

Klamath River Canyon Oak Thin and Big Bend Fuels Reduction Environmental Assessment #OR-014-06-02

PROJECT TITLE/TYPE: Klamath River Oak Thin and Big Bend Prescribed Fire Treatments

PROJECT LOCATION: T 40S 6E Sec 11, 12, 13, 14, 23, 26, 27, 34
T 41S 6E Sec 03, 04, 09

BLM OFFICE: Klamath Falls Resource Area, Lakeview District

CONFORMANCE WITH APPLICABLE LAND USE PLANS

This proposed action is subject to one or more of the following land use plans:

- Klamath Falls Resource Management Plan and Environmental Impact Statement Record of Decision (1995)
- Draft – Upper Klamath River Management Plan and EIS (2003)
- Vegetation Treatment on Bureau of Land Management (BLM) Lands in Thirteen Western States FEIS and ROD (1991)
- Supplement to the Northwest Area Noxious Weed Control Program FEIS and ROD (1987) Integrated Noxious Weed Control Program EA #OR-013-93-03 (1994)
- Lakeview District Fire Management Plan - Phase 1 (1998)
- Rangeland Reform '94 FEIS and ROD (1995)
- Standards for Rangeland Health and Guidelines for Livestock Grazing Management for Public Lands Administered by the Bureau of Land Management in the States of Oregon and Washington (1997)

INTRODUCTION

The project area is within the Wild and Scenic portion of the Klamath River Canyon. In 1994, the Klamath River from the J.C Boyle Powerhouse to the California/Oregon state line was designated a wild and scenic river based on values (including recreation, wildlife, fish, prehistoric, historic, scenic quality and Native American traditional use) identified in the “Final Eligibility and Suitability Report for the Upper Klamath Wild and Scenic River Study” completed in 1990. The project area is also designated by the BLM (KFRA RMP/EIS 1995) as an Area of Critical Environmental Concern (ACEC). This encompasses 5,205 acres and the designation extends laterally from rim to rim the length of the river from the J.C. Boyle Powerhouse to the California/Oregon state line. The objectives for the ACEC are to maintain, protect or restore historic, cultural, scenic, fisheries, wildlife populations and habitat (KFRA RMP/ROD 1995 pp. 42).

The plant communities in the proposed area are an extension of the warm, dry chaparral of northern California, mixed with plant communities of the east slope of the Cascades and Sierra Nevada (USDI 2003) provinces. The major plant communities identified are conifer forest and woodland, dense oak woodland, and open oak woodland. The oak stands within the project area are predominately Oregon white oak (*Quercus garryana*) and a lesser number of California black oak (*Quercus kelloggii*).

The vegetation in the units is strongly influenced by slope and aspect. The Big Bend Prescribed Burn unit is a diverse mix of vegetative communities. The majority of the unit has a steep drier south and easterly aspect and is dominated by a mix of oak (white oak with a lesser component of black oak), choke cherry (*Prunus virginianus*), buck brush (*Ceanothus cuneatus*), Oregon grape (*Berberis aquifolium*) and birch-leaf mountain mahogany (*Cercocarpus betuloides*). There is a dense stand of mixed conifer on a northeast aspect with the major tree species being Douglas-fir (*Pseudotsuga menziesii*) with a lesser component of larger ponderosa pine (*Pinus ponderosa*). This stand is approximately 50 acres of the proposed burn unit. There are also scattered pockets of mixed conifer stands typically associated with the drainages.

The oak units are predominately on the southeast aspect and are generally drier sites. The stands are composed primarily of Oregon white oak and California black oak. There is a mix of ponderosa pine stands adjacent to some of the oak units and some scattered ponderosa pine within the units.

Since European settlement, several factors have allowed changes in the vegetative communities to occur. Native American subsistence burning has been eliminated, heavy grazing has occurred in certain areas and active fire suppression has occurred in the project area (USDI 2003). Historically, in the conifer forest/woodland communities the estimated fire return interval is 10 to 20 years. In the oak woodland communities the fire return frequency is estimated to be shorter at 5-15 years (USDI 2003). The change in fire frequency has resulted in an altered vegetative landscape. The oak stands in particular have transitioned into overstocked stands of stunted Oregon white oak and California black oak (see Photo A.). There have been very few larger fires in the canyon although here have been 20 documented lightning ignitions within the Klamath River Canyon from 1990 to 1999 (ODF as stated in USDI 2003). Portions of the proposed burn area, and portions of the canyon in general, are heavily infested with yellow star-thistle (*Centaurea solstitialis*), medusahead (*Taeniatherum caput-medusae*), and cheatgrass (*Bromus tectorum*).

Figure 1: Typical Oregon White Oak Stand in the Klamath River Canyon. Trees are stunted and are in overcrowded growing conditions. Some California black oak is generally intermixed within these stands.



PURPOSE AND NEED FOR ACTION

The purpose of the proposed action is to: transition the vegetative communities towards their historical structure by creating an open oak woodland, reintroduce fire to a plant community that developed with fire as an integral part of its evolution, and reduce the fuel levels in the Klamath River Canyon. The need for the proposed project is to protect and enhance the Outstanding Remarkable Values (ORV's) – scenic quality and wildlife – for which the Wild and Scenic Klamath River was designated, reduce the risk of high intensity wildfire, reduce the presence of invasive weeds, reestablish native vegetation, and improve wildlife habitat. The proposed project is needed to enhance the oak woodland habitat in the planning area and benefit those wildlife species associated with that habitat. Many species of wildlife are associated with large oak trees, the mast (acorns) they produce and the cavities they provide. Species such as acorn woodpeckers, wild turkeys, black-tail and mule deer, western blue bird, western wood peewee, savanna sparrow, and gray squirrel (Vesely and Tucker 2004). For the oak stands this would have the long-term benefits of producing larger oaks (open oak woodlands and oak savannah habitat) and increased acorn production. Trees with inverted vase-shaped crowns typical of dense forest stands produce fewer acorns

than those with columnar or mushroom shaped crowns typical of more open areas (Peter and Harrington 2002). The use of prescribed fire will continue overtime to maintain the fuel levels and maintain and enhance the oak and mixed conifer forest.

DESCRIPTION OF PROPOSED ACTION AND ALTERNATIVES

No Action Alternative

The National Environmental Policy Act (NEPA) requires analysis of a No Action Alternative. This alternative proposes no new management activities in the project area. Activities proposed in and adjacent to the analysis area and analyzed and approved in other NEPA documents would still occur, such as fuel reduction treatments, routine road maintenance, forest inventory and surveys, and fire suppression. The selection of the no action alternative would not change land allocations or the direction that the BLM has to manage these lands.

Proposed Action

There are two separate actions (Oak thinning and Prescribed Fire) proposed under this Alternative. Although they are separate actions they do overlap and will occur over much of the same ground. It was thought that covering them under the same environmental assessment was appropriate to best assess the cumulative effects of the proposed project.

Big Bend Prescribed Burn

The proposed prescribed burn would occur on approximately 892 acres within the Klamath River Canyon (See Map 1). The initial burn would take place in the winter or spring of the year to ensure that the intensity would be within prescription to meet vegetation management objectives. Additional applications of fire will occur to complete the fuels treatment. No mechanical pretreatment of the burn unit is planned. Portions of the unit would require fire line to be dug by hand to minimize the risk of the fire moving outside of the unit boundaries. Ignition of the unit would be completed by personnel on the ground, primarily using drip torches. Aerial (helicopter) support may be necessary for holding purposes or to shuttle personnel due to the terrain in the canyon. Other heavy equipment (fire engines) use would be limited to the road system which is minimal within the canyon and the proposed project area.

Prior to implementation a Prescribed Fire Burn Plan would be developed by the BLM with all the objectives, prescriptive parameters for burning, and any safety issues for the proposed burn. The overall objective of the burn would be to have a light to moderate intensity burn and to create a mosaic of burned and un-burned vegetation within the unit. This would break up the continuity of the fuels and create a mosaic of young and mature vegetation within the unit while reducing high intensity wildfire risk.

Following the Big Bend Prescribed Burn approximately 274 acres of the burn area (see Map 4) would be seeded with 4-5 species of native perennial grasses. The prepared seed bed created by the prescribed fire would provide the opportunity to reintroduce native seed to the site. The nutrient flush following the prescribed burn and the reduction of noxious weeds would provide a competitive advantage allowing the native perennial plants to become established and begin the vegetative composition shift desired within the plant community. Seeding has been shown to reduce the impacts from noxious weeds on the Klamath Falls Resource Area. Seeded areas would include the oak woodlands and grasslands that occur on primarily dry south facing steep slopes (approximately 75%). These areas are currently heavily infested with yellow star-thistle, medusahead, and cheatgrass. Using seeding rates recommended by the U.S. Department of Interior emergency stabilization and rehabilitation program and U.S. Department of Agriculture Natural Resource Conservation Service, seed would be aerially broadcast utilizing a helicopter seeder.

The primary objectives for this unit are:

- Reintroduce fire into areas in which fire has had a profound biological influence on ecosystem composition, structure and function. Fire has played a major role in the early development and maintenance of plant associations in South Central Oregon.

- Restore sustainable function and structure to plant communities that would improve forest health in fire adapted ecosystems. This would include restoring forest composition from fire intolerant species to fire resistant species.
- Treat areas infested with yellow star thistle, a noxious weed. Fire would reduce the competitive advantage of star thistle so that native perennial grasses could be aerially seeded for the purpose of shifting the vegetative composition to improve soil stability and wildlife forage.
- Reduce major losses of sustainable ecosystem resources from catastrophic wildfire, which results from heavy fuel loadings and vegetation change that developed with fire suppression. Reduce the potential for severe high-damage, forest over story/stand replacing fires
- Reduce overall fire management costs by reducing the number of large acreage multi-burn period fires. Reduce the number and type of suppression resources needed in extended attack and project fire situations. The number and type of initial attack (IA) resources would remain unchanged. The BLM fire planning process would recognize the changes in the amount of area burned, fire intensity and adjust IA resources.

The Big Bend Prescribed Burn is proposed to be implemented in 2007. Due to specific environmental parameters needed to implement a prescribed fire, it may take several years to be within that “window” of opportunity where those parameters are met and the prescribed fire can be completed.

Oak Thinning and Prescribed Burn

The proposed oak thinning would occur on approximately 200 acres (see Map 2). The stands proposed for treatment are very dense stands of Oregon white oak with a lesser component of California black oak (Photo 2). These stands would be thinned using chainsaws. The cut material would be lopped and then piled in preparation to be burned at a later date. The remaining oaks would be spaced at a variable width of 15-20 feet between leave trees (Photo 3). The majority of the oaks range between one inch and eight inch diameters at breast height (DBH). Those trees greater than 12 inch DBH would be reserved from cutting. The piles would be partially covered and burned in the late fall or winter after the piles had cured. No commercial utilization is planned for the cut material due to its size and location within the river canyon but there may be some miscellaneous use for firewood due to the proximity of the Klamath River campground.

Figure 2: Pretreatment Oak Stand



Figure 3: After Treatment Oak Stand



In order to achieve and maintain the results of more open growing oak woodland, subsequent treatments would be necessary. These proposed treatments would consist of applying prescribed fire to those units to eliminate the oak sprouts after the initial cutting and maintain open growing conditions for the remaining oak trees. Due to the position of the oak units within the canyon, the area of prescribed fire will be larger than those units (See Map 3). They would need to be expanded to be able to logistically apply prescribed fire and hold the fire within the defined boundaries. The approximate additional prescribed fire areas would be the area above the oak units to the top of the river canyon. Two of the proposed units are within the prescribed fire unit. The prescribed fire objectives would be consistent with those described in the Big Bend Prescribed Burn section above.

Table 1: Proposed Oak Unit Acres and Additional Acres Maintenance Burns

Unit	Oak Acres	Additional Prescribed Fire Acres
Oak Unit 1	10.6	N/A (within Prescribed Burn unit)
Oak Unit 2	12.2	63
Oak Unit 3	66.0	223
Oak Unit 4	47.6	82
Oak Unit 5	41.0	170
Oak Unit 6	22.8	N/A (within Prescribed Burn unit)
Total	200.4 Acres	538 Acres

The proposed oak thinning projects are to be implemented in 2006 and 2007 depending on funding. The subsequent prescribed fires after the oak thins (maintenance burns) would be conducted every 3-15 years after the initial thinning.

AFFECTED ENVIRONMENT

Vegetation/Botany

Special Status Plant Species

There are no known populations of special status plant species, including Survey and Manage species, within the area proposed for treatment. No systematic surveys for special status plant species have been conducted in the areas proposed for treatment. However, the steep, rocky, south and southeast facing slopes offer no habitat for any special status plant species documented or suspected to occur in the Klamath Falls Resource Area. Also, the oak thinning treatment would not use ground disturbing equipment, and fire is an ecological process to which native plants are adapted. Therefore, it was determined that no systematic surveys for special status plant species would be required.

Noxious Weeds

No systematic surveys for noxious weeds have been conducted within the areas proposed for treatment. However, several noxious weed species have been documented to occur within this area. Yellow starthistle occurs as both large, dense populations and as small patches. The steep, rocky slope precludes chemical treatment of yellow starthistle, and biological control organisms that have been released have not produced an observed reduction in the size or density of the populations thus far. Other noxious weed species documented within or adjacent to the project area include St. Johns's wort (*Hypericum perforatum*), meadow knapweed (*Centurea pratensis*), Dalmatian toadflax (*Linaria genistifolia* ssp. *dalmatica*), and poison hemlock (*Conium maculatum*).

Wildlife

The proposed area is considered winter range for deer (ROD/RMP 1995). During the winter months the deer move from the higher elevations (summer range) where deeper snow can occur and concentrate at these lower elevations in the Klamath River Canyon that often have snow free conditions. The deer spend much of the winter in the canyon depending on snow depth and weather conditions.

Bald Eagles

The project area is within the Klamath River Canyon bald eagle territory and has a total of four known nests. Three nests occur on private land and one nest on BLM managed land. No nests occur within the proposed project but two of these nests are on private land within a ¼-mile of two of the proposed oak thin units. These nests are both near the top of the river canyon. The territory has been active since at least 1979 and produced 38 young in that time (Isaacs and Anthony 2005). The nests are monitored annually for occupation and reproduction. One nest is currently occupied (2006) and produced two young.

Survey and Manage Species

Terrestrial and Aquatic Mollusks

This portion of the EA will consider those species under the Special Status Species category of Survey and Manage that are listed as potentially occurring (S&M Protocol 2003) on the BLM Lakeview District, Klamath Falls Resource Area. This includes those species from the 2001 ROD and subsequent 2003 ASR (IM 2004-034) that require pre-disturbance surveys.

Surveys were conducted for survey and manage aquatic mollusks. There is one perennial spring within the proposed project area. The Klamath Rim Pebblesnail was located in this spring. There is no other perennial water within the project area. There is habitat (Upper Klamath River) adjacent to the project but this habitat would not be affected by the proposed project, therefore this area was not surveyed. During additional survey efforts along the Klamath River, surveyors found additional *Fluminicola* and a *Lanx* species (bureau sensitive) but the river habitat will not be affected by the proposed project so these species will not be analyzed.

For terrestrial mollusks the Chase Sideband terrestrial snail may be associated with oak woodlands (Conservation Assessment 2005) and therefore, surveys were conducted within the proposed Big Bend Prescribed Burn and within the proposed oak thin units. Surveys were conducted in priority habitat (moister, north aspect, drainages) for the Chase sideband terrestrial snail. No confirmed Chase Sidebands were detected although one juvenile *Monadenia* sp. was found but no confirmation was made on that species due to its early development. Several slugs (*Prophysaon* sp.) were located and are discussed in the bureau sensitive section. No suitable habitats occur for the other survey and manage terrestrial species (S&M Protocol Version 3.0, 2003). Since no Survey and Manage terrestrial mollusks were located they will not be analyzed further in this document. See attached survey and manage compliance table for detailed information on protocols and surveys needed for the proposed action (Appendix C.)

Bureau Sensitive and Assessment Species

The BLM Special Status Species Policy designates special status species as Bureau Sensitive, Bureau Assessment, or Bureau Tracking. A brief description of these categories follows;

Bureau Sensitive – Generally these are species which are restricted in their range and have natural or human-caused threats to their survival.

Bureau Assessment – Species which are not presently eligible for official federal or state status but are of concern.

Bureau Tracking – This list is designed as an early warning system for species that may become threatened in the future.

There are two Bureau sensitive species that may be affected by the proposed project, the Lewis Woodpecker and the Klamath tail-dropper. A list of the Bureau special status species is kept at the Klamath Falls Resource Area office.

Lewis Woodpecker (*Melanerpes lewis*)

The Lewis Woodpecker, a bureau sensitive species, is uncommon in the Klamath Falls Resource Area but common within the Klamath River Canyon. This woodpecker is associated with open woodland and relies on flycatching during the spring and summer for food and stored mast (acorns) in the fall and winter (Marshall et al 2003).

Klamath Tail-dropper (*Prophysaon* sp. nov)

Several sites of the Klamath tail-dropper slug were located in the proposed oak units. This species was previously identified as the blue-gray tail-dropper (2001 SEIS pp. 336) in this region of southern Oregon. Recent genetic work (Wilke and Duncan 2005) and previous documentation (2001 SEIS pp. 337) has identified the Klamath tail-dropper as occurring in this region instead of the blue-gray tail-dropper (a former survey and manage species). This is the first survey for and the first documentation of the *Prophysaon* sp. in the canyon. A total of 20 sites were located within the project area. The Klamath tail-dropper is considered

a bureau sensitive species. This species is a common species in the resource area (331 sites) and has been found in most of the mixed conifer forested habitat surveyed on the resource area although this is the first time that it was looked for and located in oak woodlands.

Wild and Scenic River/ACEC/VRM

The project area is partially located in the Upper Klamath Wild and Scenic River corridor. An 11 mile reach of the river canyon, from ¼ mile downstream of J.C. Boyle powerhouse to the California state line, was designated in 1994. The river canyon was designated in recognition of a number of outstandingly remarkable values (ORVs): recreation, wildlife, fish, prehistoric, historic, scenic quality and Native American traditional use. Under Wild and Scenic designation the BLM is directed to protect and enhance the ORVs for which the river was designated.

The BLM manages scenic resources through the Visual Resources Management (VRM) program. All BLM lands are inventoried and managed in specific VRM classes. The land in the project area is classified as VRM class II, management objectives for VRM class II are for low levels of change to the visual/scenic resources of the affected landscape. Management activities may be seen by the casual observer but should not attract attention.

The Upper Klamath River ACEC was designated in 1995 by the ROD for the Klamath Falls Resource Area Resource Management Plan (RMP). The ACEC extends from the J.C. Boyle Powerhouse to the California border and from rim to rim of the Klamath Canyon in order to encompass relevant and important values beyond the designated scenic corridor. Approximately 5,205 acres of BLM administered lands are included within the ACEC. The relevant and important values are essentially the same as the ORV's for the scenic river designation. Management direction is to maintain, protect, or restore historic, cultural, scenic, fisheries, wildlife populations and habitat.

For additional information about scenic resources in the analysis area and the VRM program, refer to the Klamath Falls RMP/ROD, pages 43-44, and RMP maps 2-5.

Cultural

Native American use of the area spans many millennia. The area is within a larger territory ceded to the United States in 1864 by The Klamath Tribes. Along with the Klamath and Modoc, Shasta and Takelma peoples likely utilized this area as well. The Klamath River Canyon is extremely rich in archaeological and historical resources and presumably served as one corridor for entry into the analysis area by both prehistoric and historic inhabitants. To date, archaeological and ethnographic research has demonstrated a significant and apparently year-round use of the Klamath River Canyon by prehistoric groups. Upland use was apparently only associated with seasonal rounds conducted for subsistence needs.

Historically (post-1846), after the establishment of the Applegate Trail, the project area was used primarily for logging and ranching. Logging began in the 1860s with a few small enterprising sawmills. The industry boomed in the early twentieth century both in and around the project area after the introduction of railroads. Weyerhaeuser arrived in 1923 and began constructing logging roads. Early historic towns and mills in the region include Snow, Pokegama, and Dixie. This region was also crossed by numerous early and important travel routes including the Applegate Trail, Southern Oregon Wagon Road, Topsy Road, and Ward Road. Today logging and ranching continue to be significant in the area.

Additional information about cultural resources in the analysis area may be found in various overviews of the history and prehistory of the region (Beckham 2005, Follansbee and Pollack 1978, Mack 1991, and Spier 1930).

Hydrology

The proposed oak thins and Big Bend Prescribed Burn analysis area is located in the Klamath River-John C. Boyle Reservoir Fifth Field Watershed in the Upper Klamath River Sub-basin. There are approximately 1.9 miles of intermittent streams and 0.9 miles of ephemeral streams according to KFRA/RMP definitions

(page D-43). There is one perennial spring located within the proposed Big Bend Prescribed Burn project area. There are no perennial streams in the proposed project area although the Upper Klamath River is adjacent to portions of the Big Bend Prescribed Burn. Riparian reserves would be established along the Klamath River and intermittent streams following RMP guidelines (see Appendix B). Riparian reserve widths would equal two site potential trees, or approximately 240 feet for the Klamath River and one site potential tree, or approximately 120 ft. for the intermittent streams.

The intermittent stream in the analysis area appears to be “properly functioning”, as indicated by connectivity, channel characteristics, and riparian vegetation. There is connectivity between the stream channel, riparian area, floodplains, and upslope areas. In addition, the channel shape and gradient appear to be appropriate for the landform. The vegetation in the riparian reserve for the intermittent stream is comprised of riparian and upland plant communities. The riparian areas are adjacent to the stream and are functioning, with a variety of riparian vegetation present, including willows, rushes, and spirea. The streamside vegetation appears to be providing adequate shade to the stream.

The ephemeral streams in the analysis area are located in draws and have water flow only during high precipitation events. Vegetation adjacent to ephemeral streams is similar to the surrounding upland forest types, with sparse to no riparian vegetation.

Wildland Fire and Fuels Management

The Klamath River Canyon vegetation is a very diverse assemblage of plant communities. The Potential Natural Vegetation Groups (PNVG) identified within the project area are California Mixed Conifer and Northern California Garry Oak. The conifer forest overstory consists mainly of Douglas fir, sugar pine, ponderosa pine, and incense cedar. The oak woodland overstory consists mainly of the dominant Oregon white oak and lesser amounts of California black oak and western juniper. The National Fire Fuel Laboratory (NFFL) fuel models represented include 2 (grass understory), 9 (hardwood & pine litter), and 10 (Douglas-fir litter).

Lightning caused fires within the Oregon portion of Upper Klamath River Canyon have occurred at a rate of approximately two per year since 1990 (Oregon Department of Forestry). Under a natural fire regime, California Mixed Conifer has primarily short-interval (e.g., 10-20 yr) surface fires with occasional mixed severity and replacement fires (e.g., 30-100 yr intervals). The Northern California Garry Oak has primarily short-interval (e.g., <10 yr) surface fires. Both are classified as Fire Regime I due to their short mean fire return interval.

Since European settlement, several factors have allowed changes in the vegetation to occur. Native American subsistence burning has been eliminated and heavy grazing and active fire suppression has occurred in the area. Despite evidence of historic fire within the project area, there is no evidence that any significant wildfire has occurred within the last hundred years. The resulting additional biomass has caused an increase in crown and ladder fuels, which have contributed directly to the lethal effects of recent fires in the southwest Oregon area. Based on these conditions found within the conifer stands, the First Order Fire Effect Model predicts >95% mortality of the trees in a wildfire. This is a significant departure from the historic fire regime. In the current condition, a wildfire in the oak woodlands would be expected to cause top-kill and resprouting. This would likely maintain the undesirable overstocked, stunted state.

The canyon is currently classified as Condition Class III, reflecting its high departure from the natural regime. The fire regime has been substantially altered from its natural (historical) range. The risk of losing key ecosystem components is high. The fire frequency has departed from natural frequencies by multiple return intervals. Dramatic changes have occurred in potential fire intensity and severity. Stand structure and composition has been substantially altered from their natural (historical) range. Invasive exotic species have become established.

The Klamath River Canyon is one of the most wildfire susceptible locales within the Klamath Falls Resource Area. This is due to the poor access and egress for suppression forces, the steep terrain, local

weather, heavy fuel loading, and continuous light flashy fuels. Once established, the extreme slope and anticipated wildfire behavior make containment of a wildfire inside the canyon unlikely.

Air Quality

Air quality is a sensitive issue in the Upper Klamath Basin primarily because of the existing relatively clean air. Clean (clear) air is also an important quality, because of the role it plays in maintaining the Scenic values attributed to the Klamath River Canyon. The closest Class I airshed is Mountain Lakes Wilderness, 14 miles north. Predominant winds are westerly to northwesterly, however, wind direction fluctuates greatly from the north, south and more rarely from the east as weather fronts move through the area.

The incised nature of the river canyon results in restrictive topography that can trap air until winds move it out. Because of the lower elevation, smoke generated outside the planning area can contribute to poorer air quality within the canyon and be evidenced as a haze. This typically could occur in the mornings after cooler downdrafts carry the smoke or dust particles down into the canyon over night. Pollutants introduced locally within the inversion layer may follow the drainage flow, but will likely stay within the stable inversion layer. During the daylight hours, when the sun warms the local topography, air adjacent to the surface warms and rises and can break down the surface inversion and ultimately results in an upslope flow.

Private Lands and Utilities

The private lands within the ACEC boundaries are primarily owned and managed by PacifiCorp. No treatment is proposed for those private lands. PacifiCorp’s J.C. Boyle Powerhouse (power generation facilities) are down hill from a portion of the prescribed fire unit. The same roads needed to access the treatment units are used by PacifiCorp to access their operation. Two powerlines are in the vicinity of the proposed treatments. One, a 69 kilovolt line, is owned by Pacific Power and Light and serves the Powerhouse (OR24416), and the other, a 230 kilovolt line, up above the rim of the canyon, is a trans-state transmission line owned by PacifiCorp (OR17364).

ENVIRONMENTAL IMPACTS

The potential environmental impacts resulting from the alternatives relative to the following critical resource values were evaluated. The following is a summary of the results:

Table 2: Critical Resource Values Impact Summary

Critical Element/ Resource Value	Affected		Critical Element/ Resource Value	Affected	
	Yes	No		Yes	No
Air Quality	X		T & E Species	X	
ACEC/RNAs	X		Wilderness		X
Cultural Resources		X	Wild & Scenic Rivers	X	
Farmlands, Prime/Unique		X	Hazardous Wastes		X
Floodplains		X	Water Quality		X
Native American Cultural/ Religious Concerns		X	Wetlands/Riparian Zones		X
Low Income/Minority Populations		X	Noxious Weeds	X	

Vegetation/Botany

Special Status Plant Species

Since the project areas contains no known populations of special status plant species, including Survey and Manage species, and no habitat for special status plants species documented or suspected to occur on the Klamath Falls Resource Area, no impacts to special status plant species would result from implementation of either alternative.

Noxious Weeds

No Action

No action would result in the yellow starthistle populations remaining in their current extensive and dense condition. Expansion of these populations would be expected as a result of abundant seed production and dispersal, the inability to chemically treat yellow starthistle due to steep, rocky slopes, and the fact that biological control organisms have not produced an observed reduction in the size or density of the populations thus far.

Proposed Action

Since no ground disturbing equipment would be used to thin the oak communities, the project would not result in the physically disturbed conditions under which many noxious weed species have a competitive advantage relative to other species. Application of prescribed fire is expected to reduce the cover and density of the yellow starthistle populations. Research in California found that a single application of prescribed fire reduced the yellow starthistle soil seedbank by 74% and the number of seedlings the following spring by 83% (DiTomaso et al. 1999). Competition from the seeded native grasses is expected to further reduce the abundance of yellow starthistle.

Wildlife

No Action – Under the no action alternative, the current management would remain the same and wildlife habitat would remain unchanged except for changes created by natural events. The current stands of oak provide minimal mast production due to their current size and form. These stands of oak would continue to provide for nesting and cover for landbirds and small mammals. The sprouts and new shoots would continue to provide some forage for big game. The prescribed burn area would remain status quo and continue to provide habitat for many landbirds, small mammals and big game species. This alternative, however, does not provide the fuels reduction and habitat enhancement that the proposed action alternative does.

Proposed Action – The proposed action is designed to enhance winter range for mule deer by continuing to provide cover and forage while increasing long-term forage by increasing mast production. The oaks in the canyon provide both cover and forage and the oak thinning will increase mast production in the long-term while also providing new shoots for forage in those areas that are thinned. There will be some disturbance while the project is ongoing but this disturbance will cease after the project is completed.

Bald Eagles

No Action – There would be no immediate affect on bald eagles from the no action alternative. The territory adjacent to the proposed treatment units has been productive since eagles were first discovered at this territory (in 1979) and this alternative would have no direct effect on this territory. There is concern that not treating the area for high fuel loads as proposed would increase the risk of a high intensity wildfire and thus increase the risk of possible destruction of the nest stand when a wildfire occurred.

Proposed Action – Without mitigation, the proposed action could cause disturbance to bald eagles during the critical part of the year. Bald eagles are susceptible to disturbance during courtship, nest building, egg laying, nesting stage and fledgling period. Generally that is Jan 1- August 15th in this area. The proposed project would have activities in the area that may cause disturbance during this time period. The Project Design Features (PDFs) that are incorporated into this project would reduce or eliminate those disturbances that may affect bald eagles and reduce the risk of nest failure or nest abandonment during this time period (See Appendix A).

Bureau Sensitive Species

No Action – The no action alternative would have no immediate effect on sensitive species or their habitat. The current habitat conditions would continue to provide for those species as it currently does. In those areas with higher than average fuel loading there would be a continued risk of a high intensity wildfire that could reduce both the quality and quantity of habitat for these species.

Proposed Action – The Lewis woodpecker is associated with oak and it is an important part of its lifecycle (Marshall et al 2003). The proposed project would have long-term beneficial effects to the oak habitat used by the Lewis woodpecker by increasing the mast production available in the Klamath River Canyon. The proposed treatment is designed to increase both the size and mast production of oaks by thinning the small oaks and maintaining the larger oaks. There is little risk of losing any forage production since the oak treatments are designed to maintain all oaks greater than 12 inches and only thin those smaller oaks that currently do not produce acorns. There would be some short-term disturbance from the proposed project during implementation but this would end after the initial cutting.

The Klamath tail-dropper (formerly considered the blue-gray tail-dropper) has been found in many of the mixed conifer stands that were surveyed for terrestrial mollusk. This was the first time it was located in an oak stand. The proposed oak thinning should have minimal affect on this species. The overall microsite for the area would remain similar and long-term should increase canopy cover and stand structure. Fire has been shown to have negative impacts to this species (Duncan 2005). The proposed prescribed fire may eliminate some known sites and change the microsite for that area by removing some down woody debris and removing some understory structure. Overall the population is well distributed across the resource area and the loss of some individual sites would not negatively effect the population as a whole. The proposed burn would be planned to be a cooler burn and the majority of the understory structure would remain. The area is rocky and there is ample rock substrate to provide structure and residual habitat for this species.

Survey and Manage Species – Klamath Pebblesnail

No Action – The no action alternative would have no immediate effect on the Klamath Pebblesnail or the spring habitat. No other actions are planned that would likely effect the habitat. The current habitat conditions would continue to provide for those species.

Proposed Action – The proposed action would have minimal to insignificant effects on the perennial spring habitat (see hydrology write-up) and therefore the effects to the Klamath Pebblesnail would be similar. The draft management recommendations (Appendix C) for this species will be applied. No adverse effects to the spring or the Klamath Pebblesnail are anticipated from the proposed action.

Wild and Scenic River/ACEC/VRM

No Action – Under the no action alternative scenic/visual resources would remain unchanged except for gradual changes as vegetation ages and dies due to insect and disease or other mortality. There may be a greater possibility for large scale change over time to the scenic resources along the Wild and Scenic River due to widespread mortality caused by catastrophic wildfire or extensive insect or disease infestations.

The no action alternative would not change the current condition of the wildlife and wildlife habitat relevant and important values in the ACEC. However, fuel loads would remain high with the potential of a wildfire that would burn at intensities greater than that to which the vegetation is adapted, and thereby negatively affect those relevant and important values

Proposed Action – Proposed treatment activities would have minimal negative affects on scenic/visual resources along the Wild and Scenic River. Scenic resources would likely be positively affected and protected by the proposed treatments by reducing the likelihood of catastrophic wildfire and by maintaining a healthy, multi-aged, and diverse forest and woodland landscape. The Project Design Features (PDFs) that are incorporated into this project would reduce or eliminate the potential disturbances to scenic resources (see PDFs, Appendix A).

The proposed treatments are designed to improve the wildlife habitat, and thereby the wildlife populations, within the ACEC. The proposed action is considered part of the special management attention needed to maintain and restore the relevant and important values (wildlife populations and habitat) in the ACEC.

Cultural Resources

No Action – Under the no action alternative, archaeological sites would continue to be protected from ground disturbing activities. Projects proposed in the future would be reviewed for cultural resources on a case by case basis and adverse effects would be avoided.

Proposed Action – All proposed treatment areas except the canyon rim above Unit 3 have been surveyed for cultural resources using BLM Class III survey methods. No archaeological sites are known within areas proposed for treatment. Prior to project implementation, a cultural resource survey will be conducted for the area that has not been inspected. If sites are encountered, they would be avoided by creating a buffered area encompassing the identified resource, and the stands will not be treated within the buffer. Thus, no adverse effects to cultural resources are anticipated as a result of this alternative.

Hydrology

No Action – The effects from the no action alternative would include the impacts resulting from fire suppression and road maintenance. Under the no action alternative the characteristics of the stand would be unaltered and stream shade would remain the same. The no action alternative; however, would not address the current fuel conditions and there would still be the risk for a high intensity wildfire to occur. A stand replacement fire can decrease stream shade through extensive loss of riparian vegetation and increase sediment input into the stream channels by devastating ground cover and decreasing slope stability. Furthermore, a high intensity fire can reduce future supplies of Large Woody Debris (LWD) to stream channels in the long-term. However, LWD falling into the channel could increase following wildfires in the short term depending on the severity of the fire. Routine road maintenance (grading, spot rocking and brushing) would continue and be designed to minimize effects on sediment input into stream channels.

Proposed Action – Potential negative effects on water resources due to the proposed action should be insignificant to minimal when PDF guidelines are followed (see Appendix A). Riparian reserves would be delineated in accordance with the PDFs, two site potential tree lengths surrounding perennial fish bearing streams and one site potential tree length surrounding intermittent streams. There is one perennial spring located within the proposed Big Bend Prescribed Burn. In concurrence with the PDFs, the spring requires a minimum riparian reserve to the extent of saturated soil, or the outer edges of riparian vegetation, or the extent of stable, or potentially unstable areas, depending on which criteria covers the greatest area. The location of the spring is at the foot of the slope within Unit 1 (see Map 2). In order to ensure the least amount of impact to the spring, points of ignition would be upslope or above the spring riparian reserve. Hand thinning and piling will keep soil disturbance (compaction, displacement etc.) low. This will prevent significant soil transport into drainages. Due to prescribed burning there may potentially be a short term rise in erosion with the loss of vegetation until new vegetation is established. The burn will take place in winter or spring when new vegetation can rapidly reestablish itself in the next growing season and keep erosion to a minimum. Existing flows are expected to remain unchanged because proposed treatments are limited to thinning, hand piling, and prescribed fire. Construction of piles for burning will not occur within 20 feet of the stream channels.

There is no planned construction of roads or landings within the area proposed to be treated. Sediment transport from increased traffic during the time of treatment would be minimal. The required amount of hand crew and fire personnel needed for this proposed project is nominal and watershed impacts from this amount of increased traffic are negligible.

Wildland Fire and Fuels Management

No Action – No action would result in the potential fire intensity and severity remaining at current level. Due to the active human and lightning ignition sources present, and the difficult fire suppression environment, a wildfire within the Klamath River Canyon will inevitably escape initial attack. The impact of this wildfire and the suppression effort is a potential result of this alternative.

Proposed Action – Prescribed burning of the conifer stand will decrease the intensity, and associated mortality, caused by a wildfire when it occurs. It is expected that several applications of fire will be

necessary to yield the desired stand structure and sufficiently decrease fuel loading. The thinning, piling, and burning within the oak woodlands is expected to increase individual trees' likelihood of surviving a wildfire. In addition, the effectiveness of suppression within that area is expected to increase due to the greater spacing of trees and reduced surface fuel. The subsequent application of broadcast prescribed fire to the oak woodlands is expected to maintain this character.

By decreasing wildfire intensity and increasing the effectiveness of the suppression effort, impacts of a wildfire and the associated suppression effort are expected to be lessened.

Air Quality

No Action – Under the no action alternative, compliance with the Oregon Smoke Management Plan would continue. There is an increased potential for large wildfires, which would have limited-duration air quality impacts. Wildland fire is a stochastic event and smoke and particular matter cannot be anticipated.

Proposed Action – Emission of PM_{2.5} is predicted to be 111 tons from the Big Bend Prescribed Burn, 3 tons from burning the oak thinning piles, and 60 tons from the oak thin maintenance burn. Due to the ability to manage emissions from prescribed fire (through timing burns with projected weather patterns) the air quality goal should be met. This alternative has greater short-term impacts, but should have a lesser impact on air resources from wildfires in the long-term. Due to the relative isolation of the area and the predominant wind patterns for smoke dispersion, the probability of degrading any key airshed with this project is low. These local impacts would be transitory in nature and no long-duration smoke impacts are expected.

Prescribed burning would comply with the guidelines established by the Oregon Smoke Management Plan (OSMP) and the Visibility Protection Plan. All ignitions will comply with direction found in the Smoke Management Forecast. Prescribed burning is not expected to affect visibility within nearby smoke sensitive Class I areas (Mountain Lakes) during the visibility protection period (July 1 to September 15). Prescribed burning is not routinely conducted during this period primarily due to the risk of an escape wildfire.

Prescribed burning emissions are not expected to adversely effect annual PM₁₀ attainment within Klamath Falls, or the Medford non-attainment area. Any smoke intrusions into these areas from prescribed burning are anticipated to be light and of short duration. Prescribed burning would be scheduled primarily during the period starting in February and ending in June. Handpile burning would also be planned during the fall, winter and spring months to reduce damage to the site from high intensity burning and to facilitate control of the units being burned. Smoke retained on site could be transported into portions of non-attainment areas if it is not dispersed and diluted by anticipated weather conditions, however, current avoidance strategies for prescribed fire assume that smoke can be lifted from the project site and dispersed and diluted by transport winds. Localized concentration of smoke in rural areas in northern California may occur.

Private Lands and Utilities

No Action – No direct impacts would occur to private lands and nearby utilities. The potential for impacts from wildfire would remain the same.

Proposed Action – Treatments proposed adjacent to the private lands owned and managed by PacifiCorp would be coordinated with the company and local powerhouse operators. No treatment is proposed for the private lands. The burn plan will be written to include protection of PacifiCorp's power generating facilities and adjacent utilities. Any need to temporarily close the roads needed by PacifiCorp to access their operation would also be coordinated with the company and local powerhouse operators, but impacts to PacifiCorp's operation should be minimal to non-existent. The proposed treatments should actually aid long term in the protection of the adjacent transmission line from damage due to wildfires.

CUMULATIVE EFFECTS

For this analysis we will consider those cumulative effects to the Klamath River Canyon ACEC. This boundary is from rim to rim of the canyon extending from the J.C Boyle Powerhouse to the Oregon/California border. This area encompasses approximately 5,205 acres of BLM administered lands. Within the boundaries of the ACEC there is approximately 2,504 acres of intermixed private lands. The proposed project is the only planned habitat treatment project in the Klamath River Canyon ACEC on BLM administered lands. No other vegetation management projects are proposed for the ACEC outside of normal fire suppression activities. Currently there is no grazing within the ACEC boundaries on BLM lands and no grazing is currently occurring on PacifiCorp lands. Since the proposed project is the only foreseeable project planned within the ACEC, the impacts from that action are the only impacts that would need to be analyzed. The cumulative affects to the ACEC are no greater than those already analyzed under the proposed action.

Cumulative effects of the proposed action over the entire watershed are expected to be negligible. The proposed treatment area comprises approximately 1.4% of the total watershed. The proposed action would not produce impacts that would affect the Klamath River system.

DESCRIPTION OF MITIGATION MEASURES AND RESIDUAL IMPACTS

With the implementation of Project Design Features, Best Management Practices, and other mitigating measures (Appendices A and B), no residual impacts beyond those discussed above are expected.

PERSONS/AGENCIES CONSULTED

A programmatic consultation with the U.S. Fish and Wildlife Service (FWS) was completed for the Klamath Falls Resource Area fuels program in February of 2006. This consultation considered those actions that “May Affect” ESA listed species that may occur on the KFRA. A “May Affect but not Likely Adversely Affect” determination was made by the BLM for the bald eagle, northern spotted owl, short nose sucker, and Lost River sucker. A concurrence letter (81450-2006-0104) was received by the BLM from the FWS. This proposed action is within the scope of that consultation.

PREPARER(S)

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APPENDIX A – PROJECT DESIGN FEATURES AND BEST MANAGEMENT PRACTICES

For fuel treatment units adjacent to or containing Bald Eagle nest sites:

- No fuel treatments will be planned within the core area (as identified by the BLM wildlife biologist) of a bald eagle nest site during the nest season. Nesting season is considered January 1st – August 15th. The wildlife biologist may adjust these dates if the young have fledged prior to Aug. 15th (usually the fledging date plus 2 weeks). The core area will consist of the withdrawn area around the nest and the disturbance area around the nest. Generally the disturbance area is considered ¼-mile or ½ mile line-of sight. This distance may vary depending on topography and site-specific information.
- Smoke management will be planned in such a way to avoid adverse effects of residual smoke on nest sites adjacent to burn units
- A BLM wildlife biologist will be consulted about eagle use of the area before the fuel treatments are initiated to ensure the eagle situation is closely monitored.
- A biologist/designee will monitor the nest area during the burns to ensure that objectives and PDFs are met (smoke management, fire intensity, etc).
- In areas where prescribed fire activities are being planned, remove the brush, ladder fuels and large down woody debris within the dripline (approximately 30+ ft.) of the eagle nest trees and potential or identified perch/roost trees to reduce ladder fuel. The brush would be piled away from the nest and burned.
- So fire activity will be reduced immediately adjacent to the nest trees during the broadcast burning of the area, personnel will be required to complete one or more of the following:
 - Pull back of 10 and 100 hour fuels 30' from the base of the nest trees/ perch trees
 - Construct fire line around the nest trees/perch trees
 - Use foam, water, or other retardants to protect the nest tree (foam would not be allowed if the nest tree is in a riparian zone).
 - Ladder fuels would be removed from the dripline (30ft.)

For units adjacent to or containing riparian areas or fish habitats:

- Objectives of fuels treatments within riparian reserves (RRs) are: protection of vegetation and soils from catastrophic fire, (including overhead canopy for stream shading); restoration of riparian areas to the potential natural community for the site; increased productive vigor vegetation within the riparian areas; and retention and protection of coarse woody debris (CWD) and overhead cover for stream function and aquatic habitats.
- From the Klamath Falls Resource Area Resource Management Plan, "Riparian Reserves are lands along streams and unstable and potentially unstable areas where special standards and guidelines direct land use."
- Riparian areas, for the purposes of these PDFs are defined as lands adjacent to perennial and intermittent streams, springs, lakeshores, wetlands, and reservoirs. Riparian areas have vegetation and soil with physical characteristics showing permanent surface or subsurface water influence.
- Streams covered under these PDFs include perennial streams, (streams that generally flow year round) and intermittent streams (streams that generally run for at least 30 days per year and have a definable channel and evidence of annual scour or deposition).
- Wetlands are areas that are inundated by surface or ground water and support vegetation adapted for saturated soil conditions.
- There should be an opportunity on a case-by-case basis to assess the affect of the buffer width on riparian areas and aquatic species and habitats.

Table A-1: Riparian reserve types and widths KFRA

Riparian Reserve Type	Reserve Width (for each side of streams/wetlands)
Fish-bearing streams	At a minimum, the reserve width will include: <ul style="list-style-type: none"> ▪ Slope distance equal to the height of two site potential trees (240 feet); or, ▪ The stream channel and the area extending to the top of the inner gorge; or, <ul style="list-style-type: none"> ▪ The area extending to the outer edges of riparian vegetation; or, ▪ The 100-year floodplain; or, ▪ The extent of unstable or potentially unstable areas, whichever is greatest.
Perennial non-fish-bearing streams and Intermittent (seasonal) non-fish-bearing streams and Constructed ponds and reservoirs and Wetlands greater than one acre	At a minimum, the reserve width will include: <ul style="list-style-type: none"> ▪ Slope distance equal to the height of one site potential tree (120 feet); or, ▪ The stream channel (or waterbody/wetland) and the area extending to the top of the inner gorge; or, ▪ The area extending to the outer edges of riparian vegetation; or, ▪ The 100-year floodplain (for streams) or the extent of seasonally saturated soil (for waterbodies and wetlands); or, ▪ The extent of unstable or potentially unstable areas, whichever is greatest.
Wetlands less than one acre and Unstable or potentially unstable areas	At a minimum, the reserve width will include: <ul style="list-style-type: none"> ▪ The wetland and the extent of seasonally saturated soil; or, ▪ The area extending to the outer edges of riparian vegetation; or, ▪ The extent of stable or potentially unstable areas, whichever is greatest.
Lakes and natural ponds	At a minimum, the reserve width will include: <ul style="list-style-type: none"> ▪ Slope distance equal to the height of two site potential trees (240 feet); and, ▪ The body of water or wetland and the area to the edges of riparian vegetation; ▪ The extent of seasonally saturated soil; ▪ The extent of unstable or potentially unstable areas; whichever is greatest.
Springs	Reserve widths vary according to the size of the associated wetland (see above).

Mechanical fuels treatments in riparian reserves:

- Hand treatments would be performed within the no-mechanical-entry zones to meet fuels management objectives.

Ignitions within the riparian reserves:

- Ignition of broadcast fires should not occur within a minimum of 50 feet from the stream channel within the riparian reserves. (The specific distance for lighting fires within the RR will depend on topography, habitat, ignition methods, and fuel moisture.)
- Ignition line location nearest the stream should be based on topography and ignition methods and should be sufficient to protect water quality, CWD, and stream overhead cover. If CWD directly touches the high water mark of the stream, or the CWD may be affected by high flows, don't ignite it. If there is a thick vegetation cover that extends out from the stream to the line of ignition then move the line of ignition into the forest stand, away from the stream.
- Mobile ignition methods, i.e. ping-pong ball ignition, ignition distance from the stream
 - 50 feet on slopes of 35 percent or less.
 - Slopes greater than 35 percent - increase ignition distance to 100 feet.
- Ignition line location near large open meadows, associated with the stream channels located at the toe of the slope above the meadow elevation as much as possible to protect meadow vegetation.
- When igniting fuels on the lower end of the window of moisture content, increased ignition spacing from stream would be recommended to further protect CWD and overhead cover components.

Roads and temporary fire trail access in riparian reserves:

- No new permanent roads will be constructed within Riparian Reserves except where construction or re-alignment of road segments allows obliteration of existing road segments that are causing greater resource damage within Riparian Reserves. If possible, use new technology construction methods for building temporary roads into treatment units (including but not limited to wood chip constructed roads).
- Existing landings and roads within Riparian Reserves would be used only if replacing them with landings and roads outside the Riparian Reserves would result in greater overall disturbance to the Riparian Reserve or water quality. Use of existing roads and landings within the RR will be reviewed and approved by the resource advisor.
- Minimal or no grading of the existing roads will be done to maintain the existing ground cover and vegetation and to decrease sediment movement.

Chemical fire retardants in riparian reserves:

- No use of chemical retardants would occur within the full width of the riparian zone (per KFRA RMP.)
- In cases of escaped or wildfire control, soap based retardants may be applied to within 50 feet of a stream that contains water.

Streamside pumping sites:

- Pumping on small streams should not reduce the downstream flow of the stream by more than half the flow.
- If possible, avoid the construction of temporary pump chances. When necessary use temporary plastic dams to create chances and remove these dams when not actively pumping.
- All pumping located on fish bearing streams must have a screen over the intake to avoid entrainment of small fish.
- The pump intake should be suspended near the thalweg (deepest/highest quantity of flow) of the stream. Avoid placing pump intakes on the substrate or edges of the stream channel.

Post-fuels treatments for access roads and temporary fire trails:

- Install drainage dips, or water bars, in accordance with RMP BMPs to reduce surface run-off.
- A layer of duff (average of ½ inch after final burn) will be retained on roads

Scenic/Visual Resources

- Cut stumps close to the ground (less than 4 inches)
- Use multiple prescribed fire treatments over time to maintain the desired character of the landscape and to limit the level of change at each treatment so that it does not attract the attention of the casual observer.
- Where possible, maintain a vegetative visual screen along roadways.
- Minimize the use of tree marking paint in marking unit boundaries or other layout.
- Design vegetation and fuel treatment areas to have feathered, irregular edges and shapes. They should mimic naturally appearing shapes, forms, and textures of the surrounding landscape.

Noxious Weed Considerations

All vehicles and equipment will be cleaned off prior to operating on BLM lands. Removal of all dirt, grease, and plant parts that may carry noxious weed seeds or vegetative parts is required and may be accomplished with a pressure hose.

APPENDIX B - MANAGEMENT RECOMMENDATIONS FOR THE KLAMATH PEBBLESNAIL

1. Maintain water temperatures below 18°C (65°F) to avoid thermal stress and ensure adequate availability of oxygen. (18C represents the critical threshold for trout.)
2. Maintain dissolved oxygen levels at or near saturation levels.
3. Maintain and/or restore native riparian plant communities that aids in maintaining cool water temperatures (i.e. below 18°C) by providing shade, reducing sedimentation impacts, and providing litter fall nutrients to energy pathways in the stream ecosystem.
4. Avoid or mitigate for activities that could significantly increase sedimentation, pollution, or potential for eutrophication of occupied sites (e.g., logging, grazing, mining, construction activities).
5. Avoid water diversions or other activities that may reduce water flow below levels necessary to sustain viable populations. This level must be determined on a site-specific basis, but these species generally need flowing water.
6. Avoid or mitigate for the construction of dams that could have the following negative impacts: submersion of cold springs, slowing of current velocities, lowering of dissolved oxygen, and increased sedimentation.

APPENDIX C - 2001 ROD COMPLIANCE REVIEW: SURVEY & MANAGE WILDLIFE AND BOTANY SPECIES

Environmental Analysis File: Lakeview District BLM – Klamath Falls Field Office

Project Name: Klamath River Oak Thin and Big Bend Prescribed Fire Treatments

Prepared By: Steve Hayner and Lou Whiteaker

Project Type: Oak thin and Prescribed Fire

Location: T 40S 6E Sec 11, 12, 13, 14, 23, 26, 27, 34 T 41S 6E Sec 03, 04, 09

Date: 07/17/06

S&M List Date: December 29, 2003

Species listed below were compiled from the 2003 Annual Species Review (IM 2004-034) and include those vertebrate and non vertebrate wildlife and non vascular and vascular botanical species whose known or suspected range includes the Klamath Falls Resource Area according to the protocols listed below. There are no known sites for Category B, D, E, and F species.

- Survey Protocols for Survey and Manage Strategy 2 Vascular Plants Version 2.0 (December 1998)
- Management Recommendations for Survey and Manage Lichens Version 2.0 (March 2000)
- Natural History and Management Considerations for the Northwest Forest Plan Survey and Manage Lichens Based on Information as of the Year 2000 (USDA FS R6-NR-S&M-TP-03-03 2003)
- Survey Protocols for Survey and Manage Category A & C Lichens in the Northwest Forest Plan Area Version 2.1 (2003)
- Amendment to the Survey Protocol for Survey and Manage Cat. A and C Lichens Ver. 2.1 (2003)
- Survey Protocols for Survey and Manage Component 2 Bryophytes Version 2.0 (1997)
- Survey and Manage Protocols Protection Buffer Bryophytes 2.0 (1999)
- Handbook to Strategy 1 Fungal Species in the Northwest Forest Plan (PNW-GTR-476 Oct. 1999)
- Handbook to Additional Fungal Species of Special Concern in the Northwest Forest Plan (PNW-GTR-572 January 2003)
- Survey Protocol for the Great Gray Owl within the Range of the Northwest Forest Plan v3.0 (2004)
- Survey Protocol Aquatic Mollusk Species From the Northwest Forest Plan Version 2.0 (Oct. 1997)
- Draft Survey Protocol for Terrestrial Mollusk Species from the Northwest Forest Plan Ver. 2.0 (1997)
- Survey Protocol for S&M Terrestrial Mollusk Species v3.0 (Feb. 2003)

Statement of Compliance

Pre-disturbance surveys and management of known sites required by protocol standards to comply with the *2001 Record of Decision and Standard and Guidelines for Amendments to the Survey and Manage, Protection Buffer, and other Mitigation Measure Standards and Guidelines* (as the 2001 ROD was amended or modified as of March 21, 2004) were completed for the Klamath River Oak Thin and Big Bend Prescribed Fire Treatments. The Klamath River Oak Thin and Big Bend Prescribed Fire Treatments also complies with any site management for any Category B, D, and E species as identified in the 2001 ROD (as modified): no sites of any of these species (B, D, E) is present in the planning area.

Based on the field review of the sale area, there are currently no known sites of Survey & Manage species that require management within the project area. Therefore, based on the preceding information (refer to Table A above) regarding the status of surveys for Survey & Manage wildlife species Klamath River Oak Thin and Big Bend Prescribed Fire Treatments complies with the provisions of the *2001 Record of Decision and Standard and Guidelines for Amendments to the Survey and Manage, Protection Buffer, and other Mitigation Measure Standards and Guidelines* (as the 2001 ROD was amended or modified as of March 21, 2004). For the foregoing reasons, this contract is in compliance with the 2001 ROD as stated in Point (3) on page 14 of the January 9, 2006, Court order in Northwest Ecosystem Alliance et al. v. Rey et al.

D.K. Hoffheins

Don Hoffheins, Acting Field Manager
Klamath Falls Resource Area

August 1, 2006

Date

Table A. Survey & Manage Wildlife and Botany Species.

Species	S&M Category	Survey Triggers			Survey Results			Site Management
Species	S&M Category	Within Range of the Species?	Project Contains Suitable habitat?	Project may negatively affect species/habitat?	Surveys Required?	Survey Date	Sites Known or Found?	
Vertebrates								
Great Gray Owl (<i>Strix nebulosa</i>) ¹	A	Yes	No	No	No	NA	0	
Mollusks								
Siskiyou Sideband (<i>Monadenia chaceana</i>) ²	B	Yes	Yes	Yes	Yes	NA	0	
Crater Lake Tightcoil (<i>Pristiloma arcticum crateris</i>) ³	A	Yes	No	No	No	NA	N/A	
Evening Fieldslug (<i>Deroceras hesperium</i>) ⁴	B ⁴	Yes	No	No	No	NA	N/A	
<i>Fluminicola no. 3</i> ⁵	A	Yes	Yes	No	Yes	NA	1	Apply Management Recommendations
<i>Fluminicola no. 16</i> ⁵	A	Yes	Yes	No	Yes	NA	0	
Vascular Plants								
<i>Cypripedium fasciculatum</i>	C	Yes	No	No	No	NA	#	No
<i>Cypripedium montanum</i>	C	Yes	No	No	No	NA	#	No

¹ Pre-disturbance surveys for great gray owls are not required since there is no suitable nesting habitat within the project area. No nesting habitat is available on the proposed project area. The required habitat characteristics of suitable habitat include: (1) large diameter nest trees, (2) forest for roosting cover, and (3) proximity [within 200m] to openings that could be used as foraging areas (*Survey Protocol for the Great Gray Owl within the range of the Northwest Forest Plan v3.0*, January 12, 2004).

² Equivalent-effort pre-disturbance surveys are required for the Siskiyou Sideband (IM-OR-2004-034). (*Survey Protocol for S&M Terrestrial Mollusk Species v3.0*, 2003). High priority habitats for *M.chaceana* on the KFRA are rocky outcrops, riparian and seepy areas. (Nancy Duncan, personal communication, 2005. The Siskiyou Sideband may also be associated with oak woodlands (Conservation Assessment, 2005). The area was surveyed due to the oak habitat and the potential for this species.

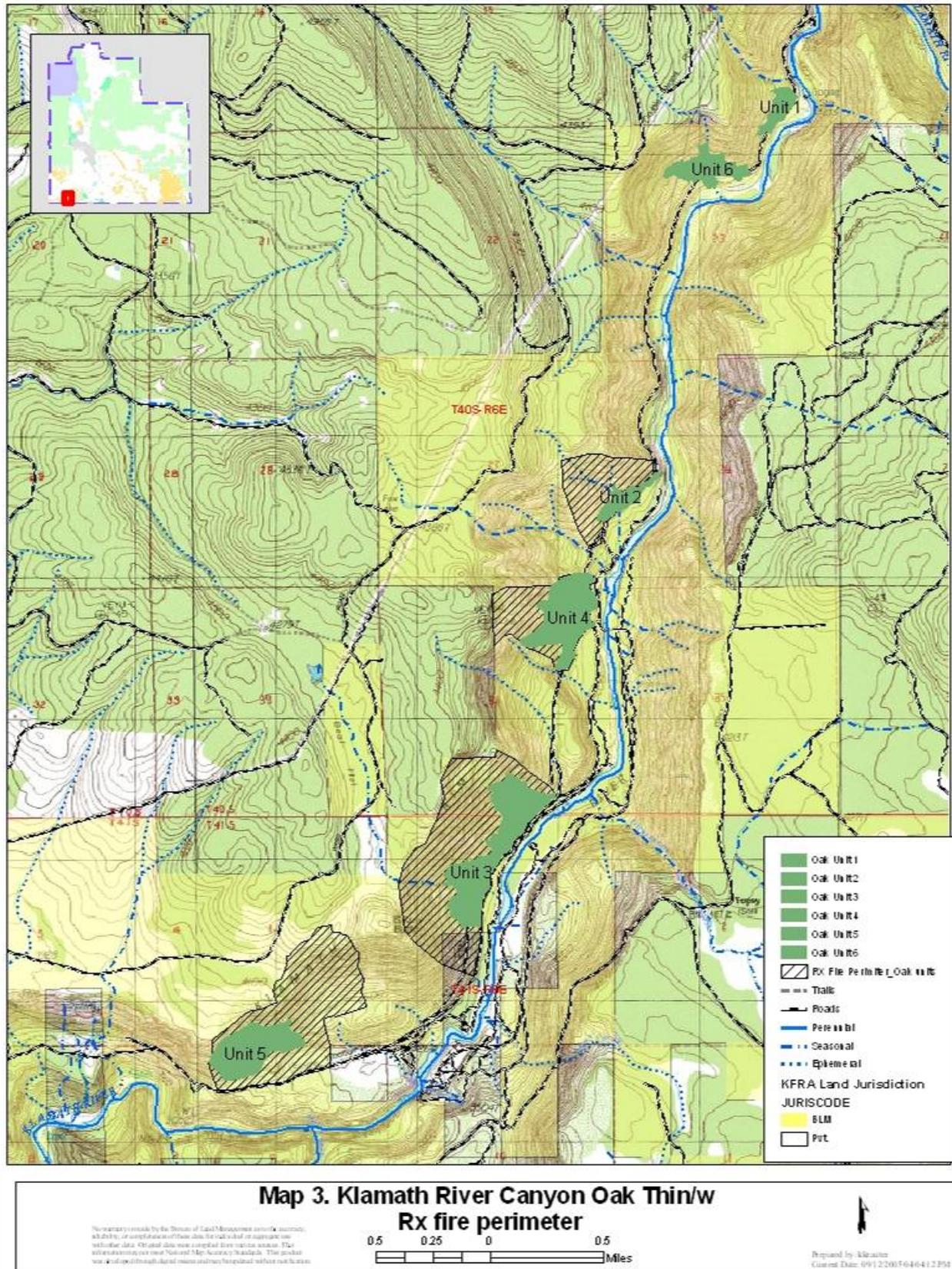
³ Suitable habitat for the Crater Lake tightcoil is “perennially wet situations in mature conifer forests, among rushes, mosses and other surface vegetation or under rocks and woody debris within 10 meters of open water in wetlands, springs, seeps and riparian areas...” (pg. 43, *Survey Protocol for S&M Terrestrial Mollusk Species v3.0*, 2003). Within the project, suitable habitat is confined to the stream-side areas that are contained within Riparian Reserves. The proposed project area does not contain suitable habitat.

⁴ The evening field slug’s range was extended to include the KFRA in March 2003 (pg 2 and 3 2002 Annual Species Review and Appendix A, pg. 32, *Survey Protocol for S&M Terrestrial Mollusk Species v3.0*, 2003). Their habitat is typically associated with wet meadows in forested habitats in a variety of low vegetation, litter and debris. Surveys may be limited to moist surface vegetation and cover objects within 30m of the stream (*Survey Protocol for S&M Terrestrial Mollusk Species v3.0*, 2003). The proposed project area does not contain suitable habitat.

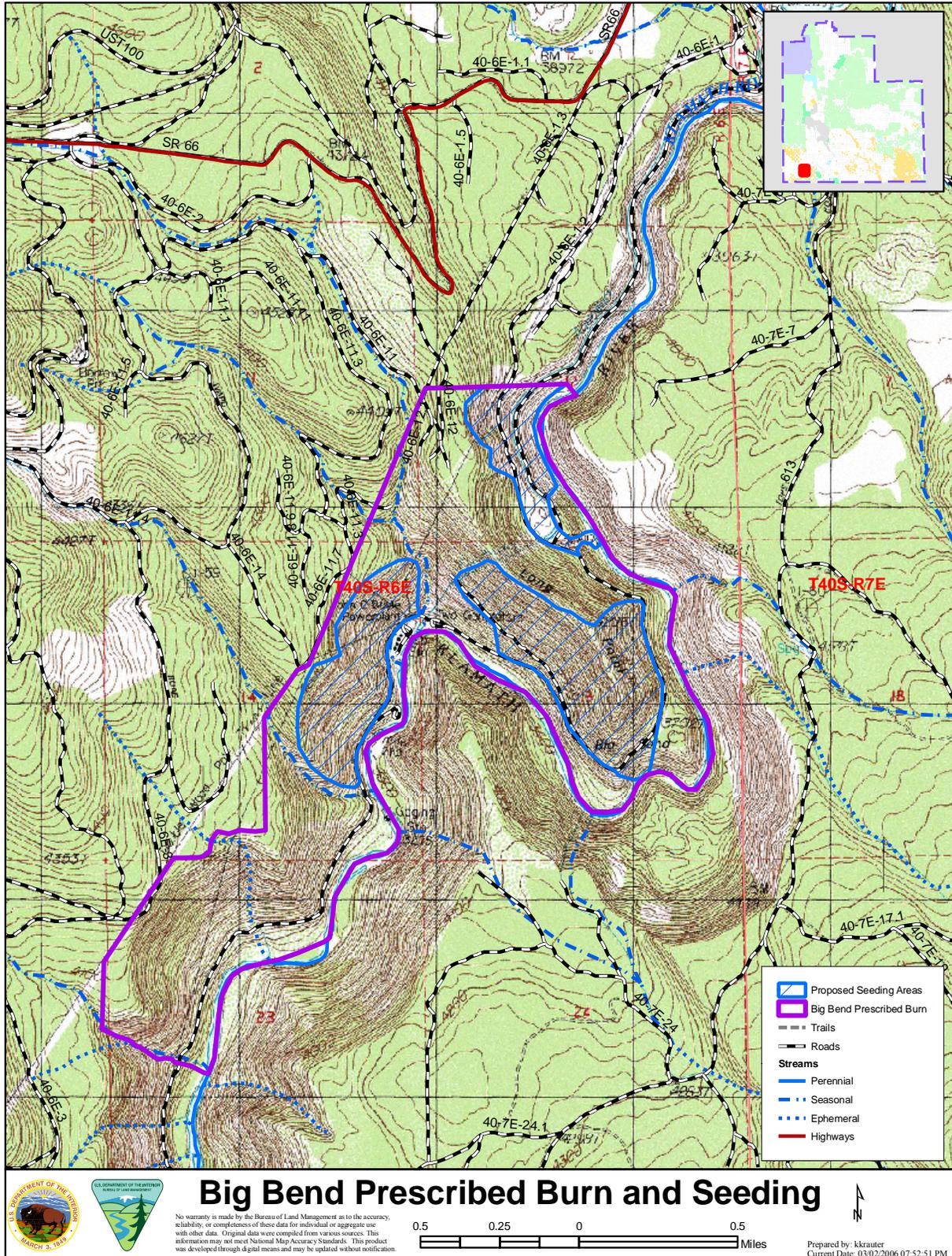
⁵ *Fluminicola sp no. 3 and no. 16* are found in cold seeps and springs (*Aquatic Mollusk Survey Protocol Version 2.0 October 1997*). The proposed land sale area does contain suitable habitat. Surveys were conducted in the perennial spring and along the Klamath River.

APPENDIX D – MAPS

Map 1 – Klamath River Canyon Oak Thin and Prescribed Fire Units



Map 2 – Big Bend Prescribed Burn and Seeding Units



APPENDIX E – REFERENCES

- Beckham, Stephen Dow. 2005. *Upper Klamath River Canyon of Oregon and California: Historical Landscape Study*. Department of the Interior, Bureau of Land Management, Klamath Falls, Oregon.
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