FINDING OF NO SIGNIFICANT IMPACT (FONSI)
for the
Juniper Chip Road Pilot Project
Klamath Falls Resource Area - Lakeview District
Environmental Assessment #OR-014-02-02

Background:
The Klamath Falls Resource Area of the Lakeview District, Bureau of Land Management, completed an environmental assessment (EA) for the proposed Juniper Chip Road Pilot Project. The project includes surfacing a total of 8.72 miles of existing public roads and 1.63 miles of new temporary roads with wood chips. The roads are located in five separate locations on BLM administered lands approximately 10 to 35 miles southeast of Klamath Falls, Oregon.

The proposed project will explore the feasibility of using wood chips as road surfacing material. The chip material will be manufactured on-site from juniper trees that are being thinned for forest health and fuels reduction treatments. A monitoring plan will be developed to assess whether this method of road surfacing would cause less ground disturbance than standard methods, and whether this method is cost effective. The improved roads will provide temporary access for public firewood gathering and fuels reduction treatments, and the wood chip material will eventually degrade into the soil.

Based on the information within the Environmental Assessment, it is my determination that none of the alternatives analyzed constitutes a significant impact affecting the quality of the human environment greater than those addressed in the:

- Final-Klamath Falls Resource Area Management Plan and EIS (FEIS)(Sept. 1994), and its Record of Decision and Resource Management Plan and Rangeland Program Summary (June 2, 1995) (KFRA ROD/RMP/RPS).
- Klamath Falls Resource Area Fire Management EA#OR-014-94-09 (June 10, 1994).
- Klamath Falls Integrated Weed Control Plan EA (July 21, 1993).
- Final Environmental Impact Statement, Vegetation Treatment On BLM Lands in Thirteen Western States.
- Interior Columbia Basin Ecosystem Management Project/Eastside Draft Environmental Impact Statement/May 1997(ICBEMP). We have reviewed the direction of the preferred alternative in ICBEMP and feel that the proposed action meets the intent/general direction of that alternative.

Impacts to the environment would be similar to or less than those disclosed in the above mentioned documents. Therefore, it is my decision that an Environmental Impact Statement is not necessary and will not be prepared.

Signed: Teri Raml Date: 8-7-02
Teri Raml, Field Manager – Klamath Falls Resource Area

UNITED STATES
DEPARTMENT OF THE INTERIOR
BUREAU OF LAND MANAGEMENT
LAKEVIEW DISTRICT
EA COVERSHEET

RESOURCE AREA: Klamath Falls

FY& EA #: OR-014-02-02

ACTION/TITLE: Juniper Chip Roads Pilot Project

LOCATION: Klamath Falls Resource Area

FOR FURTHER INFORMATION CONTACT:

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FREEDOM OF INFORMATION ACT AND RESPONDENT'S PERSONAL PRIVACY INTERESTS: The Bureau of Land Management is soliciting comments on this Environmental Assessment. Comments, including names and street addresses of respondents, will be available for public review at the above address during regular business hours. Individual respondents may request confidentiality. If you wish to withhold your name or street address from public review or from disclosure under the Freedom of Information Act, you must state this prominently at the beginning of your written comment. Such requests will be honored to the extent allowed by law. All submissions from organizations or businesses, and from individuals identifying themselves as representatives or officials of organizations or businesses, will be made available for public inspection in their entirety.

Environmental Assessment (short form)

EA Number: OR-014-2002-02

PROJECT TITLE/TYPE: Juniper Chip Road Pilot Project

PROJECT LOCATION: (see attached maps)

BLM OFFICE: Klamath Falls Resource Area, Lakeview District

LEASE/SERIAL/CASE FILE #: N/A

APPLICANT (if any): N/A

CONFORMANCE WITH APPLICABLE LAND USE PLAN: This proposed action is subject to one or more of the following land use plans.

Name of Plans: Klamath Falls Resource Area Management Plan and Environmental Impact Statement (1994), Klamath Falls Resource Area Record of Decision and Resource Management Plan and Rangeland Program Summary (1995), Vegetation Treatment on 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), and 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).

PURPOSE and NEED FOR ACTION:

Access to BLM fuels reduction areas in the Klamath Falls Resource Area is limited to few roads in good travel condition. Many of the access roads, both system and non-system, are in poor condition due to rocky and/or seasonally wet ground conditions, requiring seasonal travel restrictions to prevent high impacts from rutting and erosion. Applying aggregate surfacing material to BLM roads is one of the most common methods used to reduce (but not necessarily eliminate) road impacts to soil and hydrology resources. Often this surfacing method involves complicated design criteria and high dollar expenditures.

This project will improve existing road surfaces, and construct new temporary access routes, with a layer of juniper chips. Juniper chip surfacing is anticipated to provide improved access to fuel treatment zone (FTZ) units for BLM administrative and contractual needs. The improved surfacing will also benefit the public by providing access to FTZs for approved small quantity woodcutting purposes. Further reducing or possibly eliminating the potential erosion impacts associated with standard road maintenance and construction is anticipated to be an advantage of this surfacing technique. No soil excavation will occur as a part of this project's operational design.

This is a pilot project designed to explore the feasibility, both economic and environmental, of utilizing juniper chips as a road surface improvement and construction material for access needs.

Juniper chip road application may prove to be a productive use of biomass resulting from mechanical fuels reduction operations within dense Western Juniper stands. Currently, this downed vegetation is piled and burned in order to remove it from the landscape.

DESCRIPTION of PROPOSED ACTION:

For *existing* BLM roads: Routes have been selected for juniper chip application based on the volume of vegetative material needed to meet the anticipated running surface coverage depth of each road. A depth of 3 to 12 inches of chips has been targeted for the selected existing roads. Task orders from the mechanical fuels treatment contract (2001) will be issued to shear juniper trees to a maximum distance of 500 feet from road centerline on each side of a selected road section. Juniper already sheared and piled under the contract will be used where possible to meet the chip coverage requirements. Only young, invasive juniper would be cut. Juniper trees exhibiting old growth characteristics (i.e. size, shape, presence of live green lichens, etc.) will be left, as will all other conifers and hardwoods.

The downed juniper trees will be skidded and laid out on, and/or adjacent to, the road centerline in the most efficient configuration possible for machine chipping. Skidding will not occur outside the 500-foot limit on each side of the road's centerline, or on the downhill side of the Van Meter temporary road.

The juniper will be chipped using a tracked Morbark 50/36 'Mountain Goat' mobile chipping machine or equivalent. The machine will follow the road centerline, grapple feeding the placed juniper material into its onboard chipper and discharging chips onto the road surface directly behind it.

A tractor or grader will then be used to level and spread the chips to the proper width and depth needed to cover each road. If needed, a water tender may be used to wet the chips prior to, or following, the grading operation. The grader/tractor or the water tender may then be used to compact the juniper chips as much as is practical.

Due to the experimental nature of the project and its anticipated need for operational flexibility, agency personnel will be utilized in most critical roles. However, contractors will also be used to accomplish work whenever and wherever it is feasible.

For *new* temporary route construction: New temporary routes will be constructed using juniper chips as surfacing material in an effort to avoid the ground disturbing effects associated with standard road construction practices. The Resource Area engineer and/or the project coordinator will flag these route locations in. The flagged line will serve as the temporary route's centerline. The methods of construction for these routes will follow those outlined above for existing roads except that a layer of chips will be placed over previously undisturbed ground and may require thicker depths (up to 24 inches) of chip material.

ALTERNATIVES:

NO ACTION – Under this alternative:

- Existing roads on public lands will remain in their present condition, receiving no juniper chip improvements to their running surfaces.
- Western juniper within 500 feet of each side of the project roads will not be sheared for the purpose of providing route chip material.
- No skidding of juniper material to route centerlines will occur.
- Public firewood cutting and gathering of dead and down juniper trees would continue as currently.

ATERNATIVE 1 - Under this alternative:

- 8.72 miles of ***existing*** BLM roads (system and non-system) will receive the chip layer improvements.
- No ***new*** temporary access routes across previously undisturbed ground will be constructed.
- Invasive western juniper within 500 feet of each side of the project roads would be sheared for the purpose of providing route chip material.
- Skidding of juniper material to route centerlines will occur.
- Public firewood cutting and gathering of dead and down juniper trees would continue, but there would be less firewood available along treated roads.

ALTERNATIVE 2 (PREFERRED) – Under this alternative:

- 8.72 miles of ***existing*** BLM roads (system and non-system) will be improved with a layer of juniper chips, ***and***
- 1.63 miles of ***new*** temporary access routes will be constructed across previously undisturbed ground to provide access into fuel treatment units.
- Invasive western juniper within 500 feet of each side of the project roads would be sheared for the purpose of providing route chip material.
- Skidding of juniper material to route centerlines will occur.
- Public firewood cutting and gathering of dead and down juniper trees would continue, but there would be less firewood available along treated roads.

AFFECTED ENVIRONMENT:

Hydrology

Watercourses in the vicinity of the proposed actions include intermittent and ephemeral streams. These include:

- two intermittent streams on or near Van Meter Flat,
- one intermittent stream in Schnipps Valley (tributary to Miller Creek),
- one ephemeral stream tributary to Gerber Reservoir, and
- two intermittent and multiple ephemeral streams tributary to Antelope Creek downstream from Duncan Spring.

All of the streams in the vicinity of the proposed action are ultimately tributary to the Lost River. The project areas are between 4 to 11 miles distant from the mainstem of the Lost River.

The streams that are in the immediate vicinity of the proposed action flow during varying periods of the year in response to snow melt and rain storms. Shallow, clay-rich upland soils cause precipitation to run-off over the land surface, rather than infiltrate, and therefore, produce "flashy" streamflow patterns characterized by rapid increases and decreases in flow.

The deeper, coarser textured soils adjacent to intermittent channels have greater infiltration capacity. These meadow areas can absorb and store peak flows, then release that water later in the spring. Meadows such as occur on Van Meter Flat and in Schnipps Valley play important roles in moderating flood events and extending the duration of the streamflow period.

Some roads in the eastern portion of the KFRA intercept precipitation and overland runoff. These roads reroute natural flow patterns – especially when the roads are rutted or in poor condition – and can increase the volume of peak flow that is delivered to stream channels.

Water Quality

In intermittent and ephemeral streams, sedimentation is a primary water quality concern. Fine sediment is supplied to these streams from three primary sources: bank erosion, hillslope erosion, and road surfaces. Roads that closely parallel, cross, or drain into watercourses often deliver fine sediment to stream channels. This effect is greatest when the road is rutted, has few drainage features (such as water bars or cross drains), or is native surface. The CCC Road and roads near streams on Van Meter Flat and in Schnipps Valley currently deliver low to moderate amounts of sediment into streams.

Numeric water quality data is generally lacking for the intermittent and ephemeral streams in the vicinity of the proposed action.

A Proper Functioning Condition (PFC) survey for the stream draining Van Meter Flat, conducted in 1996, noted excessive sediment delivery from a spur road located near the stream channel.

Miller Creek is included on the Oregon DEQ 1998 303(d) list for high summer water temperatures. The water quality data set for this stream is not sufficient to determine whether or not state criteria for sedimentation and habitat modification are being met.

The lower one mile of Antelope Creek is also included on the 1998 303(d) list for high summer water temperatures. Antelope Creek has relatively cool summer water temperatures (approximately 55 to 65 degrees F) downstream from Duncan Spring. The range of stream temperatures warms to between about 65 to 75 degrees F by the time the stream flows into Willow Valley Reservoir. Macroinivertebrate monitoring data from 1993 and 1996 indicated a moderate degree of organic enrichment and, possibly, enhanced delivery of fine sediments. The 1996 PFC survey in this area noted sediment delivery from upstream bank erosion and bank trampling by cattle.

Riparian Reserves

The widths of riparian reserves for intermittent streams in the eastern portion of the KFRA are equivalent to one site potential tree, or 120 feet, on each side of the stream. These reserve widths apply to the intermittent streams on Van Meter Flat, in Schnipps Valley, and tributary to Antelope Creek. Riparian reserves are not designated for ephemeral drainages.

Roads cross or parallel the riparian reserves for each of the five intermittent streams in the vicinity of the proposed action. Other land uses within these riparian reserves includes grazing and forest management.

Vegetation

The project proposes to cut juniper in 1000-foot wide strips (500' each side of existing roads or new trails; except for Van Meter Flat, which will only skid juniper from the uphill side of the route). In most areas, the vegetation is dominated by western juniper woodlands of varying density, with scattered ponderosa pine in a few places. Western juniper is a natural component of much of this area, as evidenced by the presence of old growth trees (over 150 years old). However, unregulated heavy grazing (starting in the 1870's, up to 1935) and the disruption of periodic natural fires have allowed juniper seedlings to survive in areas where natural fires would have killed most of them. This has resulted in today's vegetation where juniper has increased in density on naturally-occurring juniper sites, and has expanded to adjacent sagebrush-bunchgrass rangelands and increased in density there over the last 150 years. These junipers are "invasive," and their extravagant consumption of water has resulted in the decline of native grasses, forbs and shrubs.

Grazing

The proposed chip roads are located in the following grazing allotments with the listed grazing parameters:

Chip Road Name	*Allotment Name & (#)*	*Season-of-Use*	*AUMs*
Van Meter	Rodgers (0852)	May 1 - July 1	238
O'Shea	Horsefly (0882)	April 15 - June 30 & October 1 - Nov. 15	2,656
Boundary Spring	Horsefly	same as above	same as above
Kilgore	Willow Valley (0890) - CCC road	April 15 - June 30	1,200
Bumpheads	(0877) - Bumpheads	April 21 - June 30	420

Special Status Plants

The areas around the Van Meter Chip Routes (T40S R11E sections 5 and 6) were surveyed for botanical resources in 1997. No special status plant populations were found in these two sections. Smaller surveys in the same area for a road re-alignment and a new fence also did not find any special status plant populations.

The areas around the O'Shea Chip Routes (T39S R13E sections 25 and 36) were surveyed for botanical resources in 2001. No special status plant populations were found in these two sections.

The areas around the Kilgore Chip Routes have not yet been surveyed for botanical resources. No special status plant populations are currently known from these areas.

The area around the Boundary Spring Chip Route (T39S R13E section 4) was surveyed for botanical resources in 2000. One large population composed of seven sub-populations of fringed campion (*Silene nuda* ssp. *insectivora*), a Bureau tracking species, was found at the junction of the proposed chip road and the CCC Road, on the south side of the proposed chip road. All seven sub-populations have a total of 88 plants and cover about 10 acres. A second population of fringed campion was found in this section in the NW/NW quarter.

Noxious Weeds

The areas around the Van Meter Chip Routes (T40S R11E sections 5 and 6) were surveyed for botanical resources in 1997. No noxious weed populations were found in these two sections.

The areas around the O'Shea Chip Routes (T39S R13E sections 25 and 36) were surveyed for botanical resources in 2001. One roadside population of Canada thistle (*Cirsium arvense*) was found in section 25 in the NE/SE quarter. Two populations of musk thistle (*Carduus nutans*) were found in section 25; a roadside population in the SE/SW, and a one upslope from the road in the SW/SW quarter.

The areas around the Kilgore Chip Routes have not yet been surveyed for botanical resources. A large population of St. John's wort (*Hypericum perforatum*) occurs in this general area along Duncan Creek.

The area around the Boundary Spring Chip Route (T39S R13E section 4) was surveyed for botanical resources in 2000. One population of Canada thistle occurs in section 4 in the NW/NW quarter. Three populations of musk thistle occur nearby the project area in the west half of section 3.

Special Botanical Areas

The Bumpheads Special Botanical Area is located in T40S R11½E sections 31 and 32, near one section of the Kilgore Chip Routes. This area was designated to conserve a remnant native bunch grass community.

Cultural Resources

The area of potential effect (APE) falls within a larger territory ceded to the Unites States in 1864 by the Klamath and Modoc Tribes, and the Yahooskin band of Snake Indians. Today, descendants of these three groups collectively comprise the majority of The Klamath Tribes. Prior to Euro-American settlement of the area, the Modoc occupied villages along the Lost River, which is located just south and west of the analysis area. Klamath villages were located to the northwest along the Williamson River and Klamath Marsh, and to the west along Upper Klamath and Agency Lakes. The present analysis area falls within territory that would likely have been utilized by both the Klamath and the Modoc. Historically, this is represented by the joint use of a fishery that was located near present day Olene, along the Lost River, just southwest of the analysis area.

The boundary of the former Klamath Indian Reservation, which was terminated by Congress in 1954 along with their federal recognition, lies at the northern boundary of the analysis area. With passage of the Klamath Restoration Act in 1986, the federal government again recognized the Klamath Tribes. The Consent Decree, signed in 1981 prior to restoration, reaffirmed Klamath "treaty rights" to hunt, trap, and fish within the former reservation lands as in place in 1954. These lands lie just to the north of the current analysis area (the proposed Boundary Spring chip route), which is delimited, in places, by the former southern boundary of the reservation. Though currently having no federally recognized "treaty rights" on BLM lands within the analysis area, the Klamath Tribes remain concerned about land use decisions made by the BLM, which have the potential to impact archaeological sites and landscapes of cultural significance. Efforts have and continue to be conducted to keep the Klamath Tribes informed about potential BLM actions and associated impacts.

Stephen Dow Beckham (2000) presents a thorough historical overview of the Gerber Reservoir area. A general description of prehistoric and historic cultural resources located within the general area is given in the Klamath Falls Resource Area Resource Management Plan and Environmental Impact Statement, Volume 1, pages 3-48 to 3-50. More detailed information is presented within "Prehistory and History of the Jackson-Klamath Planning Unit: A Cultural Resources Overview" (Follansbee, 1978). A detailed ethnography for the Klamath is contained within "Klamath Ethnography" (Spier, 1930), and Modoc culture is presented in "Primitive Pragmatists, The Modoc Indians of Northern California" (Ray, 1963).

Both cultures relied heavily on marsh, lacustrine, and riverine resources. Generally, winter villages of both groups were located along lakeshores, marsh fringes, and riverbanks. No such habitat lies within the present area of analysis, which is composed mostly of upland ridges and slopes. Though perhaps more sporadic than lowland use, ethnographic and archaeological information has documented somewhat intensive use of the upland areas for resource procurement and spiritual enrichment. Manifestations of such activities are often represented by sparse to concentrated lithic scatters and constructed rock features/cairns respectively. Based upon previously conducted archaeological survey, Native American cultural sites are known to occur within the immediate analysis area.

One of the earliest recorded visits by Euro-American explorers within the Klamath Basin occurred within or very near the area under consideration. Peter Skene Odgen, under the employ of the Hudson's Bay Company, visited the general area in 1826 when traveling south from the Williamson River and Upper Klamath Lake vicinity to the Lost River. After the initial exploration period, roughly 1826 through 1864, early historic economic activity centered on trapping, grazing, and lumber production. Dispersed livestock grazing and timber harvest continues through the present on BLM administered lands. Historic resources, predominantly "can dumps", are known to occur within the analysis area.

Wildlife - Terrestrial

For a list of common species that may occur in the proposed project areas, reference the Klamath Falls Resource Areas Draft RMP/ROD, Appendix 3C and the Klamath Falls Resource Area FEIS (pages 3-37 to 3-41).

The proposed chip road construction and existing road improvement are in the eastern part of the KFRA. The majority of this area is considered mule deer winter range, which equates to their reliance on these areas during the winter months, especially when snows at the higher elevations are deep. The proposed area would also be considered Rocky Mountain Elk winter range and they are becoming a more frequent visitor to this part of the resource area as their numbers continue to increase.

An historic sage grouse lek site is next to the proposed Bumpheads road improvement project. There is very limited information on this site but no sage grouse have been documented at this location in the last decade. A juniper removal project to improve sage grouse habitat was conducted in 2000 and 2001. Surveys for sage grouse at this location continue, but to date, none have been detected.

Wildlife - Special Status Species

There is a bald eagle nest in the vicinity of the Weber Road proposed location, although the nest site is greater than ¾ mile away from proposed road activity. There are also two golden eagle nests in the vicinity of the Weber Road proposed road improvement and new chip road construction. Both nest sites are over ½ mile away from any activity and out of line-of-sight. No other T&E species, special status species, or their habitat, are known to exist in the project area.

Fish - Special Status Species

Lost River and Shortnose Suckers

The Lost River sucker (*Deltistes luxatus*) and shortnose sucker (*Chasmistes brevirostris*) are known to inhabit the Gerber Watershed and the Lost River system. The shortnose and Lost River suckers were listed as endangered in 1988 under the Endangered Species Act (USDI-FWS 1988). Both species inhabit lakes and streams in the Klamath Basin. They were once abundant in the Lost River watershed, Upper Klamath Lake, and its tributaries. Both species have declined rapidly in recent years.

Gerber Reservoir and its watershed is identified as unit 6 in the proposed critical habitat for shortnose sucker and is the only major habitat area inhabited by shortnose suckers but not Lost River suckers (USDI-FWS 1994). The Gerber Reservoir population of shortnose suckers appears healthy in that it has successfully recruited in the last few years. Reproduction of shortnose suckers has been documented in Gerber Reservoir and its tributary streams despite stress likely induced by low reservoir levels associated with the drought condition and irrigation releases.

Boundary Spring Chip Route is within the Casebeer Drainage of the Gerber Watershed. Shortnose suckers have not been identified within Casebeer Creek, and the nearest suitable spawning habitat is two miles downstream from the project area.

O'Shea Chip Route is within an un-named tributary drainage to Miller Creek. The drainage encompassing the project area is non-fish bearing. The fish bearing waters of Miller Creek are approximately one mile downstream of the project area.

Kilgore Chip Route is within the East Branch Lost River drainage upstream of Willow Valley Reservoir. No listed suckers are known to occur in the Willow Valley Reservoir or its tributaries.

Van Meter Chip Route is located within the Lost River drainage. No listed species are present within or adjacent to the Van Meter Chip Route project area. The tributaries and drainage associated with the project area are largely disconnected from downstream populations of listed species due to irrigation diversions. Nearest fish populations would be four to eleven miles downstream from the project areas.

Redband Trout
Redband trout are listed as State Vulnerable and are managed as BLM sensitive (Heritage Program 2002; BLM Manual 6840). Redband in the Lost River drainage are limited to a few small, scattered populations that are largely limited by restricted habitats (ODFW 1997). Miller Creek, downstream from Gerber Reservoir, has supported a population of redband-like trout, but that stream was virtually dry during recent drought years. Substantial numbers of trout moved into Miller Creek during the spring of 1996, with spill from Gerber Dam providing stream flow. This suggests either trout occur in other areas of Lost River, or trout were recruited from the reservoir during spill periods.

Consultation
None of the proposed action areas contain any T&E species or their habitat. There is a bald eagle nest site approximately ¾ mile from one of the proposed units, however, activities from the proposed actions should have no effect on the nest site or bald eagles. There are endangered suckers in the Lost River and Gerber Reservoir, however, the nearest project is one mile distant from those water bodies, and there is no connectivity between those water bodies and the project areas. There are no other T&E species or their habitat near the proposed project area. Therefore, the BLM has determined that the proposed actions would be considered a "No Effect" on all Threatened and Endangered species and consequently there is no need to consult with U.S. Fish and Wildlife Service on the proposed actions.

Recreation/Visual Resources
There are no developed recreation sites or significant undeveloped recreation values in the project areas. The Boundary Spring Chip Route is located within a VRM Class II area (retain the existing character of landscapes). The Kilgore Chip Route is located within a VRM class III area (partially retain the existing character of landscapes). The other routes are in VRM Class IV areas (allow major modifications of existing character of landscapes).

Soil Resources
The primary concern and interest for soil resources is associated with the construction of new roads utilizing juniper chips as proposed under Alternative 2. The two sites which will require new access juniper chip roads, Van Meter Flat and O'Shea, are comprised of the two respective soil series, Lorella very stony loam series, and the Bumpheads soil series. The specifics descriptions for these soil series are the following.

Van Meter Flat Chip Route
The soil type for the project area is "Lorella very stony loam, 2 to 35% south slopes" (Soil Conservation Service Map Unit Symbol is 50E). This soil type comprises 100% of the area of the new road within the Van Meter project area. The surface is shallow, from slightly stony to extremely stony, and cobbly. Permeability of this soil is slow. Spring runoff is rapid, producing high erosion hazard, in areas without soil stabilizing vegetation. The soil has moderate frost heaving potential. The subsoil has moderate to high shrink/swell potential due to a high clay content. Deterioration of native plant communities may lead to domination of the site by western juniper with a high percentage of bare ground underneath, increasing the soil erosion hazard (USDA SCS, 1985).

O'Shea Chip Route
The soil type for the project area is "Bumpheads, high precipitation-Mound-Norcross complex, 1 to 10 percent slopes" (Ecological Site Index Map Unit Symbol is 515B). This soil type comprises 100% of the area of the new road within the O'Shea project area. The surface is moderately deep, from slightly stony to extremely stony, and cobbly (15 to 50 percent). Permeability of this soil is slow. Spring runoff is rapid, producing high erosion hazard, in areas without soil stabilizing vegetation. The soil has moderate frost heaving potential. The subsoil has moderate to high shrink swell potential due to a high clay content. Deterioration of native plant communities may lead to domination of the site by western juniper with a high percentage of bare ground underneath, increasing the soil erosion hazard (KFRA-ESI, 1998-1999)

These two sites have a climax community represented by Ponderosa pine (*Pinus ponderosa)* and Western Juniper (*Juniperus occidentalis*) in the overstory; Antelope Bitterbrush (*Purshia tridentata*), Mountain Big Sagebrush *(Artemisia tridentata ssp. vaseyana*), and various grasses (including Idaho Fescue (*Festuca idahoensis*), Bluebunch Wheatgrass (*Pseudoroegneria spicata*), and Thurber's Needlegrass (now = *Achnatherum thurberiana*)) and various forbs in the understory. These soils can support a highly diverse understory. With overgrazing and/or fire suppression, the understory species may be lost and replaced by a dense juniper woodland.

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:

Critical Element/ Resource Value	**Affected** Yes	No	**Critical Element/ Resource Value**	**Affected** 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

DESCRIPTION of OTHER IMPACTS:

Hydrology

No Action Alternative

The condition of existing roads that reroute runoff and/or deliver runoff into stream channels would not be altered. The condition of some roads would likely be degraded by future management actions, leading to increased diversion of surface flow paths in the future. This detrimental effect would be greatest on roads that do not receive regular (annual) road maintenance.

There would be no new access to the piles of cut juniper at Van Meter Flat, and firewood cutters will continue to cross the drainage, causing further soil compaction and possible future hydrologic impacts.

Alternative 1

Some roads that are currently rutted or are susceptible to rutting would be improved by the application of juniper chips. This would reduce interception of hydrologic flow paths and would reduce the degree to which water is channelized down roads. Because the chip layer would likely be more permeable than the underlying roadbed and surrounding soils, some water would still be routed down roadways. Overall, this alternative would have a beneficial impact on stream flow regimes, since less water would be delivered from road runoff during peak flow events.

The depth of the chip layer (six to 12 inches) could create a raised berm in some areas. Since the roads to be improved are, in many cases, "incised" into the surrounding terrain (as a result of rutting and erosion by surface runoff), the height of any berms created would be less than the depth of the chip layer. The height of the berm would be reduced further by compaction by equipment and vehicle traffic. (For instance, if the existing road is incised by four inches, and a six inch chip layer is applied, the resulting berm, after compaction, would have a height of less than two inches.) Such berms could impede, divert, and concentrate overland flow.

The natural permeability of the juniper chip material in the berms will limit the degree to which flow paths are diverted. During periods of high surface runoff, however, the capacity of the chip material to transmit flow could be overwhelmed. The likelihood of flow diversion would be highest during rapid snowmelt events or intense thunderstorms.

Skidding operations have the potential to disturb and compact the soil, leading to an increased possibility for soil erosion. Even if some soil movement did occur after skidding operations within 500' of the road, vegetation between the eroded area and the nearest drainages would likely capture much of the entrained material. It is unlikely that some fine-textured material could remain in suspension long enough to be delivered to stream channels. BMPs and Project Design Features are expected to reduce the amount of soil movement and compaction to an acceptable level, and reduce the possibility of soil erosion.

Operation of heavy equipment would occur between June 1 and October 15, a period during which soil moisture is generally low. Intense thunderstorms can occur during this period, which presents the risk of rutting soils and rerouting surface flow.

The monitoring program associated with this pilot project will be designed to identify and address concerns regarding delivery of fine sediment or juniper chips to stream channels, and to determine if there are other detrimental effects from road improvement and temporary route construction on hydrology and water quality. The monitoring program could include photo points and periodic walk-throughs.

Alternative 2

The effects of road improvement for existing roads would be the same as those discussed for Alternative 1.

Construction of temporary routes near Van Meter Flat and Schnipps Valley would result in creation of berms that are higher and more extensive than as discussed for Alternative 1. This would increase the potential for diversion of surface flow paths. Of the proposed temporary routes, those that run parallel to contours (such as near Van Meter Flat) would be the most likely to divert flow. However, temporary road construction would improve the situation at Van Meter Flat, where private vehicles are currently leaving the road and crossing the drainage overland, to gain access to the cut piles of juniper for firewood.

Standard practices when building temporary roads include blading the road surface to an acceptable grade and alignment, exposing the native material as the road surface, and closing the road with waterbars and berms when work is completed. Using this method, a layer of wood chips will be laid on top of the ground with no blading or exposure of the native material. The chip surface would eventually decay and become part of the duff layer on the forest floor, effectively closing the road. It is expected that this method would cause less soil movement, compaction, exposure, and runoff than normal methods of temporary road construction, and would improve the road surface with readily available, native vegetation.

Temporary routes would provide improved access into fuels treatment units. As a result, less soil displacement and compaction from vehicle traffic would occur, especially during wet periods. Operation of heavy equipment would occur between June 1 and October 15, a period during which soil moisture is generally low. Intense thunderstorms can occur during this period, which presents the risk of rutting soils and rerouting surface flow.

The monitoring program associated with this pilot project will be designed to identify and address concerns regarding delivery of fine sediment or juniper chips to stream channels, and to determine if there are other detrimental effects from road improvement and temporary route construction on hydrology and water quality. The monitoring program could include photo points and periodic walk-throughs.

Water Quality

No Action Alternative

Sediment delivery from roads that are currently rutted or are in poor condition would continue to affect streams. The condition of roads near streams would likely be degraded by future management actions, leading to increased sediment delivery in the future. This detrimental effect would be greatest in streams that are affected by roads that do not receive regular (annual) road maintenance, such as those near Van Meter Flat and Schnipps Valley.

There would be no new access to the piles of cut juniper at Van Meter Flat, and firewood cutters will continue to cross the drainage, causing further soil compaction and possible future impacts to water quality.

Alternative 1

Sediment delivery from existing roads near streams would be reduced. This would occur as a result of reduced road runoff and reduced potential for entrainment of fine sediment from road surfaces (which would be protected by the layer of juniper chips).

A slight potential exists for erosion of upland soils as a result of diversion by berms created by raised roadbeds, or as a result of skidding cut juniper trees within 500 feet of the road for chipping material (discussed in the Hydrology section). Were hillslope erosion to occur, vegetation between the eroded area and the stream channel would likely capture much of the entrained material. There is a small chance that some fine-textured material could remain in suspension and be delivered to stream channels. The presence of berms could also cause deposition of sediment on the uplsope side of the berm, thereby reducing sediment delivery to stream channels.

On roads that are located in the bottom of ephemeral drainages (such as at Boundary Spring), high flows could erode portions of the juniper chip layer. This could also occur where streams cross roads proposed for improvement. Decomposition of this material would require oxygen. If substantial volumes of juniper chip material were transported into intermittent or perennial streams, dissolved oxygen concentrations within affected streams would be reduced. Applying BMPs and Project Design Features would reduce the likelihood of eroding chips reaching nearby streams to a minimum level.

The monitoring program associated with this pilot project will be designed to identify and address concerns regarding delivery of fine sediment or juniper chips to stream channels.

Alternative 2

Effects on water quality as a result of the road improvements are the same as discussed for Alternative 1.

The construction of temporary access routes could increase the potential for diversion of surface runoff and subsequent deposition or erosion of sediment or juniper chip material.

The use of these routes would reduce detrimental soil impacts associated with the use of mechanical equipment and firewood cutting at Van Meter Flat, where private vehicles are currently leaving the road and crossing the drainage overland. Subsequently, the entrainment and delivery of hillslope sediment to stream channels would be reduced.

The monitoring program associated with this pilot project will be designed to identify and address concerns regarding delivery of fine sediment or juniper chips to stream channels.

Riparian Reserves

No Action Alternative

Existing roads within riparian reserves would continue to supply excess runoff and sediment to riparian reserves. Some plant communities could be affected by scour or deposition.

Alternative 1

The delivery of runoff and sediment to riparian reserves would be reduced. Public access into firewood cutting units near Van Meter Flat would not be improved, and some rutting and soil displacement could occur in the meadow next to the stream as a result of public entry during wet periods.

Alternative 2

No temporary routes would be placed within riparian reserves. In the O'Shea area, portions of the proposed temporary route cross ephemeral swales.

The delivery of runoff and sediment to riparian reserves would be reduced. The construction of a temporary route into firewood cutting units near Van Meter Flat would reduce the risk of resource damage (e.g., rutting and soil displacement) associated with this activity.

Vegetation

No Action Alternative

No juniper would be cut in the 1000' roadside strips for road improvement and temporary construction, although units that include the roadside strips, which were already planned for juniper thinning, would continue. In unthinned areas, juniper would continue to out-compete native grasses and forbs and increase in density, resulting in the decline of native vegetation.

Alternative 1

Benefits of juniper utilization and thinning (releasing native grasses, forbs, and shrubs) would be limited to project areas along existing roads only.

Alternative 2

Benefits of juniper utilization and thinning (releasing native grasses, forbs, and shrubs) would be limited to project areas along all proposed chip routes, both existing roads and new routes.

Grazing

No Action Alternative

There would be no impacts to grazing resources in this alternative.

Alternatives 1 & 2

Impacts to livestock grazing from the proposed chip road project are either neutral (no effect) or slightly positive. The improved roads will allow for better access to grazing areas by the grazing permittees; useful for checking on the status of their cattle and range improvements. Cattle may also trail around the areas easier if the roads are "smoother". Removal of the invasive juniper has a positive effect on the ecological conditions of the upland plant communities by allowing for increases is more desired plants, i.e. native bunch grasses and shrubs. This increase, along with the commensurate decrease in juniper composition, results in a higher ecological condition rating, which moves the vegetation community closer to meeting land use plan objectives related to upland vegetation conditions.

Special Status Plants

No Action Alternative

No new ground disturbing activities are proposed, therefore no impacts to special status plants would occur.

Alternative 1

The only known special status plant population adjacent to roads proposed to be covered with wood chips is Boundary Spring Chip Route area. This population could receive direct impacts from mechanical harvest and skidding to the road of juniper trees for chipping. However, this area will be flagged and avoided by the machinery such that this population will not receive impacts from the operation. The other special status plant population in this section is beyond the area to be affected by the project. There are no known populations of special status plants near other projects areas under this alternative, therefore there would be no other potential impacts to special status plants species.

Alternative 2

The potential impacts to special status plants would be similar to Alternative 2, but more area would be affected by harvesting and skidding of juniper trees. No special status plant populations are known from areas adjacent to proposed new temporary access routes; therefore, no additional impacts to special status plants beyond those described under Alternative 2 would be expected under this alternative.

Noxious Weed Risk Assessment

No Action Alternative

This alternative would not create additional physically disturbed conditions under which many noxious weeds have a competitive advantage. Therefore, the potential for the introduction and spread of noxious weed would not increase under this alternative.

Alternatives 1 & 2

The use of the mechanical equipment under Alternatives 1 and 2 may create the disturbed conditions under which many noxious weeds have a competitive advantage. These effects of the project using mechanical methods would be over a larger area in Alternative 2 than in Alternative 1. The vehicles and machinery entering the project area to implement these treatments would increase the potential for the introduction of noxious weeds into the area from sources outside the project area. Project design features for the prevention of the introduction of noxious weed seeds and plant parts would reduce the potential for the dispersal of these species into the project area.

Under both Alternatives 1 and 2, the potential exists to spread known populations of noxious weeds in the O'Shea Chip Routes and the Boundary Spring Chip Route areas from project activities. Flagging and avoidance of these populations will reduce the potential to spread these noxious weeds. Alternately, project design features to mow noxious weed plants to the ground and wash vehicles before leaving these areas would also reduce the potential to spread noxious weeds.

Special Botanical Areas

All Alternatives

The Bumpheads Special Botanical Area is located on top of volcanic formations rising above the surrounding landscape. The harvest and skidding of juniper will be designed to avoid these areas, and the sides of the volcanic formations are steep enough to make them inaccessible to machinery. Therefore, no impacts to the plant community for which the special area was designated will occur under any of the action alternatives.

Cultural Resources

No Action Alternative

No new ground disturbing activities are proposed, therefore no impacts to cultural resources would occur.

Alternatives 1 & 2

The areas to be affected by this project have been surveyed for cultural resources and all sites have been flagged for avoidance. Table 1 provides an overview of the cultural resource surveys conducted within the project areas.

Several archaeological sites are known to exist within the 1000-foot strip (500 feet on either side of the route) where the juniper will be harvested. Survey reports have been or will be sent to the Oregon State Historic Preservation Office (SHPO) for review and filing before the start of project activities (the recent cultural survey for the proposed Van Meter and Kilgore Chip Routes still require documentation and SHPO review). All sites within the project areas discovered during survey will be avoided/protected during ground disturbing activities.

Table 1. Cultural Resource Surveys Previously Conducted

Survey Name	***Survey Number***	***Date Surveyed***
Cultural Resources Reconnaissance of Van Meter Flat Timber Sale	OR014-CRR-FY78-002	1978
Archaeological Survey of BLM Lands on Bryant and Stukel Mountains	OR014-CRR-FY94-005	1994
Archaeological Survey of BLM Properties in the Klamath Falls Resource Area, Klamath County, Oregon	OR014-CRR-FY97-008	1997
Wildlife Juniper Thinning: Gerber 1998	OR014-CRR-FY98-006	1998
1998 Prescription Burn Survey	OR014-CRR-FY98-018	1998
CCC Road Juniper Thin Cultural Resources Inventory Report	OR014-CRR-FY00-009	2000
2001 Cultural Resources Survey, Indefinite –Delivery, Indefinite Quantity, Klamath County, OR	OR014-CRR-FY01-012	2001
Archaeological Survey of BLM Lands on Van Meter Flat and Kilgore	OR014-CRR-FY02-009	2002

Wildlife

No Action Alternative

This alternative would have no new impacts on any wildlife species.

Alternatives 1 & 2

Under Alternatives 1 and 2, there would be minimal impacts on wildlife species and their habitat. There may be some disturbance to deer and elk from machinery and activities associated with new and current road construction. This disturbance however would be short-term impact. Clearing of juniper and other vegetation may also remove some hiding and screening cover along the roads. Retaining some uncut vegetation to aid in screening may help reduce this impact. Impacts would also be reduced if new roads were blocked after access for woodcutting was no longer needed.

The sage grouse lek along the Bumpheads project area is currently not occupied. Under Alternatives 1 and 2, if the lek site were to become occupied prior to or during road construction activity, the action would need to be halted to minimize disturbance from March 1st to May 1st.

Under Alternatives 1 and 2, there would be no impacts to either bald or golden eagles. All nest sites are on the opposite side of the ridge and over ½ mile away from any proposed activity.

Fish – Special Status Species

No Action Alternative

No new impacts to special status fish species would be anticipated from this alternative.

Alternatives 1&2

No new impacts to special status fish species would be anticipated from the proposed action alternatives. All the project areas are at least one mile distant from known populations, which would protect the fishery resources from potential erosion that may occur as a result of temporary road construction. The road improvements and new road construction proposed in this project will have much less impact on the land than normal road construction and improvement activities. In addition, the proposal to surface the access roads with wood chips would, to an extent, protect road surfaces from erosion and would minimize risk to downstream fishery resources. Adherence to the practices listed in "Appendix A—Road Management BMPs from EPA" would further reduce risks of erosion and protect downstream fishery resources.

Recreation/Visual Resources

No Action Alternative

Existing roads within the project areas would continue to be available for recreation access. There would be no change to visual or scenic resources.

Alternative 1

Existing roads receiving juniper chip layer improvements may see a slight increase in vehicle traffic, especially when available for firewood cutting. However, as most of these roads are away from developed recreation sites and major population centers, use by the public is expected to remain very light. Access to fishing and hunting opportunities at Bumpheads Reservoir would be somewhat improved (a positive benefit for recreationists), as a portion of the primitive Bumpheads access road would receive chip surfacing.

For visual resources, there would be some negative effects to scenery (from temporary skid trails and brush piles, and semi-permanent tree stumps) as invasive juniper is removed. However, long-term scenic resources would be maintained nearer to the historic range and level of juniper stocking, and old growth juniper would be maintained along the project roads.

Alternative 2

Effects on recreation/visual resources as a result of road improvements would be the same as discussed for Alternative 1. Under alternative 2, those newly constructed roads receiving temporary surfacing would be available for firewood cutting and general recreation use. However, the effects would be temporary, as these roads would be decommissioned when administrative or contractual needs are completed.

Soil Resources

No Action Alternative

This alternative would have no new impacts on soil resources. Current impacts of traffic and runoff on unimproved roads will continue.

Alternative 1

Alternative 1 consists of improving 8.72 miles of existing BLM system and non-system roads. As these roads are already in place, the effect to the soil resources in these areas is minimal, except for the ground based juniper/fuel treatments associated with the road improvements. These associated ground based juniper/fuel treatments have been assessed in a separate Determination of NEPA Adequacy (DNA) and/or separate environmental assessments. There is a potential for positive aspects to soil resources, by improving existing access roads utilizing juniper chips, as proposed under both Alternatives 1 and 2.

Alternative 2

Alternative 2 includes 1.63 miles of new temporary access route construction across previously undisturbed ground, as well as improving 8.72 miles of existing BLM roads, utilizing juniper chips for surfacing material. The utilization of juniper chip roads may have a potential to reduce detrimental soil disturbance and soil compaction associated with new road construction. Detrimental ground disturbing effects and soil compaction associated with current methods of road construction has an associated risk of soil compaction, soil erosion, and loss of site productivity. Soil compaction occurs when soil macropores are removed or reduced resulting in an increase in soil bulk density. These macropores are critical to soil health as they are where soil organisms reside, fine roots of plants reside, and the means by which water infiltration into soil occurs.

Soil compaction and the associated compromise of macropores is a risk also associated with mechanized ground based harvest. The use of mechanized ground based harvest and skidding equipment may be higher than would normally be expected with a juniper/fuels treatment due to the need to skid adequate amounts of juniper for chipping to the access road area. The trade offs associated with this will have to be considered when planning future chip roads.

The two sites which have new juniper chip roads planned, Van Meter Flat and O'Shea, are comprised of the two respective soil series: Lorella very stony loam series, and the Bumpheads soil series. Both these soil series have a high stony, cobbly content. A high percentage of rock fragments may lessen detrimental soil compaction by increasing the surface area for the weight of ground based harvest equipment. Both these soil series also have moderate frost heaving potential and moderate to high shrink swell potential due to a high clay content. This soil attribute may over a period of time reduce the effects of compaction in the upper soil layers. It is unknown how long these processes take to ameliorate compaction that may occur during treatment.

20% of all resource area ground disturbing activities are monitored for compliance with KFRA-RMP and Regional Standards and Guidelines for detrimental soil disturbance and detrimental soil compaction (Bureau of Land Management. September 1994; Meurisse, 1997).

KFRA is currently conducting soil compaction monitoring in soil series representative of the proposed project areas. Effects of these monitoring efforts will not be known until the projects are completed and post treatment monitoring and analysis occurs. Findings of this monitoring will be used to modify, if necessary, future treatments to reduce potential soil impacts. Monitoring will be done to compare soil density and porosity pre- and post-road construction that is associated with this project. It will be beneficial for future proposals to determine if pre-road soil bulk densities differ significantly from post-road soil bulk densities.

DESCRIPTION of MITIGATION MEASURES:

The following mitigation measures will function as Project Design Features (PDF):

1. All new temporary access route construction will avoid drainage areas whenever possible. No project activities will take place in riparian zones unless approved by a Hydrologist.

2. Juniper tree shearing and skidding for purposes of surfacing the roads, will not be allowed beyond 500 feet on each side of the road centerline. For the Van Meter temporary road, skidding will not be allowed on the downhill side of the road.

3. Mechanical equipment will not be used off of road surfaces during periods when soil moisture levels exceed 20 percent by weight (KFRA RMP page D-24).

4. Avoid refueling, equipment maintenance, or other handling of petroleum products or other chemicals in or adjacent to riparian reserves (KFRA RMP page D-9).

5. Any use of surface or ground water that is outside of the permitted amount or type of use must be covered under a Limited License to Use Surface Water, which is issued by the state (KFRA RMP page D-42).

6. If temporary access routes are constructed across ephemeral drainages, remove in-channel fill material during low flow and prior to fall rains. Reestablish natural drainage configuration (KFRA RMP page D-19).

7. To prevent the expansion of the system and non-system road network, decommission temporary access routes where they intersect open roads following contractual and administrative needs.

8. All ground operations will comply with applicable fire precaution level restrictions.

9. Routes will be constructed to the minimum design features necessary to achieve the desired results for access.

10. In areas where invasive juniper trees within 500' of the road centerline exceed the amount of chip material needed to surface the road, the excess juniper will be left for public woodcutting and gathering. To facilitate firewood removal, felled trees within 50 feet of existing roads or new temporary roads will be left for public use, and not skidded to the road or chipped.

11. All damage to fences (or other rangeland improvements) as a result of the juniper harvesting or cutting, yarding, chipping and/or route building activities must be repaired immediately after the operation ceases at the location of the damage. Livestock grazing takes place in all the proposed project areas and open fences disrupts the existing grazing systems. This is especially critical within the Horsefly allotment, which has section 7 (ESA) - Biological Opinion - required grazing parameters that mandate intact, functioning fences. (KFRA range staff members should be consulted if there are any on-the-ground questions as to the functionality of a fence.)

12. All proposed juniper chip roads will be surveyed for cultural resources prior to the beginning of project activities. If cultural resources are discovered, the chip road alignment will be modified to avoid impacts. Cultural resources will be marked in the field prior to start of the project and all project activities shall avoid disturbance to these resources.

13. If project activities result in the discovery of new cultural resource sites, all ground disturbing activity shall cease and the KFRA Lead Archaeologist shall be notified. Resumption of activities in that area will be allowed only after all necessary mitigation fieldwork has been conducted.

14. Leave no large slash piles, major skid trails, or obvious ground disturbance within 150 feet of major roads within the VRM Class II area (Boundary Springs access roads). Small piles of slash, dispersed for

firewood, pole or post gathering or burning, may be left. See attached VRM Classes map.

15. Within 150 feet of major roads, mechanical shearing and chainsaw cutting of juniper will be done as close to ground level as practical, to reduce negative visual impacts from stumps.

16. Mechanical treatment areas will be designed to blend in with natural and man-made openings and clearings, using standard BLM visual design techniques. These measures include designing treatment units with indistinct edges (little or no straight boundary lines and minimal/temporary type access roads), and leaving old growth juniper and clumps of uncut trees such as ponderosa pine, reserved to create visual breaks and diversity.

17. 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.

18. Noxious weeds in the immediate area of operations shall be mowed to ground level prior to the start of project activities.

19. All equipment and vehicles operating off of main roads shall be cleaned off prior to leaving the job site when the job site includes noxious weed populations. 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.

20. Road graders used for road construction or maintenance will grade towards any known noxious weed infestations. If no good turn around area exists within one half mile that would allow the operator to grade towards the noxious weed infestation, then the operator would leave the material that is being moved within the boundaries of the noxious weed infestation.

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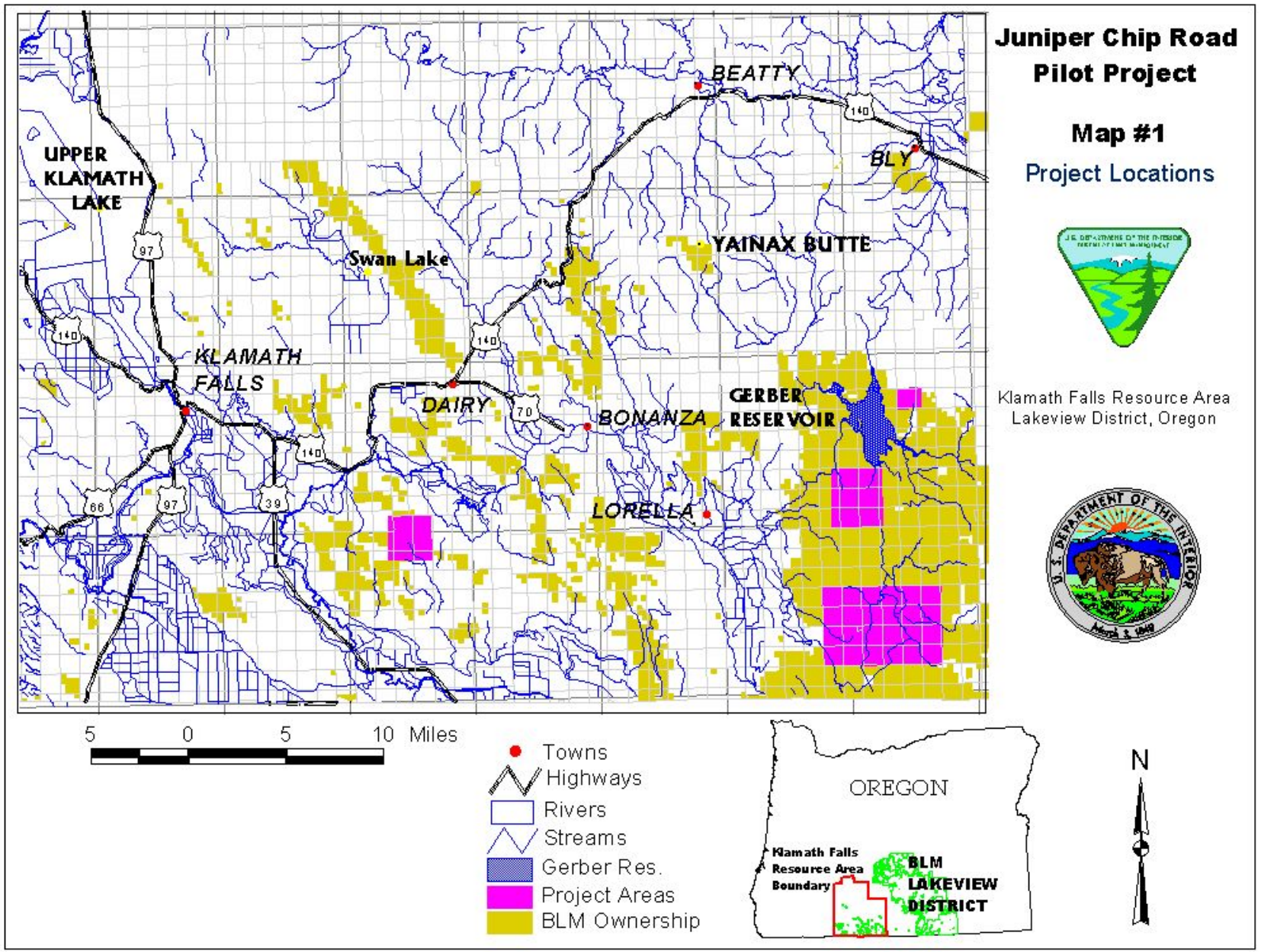
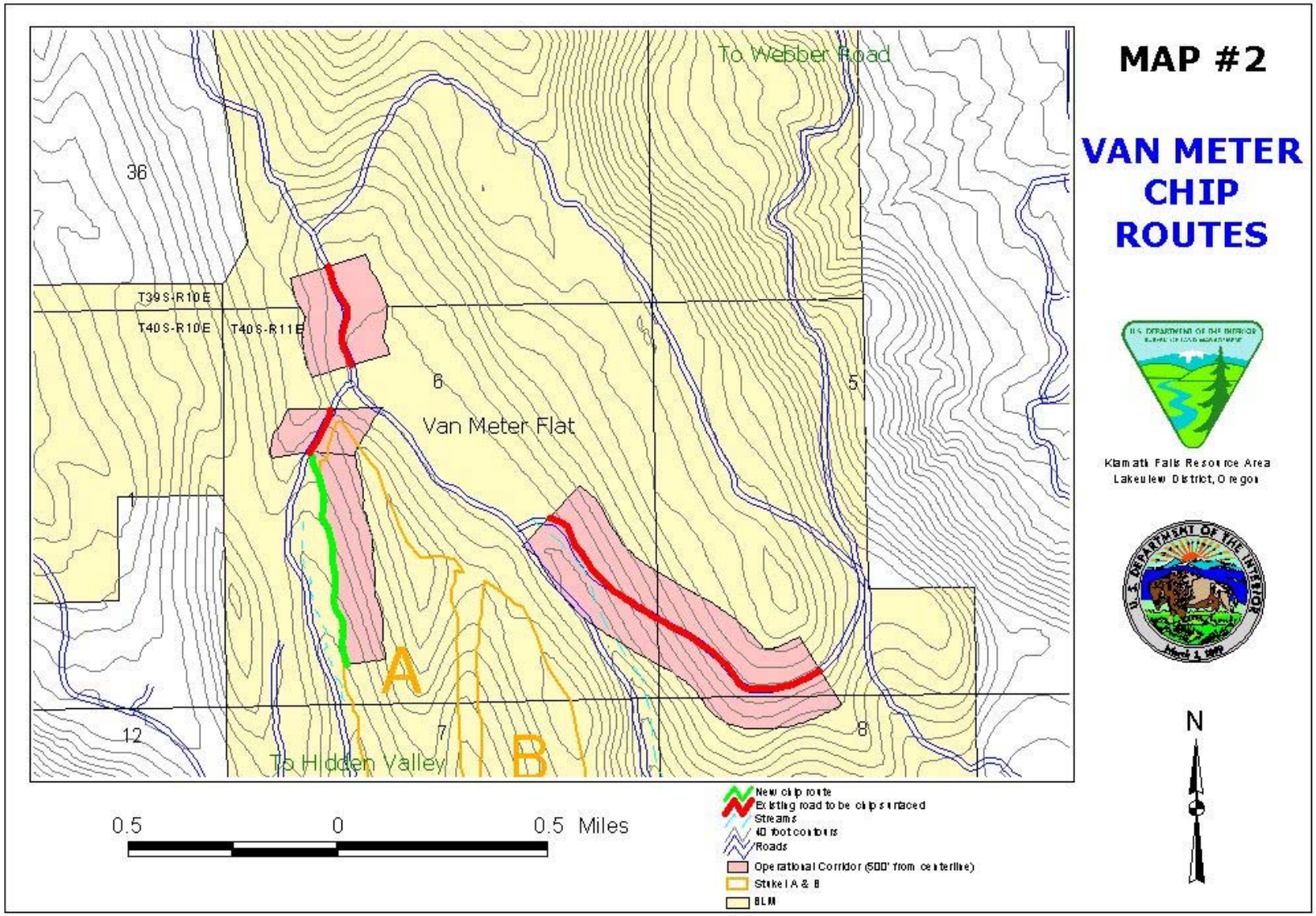
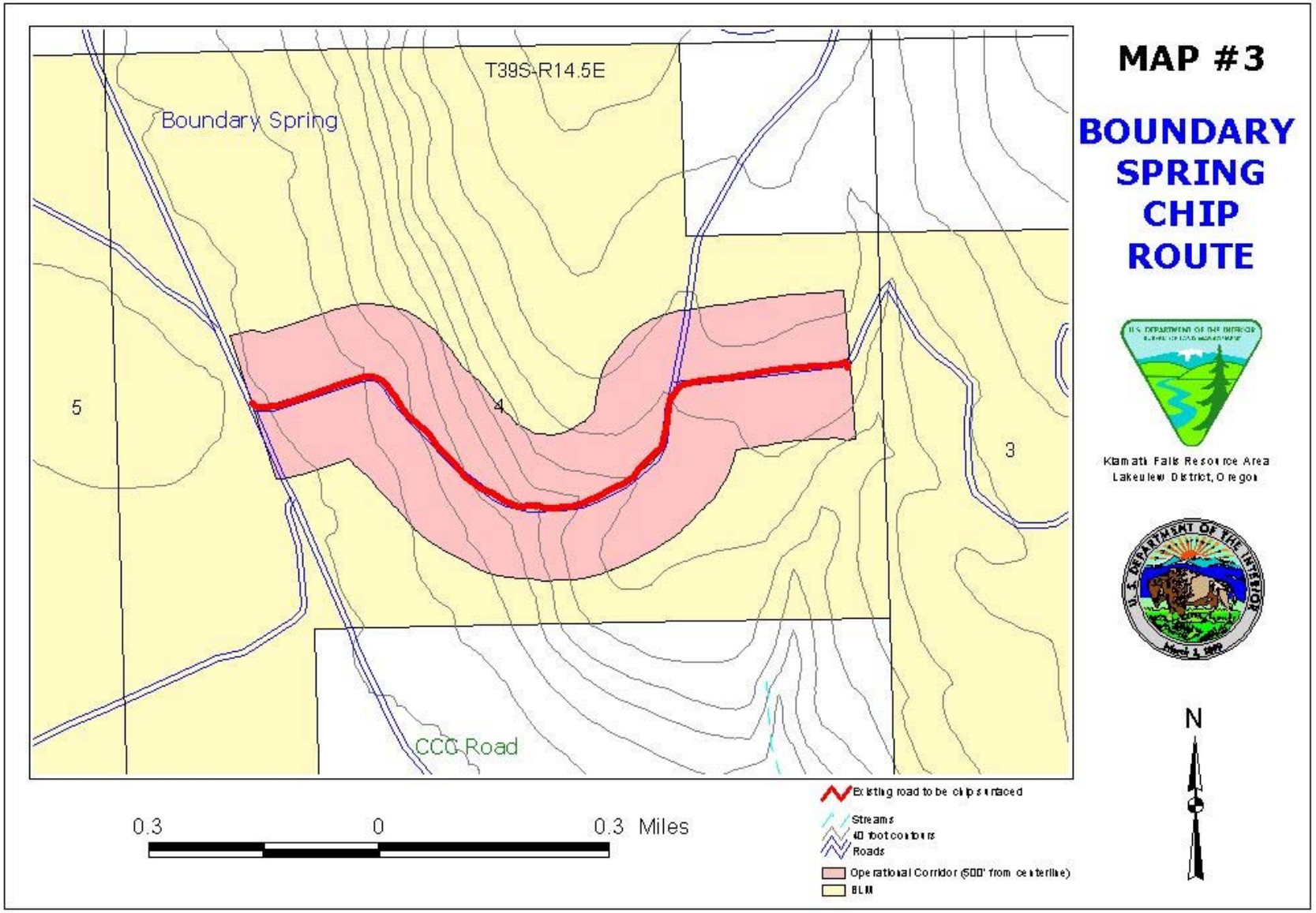
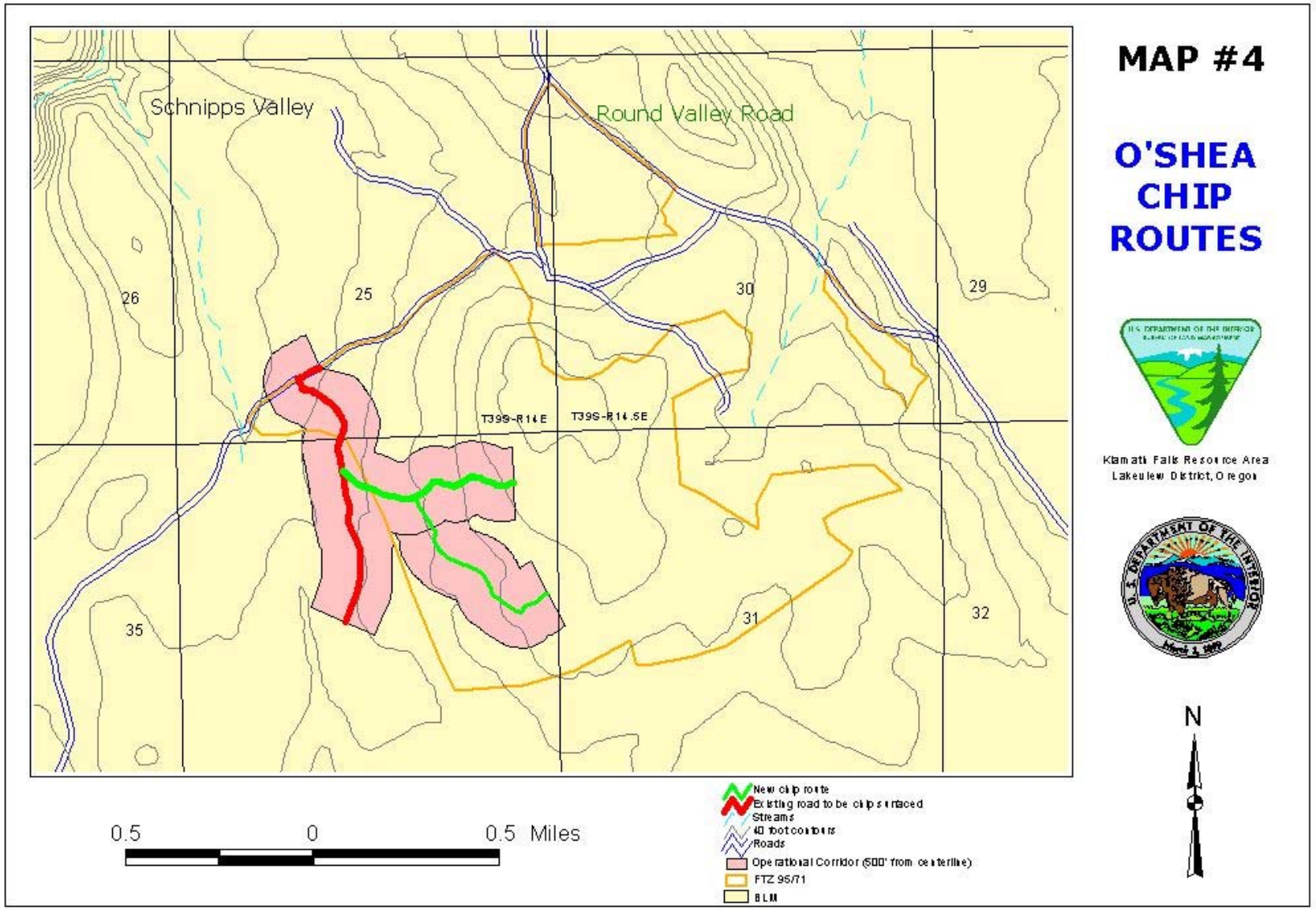
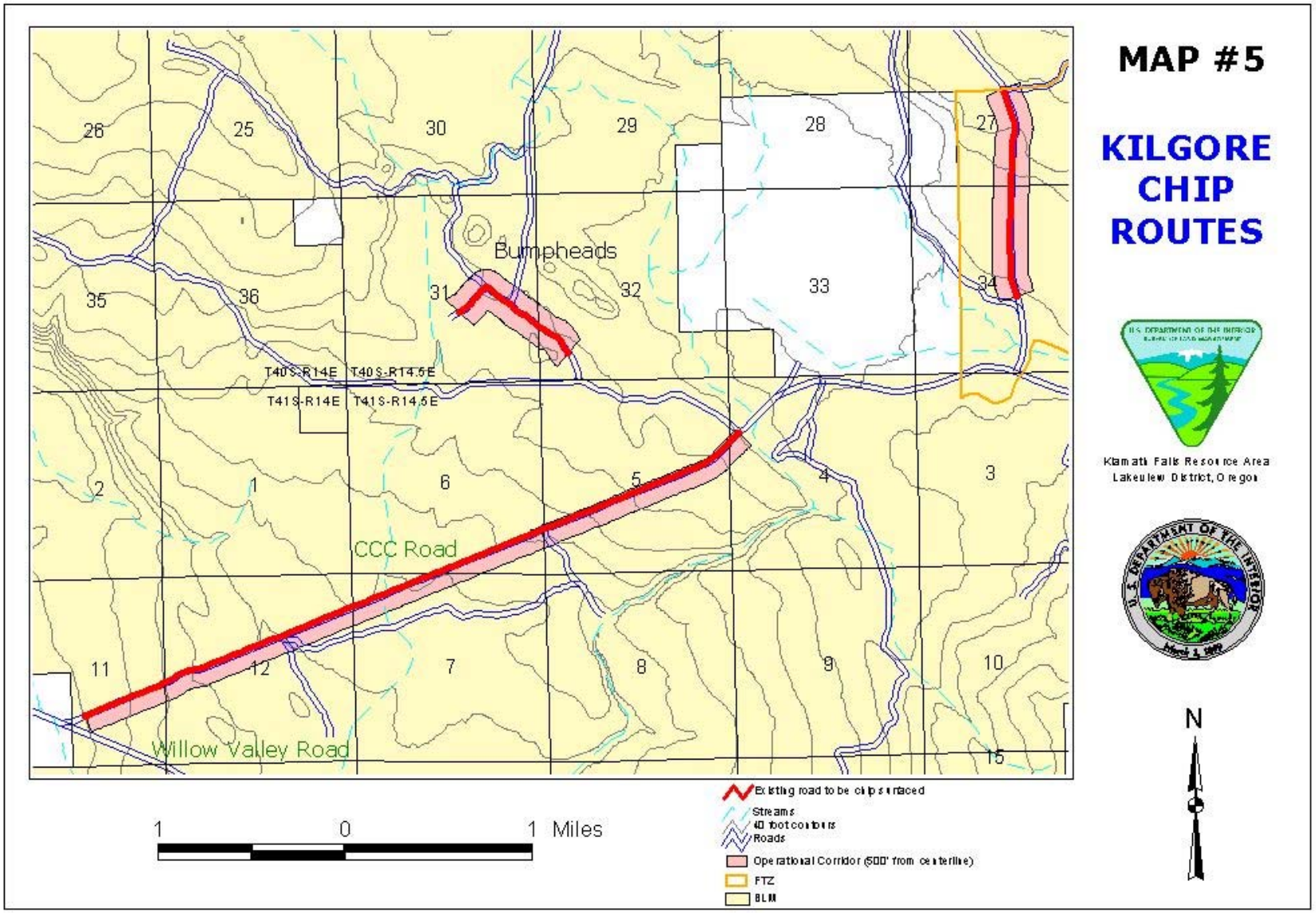

Juniper Chip Road
Pilot Project
Map #1
Project Locations
Klamath Falls Resource Area
Lakeview District, Oregon
BEATTY
BLY
YAINAX BUTTE
UPPER KLAMATH LAKE
Swan Lake
KLAMATH FALLS
DAIRY
BONANZA
GERBER RESERVOIR
LORELLA
97
140
70
66
39
5 0 5 10 Miles
Towns
Highways
Rivers
Streams
Gerber Res.
Project Areas
BLM Ownership
OREGON
Klamath Falls Resource Area Boundary
BLM LAKEVIEW DISTRICT
N


MAP #2
VAN METER CHIP ROUTES
To Webber Road
To Hidden Valley
Van Meter Flat
36
T39S-R10E
T40S-R10E
T40S-R11E
6
5
1
12
7
8
A
B
Klamath Falls Resource Area
Lakeview District, Oregon
N
0.5
0
0.5 Miles
New chip route
Existing road to be chip sealed
Streams
40 foot contours
Roads
Operational Corridor (500' from centerline)
Strike A & B
BLM


MAP #3
BOUNDARY SPRING CHIP ROUTE
T39S-R14.5E
Boundary Spring
5
4
3
CCC Road
Klamath Falls Resource Area
Lakeview District, Oregon
N
0.3
0
0.3 Miles
Existing road to be chip surfaced
Streams
40 foot contours
Roads
Operational Corridor (600' from centerline)
BLM


MAP #4
O'SHEA CHIP ROUTES
Schnipps Valley
Round Valley Road
26
25
30
29
35
31
32
T39S-R14E
T39S-R14.5E
Klamath Falls Resource Area
Lakeview District, Oregon
N
0.5
0
0.5 Miles
New chip route
Existing road to be chip surfaced
Streams
40 foot contours
Roads
Operational Corridor (600' from centerline)
FTZ 95/71
BLM


MAP #5
KILGORE CHIP ROUTES
Klamath Falls Resource Area
Lakeview District, Oregon
Bumpheads
CCC Road
Willow Valley Road
T40S-R14E
T40S-R14.5E
T41S-R14E
T41S-R14.5E
26
25
30
29
28
27
35
36
31
32
33
34
2
1
6
5
4
3
11
12
7
8
9
10
15
N
1 0 1 Miles
Existing road to be chip surfaced
Streams
40 foot contours
Roads
Operational Corridor (500' from centerline)
FTZ
BLM