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Environmental Assessment Rush2 Vegetation Treatment

Big Valley Ranger District, Modoc National Forest

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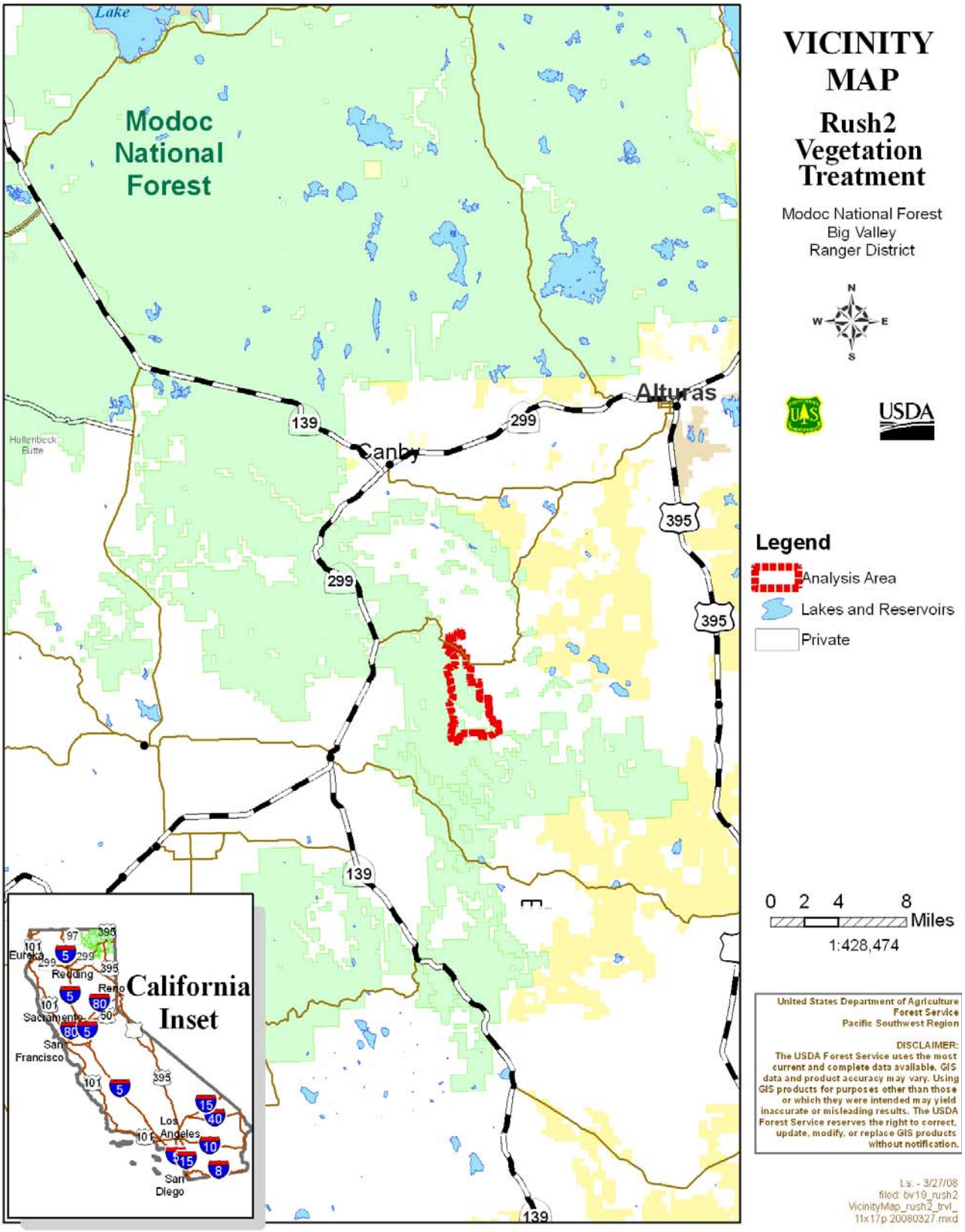

Figure 1. Project vicinity map

Introduction

The Big Valley Ranger District is proposing a series of fuel reduction activities on approximately 3,600 acres in the vicinity of Sweagert Flat (Figure 1 – project vicinity map). This planning area was selected because present fuels conditions create a high potential for a destructive wildfire to develop within this general area if an ignition were to occur under high fire-danger conditions. The vegetative configuration in combination with residential locations within the adjacent California Pines subdivision create a hazard that could threaten life, property, watersheds, and wildlife habitat in the event of a fire occurrence. The intent of this project is to provide defensible space, through vegetation treatments, where wildfire suppression activities can more safely and efficiently be conducted on National Forest System Lands. Our goal is to coordinate efforts with the California Pines landowners and with local and state fire protection agencies to mitigate the hazards associated with wildfire.

The Forest Service has prepared this Environmental Assessment in compliance with the National Environmental Policy Act (NEPA) and other relevant Federal and State laws and regulations. This Environmental Assessment discloses the direct, indirect, and cumulative environmental impacts that would result from the proposed action. It also provides the supporting documentation for a determination to prepare a Finding of No Significant Impact (FONSI).

Additional documentation, including detailed analyses of project-area resources, may be found in the project planning record located at the Big Valley Ranger District Office in Adin, California.

Purpose and Need for Action

The purpose and need for the Rush2 Vegetation Treatment project is to reduce fuel loading, maintain/enhance wildlife habitat, and enhance forest health. The development of the Rush2 Vegetation Treatment proposal is described in the following sections covering the existing and desired conditions, and the rationale for action at this time. Also included is a summary of the public collaboration process and results used by the Forest Service to develop this project and inform the public of the proposal.

Existing Condition

The project area has not directly experienced a large wildfire recently. The lack of fire has allowed dense vegetation and surface fuel loading to accumulate. The potential for a wildfire start is high due to residential development, recreational use, and lightning. Predicted fire behavior modeling of timber stands and representative fuel types indicates that high intensity fire with rapid rates of spread would be likely under high fire-weather conditions.

The location of values at risk, topography, access, and weather patterns in the California Pines area dictate that primary fire suppression efforts in the event of a large wildfire would be along the major ridges and roads. These are the areas where it is critical to thin stands and reduce fuel loadings. While fuel treatments do not “fire proof” an area, strategically placed treatments can reduce surface, ladder, and canopy fuel loading and continuity--fuel-related factors that contribute significantly to high-intensity fire behavior.

Logging, fire suppression, and subtle climate changes have resulted in changes in species composition, structure, and density. Dense, closed canopies have favored the regeneration of shade tolerant white fir, to the exclusion of shade intolerant pine. The shade tolerant species are more susceptible to mortality from fire, and form a dense understory, which acts as fuel ladders to the larger overstory trees. Thinning of the understory can increase the proportion of shade intolerant species, and increase the health and growth rates of the larger overstory trees.

Why Here Why Now

The Rush2 Vegetation Treatment planning area covers the upper portion of the Cottonwood Creek watershed. Vegetative cover is critical to maintain the hydrological function of any watershed. A large, high intensity fire within any of the sub-watersheds in the planning area would have severe impacts on water quality. Hill slope stability would likely be reduced, and short-term increases in turbidity from fine, suspended sediment would occur. Aquatic systems and habitat may be temporarily degraded. Water temperatures would be affected in stream reaches where riparian vegetation mortality is high and the tree canopy is consumed by fire.

Fire exclusion has allowed dense vegetation and surface fuel loading to accumulate. The potential for a wildfire start is high due to residential development, recreational use, and lightning. Predicted fire behavior modeling of timber stands and representative fuel types indicates that high intensity fire with rapid rates of spread would be likely under high fire-weather conditions.

Fuel (vegetation), weather, and topography are the three factors that influence fire behavior. In this area, fuel and weather are especially influential to fire behavior, and together have the potential to make a fire's behavior become extreme. Fuels are dense, and will readily support crown fires over much of the area. The Mediterranean climate assures numerous days of weather conditions capable of fueling high intensity wildfires each year. As managers, the only fire behavior factor we are able to modify is fuel, through vegetation treatments.

The following table displays the outcomes of fuels treatments recommended to achieve desired fire behavior, and the estimated existing conditions within the areas proposed for treatment.

Table 1. Fuel Treatment Outcomes

Height to Live Crown[a]	Flame Length[b]	Type of Fire Behavior
Desired: 15' to 25' Existing: 2' to 8'	Desired: < 6' Existing: 13' to 18'	Desired: Surface Existing: Passive to Active Crown Fire

[a] Average distance from the ground fuel bed to the live crowns.
[b] The estimate average length of flames during 90 th percentile weather conditions.

The Rush2 Vegetation Treatment addresses management on National Forest System lands. However, it has been designed to function in coordination with treatments planned on privately owned lands. Some treatments have been accomplished on both private and public lands. The Rush2 Vegetation Treatment would provide the mutual benefit of expanding these treatments by treating along public/private boundaries. There is high interest in the community to expand treatments on public lands, working in collaboration with the

California Department of Forestry and Fire Protection (CALFIRE), the California Pines Community Services District and the Modoc Fire Safe Council.

Within the Rush2 Vegetation Treatment planning area there is wildlife habitat managed for one California Spotted Owl protected activity center (PAC) and four Northern Goshawk PACs. Vegetation and fuel treatments within and adjacent to these critical wildlife habitats is important to reduce the potential for high intensity wildfire to destroy these areas.

Desired Condition

The National Fire Plan (2003) and Healthy Forest Restoration Act (HFRA) (2003) provide direction to reduce fuel loadings in fire-prone forests to protect people and sustain resources. Concurrent with these initiatives, the Pacific Southwest Region of the Forest Service has launched the "Forests with a Future" campaign (USDA FS 2004d), to emphasize the protection of communities, old growth trees, and wildlife in the Sierra Nevada from the risk of catastrophic wildfires. The wildland-urban interface (WUI), areas where flammable wildland fuels are near homes and communities, is one of the highest priorities for treatment.

This action complies with the National Fire Plan, HFRA, and the Modoc National Forest Land and Resource Management Plan (LRMP) as amended by the Sierra Nevada Forest Plan Amendment Supplemental Environmental Impact Statement (USDA FS 1991, USDA FS 2004a). The proposed action is designed to meet Forest program goals (LRMP, pages 4-2 to 4-5) and follow standards and guidelines (LRMP, pages 4-13 to 4-33).

The Sierra Nevada Forest Plan Amendment Final Supplement (SNFPA) was approved and signed in January 2004. This document amends all forest plans across the Sierra Nevada range, including that of the Modoc National Forest. However, all but 40 acres of the Rush 2 project is located within the Big Valley Federal Sustained Yield Unit (BVFSYU), under which proposed actions are exempted from standards and guidelines outlined in the SNFPA. Management within the BVFSYU is thereby directed by the Modoc National Forest Land and Resource Management Plan (1991). The science underlying habitat management in the SNFPA has been considered and incorporated into the proposed action's design.

Proposed Action

The Rush2 Vegetation Treatment planning effort is proposing to reduce fuels and thin timber stands in order to alter fire behavior, and improve wildlife habitat and forest health. Treatments are designed to strategically connect with fuel reduction work already accomplished along the California Pines fuelbreak. The areas proposed for treatment form the base for establishing contiguous fuel treatments for the entire Rush Creek WUI that extends to the Rush Creek community.

Decision Framework

Given the purpose and need, the deciding official reviews the proposed action in order to make the following decisions: 1) whether to implement the Proposed Action as described, or 2) whether the No Action Alternative should be implemented.

Public Involvement

The proposal was listed in the Schedule of Proposed Actions on December 9, 2004. The proposal was provided to the public and other agencies for comment during scoping from September 30 to November 15, 2005. Presentations were made to the Modoc County Fire Safe Council on 7/14/05 and the California Pines Community Services District on 7/20/05 requesting recommendations toward development of the proposed action.

The Forest Service followed up scoping comments identifying concerns with phone conversations to clarify and alleviate concerns, and ensure public concerns would be accurately and adequately addressed in the development of issues, refinement of the proposed action, and the environmental analysis.

Government to Government Relations

A letter introducing the Rush 2 Vegetation Project was sent to Ms. Jessica Jim, Tribal Chair of the Pit River Tribe on October 4, 2005. In addition, a consultation field trip was held on Thursday, August 3, 2006, with Wally Preston, Atwamsini Band Head and representative to the Pit River Tribal Council, to discuss the proposed action for the Rush 2 Vegetation Project.

Issues

The Forest Service separates issues into two groups: significant and non-significant issues. Significant issues are defined as those directly or indirectly caused by implementing the proposed action. Non-significant issues are identified as those: 1) outside the scope of the proposed action; 2) already decided by law, regulation, Forest Plan, or other higher level decision; 3) irrelevant to the decision to be made; or 4) conjectural and not supported by scientific or factual evidence. The Council on Environmental Quality (CEQ) NEPA regulations require this delineation in Sec. 1501.7, "…identify and eliminate from detailed study the issues which are not significant or which have been covered by prior environmental review (Sec. 1506.3)…" No significant issues were identified for this project. A list of non-significant issues and reasons regarding their categorization as non-significant may be found in the project record.

Alternatives

This section describes the alternatives developed for the Rush2 project. They include descriptions and maps of the alternatives.

Alternatives Analyzed in Detail

Alternative 1

No Action

Under the No Action alternative, current management plans would continue to guide management of the project area. Neither fuel reduction nor wildlife habitat and forest health enhancement activities would be implemented to accomplish project goals.

The Proposed Action would not be implemented. Fire exclusion would continue with stands within the Rush 2 Vegetation Treatment project area exhibiting unnaturally dense understories and canopies compared to forests prior to fire suppression. The Proposed Action Purpose and Need would not be met.

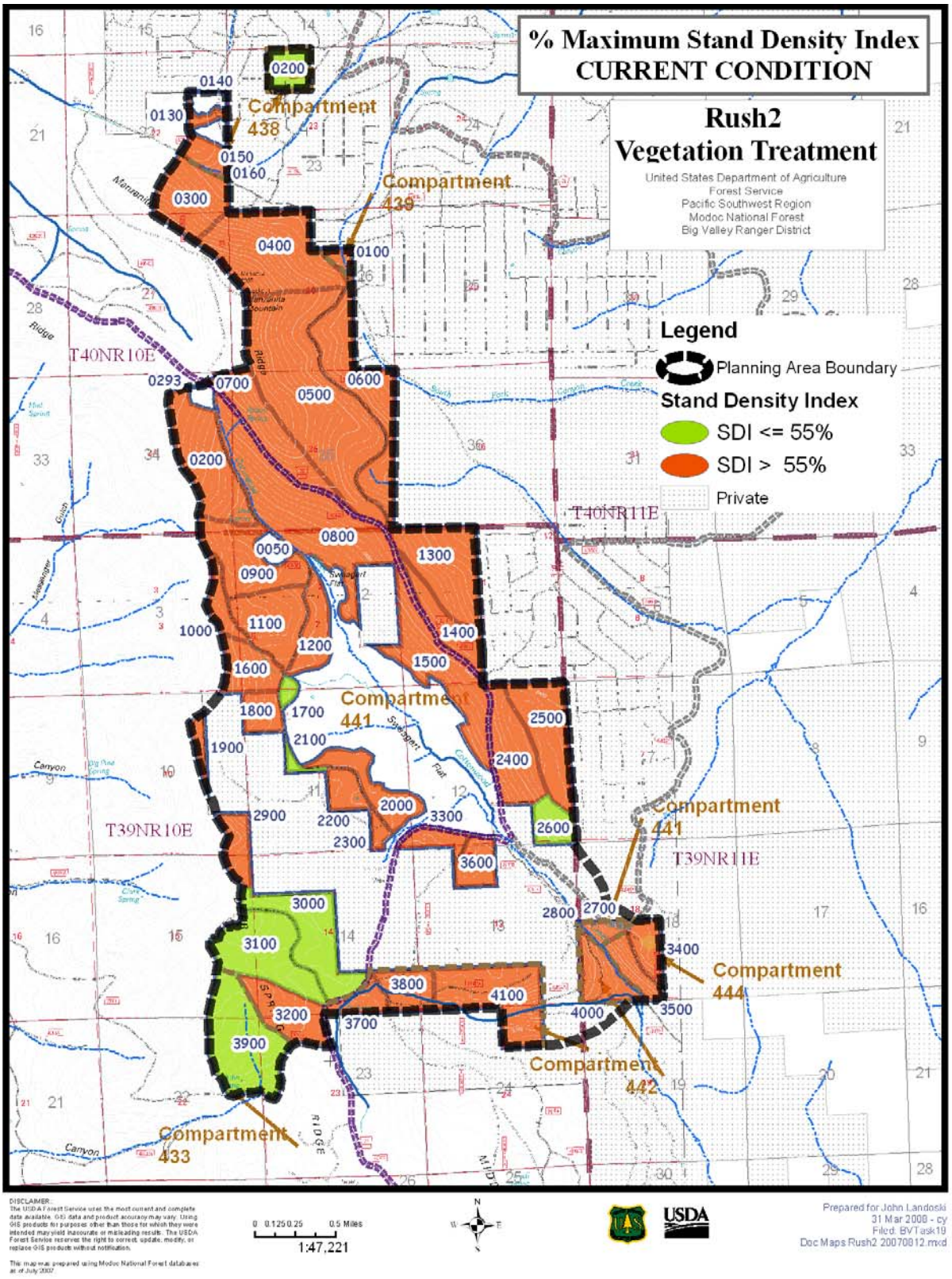

Figure 2. Existing condition – vegetation stand density

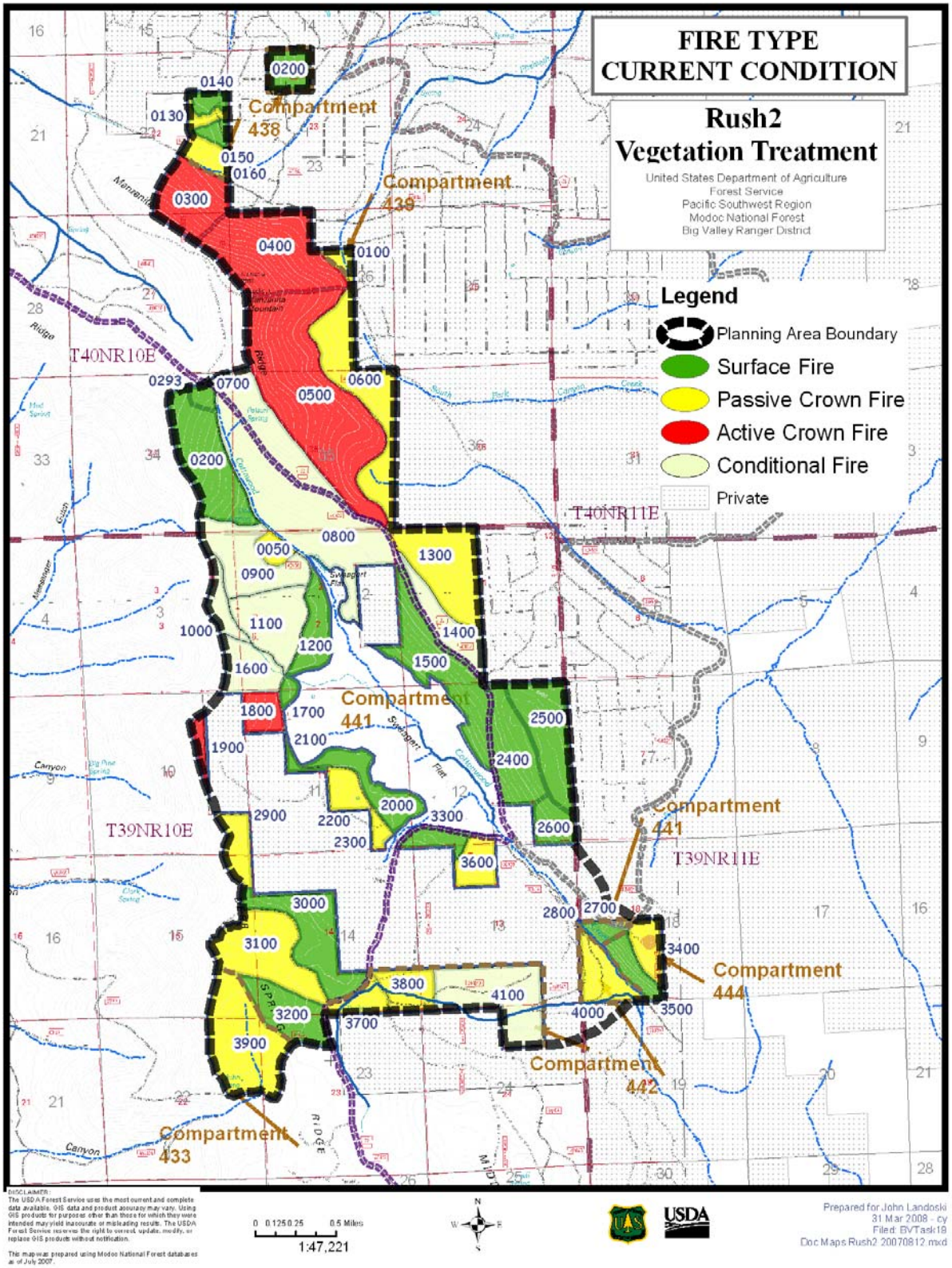

Figure 3. Existing condition – current potential fire types in the project area*

*Surface fire: tree crowns do not burn.
Passive crown fire: some crowns burn and groups of trees torch.
Active crown fire: moves through the tree crowns.
Conditional fire: dependent on the fire type that enters the stand. For example, if a fire enters the stand as a surface fire, it is expected to stay a surface fire.

Alternative 2

The Proposed Action

The purpose and need for the Rush2 Vegetation Treatment project is to reduce fuel loading, maintain/enhance wildlife habitat, and reduce intertree competition. Approximately 3,586 acres of National Forest System (NFS) land is within the Rush Creek Wildland Urban Interface (WUI). The remaining 792 acres of NFS land is adjacent to the Rush Creek WUI and is included in the Modoc County Community Wildfire Protection Plan.

Table 2 lists the acres of NFS and private land ownership within the Rush2 planning area. Table 3 lists the acres of proposed activities that would be implemented to meet the purpose and need.

Table 2. Acres by ownership within the planning area.

Ownership		**Acres**
NFS land	- Forested lands	3,620
	- Non-forested lands	758
Private land		1,444
Rush2 Planning Area	**TOTAL**	**5,822**

Table 3. Acres of planned activities within the planning area.

Planned Activity		**Acres**
Thinning from Below	- Plantations	55
	-Owl PAC*	300
	- Owl HRCA*	1,000
	- Goshawk PACs*	800
	- Aspen release	100
	- Other forested stands	1,742
Fuel Treatments**	- Hand piling	582
	- Mastication	422
	- Machine piling	505
	- Underburning	353
	- Maintenance	900

* Some wildlife habitat acres overlap
** All fuel treatments are associated with thinning activities.

The proposed thinning would thin stands from below to meet specific stand objectives (Table 4). Some dead trees may be harvested to reduce fuel loading, but salvage harvest would be a minor component of the vegetation treatment.

Approximately five miles of fuelbreak would be established to connect with the California Pines fuelbreak and other Forest Service established fuelbreaks. Pruning, hand cutting small trees, chipping and pile burning would occur within 150 feet of the forest roads that serve as the center of the fuelbreaks.

Table 4. Alternative 2 management emphasis by stand*

Stand Number	Management Emphasis
4333900	Fuels
4380130	Fuels/Forest Health
4380140	Fuels/Forest Health
4380150	Fuels/Forest Health
4380160	Fuels/Forest Health
4380200	Fuels/Forest Health
4390100	Fuels/Wildlife
4410050	Fuels/Forest Health
4410200	Fuels/Wildlife
4410293	No Treatment
4410300	Fuels/Wildlife
4410400	Fuels/Wildlife
4410500	Fuels/Wildlife
4410600	Fuels/Wildlife
4410700	Fuels/Forest Health
4410800	Fuels/Forest Health
4410900	Fuels/Wildlife/Forest Health
4411000	Fuels/Forest Health
4411100	Fuels/Forest Health
4411200	Fuels/Forest Health
4411300	Fuels/Wildlife
4411400	Fuels/Wildlife
4411500	Fuels/Wildlife/Forest Health
4411600	Fuels/Forest Health
4411700	Fuels/Forest Health
4411800	Fuels/Forest Health
4411900	Fuels/Forest Health
4412000	Fuels/Forest Health
4412100	Fuels/Forest Health
4412200	Fuels/Forest Health
4412300	Fuels/Forest Health
4412400	Fuels/Wildlife/Forest Health
4412500	Fuels/Wildlife/Forest Health
4412600	Fuels/Forest Health
4412700	Fuels
4412800	Fuels/Forest Health
4412900	Fuels/Forest Health
4413000	Fuels/Forest Health
4413100	Fuels/Forest Health
4413200	Fuels/Forest Health
4413300	Fuels/Forest Health
4413600	Fuels/Forest Health
4423700	Fuels/Forest Health
4423800	Fuels/Forest Health
4424000	Fuels/Wildlife
4424100	Fuels/Wildlife
4443400	Fuels/Forest Health
4443500	Fuels/Forest Health

*For a stand by stand breakdown of acres of activities, please see Appendix B

To provide adequate access to treat stands, approximately 2.5 miles of new temporary road would be constructed and 2.7 miles of existing non-system road would need to be reconstructed. A minor amount (less than 1 mile) of additional temporary road construction may also be needed to access landing locations that have not been identified at this time. All of these roads would be closed when administrative access is no longer needed.

To reduce the risk of injury to the public, hazardous trees with the potential to fall onto system roads would be harvested.

Landlines would be established along the perimeter of stand 4380200 to ensure that the property lines are surveyed, marked and posted to Forest Service standards.

Within the aspen release stands, after the vegetation treatment and fuel reduction activities are completed, fencing would be constructed around the aspen regeneration to protect the areas from livestock grazing.

Approximately five years after the initial vegetation and fuel treatments are completed, an assessment of the re-growth of ground vegetation would occur to determine the need for maintenance activities

within the stands adjacent to the California Pines subdivision and fuelbreaks. Maintenance activities could include approximately 900 acres of mastication and an overlap of 300 acres of underburning within ¼ mile of the property boundary along the eastern boundary of the planning area.

Vegetation Treatments

1. Standard Thinning Prescription – 1,587 acres

The standard thinning prescription is designed to thin to stocking levels that address site carrying capacity, promote the growth and health of residual trees, and increase the average tree spacing to allow for harvest operability and post-thinning mechanical fuel treatments. The standard thinning prescription would be applied on approximately 1,587 acres.

The standard thinning prescription would thin stands from below to 35-45 percent maximum stand density index (SDImax) to effectively reduce intertree competition for approximately 20-30 years. This treatment would primarily remove trees in suppressed and intermediate crown positions and some codominant trees to meet desired stocking levels. In all stands, the majority of trees removed would be less than 20 inches dbh. Some trees greater than 30 inches dbh may need to be removed for operability when constructing roads or landings.

2. Wildlife Habitat Thinning Prescription – 1,452 acres

The wildlife habitat thinning prescription is a lower intensity thinning compared to the standard thinning prescription. It would be specifically designed to retain at least 40 percent canopy cover within the California spotted owl home range core area (HRCA) and the area within the goshawk PACs that are not identified as nest stands. This prescription also retains at least 50 percent canopy cover within the owl PAC and the nest stands within the goshawk PACs. No mechanical treatment within 500 feet of an owl nest site (owl activity center) would be allowed. Hand cutting of small trees less than 6 inches diameter would be allowed within the owl activity center. Lastly, this prescription would require a 120 foot no treatment buffer around goshawk nest trees.

The wildlife habitat thinning prescription would be applied on approximately 1,452 acres and would thin stands from below to retain and enhance wildlife habitat. The projected quadratic mean tree diameter would range from 13-24 inches after thinning.

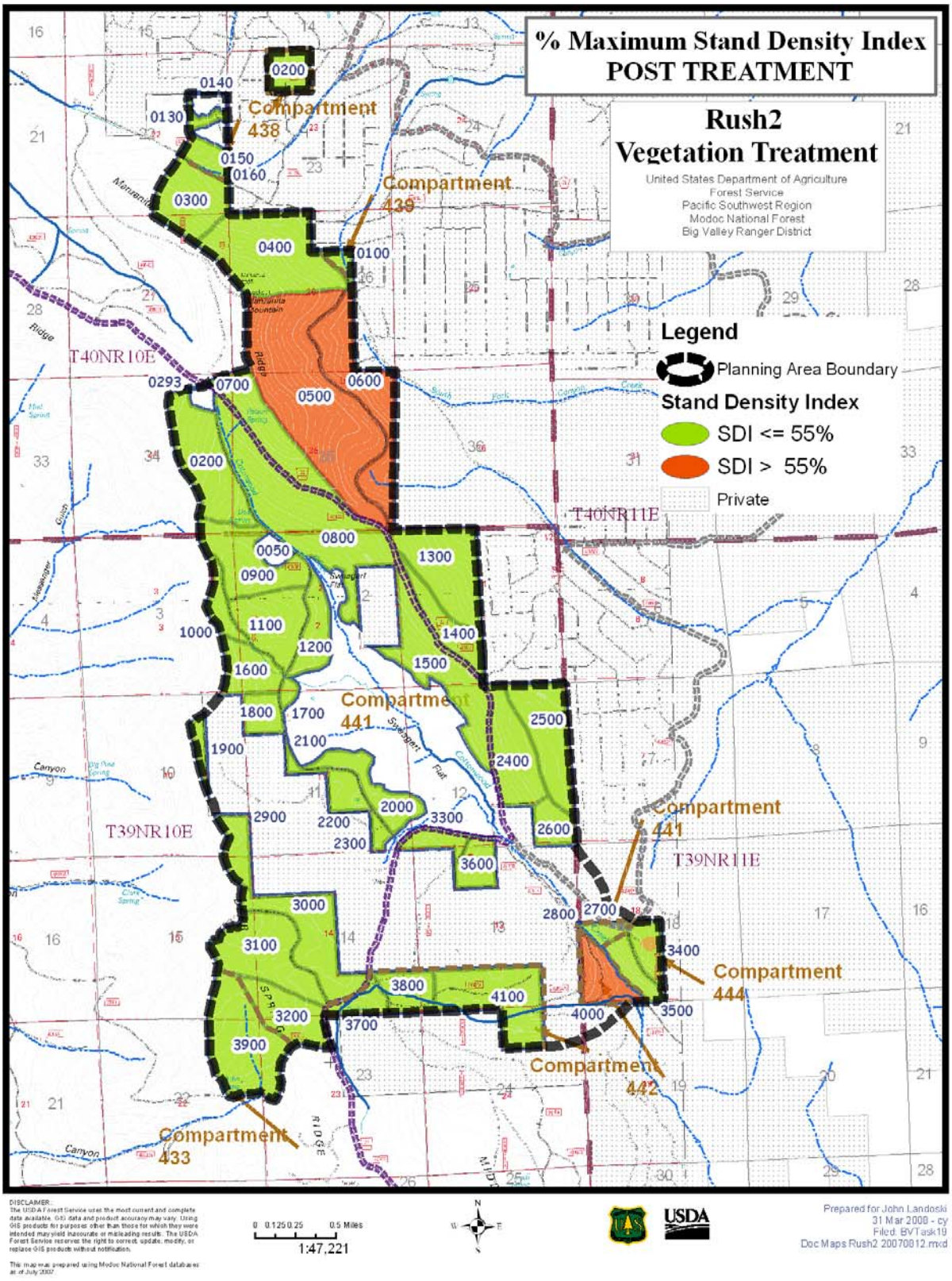

Figure 4. Post-treatment vegetation – stand density

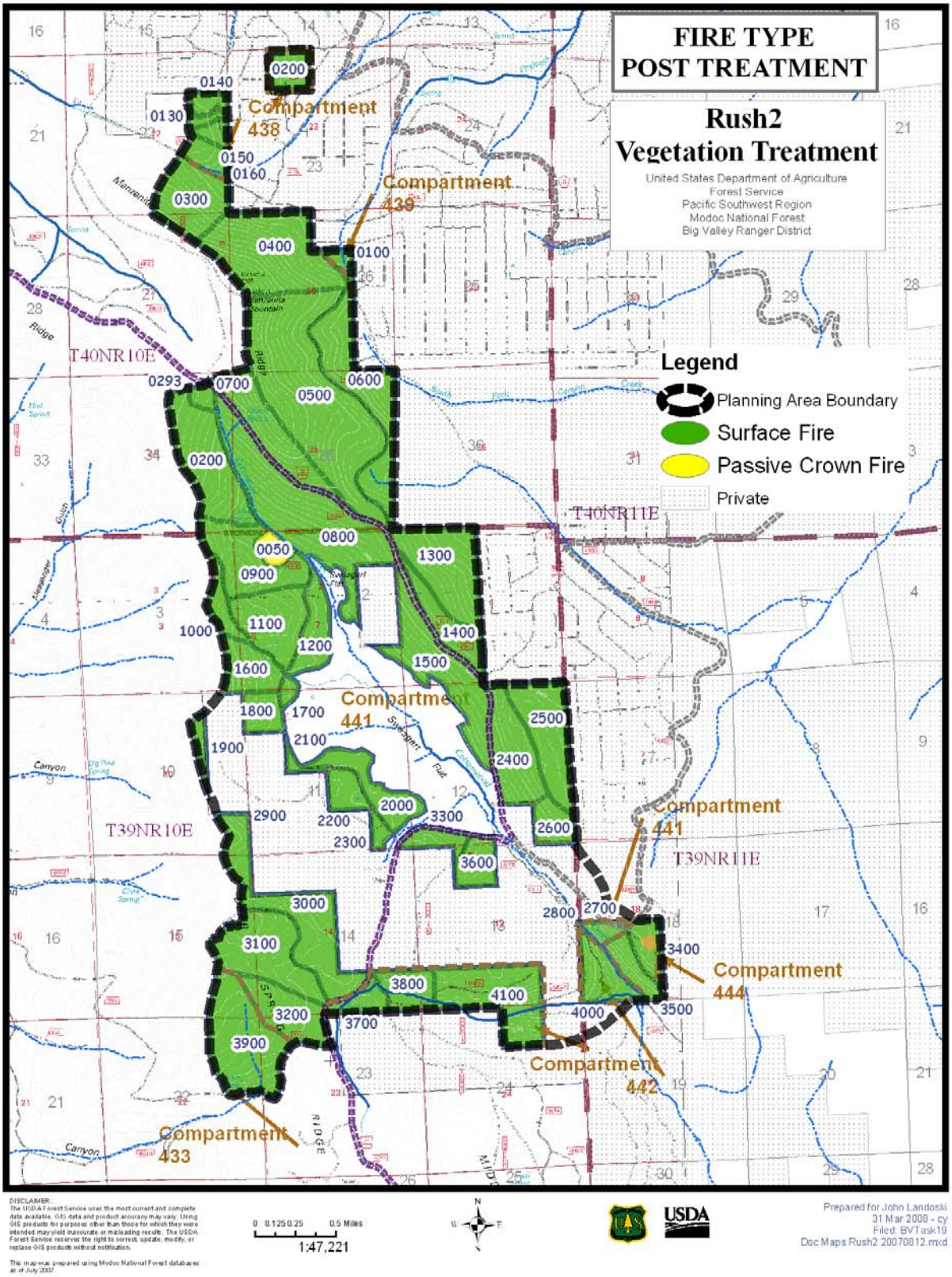

Figure 5. Post-treatment fuels – predicted fire types after implementation*

*Surface fire: tree crowns do not burn.
Passive crown fire: some crowns burn and groups of trees torch.

3. Aspen Release Thinning Prescription – 100 acres

The aspen release thinning prescription is designed to maximize sun exposure to release existing aspen trees and to stimulate sprouting. Aspen is shade intolerant. Increased soil temperatures are needed to stimulate suckering and full sunlight is needed for good sucker growth. The thinning treatment would maximize sun exposure and soil heating to facilitate the natural regeneration of aspen.

The aspen release prescription would be applied on approximately 100 acres. The majority of the aspen occurs in stands within the Cottonwood and Pothole drainages. The remainder of the aspen occurs within other stands scattered throughout the planning area. Conifers that are greater than 30 inches diameter would not be harvested.

The specific prescription for clones that exist outside the Cottonwood Creek and Pothole Creek stream management zones (SMZs) would be to remove all conifers within 120 feet of live aspen. The prescription for clones that exist within Cottonwood Creek and Pothole Creek SMZs would be to thin from below, but retention of conifers would be dependent on the amount and size of existing aspen that are currently within the SMZ. Conifer retention within SMZs could vary from retaining 25 square feet of basal area per acre of conifers if an area is well stocked with existing aspen, to retaining a considerable amount of conifer to meet canopy cover requirements within wildlife habitat.

4. Plantation Thinning Prescription – 55 acres

The plantation thinning prescription is designed to thin to stocking levels that would promote the growth and health of residual trees. Precommercial thinning in regenerated stands is generally scheduled when the stands are 15 years old and less than 4.5 inches in diameter (LRMP 1991). This thinning prescription would be applied on approximately 55 acres of pine plantations would reduce intertree competition for approximately 20-30 years.

5. Machine Piling, Hand Piling, Mastication and/or Underburning of Forest Stands – 2,762 acres

Thinning activities would be followed by machine piling and burning, hand piling and burning, mastication, and/or underburning. Machine piling would be completed where existing heavy fuels are accumulated. Hand felling, piling and burning would be completed on sites that are too steep for equipment to operate or in stands where it would be more economical to cut trees less than 3 inches in diameter manually. Mastication would be completed in areas where it would be more economical to mechanically treat shrubs and trees less than 3 inches in diameter. Underburning would be completed in areas where existing fuels and/or shrub cover are at low enough levels to allow for the safe use of prescribed fire.

6. Ongoing Maintenance – acreage will vary

Approximately five years after the initial vegetation and fuel treatments are implemented, an evaluation of the understory vegetation and surface fuel loading will be completed to determine the need for maintenance treatments. The objective of the maintenance treatments would be to ensure that the desired flame length, height to live crown, and fire type fuel objectives would be met within the defense zone. The defense zone is defined as the area within ¼ mile of the shared property boundary between Forest Service and private ownerships along the eastern boundary of the planning area.

Potential maintenance treatments are summarized in Table 5 and described below:

Table 5. Types and potential acreages of follow-up maintenance treatments

Maintenance Treatment	Time of Initial Maintenance	Acres
Mastication	5 Years	300
Prescribed Underburning	5 Years	900

Mastication: Mastication would be used to treat small trees and woody shrubs. Equipment would only operate when soils are dry such that the risk of compaction is minimized. Residual trees could be damaged by equipment accidentally rubbing up against them, or by accidentally crushing or running over smaller "leave' trees. Damage to the overstory is expected to be rare because of implementation monitoring. Areas of desirable regeneration would be avoided by equipment to provide protection.

Prescribed Underburning: Prescribed underburning would be used to remove small trees as well as shrubs and accumulated surface fuels. Underburning would reduce duff layer thickness but not remove it entirely. Occasional "torching" could occur causing small group or individual tree mortality. Burning would be conducted according to a prescribed fire plan developed for the maintenance project. Fire prescriptions would be developed to meet resource objectives including retention levels of desirable small and midstory trees. Prescribed burning would not be expected to measurably alter stand overstory structure or canopy closure, but would be designed to remove undesired understory vegetation and surface fuels.

Road Management

1. Construction, Reconstruction and Maintenance

All roads used for the project would receive pre-haul maintenance, including drainage structure inspection and repair, surface grading for drainage, and surface replacement, where needed. No new system roads are needed for this project. There is a need to construct 2.5 miles of temporary road to reduce skidding distances and minimize the number of drainage crossings. Table 6 lists the new temporary road construction. Additionally, 2.7 miles of existing non-system road will need to be reconstructed. Table 7 lists the non-system roads that need to be reconstructed. Lastly, a minor amount (less than 1 mile) of additional temporary road construction may also be needed to access landing locations that have not been identified at this time. All temporary roads that were constructed and all non-system roads that are reconstructed would be closed after the project is completed.

Table 6. Summary of Proposed New Temporary Roads

Road Number	Road Name	Length In Miles	Comments
40T09BA	South Fork Canyon Spur BA	0.45	Construct and close after use.
40N08Z	Sweagart Flat Spur Z	0.31	Construct and close after use.
40N09A	South Fork Canyon Spur A	0.87	Construct and close after use.
40N22D.1	Hunters Ridge Spur D.1	0.35	Construct and close after use.
40T08A	Cottonwood Creek Spur A	0.28	Construct and close after use.
39T14	Pothole Spring	0.15	Construct and close after use.
40T08E	Cottonwood Creek Spur E	0.13	Construct and close after use.

Table 7. Summary of Proposed Non-system Roads to be Reconstructed

Road Number	Road Name	Length In Miles	Comments
40T22EZ	Hunters Ridge Spur EZ	0.59	Reconstruct and close after use.
40T22YB	Hunters Ridge Spur YB	0.67	Reconstruct and close after use.
40T22Y	Hunters Ridge Spur Y	0.30	Reconstruct and close after use.
40T22YA	Hunters Ridge Spur YA	0.70	Reconstruct and close after use.
40T08XA	Sweagart Flat Spur XA	0.10	Reconstruct and close after use.
40T08X	Sweagart Flat Spur X	0.20	Reconstruct and close after use.
40T08Z	Sweagart Flat Spur Z	0.10	Reconstruct and close after use.

Integrated Design Features and Best Management Practices

Design features were developed based on Best Management Practices (BMPs), Forest Plan standards and guides, and other procedural direction to mitigate potential impacts during implementation. A complete list of these is located in the appendix.

Alternatives Eliminated from Detailed Study

Based upon comments from the public on our proposal, we considered one additional alternative.

Alternative 3 - A non-pesticide annosus alternative

The purpose and need for this project supports the actions of thinning stands to reduce fuel loading in the wildland-urban interface (WUI) in coordination with treatments planned on adjacent private lands. Sporax use is needed as a preventative measure to reduce the potential for annosus infection and spread. Sporax applications would follow all State and Federal rules and regulations as they apply to pesticides.

Cutting when annosus spores are lowest has been suggested as an alternative to Sporax use, but there are no data or studies to support the efficacy of such a treatment in California. There is also no literature supporting prescribed burning as a control of annosus in California ecosystems. Stump removal is expensive and disruptive to the site and would create unnecessary disturbance away from known centers where we are trying to prevent the establishment of new infection centers. Treating with *Phlebiopsis gigantea* is not feasible

at this time as it is not registered as a biopesticide either with the US Environmental Protection Agency or the State of California, and there are no efficacy data for California forest conditions. There are data suggesting that *Phlebiopsis gigantea* would not be efficacious in California because it is too dry in summer and fall. This alternative does not meet the purpose and need statements for forest health treatments because other types of annosus treatment have not been proved effective to reduce the risk of the disease, therefore this alternative was not considered in detail.

Environmental Consequences of No Action and the Proposed Action

Alternative 1 – No Action

Vegetation and Forest Health

Three threshold SDImax values are commonly used to guide stand management prescriptions (Long 1985). 25 percent SDImax approximates the onset of inter-tree competition. A trees' foliage and roots interlace with other trees, and the beginning of self-pruning (ie. the death of branches in the lower crown) occurs. 35 percent SDImax approximates the lower limit of full site occupancy. 55-60 percent SDImax is associated with substantially reduced tree vigor and the onset of tree mortality induced by intertree competition. As stands exceed 60 percent of maximum SDI, they grow at increasingly slower rates as trees are stressed for resources. Individual tree mortality occurs throughout a stand at these high densities often due to a combination of factors. Stands may persist at high tree density levels for years; however, they are prone to large scale insect and disease outbreaks, and stand replacing events because of their stressed condition and density. Drought events can exacerbate this condition and lead to widespread mortality as well.

Under the No Action alternative, no thinning or other vegetative management activities would occur in the project area. As a result, the evolving condition of most forest stands would result in a SDI that would remain in the zone of imminent mortality. Forest Vegetation Simulator (FVS) modeled results of the non-plantation forest stands calculate that SDI is currently above the desired 55 percent of SDImax threshold value within approximately 90 percent of the stands. For these stands, SDI would continue to increase for the next 20 years despite increasing amounts of annual mortality. Eventually, SDI decreases when mortality increases substantially and would result in declining stand growth rates.

Tree stocking levels in the unthinned stands would continue to be excessive, resulting in growth stagnation, continuing intertree competition for limited site resources, decreasing stand vigor, and an ever-increasing susceptibility to insects and disease. The high risk for epidemic levels of tree mortality would continue. For more information, see the Silvicultural Report located in the project record.

Fire and Fuels

Generally, fire-behavior potential for mixed conifer stands on NFS lands within the planning area will remain static or increase over the next 20 years if no action is taken. The degree of change appears to be stand-specific. Three examples are provided to represent stands within the planning area: According to FVS, if mixed conifer stand 4410800 is left untreated, its potential flame length would increase 17 fold (from 4 feet to

68 feet) and its predicted fire type would change from conditional to active crown after 20 years. For mixed conifer stand 4424100, potential flame length would increase from 49 feet to 55 feet over the next 20 years, although predicted fire type would remain as passive crown. Mixed conifer stand 4412000 is a less extreme case where potential flame length begins and ends at 4 feet after 20 years with no treatment, and predicted fire type remains as a surface fire.

Fire behavior potential in stands other than mixed conifer, including pine plantations and aspen stands, may not increase without treatment. For aspen in stand 4423800, FVS predicts flame length to decrease after 13 years from 9 feet to 3 feet, but then increase again to 5 feet after 20 years. Predicted fire type changes from passive crown to surface. For plantation stand 4410050, FVS predicts the flame length to decrease 4 fold (from 8 feet to 2 feet) and fire type to change from passive crown to surface fire after 20 years. For more information see the Fuels Report located in the project record.

Air Quality

Under the no action alternative, prescribed fire treatments would not be implemented. Because of this, there would be no direct effects on air quality. Indirectly, air quality may be adversely affected if an ignition and subsequent large fire were to occur because of the current fuels situation.

Wildlife

Under the no action alternative, existing suitable habitats for species associated with forest structure (northern goshawk, California spotted owl, American marten, pallid bat) would remain as-is, but would remain at an elevated risk to loss due to stand-replacement wildfire and insect outbreak. High snag and down wood densities would remain, and probably increase over the next 10 to 25 years as stands continue to self-thin. High tree stocking levels in untreated stands however, would continue resulting in growth stagnation, continuing intertree competition for limited site resources, and decreasing stand vigor. For more information see the Terrestrial Wildlife Biological Evaluation and Assessment and Management Indicator Species Reports located in the project record.

Hydrology, Soils and Aquatic Resources

Aquatic Resources

Without action, the evolving condition will have no effect on aquatic species within or adjacent to the project area.

Hydrology and Soils

Under the No Action Alternative, the existing erosion would continue to occur. The roads that are currently eroding would continue to contribute sediment to the stream courses. Existing temporary roads, skid trails and landings that have had erosion control work (i.e. water bars, rolling dips and drainage structures) would continue to degrade over time. The increased levels of sediment being delivered to the stream courses could potentially affect the downstream beneficial uses of the water and this could result in exceeding state and federal water quality objectives.

The large concentrations of fuels from past logging activity and the natural decay of the existing stands on the east side of Manzanita Ridge would continue to pose a risk to watershed health. Due to the amount of the fuel loading of theses stands, the affected sub-watersheds on the eastside of Manzanita Ridge are at risk for an occurrence of a stand replacement fire. In the eventuality of a stand replacement fire, more then 50 percent of NFS lands would sustain hydrophobic or water repellant soils.

The effects of a stand replacement fire would most likely result with the occurrence of large scale loss of top soil along with long term decrease of site productivity and the creation of large tracts of hydrophobic soils. The creation of hydrophobic soils would reduce the infiltration rate and surface runoff would increase. The loss of timbered stands and their action as "water pumps" would not allow for the groundwater to be utilized.

Erosion rates would increase and without the surface cover of forest debris large amounts of sediment would be delivered to the stream courses. Landslides would most likely occur due to the loss of the "water pumps" and the saturation of the soils by groundwater. This above referenced scenario would most likely overwhelm the ability of streams to transport sediment and crossings would become clogged with sediment/forest debris and most likely fail. All of these factors combined would most likely result in the occurrence of a Cumulative Watershed Effect.

Botany Threatened, Endangered and Sensitive Plants

Surveys in all areas of moderate to high potential habitat for Threatened, Endangered and Sensitive (TES) plants were conducted during the field season in 2005. No species occurrences were found, but habitat for the Sensitive long-haired star-tulip, *Calochortus longebarbatus var. longebarbatus*, was identified in the project area – a small meadow located at T40N R10E S35 NE¼ of SE¼, east of road 40N09. The No Action alternative would have no direct effect on this species. However, in the event of a stand replacing fire it is likely the habitat for this Sensitive species would be destroyed. For more information see the Sensitive Plant Biological Evaluation located in the project record.

Noxious Weeds

Noxious weeds present in the project area include Canada thistle, Scotch thistle and dyer's woad. The No Action alternative would have no direct effect on noxious weeds. However, in the event of a stand replacing fire, fire fighting vehicles and equipment may not be washed due to the emergency nature of the situation. These vehicles and equipment then have a high potential to introduce and spread noxious weeds throughout the fire area. The disturbed soil and ash resulting from the fire provide an ideal environment for weeds to become established. For more information see the Noxious Weeds Assessment located in the project record.

Range

Without action, the evolving condition of most transitory rangelands within the project area would remain static with a downward trend. Low seral is characterized by Idaho fescue, Sandberg bluegrass, squirreltail, bromegrass, needlegrass and a variety of sedges and rushes (grasslikes) being on the decline. Rabbitbrush increases and medusahead, Scotch thistle, musk thistle, tall lupine and diffuse knapweed invade on highly deteriorated sites.

Aspen populations, a special habitat, are found throughout the project area. These populations would decline and/or aspen mortality would increase with pine encroachment and large ungulate grazing.

Overstocked stands and high fuel loading when ignited has the potential to result in extreme fire behavior. Rangeland species take a long time to re-establish on hydrophobic soils. Invasive species would occupy sites with bare soil openings in some areas before native species. Less intense wildland fire will produce herbaceous species in transitory rangelands for a short period.

Heritage Resources

As no project activities would take place, this alternative would have no direct effects on Heritage Resources in the project area.

The indirect effect of the No Action alternative may result from a gradual buildup of fuels in the project area of potential effects (APE). If at some point in the future a forest fire were to ignite in the area, these heavier loads of fuel across the prehistoric sites tend to burn longer and more intensely. Such burns are likely to damage the archaeological information recoverable from them, particularly surface obsidian. Historic sites may also suffer from wildfire, particularly those containing wood structural remains. For more information see the Heritage Resources Report located in the project record.

Public Health and Safety

The Rush 2 Vegetation Treatment planning area is at risk to a high-severity wildfire event that would likely exceed the capability of initial attack suppression forces. Combined with high fire danger conditions, the planning area's fuel composition, fuel loading, fuel structure, and fuel arrangement creates the potential for the development of a high-intensity, stand-replacing crown fire. If this type of fire was to occur within the planning area, firefighter and public safety would be at risk, the adjacent California Pines community and wildlife habitat would be threatened, and the Cottonwood Creek watershed would be undesirably affected by increased surface runoff.

High intensity fires limit fire suppression ability and compromise firefighter and public safety. The heat produced by intense fires does not allow firefighting forces to safely work near the fire's edge. Additionally, control lines become ineffective due to radiant heat and embers igniting fuels across the fire's line. Because high intensity fires are difficult to suppress, civilians and their communities are at risk when in or near to the fire's path (Fuels Report).

Alternative 2 – Proposed Action

Vegetation and Forest Health

Desirable stand densities range between 35-55 percent SDImax. This stand density range represents fully stocked stands with available growing space and resources such that inter-tree competition does not largely affect stand growth. The management goal is treat stands so that inter-tree competition does not severely impact stand growth for approximately 20-30 years (USDA FS 1991).

The standard thinning prescription would thin stands from below to 35-45 percent SDImax to effectively reduce intertree competition for approximately 20-30 years. Intertree competition for resources would be reduced. Tree growth and vigor would improve and the risk for epidemic levels of tree mortality would decrease. FVS simulations estimate that post-treatment tree mortality would decrease from 29 cubic feet/acre/year to 11 cubic feet/acre/year during the first decade. Enlarging the growing space for residual trees would also add to the amount of crown (leaf surface area) that is available for photosynthesis and augment the crown to bole ratio. This would enhance diameter growth on the residual trees, as the trees would be able to absorb and use more nutrients. This would result in larger diameter trees in a shorter period of time. The projected quadratic mean tree diameter would range between 14-16 inches after thinning. The post-treatment residual basal areas for each stand would range between 80-190 square feet per acre.

The wildlife habitat thinning prescription is a lower intensity thinning compared to the standard thinning prescription. It would be specifically designed to retain at least 40 percent canopy cover within the California spotted owl HRCA and the area within the GPACs that are not identified as nest stands. This prescription also retains at least 50 percent canopy cover within the OPAC and the nest stands within the GPACs. As a result, the wildlife habitat prescription would retain relatively high SDImax values post-treatment (40 to >55 percent SDImax). Those areas above 55 percent (14 percent of proposed thinning acres) would still be considered to be within the zone of imminent mortality and would be at risk for epidemic levels of insect, disease, or inter-tree competition induced tree mortality. Those areas that fall in the range of 50-55 percent of SDImax after the vegetation treatments are completed (9 percent of the proposed thinning acres) would have adequate growing space and resources such that inter-tree competition would not largely affect stand growth for approximately 10 years. Those areas of wildlife habitat that would have a stocking level less than 50 percent SDImax (20 percent of proposed thinning acres) would have adequate growing space and resources such that inter-tree competition would not affect stand growth for approximately 20 years. It should be noted that FVS simulations for all wildlife habitat thinning estimate that post-treatment tree mortality would decrease from 19 cubic feet/acre/year to 14 cubic feet/acre/year during the first decade. In addition to thinning for wildlife habitat protection, aspen release treatments would contribute to wildlife habitat enhancement objectives.

Plantation thinning would be designed to reduce stocking levels to levels that optimize residual tree growth and health.

Cumulative Effects: approximately 1,510 acres, or 30 percent of forested land within the Rush2 planning area, is currently treated to tree density levels that would ensure adequate site resources for tree growth and vigor and minimal mortality from intertree competition for approximately 15-30 years. Alternative 2 would improve density related conditions on an additional 2,668 acres, or 53 percent of forested lands in the planning area, achieving desired forest conditions over a larger landscape. Limitations are the higher SDImax areas that require lower intensity thinning to meet wildlife management direction. For more information see the Silvicultural Report located in the project record.

Fire and Fuels

Thinning from below would directly increase the height of stand ladder fuels. By thinning from below, the height to live crown (the average distance from the top of the surface fuels to the bottom of the live tree crowns) throughout most of the NFS lands within the planning area would increase to at least 15 feet. The

result is that ladder fuels would not be continuous and less available to fires. After treatment, only 6 percent of the NFS lands within the planning area would have an average height to live crown of less than 15 feet; this mostly being pine plantation enclaves. These plantation stands consist of small, young trees whose branches are close to ground level. Until these trees mature, they will create low-level ladder fuels.

Indirectly, by increasing average stand height to live crown, potential flame length and intensity would decrease causing the potential fire type for the majority of the treated stands to be a surface fire. According to model outputs, the potential for flame lengths that would exceed the capability of hand crews and equipment (>8 feet) would be eliminated, even in 90th percentile high fire danger conditions. Additionally, the potential for crown fire development would be reduced to 1 percent of the NFS lands within the planning area. Fires after treatment would be easier to suppress and would not pose a high threat to public and firefighter safety, the California Pines Community, wildlife habitat, and the Cottonwood Creek watershed.

By implementing the proposed action on the NFS lands within the planning area, a more continuous low fire risk landscape would be created. The reduction of high-severity fire risk on NFS lands would be combined with the already present lower fire risk on private lands. A landscape effect is important for effective fuels treatment strategies. Based on the modeling data, the effects of the treatments on NFS lands would last for at least 20 years. With maintenance on both the NFS and private lands, the effects could be extended further into the future. For more information see the Fuels Report located in the project record.

Air Quality

Proposed prescribed underburning and pile burning would emit smoke in and around the planning area. Directly, this would raise short-term local air particulate matter levels. Indirectly, smoke emissions could cause harmful health effects and reduce visibility in communities and along roads. An approved burn plan and its associated smoke management plan would mitigate against adverse smoke effects. These plans would not allow burning in conditions that would cause high smoke impact to special areas of concern, including the California Pines community and high-use roads. The smoke management plan would also ensure that prescribed burning emissions do not exceed state and county air quality regulations.

Wildlife
Threatened, Endangered and Sensitive Species

See the Terrestrial Wildlife Biological Evaluation and Assessment and Terrestrial Management Indicator Species Report for a detailed analysis of the effects to the species summarized in this section.

California Spotted Owl

Vegetation treatment prescription varies within suitable habitats. Treatments outside the HRCA and OPACs would directly affect owls by removing about 476 acres (29 percent) of currently suitable habitat via reduction of canopy closures to less than 40 percent. Thinning treatments in currently suitable habitats within the HRCA would reduce stand densities and degrade habitat quality on approximately 602 acres by retaining canopy closures at the lower range of suitability (40 percent canopy closure). This would decrease the likelihood of owl nesting within the HRCA outside the OPACs.

Stands in OPACs more than 500 feet from the nest and within existing old growth would be mechanically thinned from below, with treatment prescriptions on 373 acres designed to retain suitable habitat by leaving no less than 50 percent canopy closure. Post-treatment conditions in the nest stand and OPACs would, therefore, retain tree sizes and canopy closures described as suitable for nesting (USDA Forest Service 2001), but would continue to provide marginal nesting conditions. Site conditions within 500 feet (18 acres) surrounding the nest tree would be altered slightly by hand-cutting trees smaller than 6 inches dbh.

Activities within the Rush 2 project would reduce available habitat and decrease habitat quality by removing some snags and large trees to allow for operator safety and harvest operability. These same actions, however, would reduce the potential for stand replacement wildfire within the nest stand, HRCA, and home range. Stand replacement wildfire is described as a major threat to California spotted owl habitat at landscape scales (USDA Forest Service 2004b). In the short-term (10-30 years), tree diameters and canopies will increase in response to additional growing space. Growth in stands with larger trees (>11 inches dbh) that are thinned below 40 percent canopy closure would be expected to develop suitable habitat during this period.

Northern Goshawk

Treatments outside goshawk and spotted owl PACs, spotted owl HRCA, and old growth stands would directly affect goshawks by removing about 460 acres (25 percent) of currently suitable habitat via stand density reduction that lowers canopy closures below 40 percent. Treatments in suitable habitats within the HRCA, and within goshawks PACS outside of nest stands and OPACs would reduce stand densities, but would retain suitable habitat because stand densities and diameters meet or exceed minimum thresholds (at least 40 percent canopy closure, with diameters averaging 11 inches or greater). Stands in OPACs, more than 500 feet from the nest along with goshawk nest stands more than 120 feet from nest trees would be thinned from below, with treatment prescriptions designed to retain suitable habitat by leaving no less than 50 percent canopy closure. Based on canopy closure rates for nest stands reported in the literature, treatments in the nest stands are expected to retain sufficient quality to support nesting occupancy.

Other direct effects to habitat include potential snag removal to provide for travel and operator safety, and potential removal of trees larger than 30 inches dbh to provide for harvest operability. Although removal of snags and large trees is expected to be uncommon, the action can reduce habitat quality by reducing availability of elements known to contribute to suitability.

Treatments would reduce the risk of stand-replacement fire within all goshawk territories in the project area. Thinning from below to 40 percent or higher canopy closure would improve quality of foraging habitat in stands with dense understories by creating more open conditions that enhance detection and capture of prey (Reynolds et al. 1992). Reductions in stand densities would accelerate diameter growth of remaining dominant and co-dominant trees. Within 10-30 years, canopy closures are projected to grow to 50 percent or more, and contain size and density attributes that increase the probability of nesting occupancy compared to existing conditions.

Within the cumulative effects analysis area, all or portions of 10 territories (11 PAC polygons) occur within 1.5 miles of the project area. Proposed treatments would retain goshawk nesting habitat for all (10) associated territories. Removal of suitable habitat would reduce foraging opportunities within 1.5 miles of 5 territories. Canopy closures are expected to reach suitable levels within 10-30 years after treatment. Foraging

habitat for the remaining 5 territories would be degraded, but not removed. These effects would likely last 10-30 years as well, with the exception of 900 acres subject to future fuels maintenance treatments.

American Marten

Treatment of fuels will remove much of the down log structure that contributes complexity and subnivean (below snow) access to prey. The combination of thinning and fuels reduction would also reduce habitat components potentially used for resting and denning such as hollow logs and wood concentrations (USDA Forest Service 2001). As a result, habitat quality in treated stands will decrease. Thinned stands where canopy closure is reduced to 40 percent and down wood is decreased will retain suitability by definition, but are less likely to support year-round marten occupancy. Removal of trees larger than 30 inches dbh and snags to provide for operator safety and harvest operability has the potential to reduce habitat components that could contribute to denning and resting, as well as provide habitat components for potential prey species. The number of large trees and snags that would be removed is unknown, but is likely to be incidental. Thinning of stands would also affect marten indirectly. By reducing stand densities, the rate of tree mortality is expected to decrease (see Silviculturist Report, Rush 2 Vegetation Project). As stand mortality decreases, recruitment rates of future snags and down logs would also decrease, leading to lower amounts of these components until conditions once again become crowded (10-30 years).

The status of marten within the project area is currently unknown. Sightings have been reported, but occupancy has not been verified. Habitats within Rush 2, therefore, may currently be occupied. Average size of marten home ranges reported for California is 890 acres (Buskirk and McDonald 1989). The project area, with 1,584 acres of suitable habitat, currently contains habitat to support approximately 1.8 marten pairs. Because the project reduces suitable habitat to 1,099 acres, carrying capacity would be reduced to 1.2 marten pairs. Post-treatment habitat quality for marten would also be reduced.

Cumulatively, removal and degradation of suitable habitat adds to relatively recent habitat losses in the analysis area. Because proposed treatments would retain contiguous blocks of conifer with canopy closure at or greater than 40 percent, movement by marten within as well as in and out of the project area would not be precluded by management. Because sightings and suitable habitat exist to the east, west, and south, and because the project area is located within an isolated patch of suitable vegetation, a potential marten population in Rush 2 represents an island, and therefore the range extent of the species is not potentially compromised by the project. The occasional marten sightings, but lack of evidence of occupation by surveys supports the argument that individuals in Rush 2 are likely transitory, and the area represents a potential population sink (Pulliam 1988). Because the habitat is isolated, increased risk to potential occupation in the project area is not expected to influence populations outside the area by leading to downward trends.

Pallid Bat

Because snags deemed a hazard would be removed, there is the potential for disturbance and removal of roost sites being used by the pallid bat. This could cause direct effects to individuals, and/or maternity sites if harvest takes place in the spring and early summer. Because the level is expected to be incidental, project activities may impact individuals, but not the local population. Prescribed burning during the maternity season

could impact individuals directly by creating heavy smoke levels of short duration or individual mortality by consuming individual snags.

Thinning and underburning in the project area would reduce on-site tree competition and mortality, thereby reducing potential future recruitment of suitable snags for roosting for up to 30 years in some stands. Treatments proposed under this project do, however, target non-habitats for removal by thinning from below. While incidental removal of snags and larger trees may occur, such removal is not expected to eliminate roosting habitat within the project area.

Management Indicator Species

See the Terrestrial Management Indicator Species Report for a detailed analysis of the effects to the species summarized in this section. Northern Goshawk and spotted owl are discussed in the previous Threatened, Endangered and Sensitive Species section.

Hairy Woodpecker

Approximately 3,347 acres (76 percent) of the analysis area appears to provide key habitat for hairy woodpeckers. Direct effects to habitat include the potential removal of dead trees that present a hazard for transportation and harvest operation. The amount of snags that would be removed to provide for safety is unknown, but is expected to be limited and would not decrease snag densities below levels prescribed in the LRMP (1.5 per acre). Indirect effects include the increased vigor of the residual trees and reduced potential for future tree mortality and snag recruitment due to insects, disease, and wildfire. In the short-term (up to 30 years), treatments would decrease potential tree mortality in suitable habitat on an estimated 2,584 acres (77 percent), and retain stands at or near the zone of imminent mortality on 763 acres.

Pileated Woodpecker

Direct effects to habitat include the potential removal of dead trees that present a hazard for transportation and harvest operation. This activity could disrupt nesting or cause nesting mortality of individuals. The amount of snags that would be removed to provide for safety is unknown, but is expected to be limited and would not decrease snag densities below levels prescribed in the LRMP. Thinning from below would occur within 100 percent of currently suitable habitats, with the exception of no-treatment areas around known goshawk nest trees (7 acres). Proposed treatments would reduce stand densities below 40 percent, thereby removing key habitat, on an estimated 417 acres (27 percent). Where treatments retain suitable stand densities, ground-level fuels treatments would decrease down log densities and reduce, but not remove, foraging opportunity.

Indirect effects include the increased vigor of the residual trees and reduced potential for future tree mortality due to insects, disease, and wildfire. In the short-term (up to 30 years), treatments would decrease potential tree mortality in suitable habitat on an estimated 2,584 acres (77 percent), and retain stands at or near the zone of imminent mortality on 763 acres.

Red-breasted Sapsucker

Direct effects to key habitat include the release of existing aspen stands through removal of encroaching conifers within and adjacent to aspen clones on an estimated 25 acres. Aspen stands are expected to respond

to release treatments with increased vigor and sprouting of suckers. Removal of existing aspen snags may occur to provide for operator safety, but loss of snags would be incidental. Construction of fencing for livestock exclusion is proposed to protect aspen regeneration from grazing.

Blue/Sooty Grouse

Because there are no key habitats (CWHR classes 5 or 6) identified within the project area, no direct effects would result from treatments under the proposed action. Indirectly, thinning from below in smaller-diameter stands (CWHR size 3, 4) is expected to accelerate diameter growth of conifers, thereby moving toward development of key habitat factors for sooty grouse in a shorter timeframe. Incidental removal of trees greater than 30 inches dbh may occur, but is not expected to alter overstory structure within stands.

Mule Deer

Proposed treatments would increase available key habitat (forage) by reducing stand densities on about 1,316 forested acres. The primary direct effects to habitat would be increased sunlight and associated increasing forage habitat. Subsequent forage: cover ratio on Forest Service lands would be approximately 67:33. Duration of the effects of treatments would vary, but are expected to last at least 10-15 years.

Hydrology, Soils and Aquatic Resources

Aquatics

Based on the analysis of effects of the project, it is my determination that this project will have “No Effect” on any federally listed species or their habitat by implementation of the proposed. This determination is based on the fact that the Lost River sucker, shortnose sucker, and Warner sucker are found outside of the Upper Pit River watershed and the Modoc sucker and Shasta crayfish are distributed far downstream and up tributaries of the Pit River.

There will be “No Impact” for any Forest Service sensitive aquatic species with the implementation of the Rush 2 Vegetation Project. There is no suitable habitat that is directly, indirectly, or cumulatively affected by the proposed action.

No aquatic MIS are in or adjacent to the project area and will not be affected by the project. The shortnose sucker and Lost River sucker are found in the Klamath Basin watershed, far to the north of and outside of the watershed of the project area. The Modoc sucker, Goose Lake redband trout, rainbow trout, brook trout and brown trout are found far downstream (10 miles) of the project area, primarily in Rush and Ash Creek. Largemouth bass are found on private ponds and in the main Pit River far downstream (10 miles) of the project area.

Hydrology and Soils

Direct/Indirect Effects: Under this action alternative, the ground disturbance activities on the hillsides and infrastructure necessary to support a harvest activity (i.e. temporary roads, skid trails and landings) could potentially deliver additional sediment to the stream courses. However with the application of Project Design Standards (PDS) including Best Management Practices (BMPs) the amount of sediment being delivered off

site and into the stream courses would be minimized and would meet state and federal water quality objectives.

All temporary roads would be made hydrologically stable and closed public in accordance with Tiber Sale Contract (TSC) provisions and BMP 2.26 (Obliteration or Decommissioning of Roads) following the cessation of the harvest and fuels treatments. All other system roads utilized by the timber harvest activity or used as part of the haul route will be maintained in a manner that is consistent with BMPs 2.22 (Maintenance of Roads), 2.23 (Road Surface Treatment to Prevent Loss of Materials) and 2.24 (Traffic Control During Wet Periods). When operating mechanical equipment on slopes with a High or Very High Maximum Erosion Hazard Rating, BMP 1.14 (Special Erosion Prevention Measures on Disturbed Land) would be applied.

A Riparian Conservation Area (RCA) would be prescribed for Cottonwood Creek, Pothole Spring Creek, and a small meadow and tributary to Hilton Creek. All other streams (Class I-IV) would have Streamside Management Zones designated with widths prescribed that are consistent with the Modoc NF LRMP Standards and Guidelines.

Under the project level activities Sporax use is proposed to be utilized to reduce the potential for annosus infection and spread. Sporax is proposed to be treated with the identified RCAs/SMZs. Sporax can be applied in the outer two thirds of the RCAs provided that BMP 5.8 (Pesticide Application According to Label Directions and Applicable Legal Requirements), and BMP 5.9 (Pesticide Application Monitoring and Evaluation) are implemented. Prior to application of Sporax within the identified RCA/SMZs, BMP 5.10 (Pesticide Spill Contingency Planning) would be completed. Within the SMZs and the inner third of the RCAs, the application of Sporax would be evaluated on a site specific basis and BMP 5.12 (Streamside Wet Area Protection during Pesticide Spraying) would be adopted. For more information see the Hydrology and Soils Report located in the project record.

Limited entry by mechanical equipment would occur within the Westside of Cottonwood Creek SMZ associated with treatment unit 4410800. The mechanical entry is limited to the outer half of the SMZ or 25 feet from the downhill side of the road. This will be done on an experimental basis and the response of the Cottonwood Creek would be monitored with cross sectional transect immediately down stream of the stand as well as a transect 25 feet from the edge of the road for soil compaction (BMP 1.8 and 1.9). This work within the identified SMZs is being completed to improve the stand health of the SMZ thereby benefiting the long term sustainability of the SMZ. This entry into the SMZ is being completed on an experimental basis and is consistent with BMPs 1.8 (Streamside Management Zone Designation) and 1.19 (Stream course and Aquatic Protection).

Within the Pothole Spring Creek RCA, a limited amount of aspen release would occur. This would occur when aspen stand is the dominant overstory of the RCA. When conifers are the dominant overstory within the RCA there would be limited conifer removal.

Cumulative Effects: Based on the R5 CWE Methodology, it was determined by the Forest Hydrologist that all of the affected sub-watersheds are below 100 percent TOC and that it was unlikely that the implementation of the above referenced alternative would result in an adverse cumulative effect to water quality.

Immediately following the harvest activity, the sub-watersheds on the east side of Manzanita Ridge would be at 80-100 percent of the TOC. These sub-watersheds would be at 29-65 percent of TOC by 2017 when fuel treatments should be completed. Thinning activities would occur between 2009 and 2012, and the fuels related activities would occur from 2012 to 2017. This would allow for 5 years of natural recovery of the affected sub-watershed to occur before the completion of fuels related activities. There would be very limited new road construction within these sub-watersheds.

The Pothole Spring and Sweagert Flat Sub-watersheds, contain approximately 80 percent of the ground disturbing activities that would occur on NFS lands. Following the harvest activity these affected sub-watersheds would be at 89.3 and 70.7 percent of TOC, respectively. By 2017 these sub watersheds would have sufficiently recovered to be at 58.2 and 50.2 percent of TOC, respectively. For more detailed information refer to the Cumulative Watershed Effects Report located in the project record.

Botany Threatened, Endangered and Sensitive Plants

Fuel reduction will be accomplished by thinning. It is also possible that masticating, burning piles, and underburning will be used. Underburning may be allowed to back into SMZs, as in that way, a cooler fire would enter the sensitive plant habitat. Exclusion of mechanical thinning treatment or pile burning should prevent effects to unseen individuals or habitat of the sensitive species. Allowing hand thinning and/or cool underburns to take place within habitat of long-haired star-tulip will reduce effects to the sensitive plant while allowing project implementation.

If long-haired star-tulip is present during project implementation, plants could sustain direct damage from trampling, dragging trees across the soil surface, or churning the soil. It is possible that existing individual plants could be killed by these activities. Fires could possibly get out of control, and underburning could affect plants or habitat, but it would not likely contribute to a trend toward federal listing or loss of viability.

Possible introduction or spread of noxious weeds or aggressive non-native plants could occur following project implementation, and these plants could disrupt the native vegetation. Noxious weeds are known on the district. It is recommended not to disturb sites of known noxious weed infestations, and to implement the standard equipment cleaning contract clause for off-road equipment.

No cumulative effects to sensitive species are expected from the proposed action, unless grazing allotments co-occur with treatment areas, and allotments are stocked the year following the underburning. Cows are known to prefer the young succulent plants of burned areas, and trampling and grazing of sensitive species could result. A period of rest is recommended for any areas within allotments that are burned. For more information see the Sensitive Plant Biological Evaluation located in the project record.

Noxious Weeds

Scotch thistle, dyer’s woad, and Canadian thistle are found within the project area. Other species are likely to occur in the area, and have a high priority for control; including common crupina, diffuse and spotted knapweed, musk thistle, Mediterranean sage, dyer’s woad, and Klamath weed. Medusahead, a Modoc County C-rated noxious weed, is also likely in the area. Alternative 2 includes design criteria requiring cleaning of equipment prior to entering the project area in order to minimize the potential for introduction and spread of

noxious weeds. The Noxious Weed Assessment concluded the proposed action posed a moderate to high risk of spreading noxious weeds. However, project design features including avoiding large infestations, eradicating small infestations, cleaning equipment, and post-project monitoring would prevent additional weeds from being introduced, and prevent the spread of existing weeds in the project area. For more information see the Noxious Weeds Assessment located in the project record.

Range

A temporary increase in herbaceous production and vigor would be expected as a result of the proposed action. There would be more available sunlight and moisture, and less competition as a result of decreasing percent crown cover. The treatment area is primarily rated as transitory rangeland which produces palatable forage for a limited time following timber harvest or fires (USDA Forest Service 1991).

Heritage Resources

Four of the eight recorded archaeological sites within the project area would be avoided by project activities. The project activities should have no direct effects on these resources. The remaining four sites may have some degree of project activity take place across them, in accordance with the Interim Protocol for Non-Intensive Inventory Strategies for Hazardous Fuels and Vegetation Reduction (2003). In keeping with the nature of this project, on these four sites the surface vegetation may be altered by thinning; for specific details of the proposed measures see the Archaeological Survey Report (ASR).

Sites where some of the vegetation has been removed would have lower density surface fuels and be less likely to burn at a high temperature or prolonged rate in the case of a forest fire. Vegetation removal across the four treated sites may also result in increased surface visibility, which may be useful to more accurately define the site boundaries.

The indirect effect of increased surface visibility across the sites may allow “pot hunters” to easily see surface artifacts and subject them to illegal collection.

The cumulative effect of the proposed action within the four archaeological sites to be treated should have positive consequences in the case of future wildfire. By preventing a gradual buildup of fuels on these sites, they should not be as prone to damage from fire.

The cumulative effect of the proposed action on the four untreated sites is more problematic. While it is true that without treatment, fuels may continue to build up within these four sites, treating the areas around them should afford them some protection from the spread of fire. However, lightning-ignited fires within these sites could still subject them to damage. For more information see the Heritage Resources Report located in the project record.

Public Health and Safety

Implementation of Alternative 2 would increase public and firefighter health and safety by reducing fire behavior and the potential for high-intensity wildfires that would threaten life, property and resource values (Fuels Report). Treatment activities and heavy equipment operations involve some inherent risks; however during implementation operations, all appropriate OSHA and other safety precautions would be taken to

minimize risks to the public. The national borax risk assessment was referenced for the use of borax, which concludes that application poses no risk to human health, wildlife or the environment (Borax Risk Assessment). The Proposed Action would not adversely impact public health and safety, but would reduce current and expected risks associated with forest health and wildfires.

Consistency

Alternative 2 is consistent with all applicable laws including: (1) Endangered Species Act – completion of a Biological Assessment; (2) National Forest Management Act; (3) Clean Water Act – completion of a Cumulative Watershed Effects analysis and identification of the appropriate Best Management Practices (BMP) to be utilized during project implementation, Cumulative Watershed Effects Analysis Report, Hydrology Specialist Report and Effects Analysis; (4) Clean Air Act – prescribed burn plans must address smoke management and comply with Federal, State and local air basin requirements (Fuels Specialist Report); (5) National Historic Preservation Act – completion of cultural resource surveys, protection of identified sites and coordination with the State Historic Preservation Officer (Archaeology Clearance Letter); and (6) compliance with Federal and State of California regulations regarding the proper use of pesticides (Borax Risk Assessment).

Consultation and Coordination

The Forest Service consulted the following individuals, Federal, State, and local agencies, tribes and non-Forest Service persons during the development of this environmental assessment:

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FEDERAL, STATE, AND LOCAL AGENCIES:

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California Department of Forestry and Fire Protection

California Pines Community Services District

California Department of Fish and Game

Central Valley Regional Water Quality Control Board

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Bill Wickman, American Forest Resource Council

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Appendix A - Rush2 Standards and Guides, Integrated Design Features and BMPs

Silviculture

Cut surfaces of stumps 14 inches and greater would be treated with a California registered borax fungicide (Sporax) to prevent the development of infection centers of the root disease *Heterobasidion annosum*. The use of Sporax has been shown to be effective for preventing annosus infection on conifer stumps (Graham 1971; Kliejunas 1989; Smith 1970). An evaluation of annosus root disease within the Rush2 planning area was completed by a plant pathologist (USDA FS 2005, 1-15). The evaluation report shows the locations of annosus and recommends use of Sporax in certain areas. Sporax would not be used to treat white fir stumps where S-type annosus root disease is prevalent. Sporax would be used to treat white fir stumps where S-type annosus root disease is not prevalent and it would also be used to treat pine stumps throughout the Rush2 planning area. Within the timber sale contract, standard C clause, C6.412#, Treatment of Stumps, would be used to implement this treatment.

Fuel Management

NO BMPs or IDFs in specialist report

Range

Aspen is a shade intolerant tree. Conifers would be removed to release aspen within the project area. Access by livestock into aspen stands is expected to increase after conifer removal. To facilitate livestock control felling trees in a manner that creates a barrier may be an option in lieu of expensive barbed wire fence construction and maintenance over time.

Avoid damaging all existing spring developments and range fences. Specifically, do not remove trees when range fences are attached.

Install temporary cattleguards or assign employees to monitor gates on pasture fences and exclosures.

Wildlife

Spotted Owl

Owl PACs

- Mechanical treatments may be conducted to meet fuels objectives in protected activity centers (PACs) located in WUI defense zones. In PACs located in WUI threat zones, mechanical treatments are allowed where prescribed fire is not feasible and where avoiding PACs would significantly compromise the overall effectiveness of the landscape fire and fuels strategy. Mechanical treatments should be designed to maintain habitat structure and function of the PAC.
- While mechanical treatments may be conducted in protected activity centers (PACs) located in WUI defense zones and, in some cases, threat zones, they are prohibited within a 500-foot radius buffer

around a spotted owl activity center within the designated PAC. Prescribed burning is allowed within the 500-foot radius buffer. Hand treatments, including handline construction, tree pruning, and cutting of small trees (less than 6 inches dbh), may be conducted prior to burning as needed to protect important elements of owl habitat. Treatments in the remainder of the PAC use the forest-wide standards and guidelines for mechanical thinning.

- For California spotted owl PACs: Maintain a limited operating period (LOP), prohibiting vegetation treatments within approximately ¼ mile of the activity center during the breeding season (March 1 through August 31), unless surveys confirm that California spotted owls are not nesting. Prior to implementing activities within or adjacent to a California spotted owl PAC and the location of the nest site or activity center is uncertain, conduct surveys to establish or confirm the location of the nest or activity center.
- Breeding season limited operating period restrictions may be waived, where necessary, to allow for use of early season prescribed fire in up to 5 percent of California spotted owl PACs per year on a forest.
- Conduct vegetation treatments in no more than 5 percent per year and 10 percent per decade of the acres in California spotted owl PACs in the 11 Sierra Nevada national forests. Monitor the number of PACs treated at a bioregional scale.

Owl HRCAs

- Mechanical treatment within California spotted owl Home Range Core Areas Outside WUI Defense Zones: Where existing vegetative conditions permit, design projects to retain at least 50 percent canopy cover averaged within the treatment unit. Exceptions are allowed in limited situations where additional trees must be removed to adequately reduce ladder fuels, provide sufficient spacing for equipment operations, or minimize re-entry. Where 50 percent canopy retention cannot be met for reasons described above, retain at least 40 percent canopy cover averaged within the treatment unit.

Goshawk

LMP standards and Guides

(Standard) Manage 100 suitable goshawk nest stands (of at least medium habitat capability), according to the Raptor Management Prescription.

Raptor Management Prescriptions:

- (Standard) Commercial access within nest stands is allowed August 1 through December 31.
- (Guideline) New roads should not be constructed within nest stands.
- (Guideline) Roads may be maintained, constructed and reconstructed within ¼ mile of nest stands from August through February.
- (Guideline) Within ¼ mile of nest stands, timber management activities will be scheduled from August through February.

SNFPA Direction

- Mechanical treatments may be conducted to meet fuels objectives in protected activity centers (PACs) located in WUI defense zones. In PACs located in WUI threat zones, mechanical treatments are allowed where prescribed fire is not feasible and where avoiding PACs would significantly compromise the overall effectiveness of the landscape fire and fuels strategy. Mechanical treatments should be designed to maintain habitat structure and function of the PAC.
- For northern goshawk PACs: Maintain a limited operating period (LOP), prohibiting vegetation treatments within approximately ¼ mile of the nest site during the breeding season (February 15 through September 15) unless surveys confirm that northern goshawks are not nesting. If the nest stand within a protected activity center (PAC) is unknown, either apply the LOP to a ¼- mile area surrounding the PAC, or survey to determine the nest stand location.
- The LOP may be waived for vegetation treatments of limited scope and duration, when a biological evaluation determines that such projects are unlikely to result in breeding disturbance considering their intensity, duration, timing and specific location. Where a biological evaluation concludes that a nest site would be shielded from planned activities by topographic features that would minimize disturbance, the LOP buffer distance may be modified.
- Breeding season limited operating period restrictions may be waived, where necessary, to allow for use of early season prescribed fire in up to 5 percent of northern goshawk PACs per year on a forest.
- For northern goshawk PACs: Conduct mechanical treatments in no more than 5 percent per year and 10 percent per decade of the acres in northern goshawk PACs in the 11 Sierra Nevada national forests.

American Marten

LMP Standards and Guides

- (Standard) Within each territory, manage seral stages to achieve 60% of the total territory in 4 B/C seral stages.
- (Standard) Manage snag densities in marten territories at no less than 2 snags per acre.
- (Standard) Manage down logs for no less than ten down logs per acre.
- (Guideline) Manage other habitat characteristics of pine marten stands so that they comply with the regional habitat capability model for this species, at the moderate habitat level.

Pallid bat

LMP Standards and Guides

- Maintain 1.2 snags/acre 15-24 inches dbh and 0.3 per acre >24 inches dbh.
- Where sufficient snag densities are not present, select live trees and manage as snags.
- Timber sales will be regulated to achieve snag densities. Sales will provide for snag recruitment by designation, leaving an adequate number of living and dead trees for future snags. Retain both existing snags and replacement trees in harvest units to meet snag requirements throughout the rotation.

SNFPA Direction

- Maintain three of the largest snags per acre. Use snags larger than 15” dbh to meet this guideline. Snags should be clumped and distributed irregularly across treatment units. Consider the potential losses of snags from prescribed fire during project planning to achieve desired snag retention levels.
- Design projects to sustain a generally continuous supply of snags and live decadent trees. Retain some mid- and large diameter live trees that are currently in decline have substantial wood defect, or that have teakettle branches, large diameter broken tops, or large cavities in the bole.

Heritage

Both previously recorded and newly recorded archaeological sites will be identified to the project administrator for avoidance by project activities using the standard resource protection measures. Any proposed project boundary changes will be subject to a case-by-case review for Section 106 compliance needs and documentation.

Watershed/Soils/Aquatics

Integrated Design Features (IDFs)

The proposed activity is modified to include the following Project Design Standards to protect soil and water quality:

1: A Riparian Conservation Area (RCA) is designated for the main stem of Cottonwood Creek, Pothole Spring Creek and an unnamed meadow that serves as the headwaters of a tributary to Hilton Creek.

2: Activity within the prescribed RCAs will be consistent with the Hydrologist recommendations to the District Silviculturalist and these activities will include the designation of a Streamside Management Zone’s (SMZs) and treatment prescriptions.

3. SMZs for all other intermittent and ephemeral is prescribed and the widths are based on the geomorphic conditions on the ground.

4. Under burning of the treatment units located on the east side of Manzanita Ridge will be completed only after the down woody debris and jack potted fuels concentrations within units are adequately treated to ensure that the under burning activities does not pose a risk to spread outside of the unit or off NFS lands.

Streamside management Zones (SMZs)

Streamside Management Zones (SMZs) have been designated for all Class I-IV stream courses in accordance with the Modoc National Forest Land and Resources Management Plan (MNF-L&RMP). Handwork within the identified SMZs to reduce the fuels load and restore the natural fire resiliency of these sensitive areas is a permitted activity. The SMZs would maintain a mechanical exclusion zone, unless prior approval by the Forest Hydrologist for entry into the SMZs. No new landings of skid trails will be permitted within the prescribed SMZ.

- Treatment of slash or other by products of the work within the SMZs could be hand piled and burned in the outer half of the SMZ, provided that they are burned above the slope break (if one is present) and done so in a manner that will not result in burning of the SMZ (BMPs 1.8, 1.19 and 1.22).

Riparian Conservation Areas (RCAs)

A RCA of 150 feet is prescribed for Cottonwood Creek.

- Limited entry by mechanical equipment would occur within the Westside of Cottonwood Creek SMZ associated with treatment unit 4410800. The mechanical entry is limited to the outer half of the SMZ or 25 feet from the downhill side of the road. This will be done on an experimental basis and the response of the Cottonwood Creek would be monitored with cross sectional transect immediately down stream of the stand as well as a transect 25 feet from the edge of the road for soil compaction (BMP 1.8 and 1.9).
- On the east side of Cotton Creek within treatment unit 4410800, a 50 foot no mechanical entry SMZ would be maintained. The outer two third of the RCA for Cottonwood Creek the upland treatment prescription would be applied. Hand piling of forest debris could occur provided that it is limited to no more then 10% of the SMZ acreage and the piles to be burned were a maximum size of 4x4x4 in size. Pre-existing landings, skid trails and temporary roads could be used in the outer two thirds of the RCA, provided that they are rehabilitated prior to the onset of the fall rains (BMP 1.8, 1.9 and 2.26).
- Treatment units 4410050, 4410200, 441293, 4410900, and 4411200 uphill of Forest Road 40N22 could be treated with the upland treatment prescription. Pre-existing landings, skid trails and temporary roads could be used in the outer two thirds of the RCA, provided that they are rehabilitated prior to the onset of the fall rains (BMP 1.8 and 1.9).

A RCA of 150 feet is prescribed for Pothole Spring Creek.

- A mechanical exclusion SMZ of 75 feet or slope break (whichever is greater) is prescribed for Pothole Spring. Hand piling and burning is not permitted within 50 feet of the high water mark for Pothole Spring Creek and no new landings or skid trails are permitted with the identified SMZ (BMP1.18, 1.9 and 1.22).
- Within the outer half of the RCA for Pothole Spring Creek (75 feet from the edge of the high water mark or slope break which ever is greater, the upland treatment prescription could be applied. Pre-existing landings, skid trails and temporary roads could be used in the outer half of the RCA, provided that they are rehabilitated prior to the onset of the fall rains.
- Within SE1/4 of S14, T39N and R10E an arterial road (39N14A) crosses the established riparian area for Pothole Spring Creek. Prior to crossing the main stem of pothole Spring the “C” road takes off to the left. A temporary road will be constructed on the contours to access the treatment units 4423800 and 4424100.

A small meadow serving as the headwaters for a tributary to Hilton Creek within the SE1/4 of S35, T40N and adjacent to Forest Road 40N09 would have a 150 foot RCA applied to the meadow.

Other

When disturbing ground on Soil Management Units (SMUs) 112, 116, 117, 123, 124, 257 and 259 the potential to increase on site soil erosion and off site movement would exceed forest standards. When operating on these above referenced soils BMP 1.14 Special Erosion Prevention Measures on Disturbed Lands would be applied. This would entail closer spacing of water bars on skid trails and temporary roads, mulching composed of forest debris on the outlet of the water bars and mulching using lop and scatter method at the connection of the skid trail to the landing or temporary road from the landing onto system roads.

Soil disturbance would occur on the contours where feasible, and would be based on slope, soil erosion hazard rating, water runoff potential and soil moisture. A slope limitation of 40% would be applied on all soils within the project area. On slopes greater then 40% would require that the activity be completed by hand (BMP 5.2).

When operating within treatments units located on the east side of Manzanita Ridge, at least 50% of the units would be machine piled and burned following the harvest activity. The fuels treatment of under burning would not occur until the jack potted fuels is treated. The fuels treatment would not occur until 2012 to allow the sub-watersheds a chance to achieve some form of natural recovery.

A temporary road is planned to provide access to treatment units 4410400 and 4410500. The temporary road would be linked or connected to Forest Road 40N09. Temporary road would be constructed as feasible on the contours and an erosion control plan would be developed in a manner that is similar to skid trails and landings (BMP 1.16, 1.17 and 2.9).

- The temporary road would be obliterated under contract provisions and in accordance with BMP 2.26 (Obliteration and Decommissioning of Roads). Public access to the temporary road would be limited by the placement of large boulders across the road following the completion of the harvest activity. Erosion control structures (i.e. water bars and /or rolling dips) would be incorporated into the road design (BMP 2.26).

The prescribed burning prescriptions will incorporate standards to protect water quality. These standards routinely includes lighting the fire from above so that it is a backing fire and not a running fire, burning no more the 15% of the sub-watershed in a given calendar year and limiting the acreage of piles to be burned to not exceed 15% of the acreage in a given calendar year (BMP 6.2).

- During the prescribed burning the effects to the RCA and SMZs would include no attempt to introduce the fire into the SMZ, but it could be introduced into the RCA's. Allowing the fire if necessary to back into the SMZ, but not to introduce control lines into the SMZs unless it is necessary to prevent the spread of the fire. Control lines if necessary to control the spread of the prescribed fire within the outer half of the RCA could be utilized, provided that the smallest width line is utilized to accomplish the control (don't use a dozer line if a hand line would do). If the prescribed burning burns into the SMZ and starts to run up the SMZ for a distance of more then 50 feet, then suppression of the prescribed fire within the SMZ would occur (BMP 6.3).
- Treatment of the existing fuel loading and concentrations of jack potted fuels within units on the east side of Manzanita Ridge would occur prior to under burning the units for maintenance (BMP 6.3).

BMP 1.1 Timber Sale Planning Process

Incorporate water quality and hydrologic considerations into the timber sale planning process.

The Environmental Analysis and the timber sale contract will include specific requirements designed to protect riparian resources, including SMZ'S, BMP'S, and Region 5 Soil Quality Standards.

BMP 1.2 Timber Harvest Unit Design

Ensure that timber harvest unit design will maintain and protect water quality and quantity while maintaining desirable stream channel characteristics and watershed conditions.

BMP 1.3 Determination Of Surface Erosion Hazard For Timber Harvest Unit Design

Identify high erosion hazard areas in order to adjust treatment measures to prevent downstream water quality degradation.

BMP 1.4 Use Of Sale Area Maps for Designating Water Quality Protection Needs

The Sale Area Map will show Streamside Management Zones (including relevant widths), wet meadows, springs, proposed harvest unit boundaries, and all roads including any non-specified temporary roads and landings.

BMP 1.5 Limiting Operating Period Of Timber Sale Activities

Ensure that the purchasers conduct their operations, including erosion control work, road maintenance in a timely manner, within the time specified in the timber sale contract.

BMP 1.8 Streamside Management Zone Designation

Designate a zone along riparian areas, streams and wetlands that will minimize potential for adverse effects from adjacent management activities.

BMP 1.9 Determining Tractor Loggable Ground

To minimize erosion and sedimentation resulting from ground disturbance of tractor logging systems.

BMP 1.10 Tractor Skidding Design

By designing skidding patterns to best fit the terrain, the volume, velocity, concentration, and direction of runoff water can be controlled in a manner that will minimize erosion and sedimentation. This design is based on contours, percent slope, soil erosion hazard and watershed sensitivity.

BMP 1.12 Log Landing Location

Locate new landings or reuse old landings in such a way as to avoid watershed impacts and associated water quality degradation.

BMP 1.13 Erosion Prevention And Control Measures During Timber Sale Operations.

Ensure that the purchaser's operations will be conducted reasonably to minimize soil erosion.

The required erosion control work will be in place prior to the onset of the inclement weather season or based precipitation, when the Sales Administration Officer (FSR) determines it is necessary to protect water quality.

BMP 1-15: Re-vegetation of Areas Disturbed by Harvest Activities

Based on soil erosion hazard rating and determination by the FSR, re-vegetation of the disturbed areas will be completed as necessary.

BMP 1.16 Log Landing Erosion Control

Reduce the impacts of erosion and subsequent sedimentation associated with log landings by use of standardized methods as contained in the timber sale contract and as amended by the FSR.

BMP 1.17 Erosion Control On Skid Trails

Protect water quality by minimizing erosion and sedimentation derived from skid trails. The Sale Administrator(s) will determine needed erosion control measures on skid trails, to minimize accelerated runoff and soil compaction.

BMP 1.18 Meadow Protection during Timber Harvesting

Avoid damage to the ground cover, soil, and the hydrologic function of meadows, fens, wet areas, springs and seeps during the implementation of the timber sale contract. Maintain a mechanical exclusion zone of 50 feet from the outer extent of riparian vegetation. Do not skid or yard trees across the wet areas when it is likely to cause resource damage to the riparian areas or stream courses. .

BMP 1.19 Stream Course And Aquatic Protection

(1) Conduct management actions within the SMZs and other designated sensitive areas in a manner that maintains or improves riparian and aquatic values. (2) Provide unobstructed passage of storm flows. (3) Control sediment and other pollutants entering stream courses. (4) Restore the natural course of any stream as soon as practicable, where diversion of the stream has resulted from of timber management activities.

BMP 1.20 Erosion Control Structure Maintenance

All drainage structures associated with the project will be maintained in good repair to function properly. Provide follow-up inspection and maintenance as needed and to ensure adequate erosion control.

BMP 1.21 Acceptance of Timber Sale Erosion Control Measures before Sale Closure

The FSR will inspect and certify the adequacy of required erosion control work on timber sales prior to the closing of the timber sale.

BMP 1.22 Slash Treatment in Sensitive Areas

To maintain or improve water quality by protecting sensitive areas from degradation which would likely result from using mechanical equipment for slash disposal. Hand piling and burning is authorized within the SMZs provide that it is done in the outer half of the SMZ or above the slope break (if one is present).

BMP 1.25 Modification of the Timber Sale Contract.

The Timber Sale Contract can be modified if new circumstances or conditions indicate that the timber sale will damage soil, water, or watershed values. Based on review by the FSR and in coordination with the Forest

Hydrologist, additional measures to maintain and protect water quality maybe necessary when operating in areas adjacent to or within sensitive areas.

BMP 2.1 General Guidelines for the Location and Design of Roads

Locate and design roads with minimal resource damage through coordination between the FSR and the Forest Hydrologist (as necessary).

BMP 2.2 Erosion Control Plan

Limit and mitigate erosion and sedimentation through effective planning before initiation of construction activities and through effective contract administration during construction.

BMP 2.3 Timing of Construction Activities

Minimize erosion by conducting operations during minimal runoff periods, per the timber sale contract.

BMP 2.7 Control of Road Drainage

Install measures to ensure minimal erosive effects from water concentrated by road drainage features. Measures that may be used include but are not limited to cross drains, water bars or rolling dips, relief culverts, ditch blocks, armoring of ditches or low water crossings.

BMP 2.9 Timely Erosion Control Measures on Incomplete Roads and Stream Crossing Projects.

If needed, apply this BMP to minimize erosion and sedimentation from disturbed ground if the project is not completed by the end of the normal operating season.

BMP 2.12 Servicing and Refueling of Equipment

The location, size and allowable uses of service and refueling areas should be defined in the timber sale contract or by the timber sale administrator in order to prevent pollutants such as fuels, lubricants, or other harmful materials from being discharged into or near water sources.

BMP 2.13 Control of Construction and Maintenance Activities Adjacent to SMZs

To minimize sediment production originating from side cast material during road maintenance or reconstruction.

BMP 2.16 Stream Crossings on Temporary Roads

Ensure that temporary roads do not unduly damage stream channels and ensure that fish passage is unimpeded by stream crossing structures.

BMP 2.17 Bridges and Culvert Installation

Minimize sedimentation and turbidity resulting from excavation for in-channel structures.

BMP 2-21 Water Source Development Consistent with Water Quality Protection

To supply water for roads and fire protection while maintaining existing water quality, the FSR should coordinate with the Forest Hydrologist and/or Forest Fisheries Biologist in the development of new or additional water sources.

BMP 2-23 Road Surface Treatment to Prevent Loss of Materials

To minimize the erosion of the road surface materials, roads that are likely to erode from the effects of the harvest activity should be rocked on the steeper pitches and on the approaches to perennial stream crossings.

BMP 2.24 Traffic Control during Wet Periods

The FSR in coordination with the Forest Hydrologist (when necessary) will restrict the use of roads for the timber harvest activity during periods of wet weather.

BMP 2.26 Obliteration or Decommissioning of Roads

Temporary roads will be obliterated by making the temporary roads hydrologically stable in accordance with the terms of the timber sale contract and closed to public access (where feasible).

BMP 5.1 Soil Disturbing Treatments on the Contour

Operate mechanical equipment to treat the side slopes by operating on the contours (where feasible).

BMP 5.2 Slope Limitations for Mechanical Equipment Operation

Reduce gully and sheet erosion and associated sediment production by limiting tractor use based on slope. Limit the mechanical treatment areas to areas that have a sustained slope of no more then 40%.

BMP 5.3 Tractor Operation Limitation in Wetlands and Meadows

Limit tractor operation within identified wetlands and wet meadows (as needed).

BMP 5.4: Re-vegetation of Surface Disturbed Areas

Revegetate disturbed areas by where needed to maintain topsoil and reduce the off site erosion on areas disturbed by the vegetation removal activities.

BMP 5.6 Soil Moisture Limitations for Mechanical Equipment Operations

Prevent resource damage to the soil resource with resultant sediment production and turbidity when the soil are saturated and prone to excessive levels of compaction and or erosion..

BMP 5.7 Pesticide Use Planning Process

Plan where sporax fungicide will be applied to help control annosus prior to the implementation of the timber sale activities.

BMP 5.8 Pesticide Application According to Label Directions and Applicable Legal Requirements

Apply Sporax according to the label instructions.

BMP 5-9 Pesticide Application Monitoring and Evaluation

The Forest Hydrologist will be on site to determine that the application of Sporax within the RCA’S and other sensitive areas to ensure that application of sporax does not result in an adverse effect to water quality.

BMP 5-10 Pesticide Spill Contingency Planning

Develop a pesticide spill contingency plan in the eventuality of an accidental spill during the application of Sporax.

BMP 5-12 Streamside Wet Area Protection during Pesticide Spraying

Within the identified RCAs Sporax can be applied to prevent the annosus infection on conifer stumps greater then 14 inches (stump diameter) in the outer two thirds of the RCAs. Within the inner third of the RCAs and the prescribed SMZs, application of Sporax will be identified during implementation and the Forest Hydrologist will be on site to determine that the application of Sporax does not result in an adverse effect to water quality.

BMP 6-2 Consideration of Water Quality in Formulating Fire Prescriptions

Fire prescription should limit the duration and intensity of a prescribed fire so as not to create hydrophobic soils that exceed 15% of the sub-watershed in any given year, and burn from above where feasible to create a backing fire rather then a running fire.

BMP 6-3 Protection of Water Quality from Prescribed Burning Effects

Limit the entry of prescribed fire into the identified SMZs by making no attempt to encourage nor making any attempt to discourage fire from burning into the SMZs, provided that it does not burn up and down the SMZ.

BMP 7-3 Protection of Wetlands

Protect the function of wetlands, meadows and other water dependent areas by limiting the effects of the timber harvest activity near or within sensitive areas.

BMP 7.6 Water Quality Monitoring

Activities related to the implementation of the undertaken activity would be monitored under R5's Best Management Practices Evaluation Program (BMPEP) according to regional protocol.

TES Plants

- Avoid using machinery within meadow areas during project implementation.
- Do not burn piles within habitat of long-haired star-tulip
- Do not use mechanical treatments within habitat of long-haired star-tulip, instead, establish a manual-treatment only buffer of 50 feet within the forest canopy adjacent to the habitat.
- If possible, fell trees away from long-haired star-tulip habitat.
- Do not underburn within one quarter mile of long-haired star-tulip habitat with the exception that underburning can occur west of forest road 40N09.

Noxious Weeds

- Off-road equipment shall be weed-free before entering Forest Service lands. "Weed-free" means that visual inspection does not reveal soil, seeds, vegetative matter or other debris that could contain or hold weed seeds.

- Large infestations of more than 25 plants of noxious weeds shall be identified prior to the beginning of the project, and have suitable buffers placed around them and clearly marked. These infestations shall be avoided as the project is being performed.
- Small weed infestations of 25 plants or less shall be identified prior to or during completion of the project and shall be treated immediately using manual control methods.
- Weed monitoring after the completion of the project shall be performed, in order to prevent new infestations. Any new noxious weeds occurrences shall be immediately reported to the Forest Botanist.

Appendix B – Activities by stand

Stand Number	Approx. Stand	Thinning	Handpile	Mastication	Machine Pile	Underburn
	Acres	Acres	Acres	Acres	Acres	Acres
4333900	164	0	0	41	0	0
4380130	12	12	0	3	1	0
4380140	18	18	18	0	0	0
4380150	16	16	16	0	0	0
4380160	32	32	0	8	3	0
4380200	40	40	40	0	0	0
4390100	13	13	0	3	3	0
4410050	21	21	0	0	0	0
4410200	144	144	33	2	25	0
4410293	14	0	0	0	0	0
4410300	103	103	26	0	0	0
4410400	209	209	48	5	5	0
4410500	386	311	81	25	112	0
4410600	200	200	0	50	85	0
4410700	116	86	0	0	0	0
4410800	297	247	63	0	63	0
4410900	119	119	14	16	9	0
4411000	33	28	0	0	7	0
4411100	105	95	0	0	14	0
4411200	60	20	0	0	0	60
4411300	131	131	10	22	32	0
4411400	66	46	12	0	6	0
4411500	148	148	0	0	22	60
4411600	63	63	0	0	16	0
4411700	10	10	0	0	0	0
4411800	39	34	0	34	0	0
4411900	14	14	0	0	4	0
4412000	70	40	0	0	0	70
4412100	3	3	0	0	0	0
4412200	37	37	0	27	0	0
4412300	13	13	0	13	0	0
4412400	108	108	28	0	18	92
4412500	114	84	0	38	37	0
4412600	40	25	0	0	0	0
4412700	3	0	1	0	0	0
4412800	17	17	12	0	0	17
4412900	40	20	5	15	0	0
4413000	129	109	8	20	0	0
4413100	140	100	18	8	0	0
4413200	170	85	21	0	0	0
4413300	31	16	4	0	0	16
4413600	43	35	0	35	9	0
4423700	33	33	8	0	0	0
4423800	63	63	16	0	0	0
4424000	62	62	13	31	16	0
4424100	140	140	56	18	18	0
4443400	41	6	2	8	0	0
4443500	38	38	29	0	0	38
Total:	**3908**	**3194**	**582**	**422**	**505**	**353**

Appendix C – Maps

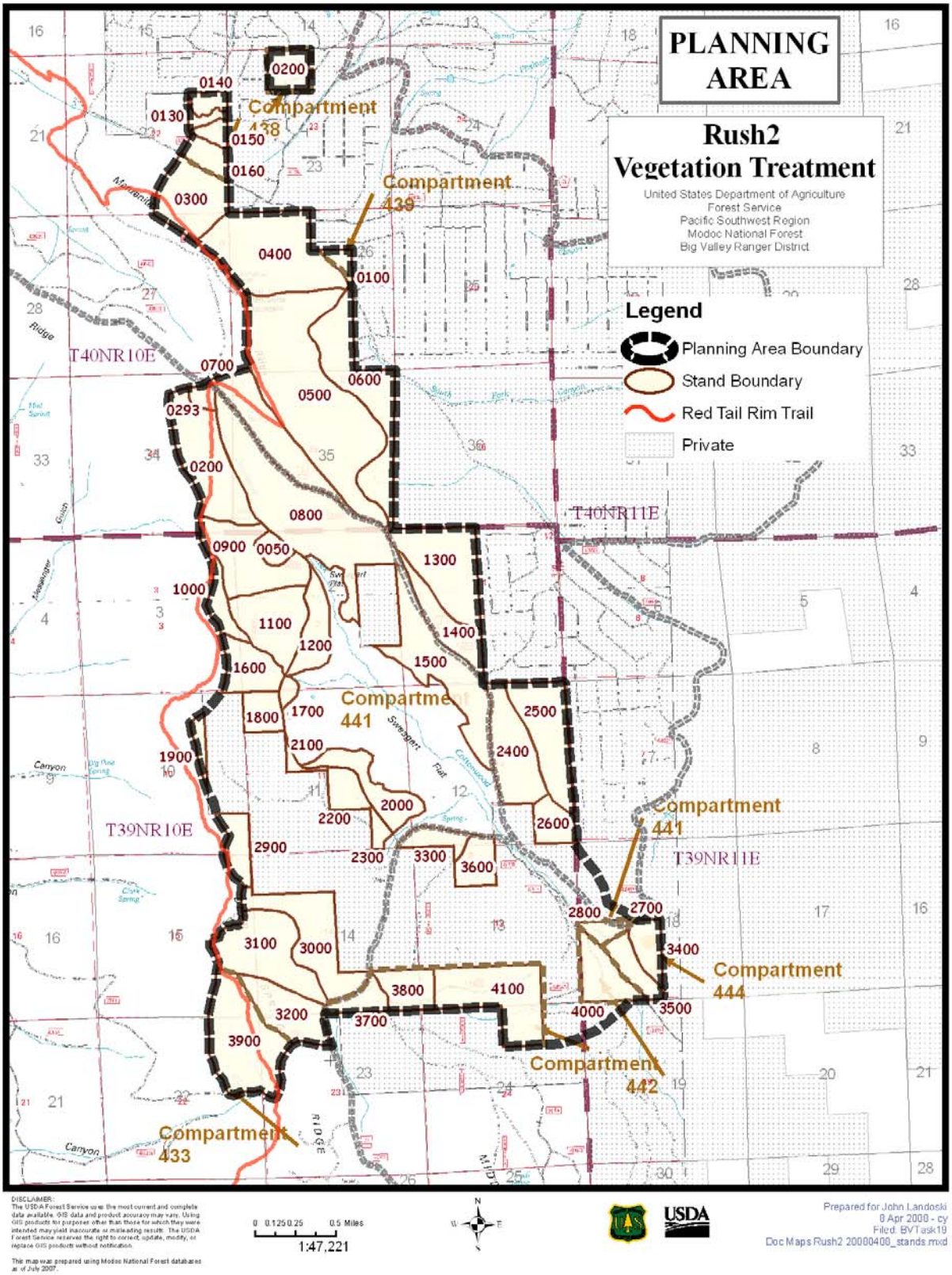

Figure 6. Map of stands proposed for treatment

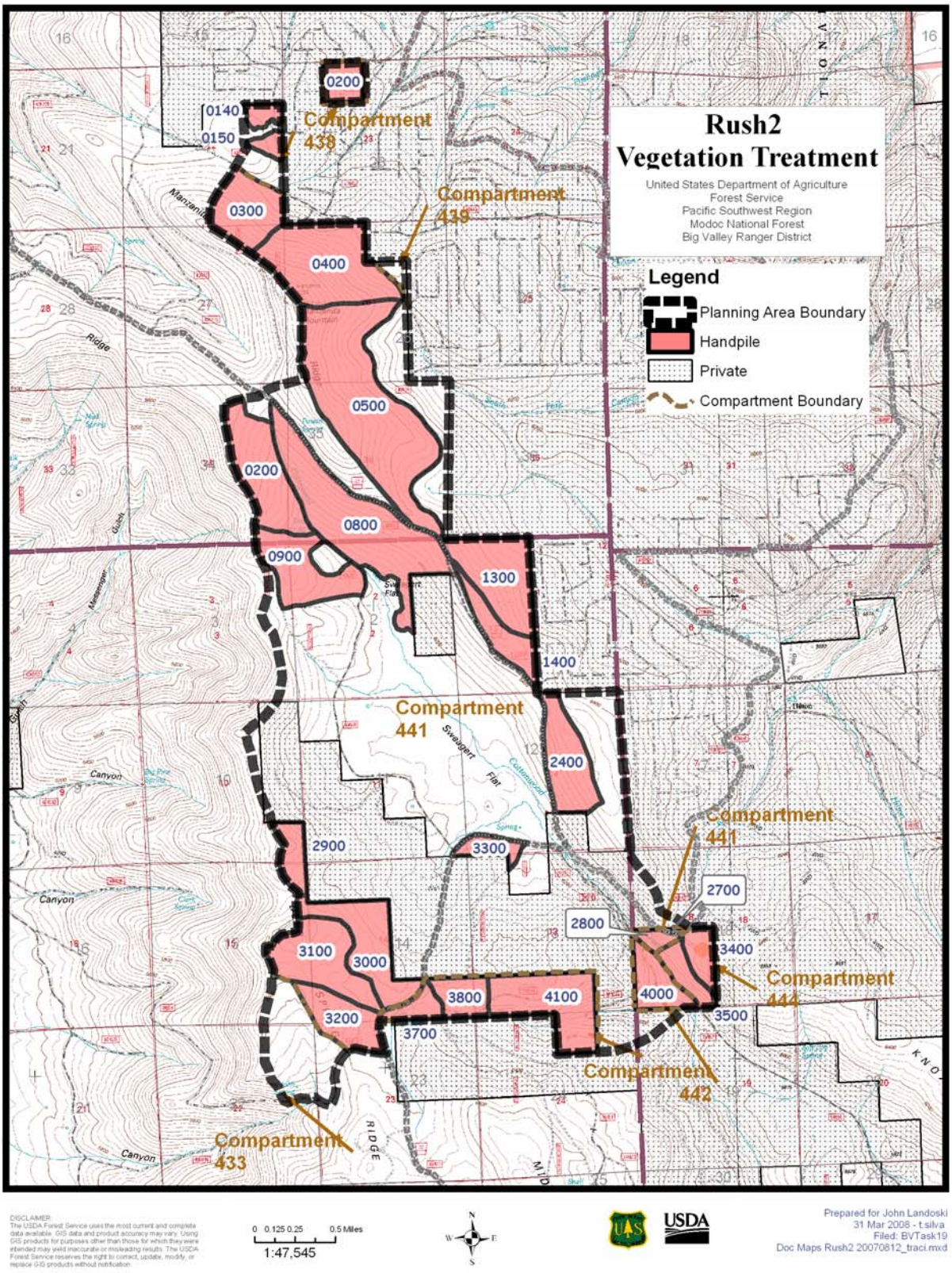

Figure 7. Project area map showing stands with handpiling prescription

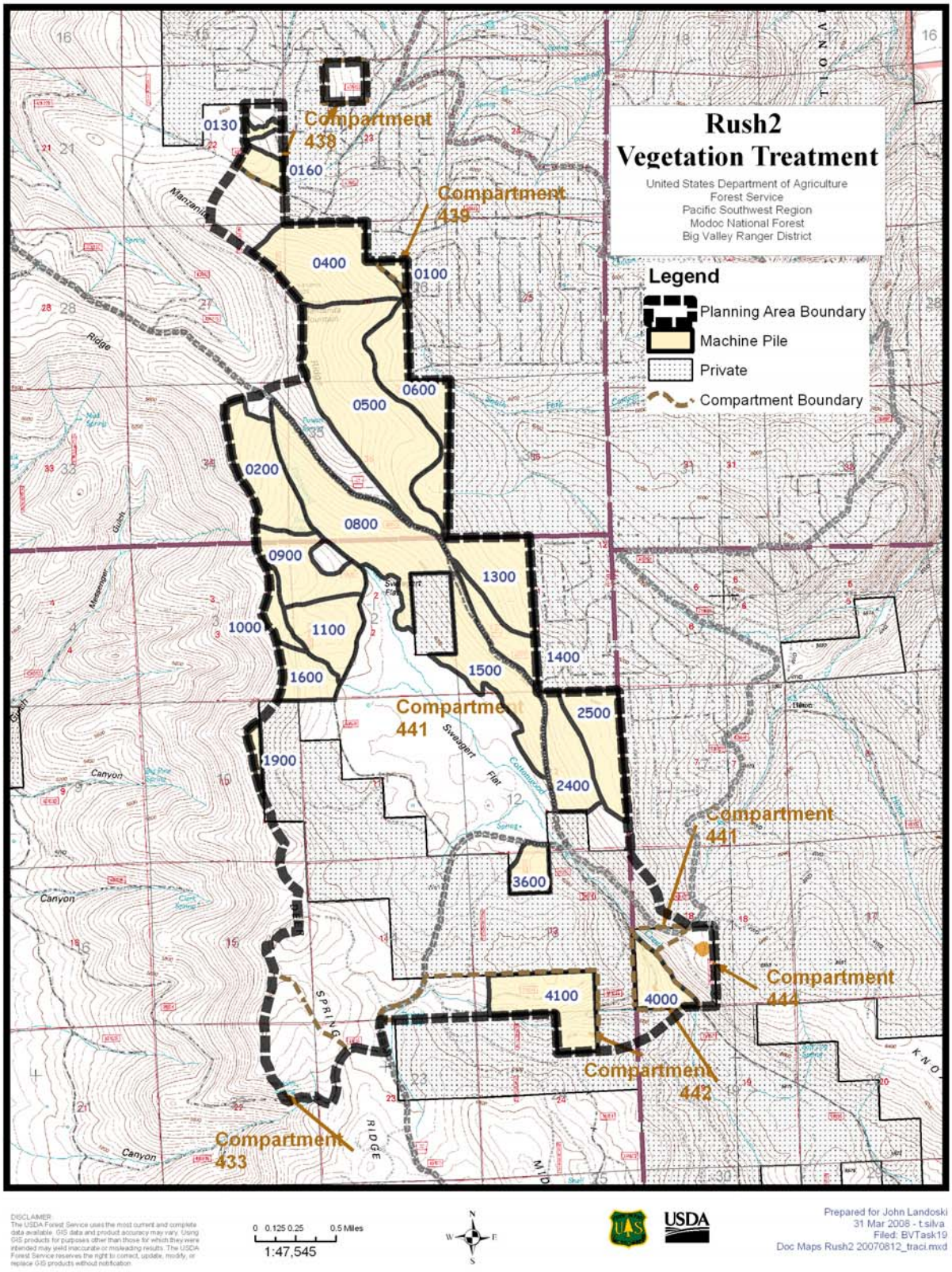

Figure 8. Project area map showing stands with machine piling prescription

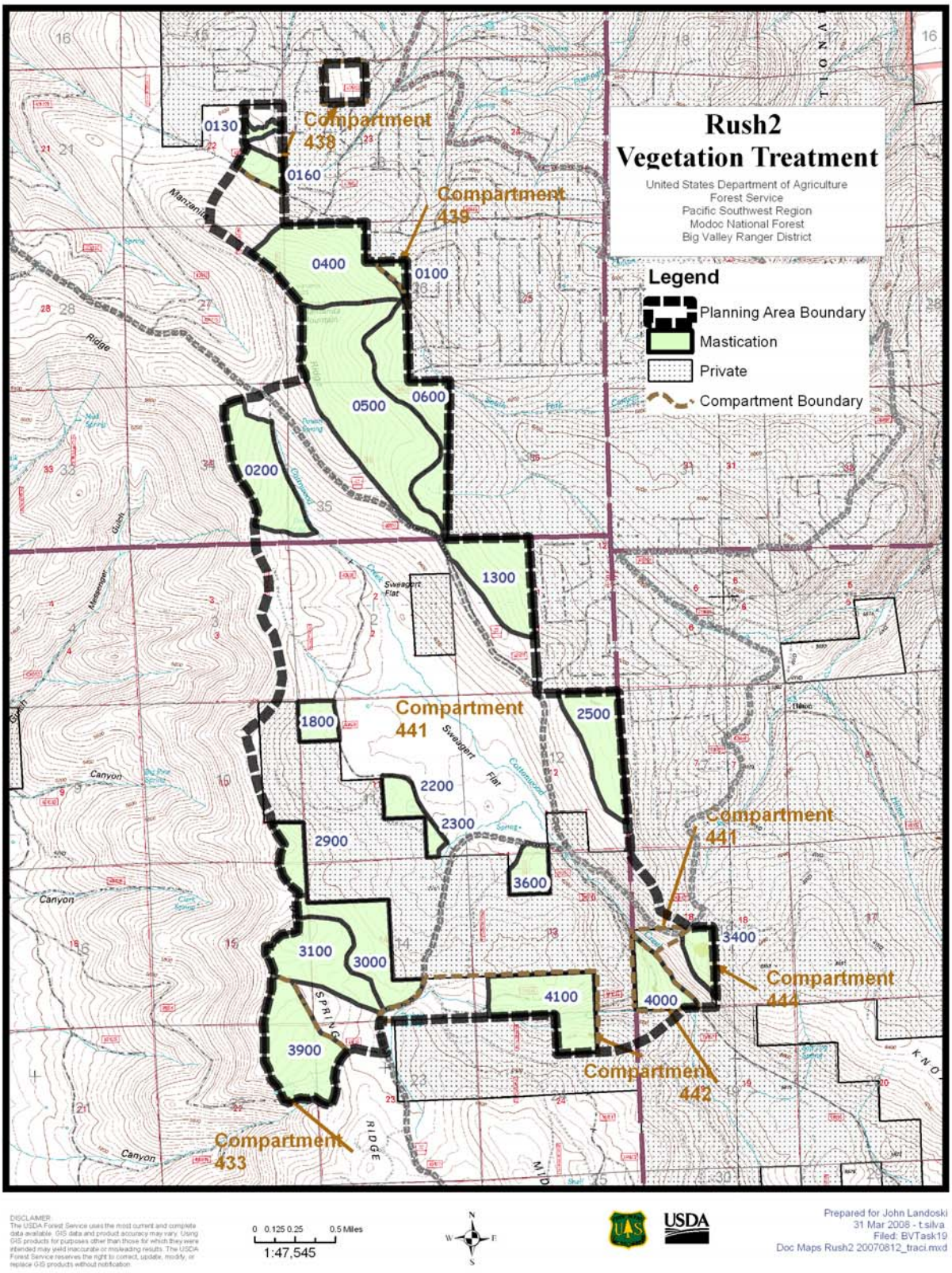

Figure 9. Project area map showing stands with mastication prescription

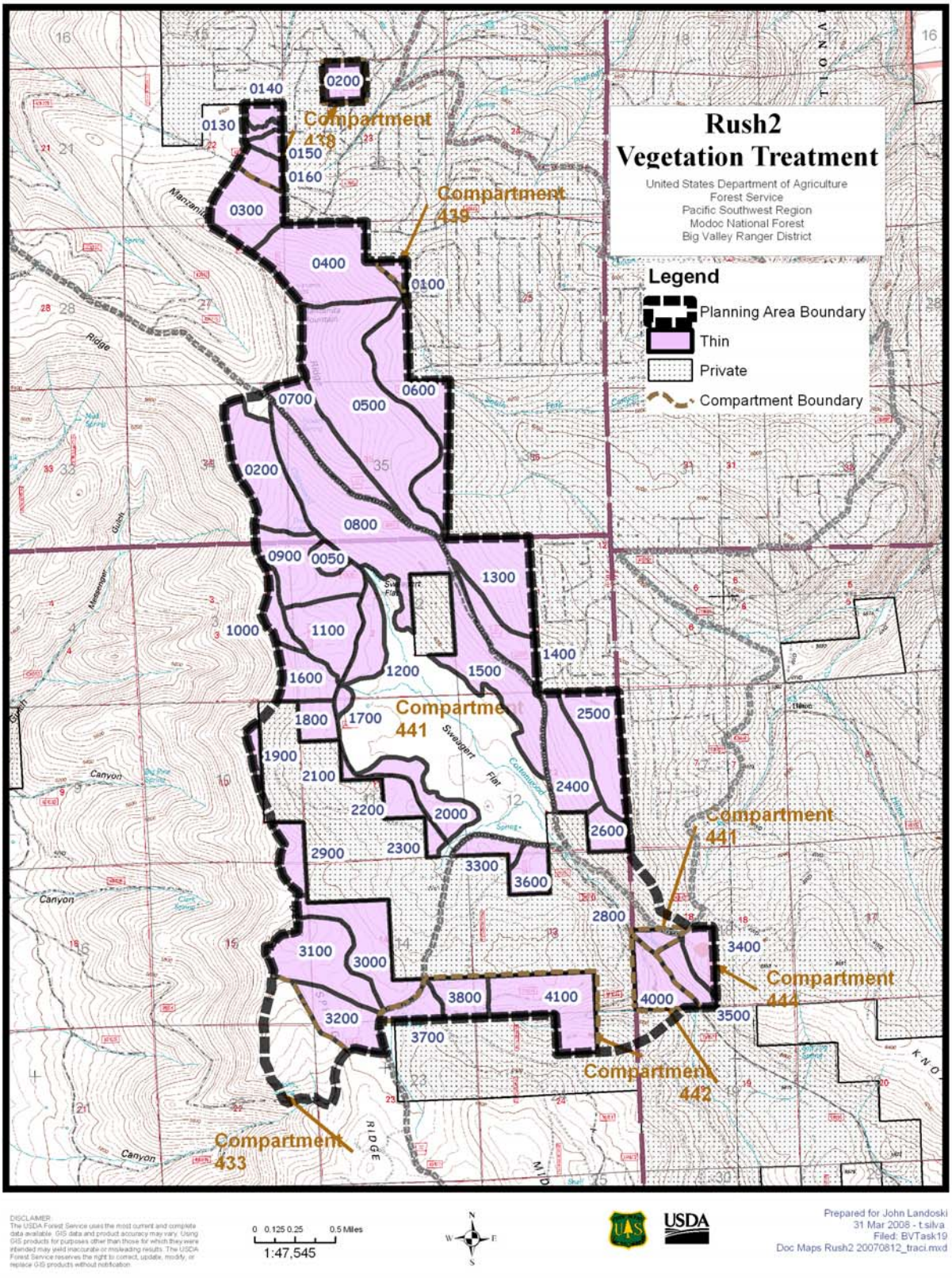

Figure 10. Project area map showing stands with a thinnning prescription

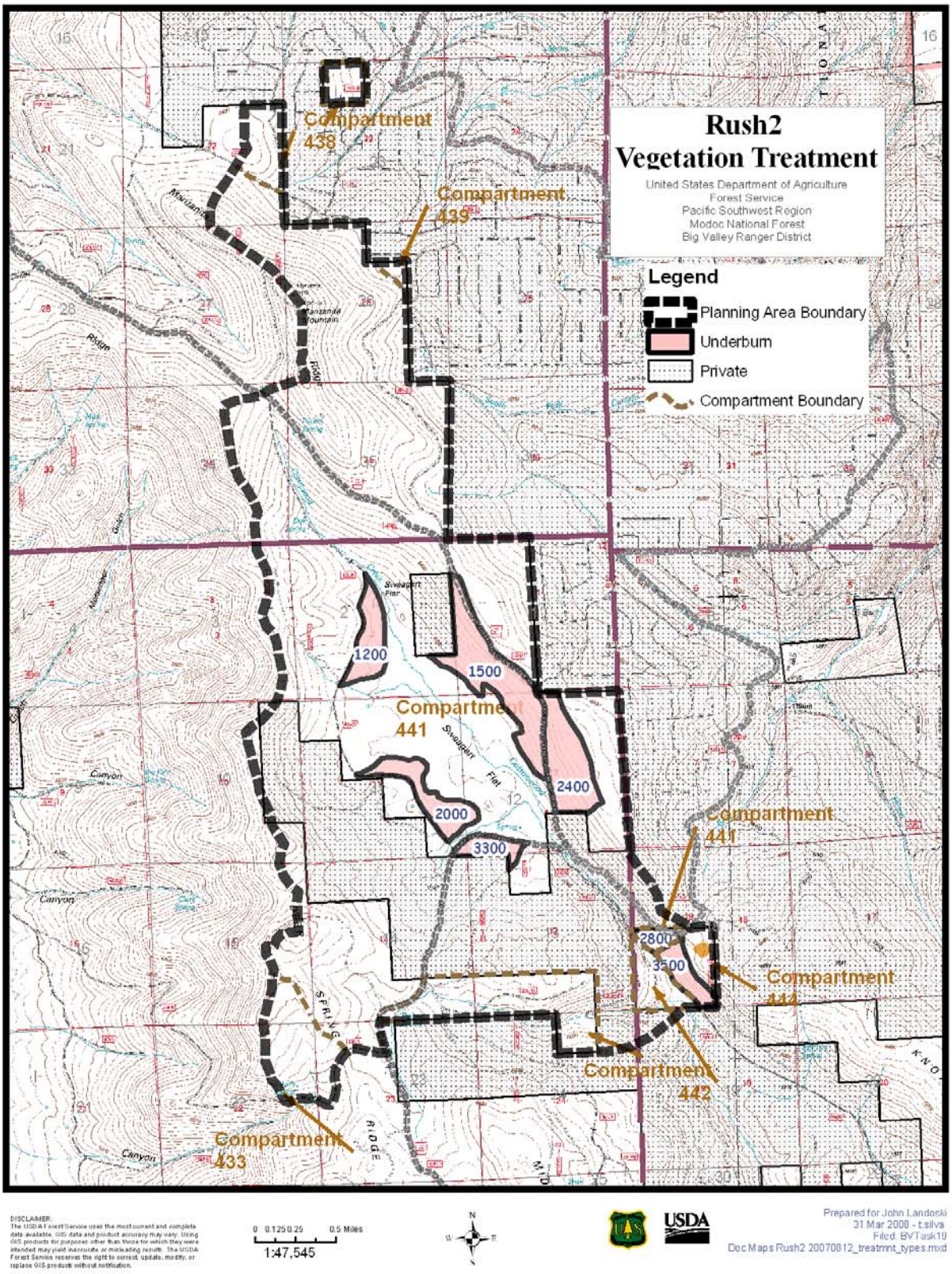

Figure 11. Project area map showing stands with an underburning prescription

Appendix D – Healthy Forest Restoration Act Old Growth Consistency Review

FINDING
Old Growth Consistency
with the
Healthy Forests Restoration Act for the
Rush2 Vegetation Treatment Project

The Healthy Forests Initiative and Healthy Forests Restoration Act (HFRA) Interim Field Guide (2004) provides guidance in applying the expedited processes provided in Title I of the HFRA. Within the field guide are decision diagrams summarizing the requirements of the law.

This document discusses treatments proposed in the Rush2 Vegetation Treatment Project to coniferous forested stands in terms of Decision Diagram 3, "Applying Old-Growth and Large-Tree Retention Requirements".

Question One--Does the RMP (resource management plan) contain old-growth management direction?

The 1991 Modoc National Forest Land and Resource Management Plan (LRMP) includes direction for managing old-growth.

The following are standards and guidelines from the LRMP:

> Treat fuels commensurate with hazards, risks, economics, values, and losses which could be sustained in the project area. Manage fuels to prevent fire and to complement other resource management direction (USDA 1991, 4-15).
>
> The health and vigor of trees will be maintained through integrated pest management and appropriate silvicultural techniques. The objective is to ensure plantation success and maintain timber stands in good condition (USDA 1991, 4-24).
>
> Stands will be precommercially thinned to remove trees that would die before the final harvest if the stand were not thinned, or to attain a desired stocking level. Stands will not be thinned below the basal areas from which they can return to acceptable stocking by the next entry (generally 20 years) (USDA 1991, 4-24).
>
> Coordinate slash disposal and fuel treatment to ensure regeneration and reduce the risk of wildfires while providing for wildlife needs and soil and water quality protection (USDA 1991, 4-24).
>
> If naturally present, maintain representative seral stages within the following vegetation (conifer) types within each management area: eastside pine, mixed conifer, white fir, red fir, and lodgepole pine (USDA 1991, 4-31-33).

Maintain a minimum of 5% of each seral stage for eastside pine, mixed conifer, white fir, red fir, and lodgepole pine on lands capable of growing >20 cubic feet per acre per year.

Land not managed for timber production will be allowed to cycle naturally, unless management is determined to be necessary for other resources. Deficits in amounts of seral stages within management areas may be corrected by vegetative manipulation. Current deficits will be corrected over time, in some cases by selecting individual stands and documenting in project EAs and on stand record cards that these stands are to be grown to old growth conditions.

Provide at least the following amounts of old growth forest habitat for viable populations of dependent species.

Species	**>20 cu.ft./acre/year**
Ponderosa Pine	13,083 acres
Mixed Conifer	7,679 acres
Red Fir	666 acres
Lodgepole	804 acres

Old growth stands maintained for habitat will be at least 40 acres. In areas where a contiguous 40-acre stand does not naturally occur, 25-acre stands within one mile of each other may be sufficient.

In management areas with insufficient old growth, select stands which nearly meet old growth standards and so manage them.

Question Two--Is the project in old-growth?

There are four mixed conifer old-growth areas within the Rush2 Vegetation Treatment planning area. Their locations are illustrated in Figure 1. Old growth stands 90 and 91 are within Rush2 stands 4410500 and 4410600; old growth stand 92 is within Rush2 stand 4411300; and old growth stand 105 is within Rush2 stand 4424100.

The general description for mixed conifer old-growth can be found on page 4-32 in the LRMP. The LRMP describes old-growth stands as being within the medium to large tree seral stage; composed of mature trees > 24 inches in diameter; 190-270+ years old to provide old growth decadence; with tree canopy's greater than 40%. The current stand characteristic parameters for the old-growth stands within the Rush2 planning area are as follows:

Parameters	**90 and 91**	**92**	**105**
Quadratic Mean Diameter	9.9	14.4	8.6
Stand Canopy Cover %	57	53	54
Overstory Age	120-320	140-220	160-370

The Forest Vegetation Simulator was used to model stand characteristic parameters after treatment. The modeled results for the old-growth stands are:

Parameters	**90 and 91**	**92**	**105**
Quadratic Mean Diameter	17.1	21.0	13.9
Stand Canopy Cover %	50	50	50
Overstory Age	120-320	140-220	160-370

Question Three--Does the plan allow vegetative treatments in old-growth stands?

Yes, see LRMP Standards and Guides above. Vegetation treatments are allowed in old-growth stands to maintain stand health and vigor, and to prevent losses to wildfire, to maintain a minimum of 5% of each seral stage, and to correct deficits in amounts of seral stages.

Question Four--Does the plan qualify as "newer management direction" (approved after Dec. 15, 1993)?

No, the LRMP was signed in 1991.

Question Five--Does the plan meet "project requirements"? HFRA Section 102(e)(2)

HFRA Section 102(e)(2) states: "In carrying out a covered project, the Secretary shall fully maintain, or contribute toward the restoration of, the structure and composition of old growth stands according to the pre-fire suppression old growth conditions characteristic of the forest type, taking into account the contribution of the stand to landscape fire adaptation and watershed health, and retaining the large trees contributing to old growth structure."

The LRMP Standards and Guides emphasizes old growth forest management by "maintaining 5% of each seral stage", "correcting deficits in amounts of seral stages by vegetative management", and "allowing land that is not managed for timber production to cycle naturally" while allowing for "fuel treatments to reduce the risk of wildfires" and ensuring that "the health and vigor of trees will be maintained through integrated pest management and appropriate silvicultural techniques". One of the objectives stated within the purpose and need for action within the Rush2 Vegetation Treatment planning area is to maintain and enhance wildlife habitat. This objective is consistent with management direction within the LRMP. The thinning from below vegetation prescription would remove the smaller sized trees and the follow-up fuels treatments would alter the amount and arrangement of dead, down and ladder fuels. These treatments would contribute to the restoration of stand structure and composition of old-growth stands back toward their pre-fire suppression old-growth conditions. The LRMP direction is consistent with the HFRA direction.

The stand prescriptions for the Rush2 Vegetation Treatment Project meet both the LRMP direction and HFRA Section 102(e)(2). The proposed treatments are designed to retain older age classes for future old-growth recruitment by establishing an upper diameter limit and by applying a thinning from below vegetation prescription. The vegetation prescription would also favor pine species to restore old growth species composition to pre-suppression conditions.

Question Six--Can the old-growth stands be identified within the covered area?

Yes. See the attached map.

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	Robert Haggard Environmental Coordinator Modoc NF, Supervisor's Office.	Date
Approved By	/s/ Laurence Crabtree	
	Laurence Crabtree District Ranger Modoc NF, Big Valley RD.	Date

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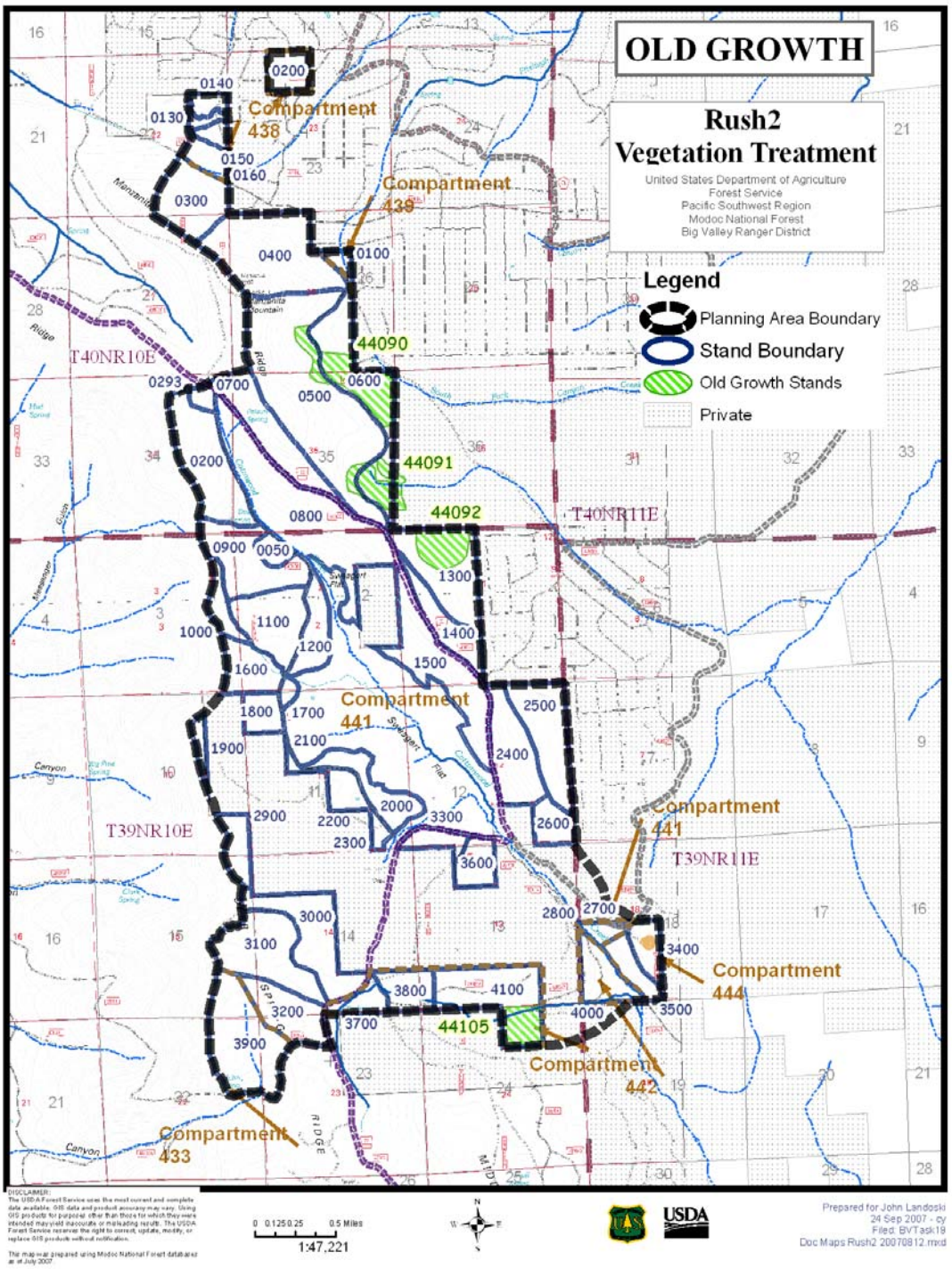
USDA Forest Service. 1991. Modoc National Forest Land and Resource Management Plan. Pacific Southwest Region, Modoc National Forest, Alturas, CA.


OLD GROWTH
Rush2
Vegetation Treatment
United States Department of Agriculture
Forest Service
Pacific Southwest Region
Modoc National Forest
Big Valley Ranger District
Legend
Planning Area Boundary
Stand Boundary
Old Growth Stands
Private
Compartment 438
Compartment 439
Compartment 441
Compartment 442
Compartment 444
Compartment 433
44090
44091
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44105
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Prepared for John Landoski
24 Sep 2007 - cy
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