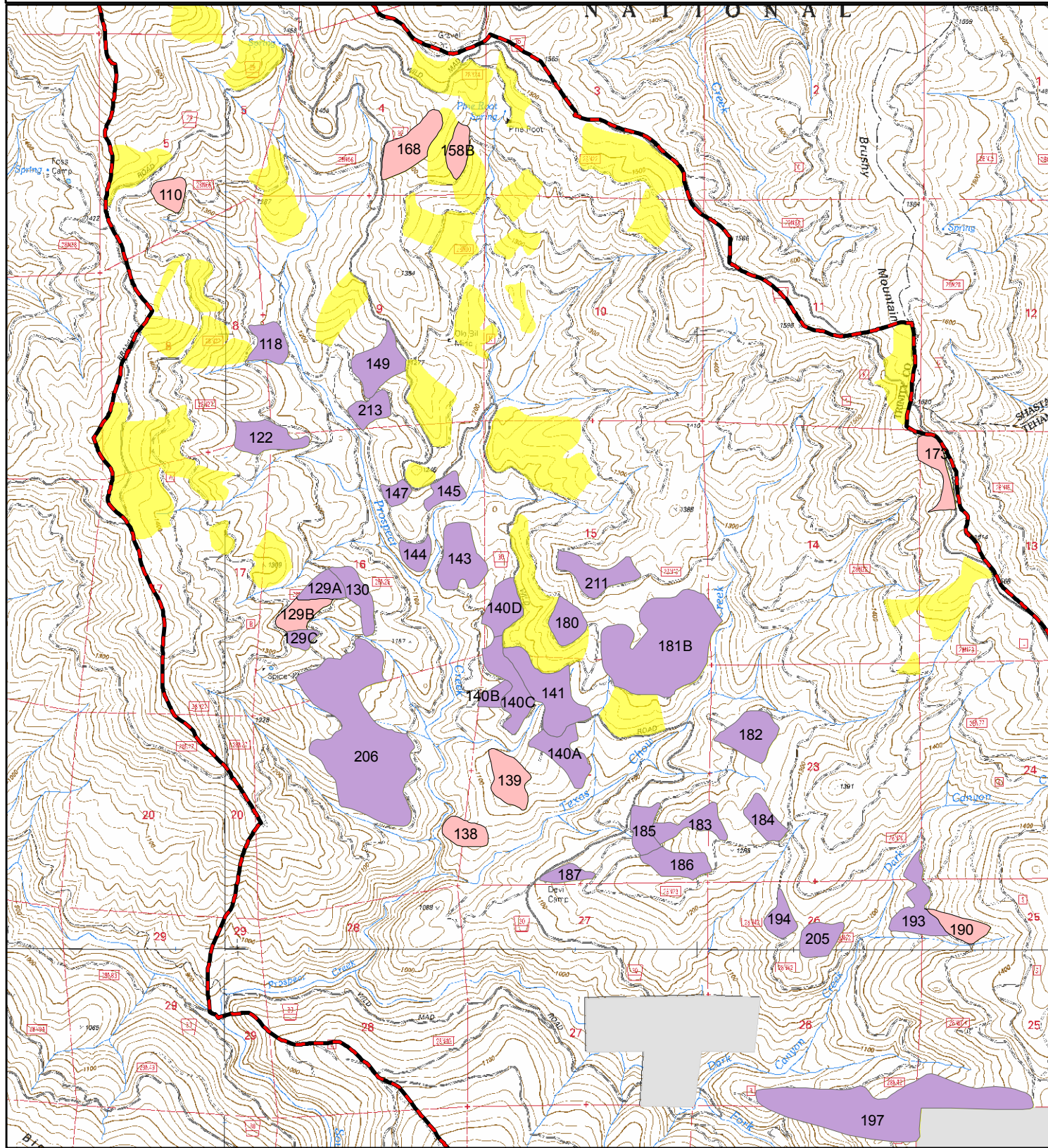
Appendix A
Project Maps



Proposed Units by Treatment:

EAST FORK II PROJECT - Proposed Action

 Assessment Area  Helicopter  Tractor  Completed



 Forest Service Land
 Private Land

 Streams
 Roads

 302  36  A  30N21 Road# Symbols

0.6 0.3 0 0.6 Miles



Scale 1:40,000





Appendix B

Public Scoping Comments
and Responses

Appendix B: Public Scoping Comments and Responses _____

Summary

The East Fork II Project was listed in the Schedule of Proposed Actions (SOPA) for the Forest (Shasta-Trinity National Forest) in September 2007. On September 5, 2007 an advertisement ran in the *Redding Record Searchlight* briefly describing the project, and the following week a scoping letter was mailed to interested individuals. The Forest received 12 letters from the public during this scoping period for the East Fork II Project. The Forest reviewed the comment letters and extracted issues for consideration in the preliminary EA. Issues are points of concern or debate over the environmental effects of a project. Significant issues are conflicts with the proposed action that become the basis for development of additional alternatives aimed at still meeting the purpose and need. The significant issue that was identified through scoping centers on the removal of larger trees in this thinning project. Public consensus over the definition of a large tree is problematic. As a result, in the EA the Forest explains a project-specific definition of a large tree, and uses this measure to develop and analyze the effects of Alternative 3.

Response to Comments

Exact quotes from public comment letters are used wherever possible to most accurately capture public concerns. The Forest focused on extracting comments relating to potential issues about the project. General statements of support, or disapproval, that do not provide sufficient project-specific information from which to respond, are not included here. All general requests from public letters were considered during EA development, although every item may not appear in this summary. Original full-text comment letters are in the project record.

Input from timber-related public

Six of the letters received were from timber industry businesses and/organizations; Trinity River Lumber Company (TRL), American Forest Resource Council (AFRC), Sierra Pacific Industries (SPI), California Forestry Association (CFA), and Timber Products Company (TPC). Below is a summary of their comments:

Comment #1 (TRL, AFRC, SPI, CFA, TPC)

I ask that you seriously consider using the Healthy Forests Restoration Act (HFRA) NEPA process for this project. This would save time by limiting the number of alternatives and reduce the potential for appeals.

Response: The STNF considered using the HFRA authorities for the East Fork II Project. Although the project may meet the definition of “authorized” or “covered” by the HFRA, the Forest decided not to use the authority due to project-specific considerations of timing and court direction for alternative development.

Comment #2 (TRL, AFRC, SPI, TPC)

I encourage the use of the economic program, “Region 5 Timber Sale Marketing Analysis and Sale Evaluation Study”. I ask that you carefully assess and review proposed restrictions/mitigations; additional mitigation items require contractors to incur additional costs on projects that may have marginal economics.

Response: A Forest Service economic analysis comparable to that cited above was conducted for East Fork II. The results are summarized in the EA and the full analysis is available in the project record.

Comment #3 (TRL, AFRC, SPI, CFA, TPC)

How long will the proposed thinning treatments be effective and when will additional treatments be necessary to meet your project objectives of forest health and fire hazard reduction?

Response: Field review of completed East Fork Project units by fuels specialists found that in most treated areas, additional treatments like underburning are not necessary to meet the stated project objectives. Because vegetation conditions are similar in the proposed East Fork II Project units, it is unlikely that additional fuels treatments would be necessary. Based upon current stand conditions, the next re-entry treatment would be in approximately 15-20 years.

Comment #4 (TRL, AFRC, SPI, CFA, TPC)

I do not support alternatives that set diameter limits because they are arbitrary designations that do not have any silvicultural merit. They are counterproductive to meeting your purpose and need statements and unnecessarily consume time for your employees driving up project planning costs.

Response: The diameter limits analyzed in Alternative 3 were developed in response to public scoping and court direction for the original East Fork Project. More discussion of diameter limits is in EA Section 3 – finding of no significant impact.

Comment #5 (AFRC)

Conventional harvesting should have at least 3-5 mbf/acre to pay for associated logging costs. For cable harvesting, there should be an average of 7-10 mbf/acre to cover costs; minimum volume for a project proposing to use cable harvest should be between 1-2 mmbf. When proposing to helicopter log the volume should be greater than 10 mbf/acre; minimum volume for a project utilizing helicopter harvesting should be greater than 2 mmbf. Flight distances to landings should be no more than ¼ mile.

Response: Similar operability guidelines influenced the original design of the project. Although the EA analyzes the effects of a less economically-viable alternative, the project still aims to provide economic opportunities in the context of ecosystem management.

Input from groups and individuals about environmental impacts

The following comments from 6 individuals express environmental concerns related to the project. Commenters are: Mary Lee Steffensen (MLS), Karen Wilson (KW), Conservation Congress (CC), Anastasia Dodson (AD), Marilyn McKinney (MM), and Joseph Bower (JB). Each comment may contain comment statements from multiple individuals.

Comment #1 – Roads, Landings

Road 28N66 needs to be completely decommissioned (MLS, KW).

We request the current road density be cited in the EA (CC). We would like to know how many forested acres will be removed for new landings, and the associated impacts to loss of habitat, water quality and soils.

Response: The East Fork/Smokey Watershed Analysis (1998) recommended decommissioning the full length (2.5 miles) of road 28N66. In 2002 the STNF completed the East Fork Roads Analysis Process (RAP) document, which further evaluated environmental impacts and benefits for each road segment in the assessment area. As recommended in the WA, the last 1.3 miles of 28N66 has been decommissioned, and removed from the Forest Service road system. As described in the East Fork RAP document, the first 1.2 miles of the road are needed for current and future foreseeable management in the area (commercial and pre-commercial thinning, and reasonable wildfire management access). The RAP document recommends that the first 1.2 miles receive reconstruction,¹ primarily to address drainage issues. These areas will receive spot rocking, and maintenance to prevent drainage issues. Current road density for the East Fork South Fork Watershed is approximately 3.5 miles per acre; although a southern portion of the watershed is roadless (about 9 mi²). Approximately 8 acres would be affected by new landing construction for the project. Associated impacts to soils, wildlife and fisheries habitat, and water quality were evaluated, and effects would be well below established adverse effect thresholds for each resource. The results of analyses are summarized in the *EA Section 3*. Comprehensive specialist reports for soils, wildlife, fisheries, and hydrology are in the project record, and available for public review.

Comment #2 – Riparian areas, ACS

No activity in riparian areas (MLS, KW). The amount of ground disturbance (caused by original project) is totally unacceptable for an area designated as key watershed, and is going to contribute significant amounts of sediment to the South Fork system (JB).

Please explain precisely how logging in riparian reserves is necessary to attain ACS objectives (CC). We request assurance for the public that the Forest is indeed adhering to the ACS for this project (CC).

Response: The project does not propose activity within riparian vegetation. Only outer portions of Riparian Reserves associated with ephemeral or intermittent channels would receive treatment, and no riparian vegetation would be affected by the project. Most RR in the watershed would be

¹ In the RAP, road reconstruction is defined as road improvements required due to an anticipated increase in traffic, or haul capacity. Activities may include culvert upgrades, grading, rocking, and improving drainage.

unaffected, and no RR associated with perennial streams would be affected. Within the assessment area, there are approximately 44 miles of perennial streams and 3,200 acres of associated RR, all of which will be left undisturbed. Approximately 16,600 acres (about 26 square miles) of the assessment area has intermittent and ephemeral streams, with associated RR, that will also remain undisturbed (this estimate includes all land designations, not only RR acres). Post-project field review of completed East Fork Project units was conducted by a professional geologist, hydrologist, and soils scientist. Results indicated that ground disturbance associated with the original project is within an acceptable range, in compliance with ACS standards and guidelines and the Clean Water Act. The hydrology analysis found that project-related sediment is not likely to be delivered to the South Fork Trinity River at any detectable, or meaningful, level.

Thinning in RR supports the development of stands that are more resilient to natural disturbances such as insects, drought, and wildfire. The project-level ACS documentation is in *EA Appendix E*, and the project Fisheries Biological Assessment.

Comment #3 – Climate change

The EA needs to consider climate change (MLS, KW).

Response: Although there is solid scientific consensus that global climate change is occurring, there is still much uncertainty about subsequent ecological interactions and trends at the local or site-specific scale. At this time, the best available science concerning climate change is not adequate to support reliable predictions about ecological interactions and trends at the local (site-specific) scale. The Forest Service evaluates the influence of global climate change on ecosystem management as part of the 2000 Renewable Resources Planning Act. More information can be found at <http://www.fs.fed.us/research/rpa/2005rpa/2000-RPA-Assessment-Update.pdf>

Comment #4 - EIS

An EIS is required for this project (KW).

Response: After review of the interdisciplinary effects analysis, the STNF determined that the project is not likely to cause significant environmental effects, as described by NEPA (40CFR 1508.27). Therefore an EIS is not required (see *EA Section 3-finding of no significant impact*). In addition, the Eastern District Court of California determined that the project did not require preparation of an EIS and the preparation of an EA is consistent with the instruction provided on remand to the district court by the Ninth Circuit. See Environmental Protection and Information Center v. U.S. Forest Service, No. 02:04-1705 (E.D. Cal. Aug. 19, 2005); Environmental Protection and Information Center v. U.S. Forest Service, No. 05-17093 (9th Cir. May 9, 2007).

Comment #5 – Request for documents

Please provide me with copies of baseline reports and any results on an ongoing basis (KW). Please provide a copy of the biological opinions from other agencies for East Fork I (KW). We request that copies of the BA, BE, and MIS Report be included in the EA for public review (CC).

Response: The commenters were sent the requested documentation, via hard copy mail, at the time of EA distribution (beginning of comment period).

Comment #6 – The original project

Was the purpose and need fulfilled (KW)? The many huge piles resulting from the original project are unacceptable and have created fire danger (KW, JB). What and where are the soil erosion prevention measures taking place (KW)? Were all the other agencies involved in making decisions that led to East Fork I (KW)?

The original project failed to accomplish the purpose and need (JB). Many of the leave trees are in dense clumps with ground and ladder fuels under them (JB). Other parts of units have extensive open ground with all trees removed, the result will be rapid invasion of brush (JB).

Response: Results of post-project field review on completed units showed that original project objectives were achieved in most treated areas. Ground and ladder fuels were reduced, with expected and acceptable levels of ground disturbance (see Appendix D photos). Fuels specialists found that post-project fuels conditions were at, or better than, the effects predicted in the original East Fork EA. Existing landing piles of submerchantable material are being utilized for chipping, consistent with the purpose and need/proposed action of the project. All appropriate interagency consultation occurred for the East Fork Project. Soil erosion prevention measures were designed to adequately minimize the risk of erosion-related impacts (See Section 2 and Appendix C). Monitoring of completed units has shown that these protective measures are being implemented successfully.

Comment #7 – Interagency involvement

Which other agencies are being consulted for East Fork II (KW)?

Response: The project included interagency involvement with the U.S. Fish and Wildlife Service, National Marine Fisheries Service, and U.S. Environmental Protection Agency (via North Coast Water Quality Control Board).

Comment #8 – Economics

What was the monetary profit gained by the public stakeholders in implementing East Fork I (KW)? Please provide an income and expense breakdown (KW). Please provide a detailed cost basis for what has already taken place and what is being proposed (AD).

Response: The relevant economic analysis for the project is summarized and disclosed in EA Section 3.

Comment #9 – Large trees

Are any large trees proposed for removal (KW)? Thinning is acceptable only in the Matrix and should not include any large trees (KW). Removing large legacy trees is a mistake, these need to be preserved (JB).

The EA should clearly display how the logging of LSR, fire-resistant trees will aid in reducing stocking levels and decrease the chance of fire, particularly if smaller saplings and brush are left in the project area (CC).

Response: These concerns were primary considerations in development of Alternative 3. Timber stands proposed for treatment are classified as size class 2 or 3.² Trees of size class 2 (also called pole-sized timber) are approximately 6-12 inches DBH and size class 3 (small sawtimber) are 13-24 inches DBH. With the proposed action (Alternative 2), no diameter size limit is set, and most trees removed are less than 30 inches DBH. According to timber cruise estimates from the original East Fork Project, no trees greater than 33 inches DBH would be removed. In the East Fork project area, 151,500 trees were cruised to get an estimate of tree sizes proposed for removal. The cruise identified that about 187 trees between 30 to 33 inches DBH would be harvested with the proposed action. Trees from 30-33 inches DBH may be removed only if they are within Matrix and show clear signs of mortality within the next 10 years. For the proposed action, this means that for every ten acres of harvest 2 large trees would be removed. For Alternative 3, no trees greater than 30 inches DBH would be removed. Also, no trees greater than 12 inches DBH would be removed in RR and LSR areas, and unit 138 is dropped. Some RR and LSR area within project units would not be treated due to accessibility problems (approximately 10 acres).

Field review of completed East Fork units by fuels specialists showed that, even though some smaller trees and brush remained in treated areas, fuels and associated fire hazard were substantially reduced while effectively maintaining suitable ground cover and wildlife habitat.

Comment #10 – Range of alternatives

The analysis should include a range of alternatives that can meet the purpose and need through a variety of methods, including prescribed fire (CC). We also request an alternative that examines the least impact to wildlife species, including MIS, TES, and aquatic species (CC). We would like to see an alternative that abstains from logging riparian reserves (CC).

Response: The East Fork interdisciplinary team considered the likelihood of accomplishing the stated purpose and need using only prescribed fire or other non-commercial harvesting methods. That alternative (Alternative 4, fire only) is described in *Section 2 – Alternatives Considered but Eliminated from Detailed Study*. Fuels specialists conclude that without thinning the existing overstocked and dense multilayered stands, future underburning in this area would be extremely difficult and costly and is not likely to meet management goals and objectives. Trees proposed for removal by this project have a high probability of being damaged beyond recovery if underburning was attempted without thinning. They would provide a fuel ladder to overstory canopies making fire control difficult and crowning likely. Without thinning as a pre-treatment, underburning in these stands is hazardous because risk of stand-destroying fire would be too high. Both action alternatives have minimal impacts to wildlife and aquatic species; however, Alternative 3 was developed to further reduce potential impacts of the project to fish and wildlife species and their habitat, while still

² Described in LRMP, Appendix D

aiming at achievement of the identified purpose and need and consistency with the multi-resource objectives of the LRMP. The effects of both action alternatives are not likely to negatively impact protected fish or wildlife, or have any meaningful effect on animal populations.

Comment #11 – Wildlife habitat analysis

The CC requests that a pre and post habitat analysis is included in the EA including the habitat needs of each MIS and TES (CC). We would also like to see how fragmentation from the proposed project will affect habitat use when measured cumulatively (CC). When (what time of year) will the project be implemented, and what mitigation measures will be implemented to ensure compliance with the Migratory Bird Treaty Act (CC)?

While the project is only removing a little old growth, it will result in the whole project area being less usable for old growth-dependant species (JB).

Response: The project does not propose activities in old growth habitat, and project effects to several old-growth dependant species (spotted owl, Pacific fisher, Northern goshawk) were analyzed and documented. The project maintains quality habitat for these species, and would not reduce habitat connectivity in the area. A pre and post project wildlife habitat analysis was completed, and fragmentation is addressed in the “Connectivity” discussion in *EA Section 3 Wildlife*. The project-level and forest-level MIS analysis is summarized in EA Section 3, and is available in the project record. Potential project effects to migratory birds were evaluated and results are summarized in the EA Section 3. The Migratory Bird Treaty Act implements various international treaties and agreements and prohibits the intentional taking, killing or possessing of migratory birds. It is a criminal statute and does not by itself compel any analysis of migratory birds prior to forest management.

Comment #12 – LRMP, Planning

We request that the Management Area designated in the LRMP involved in this project be cited in the EA (CC). Please state upfront in the EA which NFMA regs are being used (CC).

Response: The project is within the South Fork Mountain Management Area (see LRMP, pg 4-161). The project implements management direction contained in the LRMP and described in the EA Section 1, consistent with the requirements of NFMA.

Comment #13 – Project planning

Please do not thin in remote areas of forests, especially in headwaters of the Wild and Scenic South Fork Trinity River (MM).

Response: The project is not proposed within designated Wild and Scenic River corridors. The project will not affect riparian vegetation, or cause adverse impacts to the East Fork South Fork or the South Fork Trinity River. Due to the current high fuel loading in the project area there is elevated risk of stand-replacing wildfire, along with associated adverse impacts to watershed resources. The project is proposed in stands that have had previous timber harvest and is designed to increase forest health and resiliency in support of watershed and fisheries habitat restoration goals.



Appendix C

Project Best Management
Practices

Appendix C: Project Best Management Practices _____

Table C-1. Timing of Erosion Control Work

Description of Erosion Control Measure	Applicability of Erosion Control Measure to Project	BMP	Reference
Work before winter storms begin.	Applies to project area	1.5	C6.6
Purchaser monitors and maintains erosion control work.	Until accepted by FS (see monitoring section below)	1.13, 1.20	C6.6

Table C-2. Skid Trails

Description of Erosion Control Measure	Applicability of Erosion Control Measure to Project	BMP	Reference
Use designated skid trails.	Applies to project area	1.10	C6.422#
Use water bars (per Timber Sale Admin. Handbook specifications).	Applies to project area	1.13, 1.17	C6.6
Install more than normal number water bars on skid trails (>35% slope).	Water bar every 20 to 40 feet on >35% slopes	1.13, 1.17	C6.6
Spread appropriate material on skid trails to achieve a minimum 50% ground cover. Material may consist of either: fine slash, wood chips, weed-free or rice straw, or any combination.	Applies to project area where needed to attain 50% cover, such as >35% slopes or where steeper skid trails enter landings	1.14	C6.602
Skid trails generally restricted to <35% slope.	Applies to project area	1.9	STLRMP
Use skid trails when soil is dry to 4 inches deep.	Applies to project area	1.13	WW/WO
Install silt fences between skid trail and culvert when slope distance is <50 feet.	Applies to project area	1.14	C6.602
Use existing skid trails to the extent possible to minimize the number of skid trails.	Applies to project area	1.10	C6.422#
Rip (with winged subsoiler to 18 inches deep) and mulch primary skid-trails (last 200 feet to landing).	Applies to project area	NA	C6.606, C6.607

Table C-3. Skyline Cable Yarding

Description of Erosion Control Measure	Applicability of Erosion Control Measure to Project	BMP	Reference
Require one-end suspension.	Applies to project area	1.11	C6.427
Use water bars on skid corridor (per Timber Sale Admin. Handbook specs).	Applies to project area	1.17	C6.6, C6.602
Full log suspension across streamcourse protection zones.	Applies to project area	1.11, 1.19	C6.427
Cable corridors on contour (or acute angle to slope) require breaches in downhill side berm in lieu of water bars.	Applies to project area	1.17	C6.602

Table C-4. Landings

Description of Erosion Control Measure	Applicability of Erosion Control Measure to Project	BMP	Reference
Existing landings located within Riparian Reserves will be reused, expanded as needed and appropriate. However, no landing will be expanded into Streamcourse Protection Zones.	Applies to project area	1.12	IDT
Landing areas with slopes less than 25% and greater than 1 acre should have natural non-constructed designs.	Applies to project area	1.16	IDT
Outslope landings.	Applies to project area	1.16	C6.601 C6.602
Wing subsoil all landings (minimum 18 inches deep).	Applies to project area	1.16	C6.606, C6.607
Retained landings scarify to 6 inches	Applies to project area	1.16	C6.603
Seed and mulch landings.	Applies to project area within riparian reserves	1.14, 1.15	C6.601
Divert skid trail and road runoff from crossing landing.	Applies to project area	1.16	SA,C6.601
If runoff must cross-landing, design landing drainage in a way to prevent rilling and gulling of fill slope.	Applies to project area	1.16	C6.602
Pull organic materials out of fill slope of landings if necessary to prevent collapse.	Applies to project area	1.16, 2.10	C6.602
When building landings, layer place and compact soil material on fill slopes.	Applies to project area	1.16, 2.10	C6.602 (2/1/00)
Seed and mulch landing fill slopes.	Applies to project area	1.14, 1.15	C6.601, C6.6
Place silt fence below landing fill slope during wet weather operations if runoff is causing erosion.	Applies to project area	1.14	WW/WO, C6.6, C6.602

Table C-5. Use of Mechanized Equipment in Riparian Reserves

Description of Erosion Control Measure	Applicability of Erosion Control Measure to Project	BMP	Reference
No tractor yarding or piling in streamcourse protection zones.	Applies to project area, unless specifically designated	1.8, 1.19	C6.422, C6.5, C6.61
No heavy equipment in streamcourse protection zones, except at designated crossings. Streamcourse Protection Zones are defined to be 50 feet from the high water mark of the stream course, or the inner gorge, or as designated on the ground by flagging or signing.	Applies to project area, unless specifically designated	1.8, 1.19	C6.422, C6.5, C6.61

Table C-6. Roads

Description of Erosion Control Measure	Applicability of Erosion Control Measure to Project	BMP	Reference
Spot rocking of native surface roads with aggregate if used during wet weather operations.	Applies to project area	2.7, 2.23	WW/WO
Install silt fences at culvert outlets if road will be used during wet weather.	Applies to project area	2.7	WW/WO
Mulch and seed new or disturbed fill slopes.	Applies to project area	1.14, 1.15	C6.601
No debris disposal within Streamside Management Zones, meadows, wetlands. Streamcourse Protection Zones are defined to be 50 feet from the high water mark of the streamcourse, or the inner gorge, or as designated on the ground by flagging or signing.	Applies to project area	1.19, 2.11, 2.19	T-802, T-803, C5.4



Appendix D

Project Photos and
Fuels Modeling

Appendix D: Project Photos and Fuels Modeling _____



Represents fuel model 10 – existing condition in most areas proposed for thinning treatment. This is taken pre-project looking down into unit 120 of original East Fork Project.



Represents fuel model 11 – post-project unit 142B of original East Fork Project. A portion of units would be represented by this fuel model post-project.



Represents fuel model 8 – post-project in unit 171 of original East Fork Project. A portion of units would be represented by this fuel model post-project.

Behave Fuel Modeling Output

EAST FORK II
 ALT - 1
NO ACTION

FUEL MODEL 10 -- TIMBER (LITTER AND UNDERSTORY)

In a Fire Behavior Fuel Model 10 fires burn in the surface and ground fuels with greater intensity than the other timber litter models. Crowning out, spotting, and torching of individual trees are more frequent in this fuel situation, leading to potential fire control difficulties. Fire spreads through high loadings of dead and down woody fuels beneath over-mature timber stands. Shrub understory or tree reproduction may be present. Much of the woody material is over 3 inches in diameter. Any forest type may be considered if heavy down materials are present; examples are insect or disease-ridden stands, wind thrown stands, over-mature situations with deadfall, and aged light thinning or partial cut slash. Torching of individual trees and spotting is more frequent, and fire intensity is higher in this model than model #8 or #9, thereby leading to potential fire control difficulties.

FUEL MODEL 10 -- TIMBER (LITTER AND UNDERSTORY)

RATE OF SPREAD, CH/H ----- 34.
 HEAT PER UNIT AREA, BTU/SQFT -- 1511.
 FIRELINE INTENSITY, BTU/FT/S--- 955.
FLAME LENGTH, FT----- 10.6
 REACTION INTENSITY, BTU/SQFT/M 6944.
 EFFECTIVE WINDSPEED, MI/H----- 10.6

1 HOUR BURN TIME

BURNED ACRES ----- 27 acres

2 HOURS BURN TIME

BURNED ACRES ----- 106 acres

3 HOURS BURN TIME

BURNED ACRES ----- 240 acres

4 HOURS BURN TIME

BURNED ACRES ----- 426 acres

TREE MORTALITY LEVELS PREDICTED FROM THE ABOVE OUTPUTS

MORTALITY-LINKED-TO-SCORCH

SCORCH HEIGHT, FT ----- OUTPUT FROM SCORCH = 107.
TREE HEIGHT, FT ----- 20.0
 BARK THICKNESS, IN ----- .5
MORTALITY LEVEL 99. %
 CROWN SCORCH VOLUME 100. %

SCORCH HEIGHT, FT ----- OUTPUT FROM SCORCH = 107.
TREE HEIGHT, FT ----- 40.0
 BARK THICKNESS, IN ----- 1.0
MORTALITY LEVEL 96. %
 CROWN SCORCH VOLUME 100. %

SCORCH HEIGHT, FT ----- OUTPUT FROM SCORCH = 107.
TREE HEIGHT, FT ----- 60.0
 BARK THICKNESS, IN ----- 1.0
MORTALITY LEVEL 96. %
 CROWN SCORCH VOLUME 100. %

SCORCH HEIGHT, FT ----- OUTPUT FROM SCORCH = 107.
TREE HEIGHT, FT ----- 80.0
 BARK THICKNESS, IN ----- 1.0
MORTALITY LEVEL 96. %
 CROWN SCORCH VOLUME 100. %

SCORCH HEIGHT, FT ----- OUTPUT FROM SCORCH = 107.
TREE HEIGHT, FT ----- 100.0
 BARK THICKNESS, IN ----- 2.0
MORTALITY LEVEL 85. %
 CROWN SCORCH VOLUME 100. %

SCORCH HEIGHT, FT ----- OUTPUT FROM SCORCH = 107.
TREE HEIGHT, FT ----- 110.0
 BARK THICKNESS, IN ----- 2.0
MORTALITY LEVEL 85. %
 CROWN SCORCH VOLUME 100. %

SCORCH HEIGHT, FT ----- OUTPUT FROM SCORCH = 107.
TREE HEIGHT, FT ----- 120.0
 CROWN RATIO ----- .8
 BARK THICKNESS, IN ----- 2.0
MORTALITY LEVEL 82. %
 CROWN SCORCH VOLUME 98. %

**EAST FORK II
 ACTION ALTERNATIVES 2 & 3**

**TWO FUEL MODEL CONCEPT - 80% 11 -- LIGHT LOGGING SLASH
 20% 8 -- CLOSED TIMBER LITTER**

1-HR FUEL MOISTURE, % -- 3.0
 10-HR FUEL MOISTURE, % - 4.0
 100-HR FUEL MOISTURE, % 5.0
 MIDFLAME WINDSPEED, MI/H 10.0
 TERRAIN SLOPE, % ----- 35.0
 DIRECTION OF WIND VECTOR .0
 DIRECTION OF SPREAD ---- .0 (DIRECTION OF MAX SPREAD)

FUEL MODEL 11 (80%)

RATE OF SPREAD, CH/H ----- 18.
 HEAT PER UNIT AREA, BTU/SQFT -- 881.
 FIRELINE INTENSITY, BTU/FT/S--- 296.
FLAME LENGTH, FT----- 6.2
 REACTION INTENSITY, BTU/SQFT/M 2711.
 EFFECTIVE WINDSPEED, MI/H----- 10.9

FUEL MODEL 8 (20%)

RATE OF SPREAD, CH/H ----- 8.
 HEAT PER UNIT AREA, BTU/SQFT -- 225.
 FIRELINE INTENSITY, BTU/FT/S--- 31.
FLAME LENGTH, FT----- 2.2
 REACTION INTENSITY, BTU/SQFT/M 1109.
 EFFECTIVE WINDSPEED, MI/H----- 10.6

**FUEL MODEL 11 (80%) FUEL MODEL 8 (20%)
 WEIGHTED RATE OF SPREAD, CH/H-- 16.**

1 HOUR BURN TIME

BURNED ACRES----- 5.8 acres

2 HOURS BURN TIME

BURNED ACRES----- 23 acres

3 HOURS BURN TIME

BURNED ACRES----- 52 acres

4 HOURS BURN TIME

BURNED ACRES----- 92 acres

TREE MORTALITY LEVELS PREDICTED FROM THE ABOVE OUTPUTS

MORTALITY-LINKED-TO-SCORCH

SCORCH HEIGHT, FT ----- OUTPUT FROM SCORCH = 13.
TREE HEIGHT, FT ----- 20.0
 BARK THICKNESS, IN ----- .5
MORTALITY LEVEL 62. %
 CROWN SCORCH VOLUME 46. %

SCORCH HEIGHT, FT ----- OUTPUT FROM SCORCH = 13.
TREE HEIGHT, FT ----- 40.0
 BARK THICKNESS, IN ----- 1.0
MORTALITY LEVEL 10. %
 CROWN SCORCH VOLUME 0. %

SCORCH HEIGHT, FT ----- OUTPUT FROM SCORCH = 13.
TREE HEIGHT, FT ----- 60.0
 BARK THICKNESS, IN ----- 1.0
MORTALITY LEVEL 10. %
 CROWN SCORCH VOLUME 0. %

SCORCH HEIGHT, FT ----- OUTPUT FROM SCORCH = 13.
TREE HEIGHT, FT ----- 80.0
 BARK THICKNESS, IN ----- 1.0
MORTALITY LEVEL 10. %
 CROWN SCORCH VOLUME 0. %

SCORCH HEIGHT, FT ----- OUTPUT FROM SCORCH = 13.
TREE HEIGHT, FT ----- 100.0
 BARK THICKNESS, IN ----- 1.0
MORTALITY LEVEL 3. %
 CROWN SCORCH VOLUME 0. %

SCORCH HEIGHT, FT ----- OUTPUT FROM SCORCH = 13.
TREE HEIGHT, FT ----- 110.0
 BARK THICKNESS, IN ----- 1.0
MORTALITY LEVEL 3. %
 CROWN SCORCH VOLUME 0. %

SCORCH HEIGHT, FT ----- OUTPUT FROM SCORCH = 13.
TREE HEIGHT, FT ----- 120.0
 BARK THICKNESS, IN ----- 1.0
MORTALITY LEVEL 3. %
 CROWN SCORCH VOLUME 0. %



Appendix E

Project Aquatic Conservation
Strategy Analysis
and Cumulative Actions Table

Appendix E: Project Aquatic Conservation Strategy Analysis and Cumulative Actions Table - April 2008

Watershed Name	Past Projects (prior to November 2007)	Present Project (Estimated implementation of the Alternatives considered is from 2007 to 2010)	Foreseeable Projects (after implementation of the Alternatives considered)	Resource Affected								
				Botany	Economic Effects	Fire and Fuels	Fisheries	Forest Productivity	Heritage Resources	Earth Sciences	Wildlife	
Prospect Creek	Precommercial Thinning			×		×		×		×		×
	FS Timber Harvest (1,372 acres from 1966 to 2007)	Alt. 2 harvests 566 acres		×	×	×	×	×	×	×	×	×
	FS Road Construction (56 mi. from 1960 to 2007)			×		×	×	×		×		
	FS Road Decommissioning (5 mi. from 1960 to 2007)		FS Road Decommissioning and Hydroclosure (2.5 mi. Decom and 9 mi. Hydro)	×		×	×	×				
	Wildland Fire			×		×	×	×		×	×	
	Historic hard rock mining			×		×	×			×	×	
Texas Chow Creek	Precommercial Thinning			×		×		×		×		
	FS Timber Harvest (242 acres from 1966 to 2007)	Alt. 2 harvests 286 acres		×	×	×	×	×	×	×	×	×
	FS Road Construction (19 mi. from 1950 to 2005)			×		×	×	×		×		
	FS Road Decommissioning (2 mi. from 1960 to 2007)		FS Road Decommissioning and Hydroclosure (1.8 mi. Decom and 1.5 mi. Hydro)	×		×	×	×				
	Wildland Fire			×		×	×	×		×	×	
	Historic hard rock mining			×		×	×			×	×	
Dark Canyon Creek	Precommercial Thinning			×		×		×		×		
	FS Timber Harvest (298 acres from 1966 to 2007)	Alt. 2 harvests 176 acres		×	×	×	×	×	×	×	×	×
	Private Timber Harvest (54 acres from 1940 to 2007)			×		×	×	×		×	×	
	FS Road Construction (12 mi. from 1950 to 2005)			×		×	×	×		×		
	FS Road Recommission (2.4 mi.)			×		×	×	×				
	FS Road Decommissioning (5 mi. from 1960 to 2007)		FS Road Hydroclosure (2.3 mi. Hydro)	×		×	×	×				
	Private Road Construction (5 mi. from 1940 to 2005)			×		×	×	×		×		
	Wildland Fire			×		×	×	×		×	×	
Historic hard rock mining			×		×	×			×	×		
Buck Ridge	Precommercial Thinning			×		×		×		×		
	FS Timber Harvest (298 acres from 1966 to 2007)	Alt. 2 harvests 18 acres		×	×	×	×	×	×	×	×	×
	FS Road Construction (13 mi. from 1950 to 2005)			×		×	×	×		×		
	FS Road Decommissioning (2 mi. from 1960 to 2007)		FS Road Hydroclosure (1.1 mi. Hydro)	×		×	×	×				
	Wildland Fire ???			×		×	×	×		×	×	
	Historic hard rock mining			×		×	×			×	×	

Appendix E: Project Aquatic Conservation Strategy Analysis and Cumulative Actions Table

The following analysis is comprehensive of both parts of the East Fork Project, the portion which was completed prior to the May 2007 court injunction and the current proposed action called East Fork II.

Aquatic Conservation Strategy

The Aquatic Conservation Strategy (ACS) limits management entry into Riparian Reserve (RR) unless actions are specially designed to enhance or maintain natural riparian function, and habitat for aquatic and terrestrial Endangered Species Act-listed species. Within the watersheds of Prospect, Texas Chow, and Dark Canyon, the riparian zones are currently classified as “dysfunctional” due to lingering effects of past more-intensive timber management.¹ Also, increased runoff and erosion from roads is identified as a concern in these watersheds.

Proposed thinning in RR supports attainment of ACS objectives because it increases the diversity of stand conditions, which contributes to development and maintenance of diverse, resilient stand conditions over the landscape. Pole-young stands (5”-12” DBH), like those proposed for thinning, constitute the most common vegetation class in the project area and represent approximately 85% of total trees proposed for harvest. Thinning is needed to encourage development of stands with large diameter trees and multiple canopy layers. Proposed thinning is likely to result in an increase in individual tree diameter growth because it creates greater growing space for residual trees. Larger trees are more resistant to fire damage and provide a future source of large woody debris, a necessary stream habitat component. Increasing the future supply of large woody debris to streams helps restore stream sediment and flow regimes, the deposition of gravels, and the formation of deep pools and off-channel habitat.

The project would reduce the amount of small-diameter snags and woody debris in treated areas over the next few decades (trees proposed for removal would likely succumb to suppression mortality with no action). Also the project is likely to cause minor changes in localized sediment regimes (Prospect, Texas Chow, and Dark Canyon drainages) for several years after implementation. The hydrology limiting factor and Cumulative Watershed Effects modeling shows that the project will not negatively impact water quality or quantity of East Fork South Fork Trinity River, Prospect, Texas Chow, and Dark Canyon Creeks. Effects are of small scale because RR associated with all perennial channels, and most intermittent/ephemeral channels, will be unaffected by the project. In the EFSF Watershed (about 24,000 acres total), over 16,000 acres contain intermittent/ephemeral channels that will be undisturbed; the project proposes thinning from below on 312 acres of RR.

The project involves appropriate culvert upgrades, no new road construction, and no net increase in roads within key watershed.² The resource protection measures and Best Management Practices

¹ For more detail see East Fork/Smokey Watershed Analysis document, chapter 5

² Consistent with ACS direction

(BMPs) identified in the EA are known to provide adequate protection for water quality.³ BMP effectiveness monitoring on the STNF⁴ shows that BMPs, when implemented, are fully effective in protecting water quality for timber-related projects. Post-project field review of completed East Fork Project units by soils and hydrology specialists showed that protection measures (including BMPs) are being successfully implemented, and the actual effects of the project were at, or less than, those predicted in the original East Fork EA.⁵ More detailed information about project consistency with ACS and the LRMP is in the fisheries biological assessment (available in the project record).

Aquatic Conservation Strategy Objective 1

Maintain and restore the distribution, diversity, and complexity of watershed and landscape-scale features to ensure protection of the aquatic systems to which species, populations and communities are uniquely adapted.

Thinning in both the Riparian Reserve (RR) and upland areas in the project area would contribute to the restoration of the distribution, diversity, and complexity of the EFSFTR watershed and landscape-scale features. Young pole-stands are low in species diversity and structural complexity, which thinning would be expected to increase. Due to thinning, individual tree growth rates would speed the development of late-successional characteristics, such as large live trees, snags, and down wood, over the long-term. This effect in the RR would be minor because of the small area (312 acres) that would be thinned.

Aquatic Conservation Strategy Objective 2

Maintain and restore spatial and temporal connectivity within and between watersheds. Lateral, longitudinal, and drainage network connections include floodplains, wetlands, upslope areas, headwater tributaries, and intact refugia. These network connections must provide chemically and physically unobstructed routes to areas critical for fulfilling life history requirements of aquatic and riparian-dependent species.

Proposed thinning in RR is highly unlikely to cause any degradation of connectivity or increase in landscape fragmentation because of the small proportion of RR treated across the landscape and the continued resiliency of post-project stands. Any reduction in connectivity for riparian-dependent species would be minor and short-lived (potential disturbance to terrestrial species only during project implementation). Thinning both in the RR and upland areas is likely to speed the development of late-successional characteristics, and therefore would contribute to the restoration of a network of late-successional forest stands over the long-term. No new roads would be constructed in RR that could degrade connectivity for

³ More information in Region 5 BMP effectiveness monitoring report, online at <http://fsweb.r5.fs.fed.us/unit/ec/water/bmp>

⁴ The STNF monitors, and reports on, BMP effectiveness annually. Monitoring and evaluation reports are online at <http://www.fs.fed.us/r5/shastatrinity/publications/>

⁵ Hydrology notes in project record, field review of completed East Fork units

aquatic or riparian-dependent species. The project includes installation of 5 new road/stream crossings, and upgrades for 6 currently undersized crossings (able to accommodate 100-year flows). These activities improve connectivity for aquatic species because, after the crossing upgrades, habitat upstream of these areas would be accessible to fish throughout more of the year (during a wider range of flow conditions). Crossing upgrades would result in temporary disturbance at the site, but would not reduce or hinder the connectivity between watersheds or obstruct the routes to areas critical for fulfilling life history requirements of aquatic or riparian dependant species.

Aquatic Conservation Strategy Objective 3

Maintain and restore the physical integrity of the aquatic system, including shorelines, banks, and bottom configurations.

Project activities would not adversely affect the physical integrity of the aquatic systems because the residual stands in areas thinned would maintain overall root strength; the unthinned buffers would ensure that thinning does not affect streambank integrity; and management activities throughout the project area would not cause any alteration in water flows that could affect channel morphology.

Aquatic Conservation Strategy Objective 4

Maintain and restore water quality necessary to support healthy riparian, aquatic, and wetland ecosystems. Water quality must remain within the range that maintains the biological, physical, and chemical integrity of the system and benefits survival, growth, reproduction, and migration of individuals composing aquatic and riparian communities.

Proposed thinning in RR would not alter stream shading because no vegetation would be removed within 50 feet slope distance, and no riparian vegetation will be removed. Shade over intermittent/ephemeral drainages will be maintained as described in the 2002 East Fork WA. The combination of the large proportion of untreated RR and the minimal change to the existing canopy closure ensures maintenance of existing stream temperature conditions. Fuels treatments would primarily occur in upland areas and would not affect water quality because of the small area that would be burned and the distant proximity of proposed treatments to riparian vegetation. Leaks of toxic materials (oil, gas, etc.) from machinery into stream channels are unlikely due to implementation of BMPs (see Appendix C).

Water quality necessary to support healthy, riparian, aquatic, and wetland ecosystems is maintained throughout the watershed (during and after project implementation). Some sediment-related effects are likely, although due to the short duration of effects (within first year post-project), small scale (measured by post-project ERA calculations in CWE analysis), and low intensity (thinning treatments at distant proximity to perennial streams), the amount of increased sediment delivery to streams is not likely to be measurable and would result in

only insignificant and discountable effects to fish or their habitat. See Objective 5 below, and EA Section 3 – Hydrology, for more discussion of sediment-related impacts.

Aquatic Conservation Strategy Objective 5

Maintain and restore the sediment regime under which aquatic ecosystems evolved. Elements of the sediment regime include the timing, volume, rate, and character of sediment input, storage, and transport.

Project activities would not significantly alter the fine sediment regime either in the project area or downstream (see EA Section 3 – Hydrology CWE analysis). No new roads or landings would be constructed in RR, and existing roads used would be improved, which could result in a slight overall decrease in road-related sediment production. Directional falling and yarding would minimize soil disturbance from logging in the treatment areas in the RR. No thinning would occur on areas with unstable soils. The untreated RR would be adequate to continue performing the function of filtering sediment before it reaches the stream because of generally low risk of hillslope erosion, and the low risk of substantial sediment inputs from upland areas. Vegetative cover is expected to be > 50% immediately post-harvest.

Project activities would not prevent or retard restoration of the sediment regime under which this aquatic ecosystem evolved. The untreated buffers would adequately filter any sediment from the uplands before it reaches streams. The direct disturbance of road reconstruction and recommissioning could result in production of a minor amount of sediment only during times of elevated flows within the first year post-project. This disturbance would be temporary, and would have negligible effects on the aquatic ecosystem. There will be no new road construction within the RR, about 1.4 miles of road will be decommissioned, and 12.5 miles of road will be hydro-closed as a result of the project.

Aquatic Conservation Strategy Objective 6

Maintain and restore in-stream flows sufficient to create and sustain riparian, aquatic, and wetland habitats and to retain patterns of sediment, nutrient, and wood routing. The timing, magnitude, duration, and spatial distribution of peak, high, and low flows must be protected.

Project activities may contribute to a minor increase in peak flows, summer low flows, and overall water yield because of the decrease in canopy closure and the construction of new landings and creation of additional skid trails. The exact extent of the effect on flow is not certain; most research on hydrologic response to timber harvesting has been conducted in clearcuts, and the effect of density management treatments on stream flows has not yet been extensively studied. Any effect is likely to be negligible and short-lived because of the effect of the residual stands. Due to the low intensity of proposed thinning treatments and the distant proximity to stream channels, residual stands will continue to effectively trap excess sediment before it reaches stream channels. Newly constructed landings would not be located in RR

and would be appropriately rehabilitated after use (as described in *EA Section 2 – resource protection measures* and Appendix C).

No roads will be constructed in RR. About 2 miles of roads will be reconstructed, but these roads will be temporary and will be reconstructed, used and decommissioned in the same dry season. Compacted areas will be rehabilitated, as described in *EA Section 2 – resource protection measures*, to reduce the effects from past compaction to maintain or reduce peak flows. Timing, duration and intensity of in-stream flows are not likely to be affected by this project. Although flow regimes have been altered in this watershed by roads, this project will not increase peak flows because more miles of road are being decommissioned than are being built, and over the longer term, vegetation recovery is occurring across the watershed. The hydrologic recovery in the basin from growth of vegetation on large scale land allocations in the watershed far exceeds the loss of vegetation that may result from this project.

Aquatic Conservation Strategy Objective 7

Maintain and restore the timing, variability, and duration of floodplain inundation and water table elevation in meadows and wetlands.

Project activities would not alter existing patterns of floodplain inundation and water table elevation, because it would have no effects or only negligible effects on existing flow patterns and stream channel conditions. Maintaining riparian areas as well as not constructing roads or operating within floodplains would help to maintain existing conditions. This Project will not alter the timing, duration, and variability of floodplain inundation. There will be no effect on wetlands.

Aquatic Conservation Strategy Objective 8

Maintain and restore the species composition and structural diversity of plant communities in riparian areas and wetlands to provide adequate summer and winter thermal regulation, nutrient filtering, appropriate rates of surface erosion, bank erosion, and channel migration and to supply amounts and distributions of coarse woody debris sufficient to sustain physical complexity and stability.

Project activities would contribute to the restoration of the species composition and structural diversity of plant communities by speeding the development of late-successional forest characteristics, including large trees and a multi-story canopy, in the RR areas that would be thinned. The proposed action would not alter the restoration of the species composition and structural diversity of plant communities in untreated areas.

Project activities would contribute to the restoration of the species composition and structural diversity of plant communities, and habitat to support well-distributed populations of some riparian-dependent species by speeding the development of late-successional forest characteristics. Project activities would cause a reduction in canopy closure for several decades in the thinned areas, which could result in some micro-climatic alteration or other

adverse effects for species that prefer complete canopy closure or do not tolerate disturbance. Any such effect would be minor because of the effect of the residual trees, the extensive untreated and lightly-thinned areas, and because of the current poor habitat condition of the stands for most species associated with late-successional forests.

This Project will not affect plant communities in wetlands or RR.

Aquatic Conservation Strategy Objective 9

Maintain and restore habitat to support well-distributed populations of native plant, invertebrate, and vertebrate riparian-dependent species.

Project activities would contribute to the restoration of habitat to support well-distributed populations of riparian-dependent species by speeding the development of late-successional forest characteristics, including large trees and a multi-story canopy, in the RR areas that would be thinned. The current stand condition provides relatively poor habitat for riparian-dependent species associated with late-successional forests. Project activities could cause a short-term reduction in canopy closure in the RR areas that would be thinned, which could result in some micro-climatic alteration or other adverse effect for species that prefer complete canopy closure, but any such effect would be minor because of the effect of the residual trees and because of the small proportion of the RR that would be treated, and the current poor habitat condition of the stand for species associated with late-successional forests. This habitat would be maintained through the active retention of a hardwood component within the RR as well as in the uplands. Habitat would be restored spatially and temporally, as the aquatic system becomes late-successional habitat.

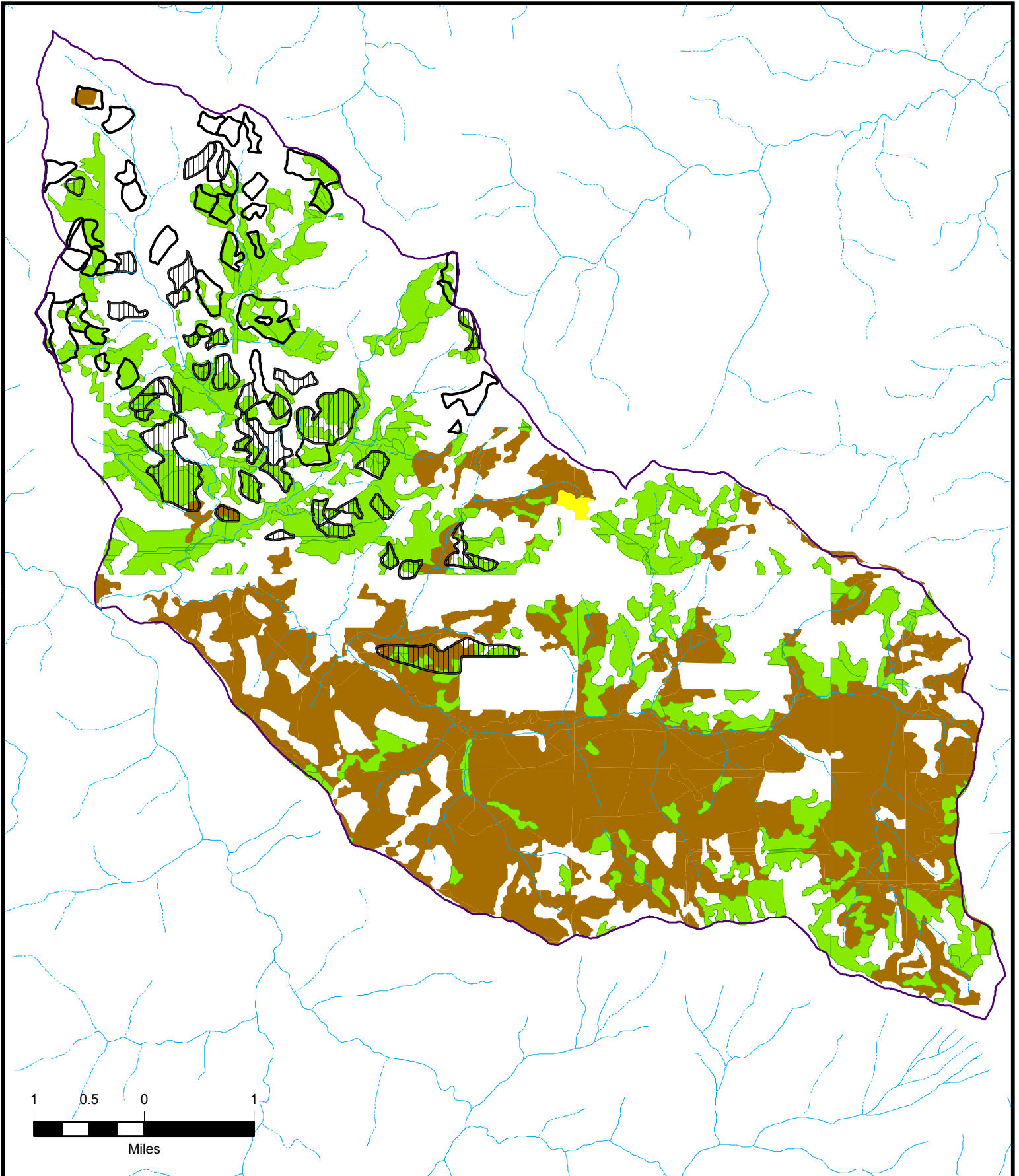
Project activities will not affect habitat such that well-distributed populations of native plant and animal riparian dependent species could not be maintained. No riparian areas are directly affected. Over time, decommissioning and hardening of roads and the natural recovery of vegetation in the basin will contribute to this objective by reducing peak flows, sediment and debris flows from roads.



Appendix F

East Fork II
Wildlife Habitat Maps

East Fork II Project - Fisher Habitat



East Fork II Units



Completed EFSF Units

Fisher Habitat Capability



High



Moderate

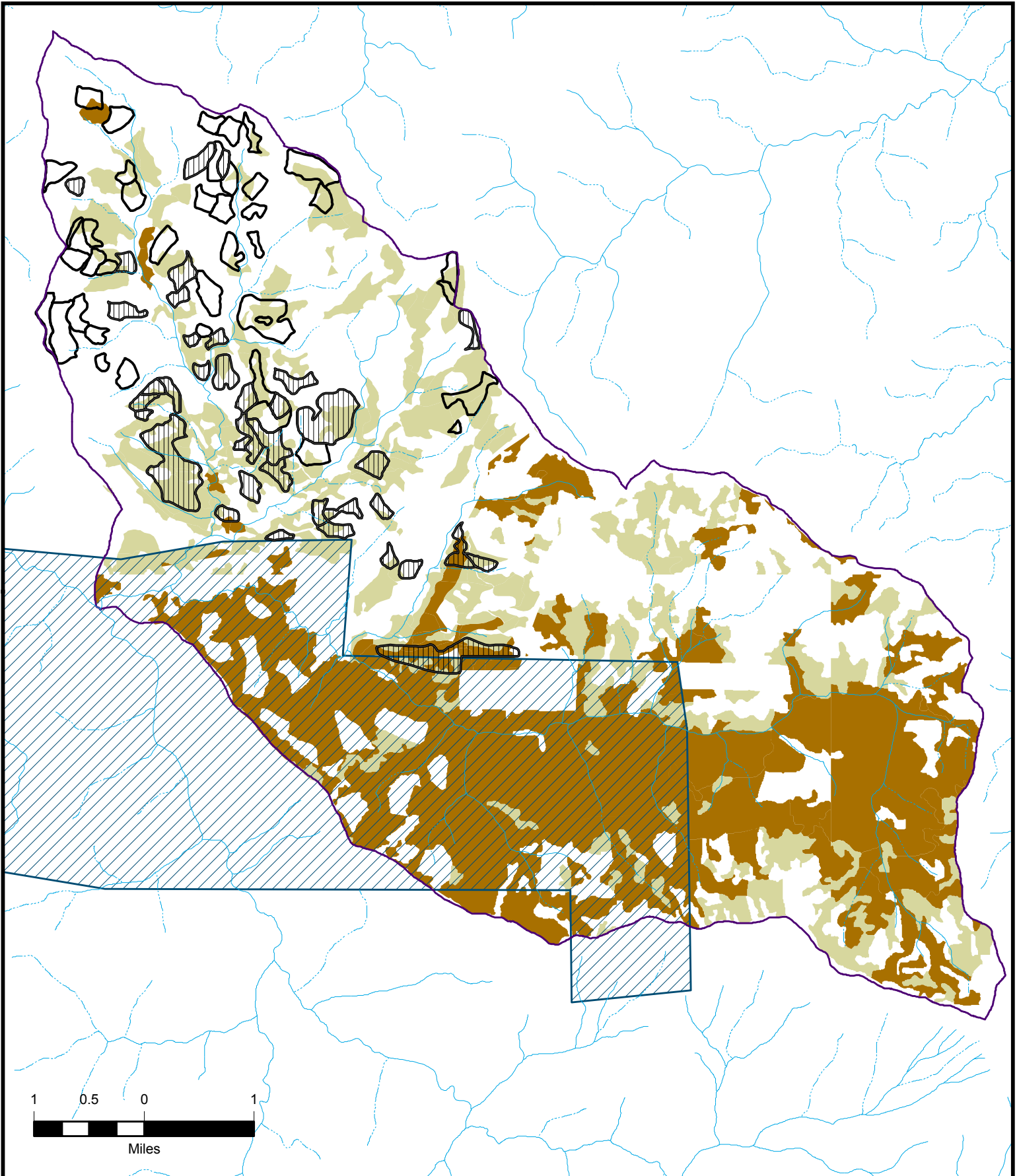


Low




SCALE 1:73,000





East Fork II Project - Northern Spotted Owl Habitat



SCALE 1:73,000

-  Designated Critical Habitat
-  East Fork II Units
-  Completed EFSF Units

Owl Habitat

-  EFSF NSO Foraging
-  EFSF NSO Nesting





Appendix G

Response to Public Comments

East Fork II Environmental Assessment Response to Public Comment

The Shasta-Trinity National Forest (referred to here as the Forest) conducted project scoping, public comment issue extraction and analysis, environmental analysis, and completed the East Fork II Environmental Assessment (EA) between September 2007 and January 2008. A legal ad initiating the comment period (pursuant to National Environmental Policy Act, 40 CFR 1503) and informing the public of the opportunity to comment on the project printed in the *Redding Record Searchlight* on January 30, 2008 and the comment period closed on February 29, 2008. Groups and/or individuals who provided project scoping comments, or otherwise expressed active interest in the East Fork II project, were mailed the EA (with any other project-related documentation specifically requested) at the beginning of the comment period. Comments on the EA were received from the 14 groups and individuals listed below.

Response to Comments

Exact quotes from public comment letters are used wherever possible to most accurately capture public concerns. General statements of support, or disapproval, that do not provide sufficient project-specific information from which to respond, are not included here. All general requests from public letters will be considered by the Responsible Official before making a decision, although every item may not appear in this summary. Original full-text comment letters are available in the project record.

I. Groups

- | | |
|---|-------------------|
| A. Sierra Pacific Industries (SPI) | February 19, 2008 |
| B. American Forest Resource Council (AFRC) | February 12, 2008 |
| C. Citizens for Better Forestry (CBF) | February 23, 2008 |
| D. Conservation Congress (CC) | February 25, 2008 |
| E. Environmental Protection Information Center,
Klamath Forest Alliance, Klamath-Siskiyou Wildlands,
Northcoast Environmental Center (EPIC) | February 29, 2008 |

II. Individuals – comments listed together by topic

- | | |
|---------------------|--------------------|
| Anastasia Dodson | February 29, 2008 |
| Heather Walker | February 25, 2008 |
| Sue Andrews | February 29, 2008 |
| Karen Wilson | February 29, 2008 |
| Mary Lee Steffensen | February 20 and 28 |
| Jim Kelly | February 28, 2008 |
| Claudia Schimmer | February 29, 2008 |
| Marilyn McKinney | February 29, 2008 |
| Christina Petterson | February 29, 2008 |

Exact quotes from public comment letters are used whenever possible to best capture public concern. Public statements are presented in this document using italics to denote direct quotes.

I. Groups

A. Sierra Pacific Industries

SPI 1: *In order for helicopter logging to be even marginally economical it needs to be at least 7 MBF/acre (Alt 2 is ~4.8 MBF/acre). Regardless of which Alternative (2 or 3) is chosen the helicopter portion of the job would require some form of subsidy to afford the cost associated with it.*

Response - The comprehensive project economic analysis is available in the East Fork II planning record, and is summarized on pages 18 to 20 in the East Fork II EA. The economic analysis conducted for the assessment indicates a net deficit for individual units proposed for helicopter yarding, but considered as a whole the project provides for a positive economic return. The overall economics of each alternative will be considered by the Responsible Official during selection of an alternative for implementation.

SPI 2: *In both Alternatives it is stated that 9,020 tons of biomass will be generated, but it is unclear if stated at all, what is to be done with the biomass?*

Response – As disclosed in the EA on page 8, both action alternatives (Alts 2 and 3) include post-harvest fuels treatment within units. Excess woody material such as boles, limbs and foliage will be removed from the site as commercial products (sawlogs or chips) wherever possible. Fuels treatment proposed for all tractor harvest units (885 acres) is “treat on site,” for removal of excess activity-generated material. This includes biomass removal in the form of whole-tree yarding, mastication, chipping, or concentration for burning. Once the material is on the landing, the Purchaser would have the option of utilizing the biomass material, or allowing the STNF to dispose of the material.

B. American Forest Resource Council

AFRC 1: *AFRC and its members do not support diameter limits imposed on activities occurring within the Matrix land allocation. The diameter limit of 12” in the Riparian Reserve treatment does not allow those stands to meet the purpose and need stated in the EA.*

Response – As disclosed in the EA on page 12, Alternative 3 was designed to respond to issues raised during public scoping, as well as direction in the May 2007 Ninth Circuit Court order for the original East Fork project. Alternative 3 was fully analyzed for the consideration of the public and the Responsible Official.

AFRC 2: *A 120 year-old tree is not an old growth tree, it should be considered early to mid mature.*

Response – Neither action alternative (Alts 2 and 3) removes old-growth habitat. In the assessment area, trees that are 30 inches DBH in size are estimated to be about 120 years old and with Alternative 2 some trees over 30 inches DBH would be removed.

AFRC 3: *We believe Alternative 3 has a greater reduction to the estimated volume than shown in the EA.*

Response – As disclosed in the EA on pages 20 to 21, volume difference between Alternatives 2 and 3 is estimated to be approximately 100 thousand board feet, our best estimate based upon available information.

C. Citizens for Better Forestry

CBF 1: *The inclusion of Alt. 3 is a step in the right direction but it still puts producing a profitable timber sale ahead of meeting the needs of the ecosystem. Alt. 3 needs further refinement to be acceptable, especially regarding the cutting of large trees. Any tree 24 inches DBH or larger should be saved regardless of its health because trees of this size are rare in the project area and needed to meet future snag and CWD requirements.*

Response – As disclosed in the East Fork II EA on pages 12, the 30 inches DBH size was identified only as an attempt to represent the public’s general perception of a large tree. An estimated 23% of the East Fork II assessment area is comprised of stands averaging 13 to 24 inches DBH (size class 3), with an additional 27% of the analysis area comprised of stands averaging 25 to 36 inches DBH (size class 4). As described in the East Fork/Smokey Creek Watershed Analysis, the area is dominated by trees 12 to 24 inches DBH, and the East Fork also contains a sizable area with 24 inch DBH or larger trees. Thus, 24 inch DBH trees are not rare in the assessment area. The project proposes thinning from below designed to retain the larger, dominant trees in stands.

The project is also designed to meet snag and CWD plan standards. Post-project monitoring in completed East Fork units found that LRMP standards for coarse woody debris (CWD)¹ were met; large down logs were retained in each unit and measured at about a 20 ton per acre level. The CWD retained after harvest was well distributed over the landscape. The average diameter of remaining green trees was about 22 inches DBH, and snags had an average of 23 inches DBH. LRMP standards for snag retention (1.5 snags per acre) are evaluated using plot data, these estimates found that overall 2.2 snags per acre remain throughout the units post project. Additionally hardwoods, including large oak trees, are retained and averaged about 12 per acre in post project units.

¹ Described in LRMP, pages 4-61 and 4-62

CBF 2: *The 12” diameter limit in RR is a positive improvement. However, some RRs will require even smaller trees to be retained to maintain the needed canopy cover.*

Response – The commenter does not define “needed canopy cover,” as it pertains to a particular species or issue of concern. As disclosed in the East Fork II EA on page 9, “Canopy closure would be reduced from an estimated 60 to 90%, to an estimated 50 to 60% in areas proposed for treatment.” Thus, treated RR stands will not have below 50 to 60% canopy closure post-project. Assuming the concern over canopy closure relates to stream shading, treatments are focused in the outer portions of RRs (farthest from streams) the project will not affect shading over streams (see project Fisheries BA for detailed analyses).

CBF 3: *Our concern is that excessive ground disturbance will lead to ponding, rilling, and introducing fine sediment into water courses.*

Response – The project is designed to avoid excessive ground disturbance which could lead to sediment mobilization. Post-project monitoring of the original East Fork Project by hydrology and soils scientists² found that the overall amount of ground disturbance within units is equivalent to levels of disturbance predicted in the original environmental analysis. These field reviews did not locate areas of ponding, rilling, and sediment delivery to water courses. Ground disturbance associated with cable units and associated landings was minimal, and less than originally predicted. This monitoring, which occurred following a fall storm event, also identified areas (specific road segments and landings) where additional protection measures were implemented to prevent sediment delivery to local stream channels.

Erosion and sediment delivery due to the project will continue to be prevented through implementation of best management practices for water quality (BMPs) along with unit and road specific mitigation measures. In addition, project field monitoring by hydrology and/or earth science specialists will continue to ensure that the estimated project-related sediment impacts are not exceeded and water quality objectives are met. Surface erosion and mass wasting sources were inventoried and included in the sediment budget. The action alternatives would increase the average ERA for the entire assessment area from 7% to 9%. The increase varies by subwatershed with a maximum of 10% for Prospect Creek (EA, Table III-2). Of the total, the majority of the ERA increases result from proposed ground based timber harvest and fuel treatment activities. However, these potential increases, expressed by the ERA calculations, are minor and do not approach thresholds of concern for watershed impacts (14%), established by the LRMP. This project has very little risk of causing substantial negative impacts to water quality or fisheries.

² Soils scientists documented project effects monitoring visits on 07/20/2006, 1/11/2007, and 10/23/2007; and hydrology field visits on 11/09/2007 and 11/10/2007.

CBF 4: *In some units (original East Fork Project) the ground and ladder fuels have not been removed under leave trees, putting them at risk of fire.*

Response – Results of post-project field review of fuels condition in completed units showed that original project objectives were achieved in most treated areas. Ground and ladder fuels were reduced, with expected and acceptable levels of ground disturbance (see EA Appendix D and project record photos). Fuels specialists found that post-project fuels conditions were at, or better than, expected during analysis for the original East Fork EA. When contrasted with no action, post-project fuels conditions increase the probability that healthy forest stands will be retained over time (improved resiliency), and increases the probability that prescribed fire could be used in the future to reduce the accumulation of hazardous fuels.

Assuming the concern is over areas of untreated fuels within project units, there are small patches within units where timber harvest and associated fuels reduction activities do not occur in order to meet other resource objectives such as for wildlife or land stability concerns. The project proposes understory thinning over most of the units, and these small undisturbed (unharvested, untreated) patches are retained to provide habitat diversity or in support of soils or geologic concerns. Because the Forest must balance consideration for all resources, as described in the LRMP, this project takes action to reduce fuels hazard and improve forest health while constraining activities to only those that support attainment of diverse LRMP goals. The project is still likely to prevent a future wildfire from developing and spreading, and can be implemented without causing adverse impacts to threatened or endangered species or watershed-related resources.

CBF 5: *While the EA infers that the many huge piles of non-merchantable material remaining on the landings will be chipped, there is no commitment to assure this will result.*

Response – As described previously and disclosed in the East Fork II EA on page 8, “Both action alternatives (Alts 2 and 3) include post-harvest fuels treatment within units....Fuels treatment proposed for all tractor harvest units (885 acres) is “treat on site.” This includes biomass removal in the form of whole-tree yarding, mastication, chipping, or concentration for burning.” Once on the landing, the Purchaser would have the option of utilizing the biomass material, or allowing the Forest Service to dispose of the material. The EA, Decision Notice and contract prepared for implementation of the project, constitute the commitment to utilize or remove piles of non-merchantable material.

Reminder: Exact quotes from public comment letters are used whenever possible to best capture public concern. Public statements are presented in this document using italics to denote direct quotes.

D. Conservation Congress

CC 1: *Section 1 of the EA does not cite which NFMA regs were used for this project, this issue needs to be remedied in the final EA.*

Response – The National Forest Management Act (NFMA) requires that projects implemented by the Forest Service be consistent with the relevant forest plan. The East Fork II project is consistent with the Shasta-Trinity Land and Resource Management Plan (LRMP), as described in the EA and supporting analyses.

CC 2: *Regarding migratory birds, the STNF has misinterpreted its legal responsibilities under the Migratory Bird Treaty Act. Clearly a ‘take’ of migratory birds is likely to occur, and there should be specific mitigation measures in place to protect the taking of these species.*

Response – The Forest Service is not proposing to undertake any activity that would result in the take of migratory birds as defined by the Migratory Bird Treaty Act (16 U.S.C. 703-712; Ch. 128; July 13, 1918; 40 Stat. 755). Accordingly, the U.S. Fish and Wildlife Service, the primary administrative agency for this statute, does not require specific measures be taken by the Forest Service.

However, the Shasta-Trinity National Forest does consider the impact of its proposed action on migratory and residential birds (see the Environmental Assessment and the Forest level Migratory and Residential Bird Population Trend Monitoring Report). Migratory bird population trends and potential impacts to migratory birds were considered as part of the project development process. The EA reported on these considerations and determined that the project was unlikely to significantly or measurably impact the population trends of these species.

CC 3: *Since the watershed is already impaired, and wildlife-related goals for NSO are not being met, logging anywhere in RR appears to be a violation of LRMP direction.*

Response – As explained in the project hydrology report, and summarized in EA Section 3, project area watersheds are not considered impaired. As shown in Table 12 of the EA (page 29), all subwatersheds in the project area are currently classified with ERA³ values well below the Forest Plan threshold of concern (TOC).⁴

The comprehensive wildlife analysis for the project determined that the project is compliant with the LRMP for Northern spotted owl (NSO). The specific issue for

³ Equivalent Roaded Area (ERA) values are identified, based on the likely watershed-related effects of past activities, to represent existing conditions in the project area, as well as to describe the post-project watershed condition.

⁴ TOC signals increasing risk of adverse watershed conditions or impacts; the LRMP defines TOC for project area watersheds as 14, and existing values (calculated as ERA) range from 4 to 9.

NSO and riparian reserves is retention of adequate habitat conditions for dispersal (NWFP page B-13). About 95% of NSO habitat in the area is not affected by the project; the existing 11,904 acres of foraging or nesting/roosting habitat in the assessment area has 40% canopy closure or greater which also provides structure for dispersal and connectivity. Additionally, thinned units would retain at least 50% cover for dispersal and in some areas, 60% cover. The project maintains the suitability of the forest for NSO foraging and dispersal and complies with LRMP direction, therefore wildlife-related goals are being met.

CC 4: *If the best spotted owl habitat currently has trees only 13-24 inches DBH, then that is the DBH that should be retained, in addition to all trees over 30 inches DBH.*

Response – Timber classifications completed for the LRMP do identify all currently suitable NSO nesting habitat as containing mixed conifer stands with trees averaging 13-24 inches DBH (size class 3). As described in the East Fork/Smokey Creek Watershed Analysis, the area is dominated by trees 12 to 24 inches DBH, and the East Fork South Fork watershed also contains a sizable area with 24 inch DBH or larger trees. The highest quality NSO habitat in the watershed (25 inches DBH and larger) will be unaffected by the project. There are 6732 acres nesting/roosting habitat and 5768 acres foraging in the assessment area. About 95% of NSO habitat (11,904 acres) in the assessment area is not affected by the project. The biological analysis and consultation with USFWS confirms that the proposed action is not likely to have adverse effects on the NSO.

CC 5: *What we do know is the NSO continues to decline throughout its range, and throughout the STNF. This project further encroaches into owl habitat causing the loss of additional nesting, roosting and foraging habitat.*

Response – About 95% of NSO habitat (11,904 acres) in the assessment area is not affected by the project. The suitable habitat affected by the project will retain the canopy cover and structural attributes important for NSO and therefore retain suitability. Habitat that is thinned retains at least 50% cover, and in some areas 60% cover. In LSR areas, harvest prescriptions maintain canopy cover at 60 - 70% and retain snag densities at or above 2.5 per acre and large logs. Also the Forest conducts annual protocol surveys for the owl and, when needed, imposes a limited operating period to prevent noise disturbance. The project is consistent with guidelines for recovery of the NSO, as described in the Wildlife Biological Assessment. Loss of habitat to wildfire is a legitimate concern and this project will reduce the risk of stand-destroying wildfire while maintaining habitat for the NSO.

CC 6: *Because the project is in key watershed and water quality is already degraded the STNF should not be conducting any activities that would degrade any amount of water quality. Any further degradation, no matter how small, is violating LRMP direction for key watershed.*

Response – The last sentence in above comment is an inaccurate interpretation of LRMP guidance. Management direction for key watersheds is found on LRMP pages 4-58 through 4-60. LRMP page 4-162 addresses key watersheds for the project’s Management Area (South Fork Management Area), and states that “Forest health is maintained and fire risk reduced through vegetation manipulation and underburning.” The project is consistent with LRMP direction.

The hydrology analysis uses the ERA model and sediment budget to evaluate existing condition and project effects. This analysis concludes that the project will not increase the short- or long-term coarse sediment yield to a level that will degrade water quality. Actions taken to mitigate the impacts of this project and other watershed restoration activities are likely to improve the long-term channel stability and help meet sediment TMDL⁵ goals.

CC 7: *The project has failed to include a legally-defensible MIS analysis and therefore the EA is incomplete. MIS is a monitoring program and also a regulatory program as set forth by NFMA. Both NFMA and the STNF LRMP require population monitoring of MIS. The STNF is required to survey both populations and habitat – not just habitat.*

Response – The NFMA does not require population monitoring of MIS; however, NFMA requires that projects be implemented in a manner that is consistent with the relevant forest plan. The Shasta-Trinity National Forest is in full compliance with the Forest LRMP for this project. The LRMP monitoring action plan allows for the use of either appropriate indicator species or habitat components to represent our selected assemblages. This monitoring will take place every one to five years and will be reported out every five years (see the LRMP Monitoring Action Plan at page 5-16). Although we assess impacts on assemblage habitat at the project level in order to provide decision makers with this information, the LRMP never intended for monitoring of indicator assemblages to occur at the project level. In addition, the decision maker is presented with population trend data on over 200 species of native birds in order to supplement the assemblage habitat information. This allows the decision maker and staff to determine, if possible, the relationship between the habitat changes and the population trends of native species.

CC 8: *Since it is over 5 years old a new BE/BA should have been conducted. A similar problem exists for Survey and Manage, the EA states that no mollusks were found at that time but the public is provided no additional information to ensure the situation has remained static.*

Response – Wildlife and Fisheries biological evaluations and assessments from the original project were reviewed, and additional analyses were completed specific to the East Fork 2 project. In November 2007, the Forest and USFWS reviewed the project Wildlife Biological Assessment and completed the technical assistance process which concluded with a letter from USFWS (received on

⁵ Total Maximum Daily Load, as used in Federal water quality regulations, is described at <http://www.epa.gov/owow/tmdl/intro.html>.

December 6, 2007). Because East Fork II involves no new effects to the NSO or its designated Critical Habitat, the original letter of concurrence was amended. The Biological Evaluation was reviewed and amended in November 2007, then again in March 2008, to address Sensitive species that were added to the Sensitive species list during the East Fork Project NEPA process.

Regarding Survey and Manage, no new species were added since the previous surveys. No Survey and Manage species were found during surveys. The surveys (conducted to protocol in 2000) continue to remain valid because the potential for recent migration or pioneering of other Survey and Manage species into the area is low, as determined by the wildlife biologist. This is consistent with the Forest Service policy as stated in the R5/R6 Forest Service June 26, 2001 memo (1920/2600) "Answers to Questions on 2001 Survey and Manage Standards and Guidelines (First Set)" and attachment 1. Available online at <http://www.blm.gov/or/plans/surveyandmanage/IM-IB/IB-OR-2001-214att1.htm>

CC 9: *Regarding NSO surveys, the EA doesn't disclose when these surveys will occur. Will the first survey occur before the project is implemented?*

Response – The wildlife resource protection measures in the EA (Section 2) explains when NSO surveys will occur in the project area (annually). The STNF has been surveying the project area for NSO since planning of the original project in 2002. The Forest has monitored known and suspected territories of NSO annually from 2002-2007, and will continue through the East Fork II Project.

CC 10: *Regarding goshawk, marten and fisher, they require special monitoring of populations as well as habitat according to the LRMP. The commenter cites the LRMP, page 5-17 and 5-18.*

Response – The LRMP Monitoring Action Plan (pp. 5-17 and 5-18) requires monitoring of goshawk and furbearers (martens and fishers). For goshawk, the LRMP specifically states to conduct surveys “for the sample of territories and for all projects that may modify habitat in designated territories.” There were no territories or goshawk nests identified within project units during field reviews by the wildlife biologist and/or wildlife tech crews. Because the project would not modify habitat and there are no designated territories near the project, LRMP monitoring using project was not warranted.

The LRMP does not require that the Forest conduct fisher or marten population monitoring as a precondition to project implementation. The LRMP specifies that the Forest conducts field review of project planning using habitat capability models, which was completed and documented in the project Pacific Fisher Report in the project record. Fisher observations on the Forest have been recorded from 1941 to 2005 through monitoring (track plates or camera stations), trapping, incidental sightings, and independent fisher research. We are currently collaborating with the researchers at the Redwood Sciences Laboratory in Arcata,

California, and the USFWS in developing a predictive model for fisher based on extensive surveys conducted on the Forest and in surrounding areas since 2003. Marten are also monitored through the same surveys. Forest monitoring and evaluation reports are generated annually and can be found online at <http://www.fs.fed.us/r5/shastatrinity/publications/>.

CC 11: *The Goshawk, Marten and Fisher are all sensitive species and therefore an MIS according to the LRMP. Commenter cites wildlife MIS-related information from the STNF FEIS that was used to develop the LRMP (pg III-122, pg III-128, pg II-116).*

Response – The LRMP FEIS is an analysis and disclosure document developed under the authority and requirements of the National Environmental Policy Act (NEPA). It is not the decision document. The FEIS discloses the anticipated environmental effects of major, proposed Federal actions and alternatives. NEPA establishes procedures by which agencies must consider the environmental impacts of their actions and does not dictate the substantive results of agency decision making.

NFMA requires that Forest actions comply with the LRMP. The substantive requirements for projects implemented on the Shasta-Trinity National Forest are set forth in the LRMP, not the FEIS [16 USCA 1604(i)].

The 1994 LRMP did not select terrestrial species for MIS; it selected assemblages as management indicators on page 3-24 of the LRMP and then provided on pages 3-25 and 3-26 examples of species represented in, by or within each of the assemblages. At no time did the LRMP select species to be terrestrial management indicators. On page 5-16 of the Monitoring Action Plan the Forest was given the flexibility of selecting appropriate species or habitat components to represent each assemblage. For reasons outlined in Forest-level documents such as the Management Indicator Assemblage and Migratory Bird reports, the Forest focuses on monitoring habitat components. The Forest may, in its discretion, also incorporate population data, and does so for over 200 species of birds. The Forest-wide Migratory Bird report updates and evaluates data for these species.

CC 12: *The hydrology analysis claims to use a smaller assessment area apparently in an attempt to lessen the significant effects already occurring in the impaired watershed. Since the EA looks at cumulative effects from a 7th field watershed the information in the EA is misleading and does not give a “hard look” at effects of proposed activity.*

Response – Baseline levels of relevant water quality and aquatic habitat measures have been incorporated into the analysis and were used to determine the appropriate spatial scale for analysis. Analyzing effects at the 7th field watershed scale is not an attempt to decrease the size of the assessment area or the level of effects in the context of the larger watershed. In the specific case of the East Fork II project, several 7th field watersheds directly within, and adjacent to project activities were analyzed. By using this scale, the likelihood of detecting project-specific effects is actually greatly increased and because effects were analyzed at

multiple points within a larger watershed area and not solely at the largest watershed scale, the possibility of the larger watershed condition diluting the effects of project activities is greatly reduced. If significant effects are not expected at the finer watershed scale than there is no mechanism for project-related cumulative effects to occur at a larger watershed scale.

The 7th field subwatershed is also the most appropriate scale to analyze effects to fish and other aquatic organisms, aquatic habitat and RR's. Many smaller subwatersheds (i.e. 8th field or smaller) are too small to support fish at the population level and don't allow effects analysis at a population level. Larger watersheds (i.e. 6th field or larger) are often so large that localized project effects are diluted to the point that they can no longer be effectively analyzed.

CC 13: *There is no discussion in the EA of the impacts associated with the loss of forested habitat due to proposed landings and road work.*

Response – The forested acres affected by landings was considered throughout the interdisciplinary analysis (including wildlife, fisheries, soils, and hydrology), and existing landings were reviewed during Endangered Species Act consultation for fisheries. There will be no new landing construction in RR, and new landing construction outside of RR is likely to affect about 8 acres (see EA, page 11). The comprehensive environmental analysis for the project included the effects of new landings (and use of existing landings) as well as proposed temporary roads. The project Fisheries BA provides the most detailed information on this aspect of the project analysis.

CC 14: *The fisheries analysis concluded with the determination of may affect, but not likely to adversely affect coho salmon and CH. We don't believe this determination is in compliance with the LRMP.*

Response – The “may affect, but not likely to adversely affect coho salmon and CH” statement is based on the Endangered Species Act (ESA) determination and is supported by a letter of concurrence issued by the National Marine Fisheries Service on July 7, 2003. It is unclear from the comment letter what particular LRMP standard the commenter believes this ESA determination is violating. The comprehensive fisheries and hydrology analyses for the project determined that the project is compliant with LRMP guidance for key watersheds and fisheries resources.

CC 15: *All impacts from the project are projected to occur in only one subwatershed, lowering it from WCC I to WCC II. It is impossible to support this with a FONSI.*

Response – Watershed Condition Class (WCC) is used to analyze potential cumulative effects for the project fisheries analysis (EA, page 33); watershed-related impacts of the project are also discussed using ERA calculations and limiting factor analysis (see EA Section 3 Hydrology). WCC values are identified

by Subwatershed using the following values: I – properly functioning, II – functioning at risk, and III – not properly functioning. After considering potential additive effects of recent private timber harvest with effects of the proposed action, the fisheries analysis found that WCC in one project Subwatershed (Dark Canyon) is likely to change from WCC I to II. The post project condition still constitutes functioning aquatic systems (no detectable adverse effect to fish habitat), and WCC would return to pre-project conditions in less than 5 years. These project-related and temporary changes to WCC in Dark Canyon will be considered by the Responsible Official and incorporated in the finding of no significant impact.

E. EPIC, KFA, K-S Wild, and Northcoast Environ. Center

EPIC 1: *The EA does not address the effects of canopy closure on fire behavior, and also fails to address a publication by Dennis Odion et al (2004). We support some understory thinning of ladder fuels in the project area, although we do not believe that the Forest Service has accurately described the current state of fire science when it fails to address that opening the canopy may increase understory growth, temperatures, and wind; decrease air humidity and fuel moisture resulting in increased fire hazard.*

Response – Any discussion of fire hazard, burn severity, and/or fire effects is fundamentally incomplete without discussion of fuels (amount and distribution), fire weather, and topography – the main drivers of fire behavior, commonly known as the fire behavior triangle. The Odion et al (2004) publication is of limited applicability because it fails to consider fire weather and topography in its analysis. Fire hazard is not determined by fuels alone; resultant patterns of a given fire event are determined by fire behavior, determined by the fire behavior triangle. Scientists and land managers long have recognized that fuels, topography, and weather are the chief determinants of wildland fire behavior, and that, of these, only fuels can be managed (Weatherspoon and Skinner, 1995). Weatherspoon and Skinner (1995) was cited repeatedly in Odion et al (2004), yet these fundamental elements of fire behavior were apparently not investigated as covariates in Odion analysis of fire patterns.

Current science indicates that thinning combined with fuels treatment can reduce the risk of stand-destroying fire,⁶ and the Forest disagrees that the Odion paper referenced above provides strong supporting evidence that the proposed action increases fire hazard in areas like the ones proposed for treatment. In addition, the Odion paper does not dispute the use of thinning to improve forest health and facilitate treatment of existing ground fuels. The Odion study evaluated trends in fire behavior over a large-scale geographic area (the Klamath Mountains) utilizing a very small sample (100 sample points to describe relationships over nearly a quarter million acres). The actions proposed in the East Fork II EA were based on an evaluation of site-specific conditions and timber harvest/fuels reduction

⁶ See Murphy et al (2007) and Agee & Skinner (2005) for a discussion of how past fuels reduction projects have influenced fire behavior in recent Northern California wildfires.

prescriptions were developed in response to these specific site conditions in the project area.

EPIC 2: *Unfortunately, the assumptions presented in the no action alternative (DEIS 3-100) simply ignore the peer-reviewed literature referenced above [Odion et al] while the response to scoping comments found in Appendix G at 4-29 repeatedly claims that despite the findings of the literature that issues surrounding thinning and fire severing are “conjectural and not supported by factual evidence.” We are convinced that federal courts will come to a much different conclusion.*

Response – The references listed in the above comment (DEIS 3-100 and Appendix G) are not contained in the East Fork II EA. This comment appears to refer to another document and no response can be provided. See the response above for a discussion of Odion, et al (2004).

EPIC 3: *Agee (1996 and 1997) finds that thinning canopies results in hotter, drier conditions and is more conducive to severe fire. Also, Weatherspoon & Skinner (1995) and Huff et al (1995) showed that partially thinned stands (or logged areas) burn more intensely and suffered higher levels of tree mortality than unlogged areas. “Fuel treatments” that reduce basal area or density from above (i.e. removal of the largest stems) will be ineffective within the context of wildfire management.*

Response – Each of these references are taken out of context, primarily with respect to treatment of surface fuels, or rather lack of treatment of activity fuels associated with historic logging practices (as compared to the proposed action).

Agee (1996 and 1997) indeed describes how stand management can alter microsite weather, which can contribute to macro weather conditions and yield more complete fuel consumption and hotter burns. However, whether or not this translates to severe fire depends upon other more dominant conditions of fuels (overall amount and distribution), fire weather, and topography.

Weatherspoon and Skinner (1995) found that previously cut stands had higher burn severity and tree mortality than uncut stands, because of the lack of surface (activity) fuels treatment associated with older harvest methods. “Clearly, stands that had been partial-cut with no subsequent fuel treatment suffered the most fire damage. Even the relatively nominal fuel treatment...substantially reduced damage.” “Our results suggest, for the short-interval, low- to moderate-severity fire regimes studied here, that if the problems are ignored and fuels are left untreated, damage from wildfires could increase significantly.” This work was clearly cited out of context with respect to the proposed action, as a primary objective is the treatment of these fuels, in both amount and distribution, to meet fuel management objectives for the area.

Huff et al. (1995) reports on work done in eastern Oregon and Washington “typified by the *Pinus ponderosa* series.” As with Weatherspoon and Skinner

(1995), this work explicitly recognizes high fuel loadings associated with logging residues typical of past more intensive harvest methods as the causal factor for increased burn severity. “As a by-product of clearcutting, thinning, and other tree-removal activities, activity fuels create both short- and long-term fire hazards to ecosystems.” The proposed action makes clear that activity fuels shall be treated to meet fuel management objectives, consistent with what is proposed in this project.

In short, the timber harvest activities and resulting fire severity described in each of the studies cited in this comment are clearly distinguishable from the proposed action, which is specifically designed for fuels treatment.

EPIC 4: *Mechanical removal has proven to have serious negative effects on the landscape. A recent study entitled "The Watershed Impacts of Forest Treatments to Reduce Fuels and Modify Fire Behavior," authored by independent hydrologist Jonathan J. Rhodes, raises serious questions about the ecological efficacy of forest thinning and other mechanical fuel treatments intended to control wildfires – primarily because of their unintended but inevitable damage to forested watersheds.*

Response – The article referred to, authored by Jonathan Rhodes, is a literature review (not a quantitative study) that discusses potential and probable watershed-related impacts of all types of mechanical fuels reduction activities together (including overstory removal, thinning, and fuelbreak activities). The publication is what is commonly referred to as gray literature, meaning that it was not subject to formal scientific peer review and publication.

The effects of thinning from below, as proposed in this project, are not specifically addressed by Rhodes although the project is consistent with many of the recommendations presented (Rhodes article, page 75). For example, the proposed thinning focuses on retaining the largest, healthiest trees; it avoids mechanized fuel treatments in areas where adverse impacts are likely to be significant and enduring; and the project incorporates road decommissioning as an effective watershed restoration technique.⁷ The author makes a valid point that the protection of smaller headwater streams is critical to ensure protection of downstream aquatic conditions. The Rhodes article also asserts that riparian protection measures part of the Northwest Forest Plan (NWFP) are inadequate (Rhodes, page 12), particularly for smaller perennial and non-perennial streams. However, the assertion that riparian protective measures provided by the NWFP (therefore the Forest LRMP) are inadequate is largely unsubstantiated and unsupported by current scientific data.

East Fork II IDT specialists, including hydrologist, fisheries biologist, and soil scientist provided site-specific analyses using best available science of the effects

⁷ Over the last ten years, approximately 24 miles of road decommissioning has been completed within the East Fork South Fork Trinity River Watershed. The entire East Fork Project (completed plus East Fork II units) results in an additional 14 miles of road decommissioning and/or road hydro-closure in the watershed.

of mechanized treatments proposed in this project. The hydrologist concluded (EA, pg 31), “Although the project is likely to cause localized short-term impacts, it contributes to overall improvements in watershed condition and resiliency of the East Fork South Fork Watershed.” The fisheries biologist concluded (EA, pg 32) for Alternatives 2 and 3 “Based on adherence to BMPs (Appendix C), resource protection measures (Section 2), implementation of proposed road restoration, and natural recovery of activity areas; effects to fish, other aquatic organisms and aquatic habitat downstream of the project area are expected to be so small as to be immeasurable.” The soil scientist concluded (EA, pg 37) for Alternatives 2 and 3 “The direct and indirect effects of the proposed action are expected to be minimal and negligible.”

EPIC 5: *The Behave Fire Model 8 and 11 were used for modeling purposes, but were not explained in the EA. Neither the decision maker nor the public can gauge if these conditions are in fact those that are on the ground. No further explanation is given as to what type of silvicultural prescription was used in modeling.*

Response – The project fuels report, containing the comprehensive fuels evaluation and modeling information, is available in the project record. The EA focuses on the effects of the project, and summarizes existing conditions for fuels only as necessary to explain these effects. The publication Aids to Determining Fuel Models for Estimating Fire Behavior - Hal E. Anderson⁸ was used to identify appropriate Behave fire models for project-level modeling. This method involves field reconnaissance and data collection regarding average fuel loading, then identification of appropriate Behave fire models for each major fuel type in the project area.

The Behave Fire Prediction Program describes potential future fire effects based on vegetation/fuels conditions, as described in EA page 25. This program involves classifying existing fuels conditions, and changes to these conditions, using described fire models explained in the publication referenced above. The program does not model the effects of specific vegetation treatments, therefore no silvicultural prescription were used in this modeling. Existing condition is represented by Behave fuel model 10, and the post project condition is represented by a combination of fuel model 8 and 11. The description of on-the-ground fuels conditions represented by each fuel model is in EA Appendix D.

EPIC 6: *Extracting multiple old growth fire resistant trees with ground based equipment inside RR's and opening the canopy to 50%, especially in RR's is contrary to LRMP, NFMA, ROD and ACS objectives.*

Response – The project does not propose removing any old growth habitat. See EA Appendix E for how the project is consistent with the LRMP and ACS. As stated on EA pg 5, “RR prescriptions emphasize retention and/or enhancement of

⁸ The publication is online at http://www.fs.fed.us/rm/pubs_int/int_gtr122.pdf

old-growth vegetation.” In addition, forest stands proposed for thinning within RR contain pole to small sawtimber size classes (trees 6-24 inches DBH). These areas are generally overstocked with high densities of understory trees that are a hazard as fuel ladders for crown fire spread. The purpose of thinning these stands in RR is to reduce the risk of spreading crown fire by reducing understory tree density, and to encourage stand growth toward late-successional conditions by giving individual trees more room to grow. Current site-specific conditions in project units, and proposed treatments, are consistent with the general discussion in the East Fork/Smoky Creek Watershed Analysis (1998) and East Fork Watershed Analysis iteration in 2002, which identified management opportunities for density management thinning within RR in the project area.

EPIC 7: *The EA gives no specific details of where activities in RR are proposed. The LRMP for intermittent streams direction calls for “Extension from the edges of the stream to a distance equal to the height of one site-potential tree, or 100 feet slope distance, whichever is greater...The action alternative proposes only half the amount of buffer, 50 feet.”*

Response – As stated in the East Fork II Hydrologist Report on page 5, “there are 5 types of riparian features within the project area: perennial, intermittent, and ephemeral stream channels; springs and seeps; ponds; meadows; and landslide prone terrain. Riparian Reserves are a land allocation, and these areas were identified for the project as described in the LRMP and using site specific data. For the project area, RR was identified as 150 feet slope distance from both sides of high water line for intermittent/ephemeral channels and 300 feet from perennial channels (RR associated with perennials are not proposed for treatment).

The attached map showing approximate landing and RR locations is included to provide more detail. Although entire RR polygons within East Fork II units are shown on the attached map, fuels treatment is proposed only in the outer portions of RR (farther than 50 feet slope distance and outside of any inner gorges) as described in EA Section 2, resource protection measures. The following RR prescription recommendations from the East Fork Watershed Analysis 2002 iteration were incorporated into project design:

- No entry into perennial fish bearing stream reaches.
- No entry into inner gorge areas, including intermittent and ephemeral channels.
- No entry into landslide prone areas, including landslides, flows, and torrent prone areas.
- No entry into springs, seeps, and meadows.
- Limited entry into perennial non-fish bearing where water temperature is a concern leaving 85-95 percent canopy closure and LWD recruitment potential.
- Enter ephemeral and intermittent RR of streams with gravel substrate thinning from below leaving 75-85 percent canopy closure and all the larger trees.

- Enter ephemeral and intermittent RR of streams with bedrock substrate thinning from below with a prescription similar to surrounding stand. Leave 40-60 percent canopy closure and all larger trees.
- Perform road maintenance and stream channel restoration where roads cross riparian reserves, reducing the potential for streamflow diversion, surface and mass erosion.
- Size culverts to pass Q₁₀₀ flood event.

EPIC 8: *The EA looks at cumulative effects from a 7th field watershed therefore the information provided in the EA is misleading...*

Response – See response for comment CC 12 above. Cumulative effects boundaries are established by resource, considering the extent and duration of project effects, and by considering actions with effects that overlap those of this project in space or time. The EA and project record specialist reports explain bounding for cumulative effects by resource.

EPIC 9: *The East Fork of the South Fork Trinity River is in Condition Class 3, direction from the LRMP calls for emphasizing watershed improvement and overall reduction in ERA levels.*

Response – See also response to CC 15 above. All project area subwatersheds are currently in Watershed Condition Class (WCC) II, with the exception of Dark Canyon which is currently WCC I (most pristine). Dark Canyon is the only Subwatershed where WCC is expected to change (from I to II) as a result of the project, and WCC scores in this subwatershed are expected to return to pre-project levels in less than 5 years following the completion of project activities. The project is consistent with LRMP direction, including Aquatic Conservation Strategy (see EA, Appendix E).

The East Fork South Fork Trinity River Watershed is in a continued natural process of recovery/improvement in previously disturbed areas. The East Fork II Project would contribute to the long-term improvements in water quality downstream (East Fork South Fork Trinity River), which would ultimately benefit all aquatic species and their habitats.

EPIC 10: *The EA calls for a number of practices known to harm water quality and inhibit attainment of the objectives of the ACS and CWA requirements and there has not been a needed TMDL study.*

Response – All project activities with any known potential to harm water quality have been evaluated and adequately mitigated by resource protection measures, BMP and a project-specific erosion plan developed for the original project (see EA Appendix C for project-specific BMP). See EA Appendix E for more details of how the project complies with the aquatic conservation strategy (ACS). Project planning included integration of State water quality input, and the project

was found to be compliant with the Clean Water Act. See also response below for comment 7 (interagency consultation) under Individuals.

There has been a TMDL study completed for the South Fork Trinity River and Hayfork Creek (EPA 1998).⁹ The TMDL sediment source analysis shows that the majority of suspended sediment and turbidity are sourced from the Coast Range Geologic Province (west side streams draining South Fork Mountain), whereas coarse sediments are sourced from the Klamath Geologic Province (project area). The CWE analysis completed for this project demonstrated that project activities will not increase the short and long-term coarse sediment yield to a level that will degrade the water quality of this basin. Actions taken to mitigate the impacts of the project and other foreseeable watershed restoration actions are likely to improve the long-term channel stability and help meet sediment TMDL goals and improve stream habitat conditions.

EPIC 11: *... over 187 old growth trees were in the timber cruise, and most likely multiple more than that were not in the cruise...*

Response – The project does not propose removing any old growth habitat (see EA Section 3 Wildlife). As stated in footnote 44 on EA page 45, “Timber cruise data from the original East Fork project estimates that about 187 trees total...” The footnote contains an error, and should refer to trees 30 inches DBH and larger, not 33 inches DBH and larger. 187 trees is our best estimate for the total number of trees of this size that will be removed by this project. Cruises for the East Fork Project were run as two separate cruises, resulting in sample errors of 8.63% and 8.81%. The planned sampling error for both sales was to be below 10%, which is the Forest Service Regional direction for “tree measurement” sales.

EPIC 12: *Neither the decision maker nor the public are given any review of the Sensitive, Endemic, or S&M botanical species.*

Response – The decision maker was provided the comprehensive botany report for the project (dated November 19, 2007), which evaluates baseline information and potential project effects for all Sensitive, Endemic, and S&M botanical species. The EA is intended to be a concise public document focused on disclosing the environmental effects of the project and does not present comprehensive baseline information or accounts of species that are not likely to be affected by the project. Of all the botanical species evaluated only Sensitive fungi may be affected by the project, and these effects are discussed in the EA. The comprehensive botany reports in the project record are available to the public upon request.

⁹ South Fork Trinity River and Hayfork Creek TMDL is online at <http://www.epa.gov/region09/water/tmdl/trinityso/fsftmdl.pdf>

EPIC 13: *LRMP direction calls for protection of each known [goshawk] nest site. However the decision maker nor the public know if nest sites exist in the analysis area because the EA does not mention that surveys have been done.*

Response – Surveys have been done in the analysis area and the decision maker is informed through the Biological Evaluation for the project that no nest sites were found. In the Wildlife BA/BE dated October 2002, it states “Goshawks have been observed within the analysis area. Subsequent surveys have failed to locate active nests or defended territories. All reported sightings of goshawks within or adjacent to proposed units were recorded and intensive field surveys of the area were conducted. It is unlikely occupied nests in the proposed units were missed.”

EPIC 14: *In the annual Candidate Notice of Review, issued by the FWS each year, the FWS reiterated the concerns highlighted in the fisher’s warranted but precluded determination...This new information regarding the fisher was simply not reflected in the EA, ROD, the Northwest Forest Plan or the Shasta-Trinity LRMP...The EA also contends the completed East Fork project retained adequate fisher habitat. However this broad sweeping assumption lacks any real data.*

Response – The existing baseline information and effects of the project on Pacific fisher and their habitat are summarized in the EA and discussed in detail in a separate report prepared for the project record, the Pacific Fisher Addendum. Relevant information about this species, and potential project effects, are also discussed in the East Fork 2 Wildlife Report and Biological Evaluation. In the 2007 Candidate Notice of Review, the USFWS reiterated what had been found in the 12-month finding without new analysis or information. The original 12-month finding was cited in the Pacific Fisher Addendum and its findings were considered during the wildlife project analysis.

EPIC 15: *The EA fails to disclose impacts or effects to MIS species.*

Response – The Shasta-Trinity National Forest LRMP did not select terrestrial management indicator species (LRMP pp 3-24), it selected assemblages. The Monitoring Action Plan in the LRMP calls for the “[U]se of appropriate indicator species or habitat components to represent the assemblages.” Monitoring is to occur at the plan level every one to five years and reported out every five years. LRMP p 5-16. The LRMP did not intend to measure these parameters at the project level. Nevertheless, we generally assess project level impacts to assemblage habitat components at the project level to aid decision makers in their consideration. Impacts to management indicator assemblage habitat components were assessed in the project level management indicator report and in assessments of those components throughout the EA.

EPIC 16: *What known [Survey and Manage] sites occur in the project area? Neither decision maker nor public is given any explanation as to why species were not considered or where known sites may be because no surveys were done.*

Response – “All proposed treatment units have been surveyed to protocol for terrestrial mollusks” in 2000 (EA pg 53). No currently-listed S&M species were found. See also response for CC 8 above.

EPIC 17: *The EA for this proposed project fails to fully and adequately disclose the current population status and trends of native forest dependent Neotropical migrant and native avian species within the project analysis area and adjacent forest...Further, the EA did not deal with direct, indirect, and cumulative impacts that the project would have on migratory birds. Recent legal analysis confirms that the Forest Service must actively prevent the take of migratory birds, or obtain a permit for incidental take of individual species.*

Response – Current population status and trends of over 200 species of migratory and residential birds are reviewed by the decision makers as part of the Forest Migratory and Residential Bird Population Trend Monitoring Report. At the project level, staff biologists consider the probable effect of proposed actions on migratory and residential birds and, under NEPA, consider the significance of those possible and probable effects. The Forest Service is not proposing any activity that would result in the take of migratory birds.

EPIC 18: *LRMP pg. 4-25 Under Standards and Guidelines Developed Through the Forest Planning Process that Apply Forest-wide – Soils and Water – “Analyze each land disturbing project for its effect on the appropriate 2nd or 3rd order watershed (average size about 1,000 acres), to prevent excessive cumulative impacts on stream channel condition and water quality.” “Management activities within 5th order watersheds, which are in condition class 3, will emphasize watershed improvement and overall reduction in ERA levels.”*

Response – The project was evaluated by the appropriate order watershed, as shown in the EA Section 3 Hydrology; watersheds evaluated range in size from 1,400-2,600 acres. The project-specific hydrology analysis classified existing Watershed Condition Class (WCC) by watershed, based on currently best available information. The project-specific current analysis supercedes any previous analysis of WCC and finds that all project watersheds, except Dark Canyon, are best classified as WCC II. Dark Canyon is currently classified as WCC I. The project is consistent with LRMP management direction, as described in the sections cited by the commenter.

EPIC 19: *Given that these are steep, Key 1 watersheds, listed as impaired under the CWA and with hundreds of acres proposed for tractor logging, there should be information within the EA that describes the geologic condition of the project area.*

Response – The comprehensive geology report details the geologic condition of the project area, this document is available in the project record. Project design

excluded activity in all geologically unstable or potentially unstable areas during individual unit layout, prescription, and landing/road location modification. Therefore, no direct or indirect effects to land stability are therefore predicted due to either action alternative. The South Fork Trinity River is listed as impaired under the Clean Water Act, and a TMDL study has been prepared. See response to EPIC 10 above and Individual comment 7 below. The project is consistent with the South Fork Trinity River/Hayfork Creek TMDL and the Clean Water Act.

The EA is intended to be a concise public document focused on disclosing the environmental effects of the project and does not present detailed existing condition information unless needed to explain the effects to the public. Since there is not likely to be any effect to land stability due to the project, details on the current geologic condition are not relevant to understanding project effects or to the decision.

EPIC 20: *It appears there may be some question as to the accuracy of FS GIS layers.*

Response – In conducting the assessment, East Fork II interdisciplinary team members used a variety of information sources, including GIS layers and field verification. Field verification and validation were on-going as the ID team conducted site-specific, on-the-ground assessment of the project’s potential effects. The best available site-specific information was used in the analysis and the Forest did not rely solely on GIS information.

EPIC 21: *Neither the decision maker nor the public know what types of trees would be harvested, because there is no mention to tree species, aside from Douglas fir mentioned in the EA. Recommendations for preserving and protecting sugar pine should be heeded.*

Response – The East Fork Marking Guidelines, which are included in the East Fork II project planning record, detail how stand management prescriptions are to be implemented. As stated in the East Fork Marking Guidelines, “Leave tree species preference is to retain vigorous Douglas-fir and uninfected (blister rust) sugar pine, followed by ponderosa/Jeffrey pine, incense cedar, and white fir.” The importance of sugar pine is recognized and has been accounted for in the project prescriptions.

EPIC 22: *The EA fell silent on the effects of landings...Neither the decision maker nor the public knows where those landings would be located.*

Response – Please see response to CC 13 above.

EPIC 23: *There is no reliable data indicating that ‘Best Management Practices’ (BMPs) consistently reduce the adverse effects of significant soil and vegetation disturbance on aquatic resources to ecologically negligible levels...Other than BMPs the EA makes no reference to monitoring.*

Response – Project-specific BMPs were developed by the Forest Service and certified by the California State Water Resources Control Board and approved by the U.S. Environmental Protection Agency as being the most effective means of controlling non-point sources of pollution. Since project-specific BMPs are included in legal contracts for implementing the project, they are binding and therefore monitored by the contractor as well as by Forest Service sale administrators for implementation. Additionally, earth science specialists conduct monitoring for BMP effectiveness during project operations and provide instructions for any needed modifications. The Forest Service in Region 5 also employs the Best Management Practice Evaluation Program (BMPEP) to monitor BMPs for implementation and effectiveness (USFS, R-5, 1992). The BMPs are evaluated on a project site basis to determine their individual use and effectiveness. The monitoring program documents the degree to which BMPs have been implemented and how effective they had been. As of 3/26/2008 there are over 84,000 evaluations stored in the Forest Service Region 5 BMP monitoring database. The most recent BMPEP report found that BMPs were 92% effective for all activities combined, based on random evaluations.

The project soils and aquatic environmental analyses considered BMP effectiveness, as described in BMPEP reports. The conclusion that the project is not likely to result in significant adverse impacts to soils and aquatic resources does not rely solely on BMPs. The project includes other protective measures, described in EA section 2 (page 13), that were designed specifically for this project to adequately minimize potential watershed impacts. Post-project monitoring in completed East Fork Project units found that these protective measures have been effective in minimizing project-related impacts as described in the EA. Forest hydrology and soils scientists routinely visit vegetation management projects during implementation to evaluate overall operations and specifically the implementation/effectiveness of resource protection measures. This type of monitoring occurred during implementation of the original East Fork Project, as described in CBF 3 above, and will continue to occur for East Fork II.

EPIC 24: *Because alternative 3 would result in a reduction of ground disturbance and sediment related impacts which is very important to this impaired Key1 watershed, be less wildlife habitat disturbance for TE&S, S&M, and MIS species, retain much needed old growth that species depend on, have a minimal effect on fire behavior in the analysis area and would still provide a viable economic opportunity, we urge you to choose this alternative and drop unit 197.*

Response – The project wildlife analysis explains that neither action alternative would remove old growth habitat or affect S&M species. Your input will be considered by the deciding official.

EPIC 25: *Regarding removal of trees over 30 inches DBH, the East Fork/Smokey WA repeatedly advises against taking this important future snag replacement structure out of*

a landscape that has been so ravaged by previous industrial logging in a landscape that is lacking this important structure, especially in Matrix.

Response – The project wildlife biologist specifically considered the effect of removing trees of over 30 inches DBH to threatened and endangered species, and concluded that the project (Alternative 2) is not likely to adversely affect Northern spotted owls or their critical habitat (EA, page 45). Estimates for post project snag retention found that at least 2 snags per acre will remain in units, which is above standards set by the LRMP.

EPIC 26: *While fires can have substantial effects on streams and riparian systems and may threaten the persistence of some populations of fish, particularly those that are small and isolated, major new efforts to actively manage fires and fuels in forests may be a threat rather than a benefit to conservation of native fishes and their habitats. This is particularly true when treatments are focused on addressing forest management symptoms (e.g., fuel load, etc.) rather than on restoration of natural processes.*

Response – While the project does aim to reduce fuel loading, which is a symptom of altered fire regimes, it also contributes to the Forest’s overall fuels management strategy to restore natural fire regimes where possible. Because of concerns over fire risk to life and property, restoration of natural fire regimes is not likely to be feasible throughout the Shasta-Trinity National Forest. The objective of fuels treatment on the Shasta-Trinity National Forest is to establish and maintain fuel profiles that contribute to safe and cost-efficient fire protection and sustainability of ecosystem values.

In addition to reducing fuel loading, the project aims to address Aquatic Conservation Strategy¹⁰ wildlife-related objectives by improving forest health (stand structure and composition) and improving stand resiliency to natural disturbances. The need for treatment in selected RR is based on several aspects of the existing condition: 1) stagnant/uniform structural condition of riparian systems, 2) low tree species diversity, and 3) overstocking of stands in RR (which will cause reduced tree growth rates and stand vigor as competition increases). A summary of how the project meets ACS objectives is in the EA Appendix E, and Appendix D of the original East Fork Fisheries BA (Lang 2003; included in EFII Project record). This project is designed to balance needed fuels reduction and thinning with wildlife and watershed-related goals, and is aimed at restoring the forest’s resiliency to natural processes, including wildfire.

II. Individuals

Comments were received from 9 individuals, listed below. Their comments are grouped by topic and summarized below with appropriate responses. Individuals are referred to

¹⁰ The Aquatic Conservation Strategy was developed, as part of the Northwest Forest Plan, to maintain and restore aquatic systems and associated species.

using the following abbreviations (in parentheses): Anastasia Dodson (AD), Heather Walker (HW), Sue Andrews (SA), Karen Wilson (KW), Mary Lee Steffensen (MLS), Jim Kelly (JK), Claudia Schimmer (CS), Marilyn McKinney (MM), Christina Petterson (CP).

1 – No Action

(AD, SA, JK, CS, MM): *Please chose Option Alternative One-No Action.*

(HW): *I prefer Alternative #1- No Action to avoid the wreckless stewardship of our forests.*

(MLS): *I prefer Alternative 1, the NO ACTION Alternative, because I want the canopy to stay closed.*

Response – Your input will be considered by the deciding official.

2 - AD

The range of alternatives is not broad in any sense and does not address issues raised in the scoping process (except for trees with a larger diameter than 30 inches DBH). Other issues raised were logging outside of areas designated as Matrix, wildlife corridors, the definition of “thinning from below,” consultation with other agencies, detailed costs, using helicopters in the action alternatives, an alternative that provides improvements for fish and wildlife species, dividing the project into smaller ones, logging only in plantations, monitoring schedules, compliance with the Clean Water Act with regard to soil compaction and allowed amounts of silt, as well as protection of waters under consideration as additions to the Wild and Scenic River System.

Response – The project interdisciplinary team developed the action alternatives to best respond to the identified purpose and need for the project, public input, and direction outlined by the Land and Resource Management Plan (LRMP). The issues identified in the comment were considered and fully evaluated. Thinning from below is implementing a silvicultural prescription where the largest and most healthy trees are retained and understory and intermediate trees are targeted for removal. This prescription is used widely across the western U.S. to reduce competition stress in dense forest stands while also reducing the likelihood of future crown fire. Interagency consultation is addressed in the EA, end of Section 1. Detailed information about water quality, project economics, and wildlife corridors is available in project record reports. Information that provides the public a complete summary discussion of the project environmental effects, including issues and considerations particularly relevant to this decision are included in the EA.

3 - Economics

(AD): *Specifically I was asking for a detailed cost basis for East Fork I, which has already taken place.*

(KW): *What were the Forest Service costs associated with repair of damage to purchaser-utilized or other roads or drainage structures in East Fork I?*

Response – Economic information, relevant to the project and this decision, is included in the EA, pages 19-21. If any damage to roads or drainage structure occurs the purchaser incurs any cost of repair. Based on monitoring during East Fork Project implementation, actions were taken to prevent damage to roads and drainage structures.

4 – Location of project

(HW): *Let's focus on the dead wood near man.*

(MM): *I want to see thinning of National Forests for fires near interface with residences, not in remote areas of forests.*

Response – The location of private land is a primary consideration during project planning, and fuels reduction projects are ongoing within wildland urban interface (WUI) areas on the Forest. WUI areas do receive higher priority and resource allocation for fuel reduction treatments, but other more remote areas of the landscape also need fuels reduction to limit the likely extent of future wildfires so they do not burn up entire watersheds (with high natural resource values) or reach WUI areas as uncontrolled wildfires.

Management direction in the LRMP, the forest-wide LSR assessment, and the Fire Management Plan¹¹ describe the Forest strategy for managing fuels. The fire management plan explains how areas on the Forest are prioritized for fuels reduction by considering critical fire danger areas based on the Hazard, Risk and Value ratings and management needs. These priorities align with the National Fire Plan and guide the strategy for fuels reduction projects and identification of essential road access for protection purposes. The National priorities are:

- A. Wildland-Urban interface
- B. Readily accessible municipal watersheds
- C. Threatened and endangered species habitat
- D. Maintenance of existing low hazard Condition Class 1 areas

The project is proposed in the East Fork South Fork Trinity River Watershed which provides habitat for the threatened and endangered (T&E) Northern spotted owl, and supports quality downstream habitat for T&E fish (coho salmon). The project fuels report explains that the project area is rated as having a high fire Hazard, moderate Risk, and moderate to high Values at risk. The East Fork/Smokey Watershed Analysis (1998) identified catastrophic, or high severity, fire as a primary threat to the critical and unique resources of the watershed. The project was designed to reduce the likelihood of future high severity wildfire by removing dense understory trees (ladder fuels) and accumulated ground fuels. The project was also designed to improve forest health and resiliency which are important to the maintenance of habitat for T&E species over time.

5 – Existing condition

¹¹ The Forest Fire Management Plan is updated annually, and available from the Forest anytime on request.

(KW): *The areas analyzed in this EA are mostly forests that have not had previous timber harvest. These are not plantations with even-aged trees as the 'Existing Condition represents. The 50 acres of LSR in unit 197 needs to be eliminated because LSR does not meet the description provided in section 1. Many other units need to be eliminated because they are not previous logged.*

(SA, CS): *Both Alt 2 & 3 include mostly units that have never had previous timber harvest and therefore are not single-stories as would be found in plantations. The entire premise at the outset is flawed and therefore the entire EA.*

Response –All areas proposed for timber harvest/fuels reduction have been previously harvested (including LSR areas), most are natural stands and plantations included in the proposed action (44 acres) originated in the 1980s. Lands designated as LSR contain the full range of wildlife habitat; this includes early, mid, and late seral conifer stands as well as barren/rocky areas, open meadows and shrublands.

6 – Key watershed

(SA, KW): *Since East Fork of the South Fork Trinity River is not only a key watershed, but a key 1 watershed (meaning it is of highest quality and therefore needs the highest protection). Two miles of roads, even if they are decommissioned within the same season, are not appropriate here. As quoted from the LRMP, this watershed is intended to provide high quality fish habitat, which means any soil disturbance is unacceptable.*

Response – See #3 in finding of no significant impact (EA, pg 56) for relevant summary of tier 1 key watershed status and management direction. The project was designed to be consistent with the LRMP, including the Aquatic Conservation Strategy. Post-project monitoring (completed by soil scientist and hydrologist) in original East Fork Project units found that actual effects were at, or less than, those predicted in the original EA.

7 – Interagency consultation

(KW): *Do you have a problem with consulting California Dept of Fish and Game, who survey these areas on-foot and in-stream on a regular basis? I would appreciate your getting their opinion. Did you specifically consult with US Fish and Wildlife Services or National Marine Fisheries or North Coast Water Quality Control Board concerning soil compaction and disturbance caused by proposed new roads and landings?*

Response – The project fisheries analysis included collecting the best available information for the project area, this includes any data available through State agencies such as Fish and Game. The project included ESA consultation for coho salmon with National Marine Fisheries Service; that process evaluated project-specific details concerning soil compaction and disturbance and concluded with a letter of concurrence supporting the “may affect, but not likely to adversely affect” determination.

The Forest complies with Clean Water Act (CWA) through implementation of projects consistent with the Categorical Waiver for Discharges Related to Timber Activities on Federal Lands Managed by the USFS in the North Coast Region (California Regional Water Quality Control Board, North Coast Region, Order No. R1-2004-0015). A multi-disciplinary analysis was conducted for the proposed action and this analysis determined that project activities may result in localized increases in suspended sediment during the first few precipitation runoff events following implementation. However, the proposed activities will not result in *cumulative watershed effects* that threaten long-term water quality objectives. Implementation of resource protection measures (retention of surface cover, retain 80% shade near streams, etc), and use of specific erosion and sediment control measures through BMPs are incorporated in the proposed action. The project complies with the Clean Water Act, Porter-Cologne Water Quality Control Act, applicable water quality control plans, and the Regional Board waiver (Order No. R1-20044-0015).

8 - Soils

(MLS): *Tractor yarding, as practised in the first stage of this project, left huge areas scraped down to bare soil.*

Response – Monitoring of the project by the soils scientist occurred on 07/20/2006, 1/11/2007, and 10/23/2007. Overall the ground disturbance observed in units was at the levels described in the original, and East Fork II, EAs. Tractor, or mechanically, harvested units were visited and post project ground cover was found to be adequate for the protection of soils as described in the LRMP. The maximum decrease in soil porosity was about 8%, found on major skid trails and trails close to mechanical landings. The commenter did not provide details about the location of areas they are concerned with, so the Forest cannot respond directly regarding specific areas of disturbance. Overall watershed-related monitoring (conducted by soils scientist and hydrologist) found no evidence of “huge areas scraped down to bare soil,” as the comment describes. Mechanical landings are associated with the most ground disturbance, and resource protection measures including BMPs and wet weather operation guidelines are being implemented successfully to avoid adverse impacts in these areas.

9 - MLS

When hauling, chopping, chipping everything in East Fork I, how did you meet LRMP standards on Matrix lands that call for specified amounts of coarse woody debris?

Response – Post-project monitoring of completed East Fork units was conducted by the project wildlife biologist and silviculturist. The monitoring found that LRMP standards on Matrix lands were met for coarse woody debris; a renewable supply of future large down logs were maintained, coarse woody debris (CWD) already on the ground was retained, and undisturbed forest patches within units retained down logs. Large down logs were retained in each unit and measured at

about 20 ton per acre. The CWD retained after harvest was well distributed and residual canopy closure was 50% or greater in sampled harvest units (provides for future CWD recruitment). Please see also response for CBF 1 above.

10 – Angora Fire comparison

(JK, CP): *Comparing the effect of untreated area to the Angora Fire in South Lake Tahoe (p. 23), and fire spreading in tree crowns is not appropriate in South Fork Headwater area under consideration.*

(CS): *Comparisons to the Angora Fire in 2007 in Lake Tahoe Basin are inappropriate and underscore the need to treat areas near places like Tahoe Paradise subdivision with greater efforts and resources, not remote watersheds.*

Response – The Angora Fire is a good example of how fire behavior can become extreme in conifer stands with heavy ground fuels and an unnaturally overstocked understory which acts as ladder fuel, especially for wind-driven fire events. Fuels effects monitoring after the Angora Fire showed that in areas where fuels had been recently reduced (using silvicultural prescriptions similar to those proposed in this project), wildfire behavior was less extreme and more likely to remain close to the ground when compared to untreated areas. Similar results were observed after the Megram Fire on the Shasta-Trinity National Forest.¹² Stand structures and fuel conditions of the project area are not unlike those in the Tahoe Basin at the time of the Angora Fire, despite the different ecotypes. Wildfires on the western portion of the Shasta-Trinity National Forest also tend to be wind-driven events, or to create their own winds due to topography. There is high probability that fires in the project area with severe fire weather would produce similar violent fire behavior and destructive results as seen in the Angora Fire, and the comparison is appropriate. Also see response for comment 4 above concerning project location.

11 – WA recommendations

(CS): *Have you accomplished the recommendations (p .7-10) made in the Watershed Analysis (WA)? They are attached for your reference and I would like to know which have been accomplished since March 1998, and on which this EA is based.*

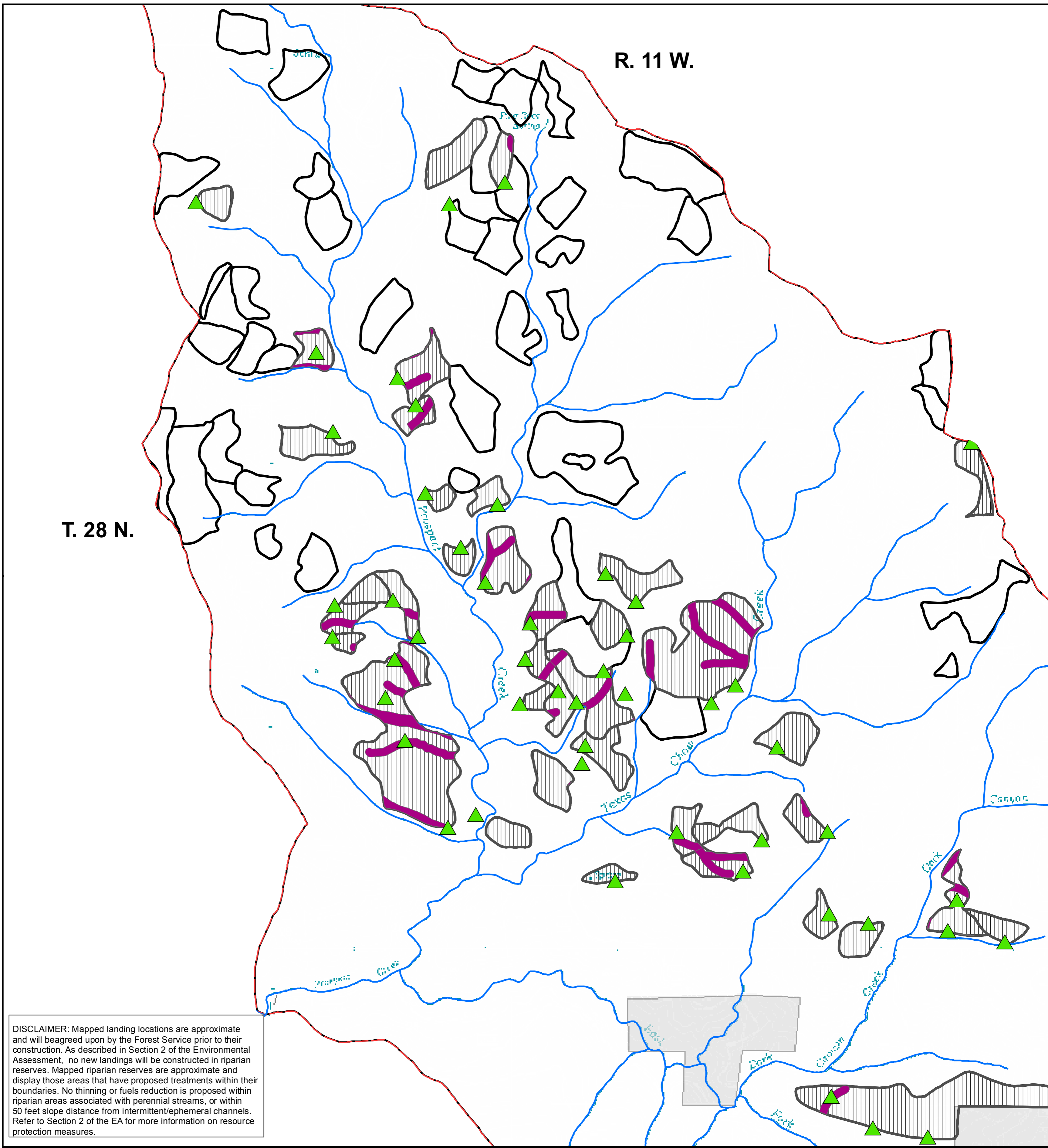
Response – Management recommendations identified as part of watershed analysis, and the documentation of those (WA documents), do not represent a prioritized list of needed projects. They encompass a range of opportunities that may be researched and developed into future actions. The need for thinning and fuels reduction like proposed in this project, (including some RR lands) is recognized in the WA.

¹² See Agee and Skinner (2005)

Acronyms used in this document

BMP = best management practices
ERA = equivalent roaded area
RR = riparian reserve land allocation
LSR = late successional reserve land allocation
CWE = cumulative watershed effects
EA = environmental assessment
LRMP = Shasta-Trinity National Forest land and Resource Management Plan
WA = watershed analysis
BA/BE = wildlife or fisheries biological assessment and biological evaluation
ESA = Endangered Species Act
NSO = Northern spotted owl
CH = critical habitat, as designated by Endangered Species Act
DBH = diameter at breast height
MIS = management indicator species
MIA = management indicator assemblages
CWA = Clean Water Act
TMDL = total maximum daily load
NFMA = National Forest Management Act
NEPA = National Environmental Policy Act
WCC = watershed condition class
NWFP = Northwest Forest Plan
ACS = Aquatic Conservation Strategy
GIS = geographic information system
S&M = survey and manage program

East Fork II Project - Riparian Reserves and Landing Locations



DISCLAIMER: Mapped landing locations are approximate and will be agreed upon by the Forest Service prior to their construction. As described in Section 2 of the Environmental Assessment, no new landings will be constructed in riparian reserves. Mapped riparian reserves are approximate and display those areas that have proposed treatments within their boundaries. No thinning or fuels reduction is proposed within riparian areas associated with perennial streams, or within 50 feet slope distance from intermittent/ephemeral channels. Refer to Section 2 of the EA for more information on resource protection measures.

Assessment Area	Completed East Fork Units	Approximate Riparian Reserve Areas Proposed for Treatment
East Fork II Units	Approximate Landing Locations	

N	Forest Service Land	Streams	Scale: 1:17,450	
April 3, 2008	Private Land		0 0.2 0.4 0.8 Miles	