

Deschutes & Ochoco National Forests Crooked River National Grassland

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Projects & Plans Project Documents

United States
Department of
Agriculture

Forest
Service
Feb 2003

Environmental Assessment KELSEY NON-MOTORIZED TRAIL

Bend/Ft. Rock Ranger District, Deschutes National Forest Deschutes County, Oregon

PREFERRED ALTERNATIVE - ALTERNATIVE 3

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We welcome your comments on our service and your suggestions for improvement.

Forest

Deschutes National Forest

1001 SW Emkay Drive
Bend, OR 97702

(541) 383-5300

Ochoco National Forest

3160 N.E. 3rd Street
Prineville, OR 97754

(541) 416-6500

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Grassland**

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Madras, OR 97741

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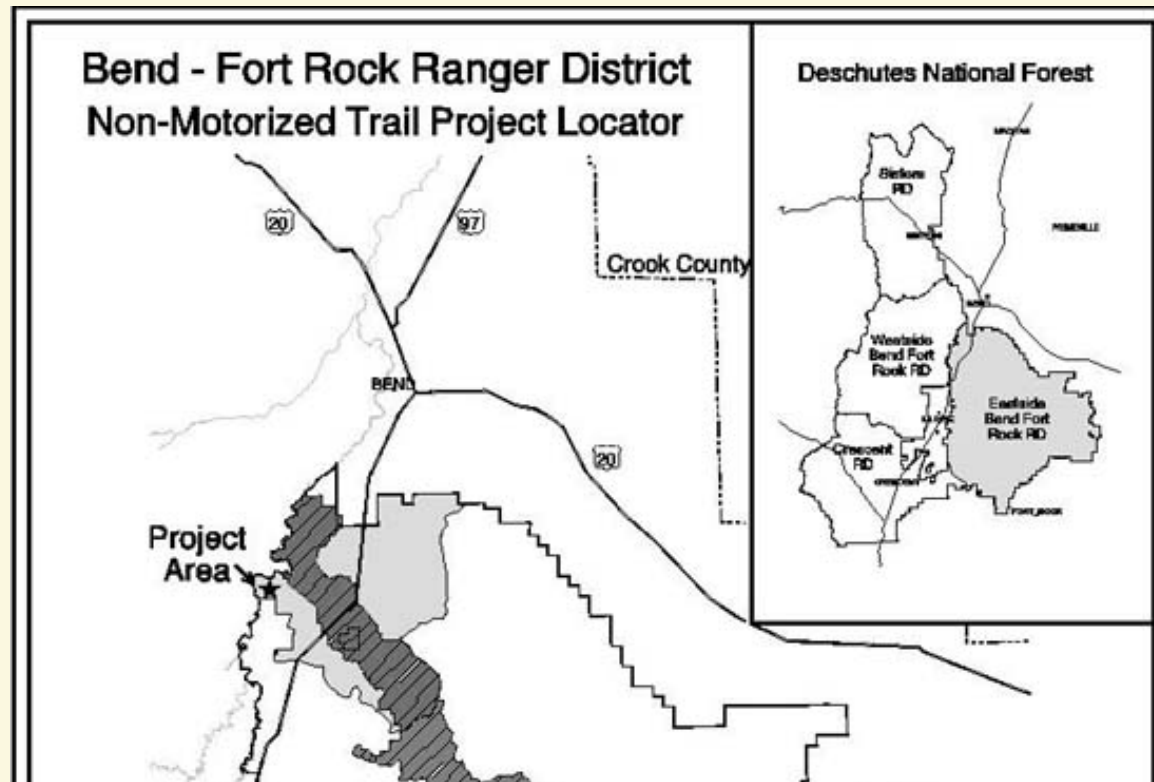
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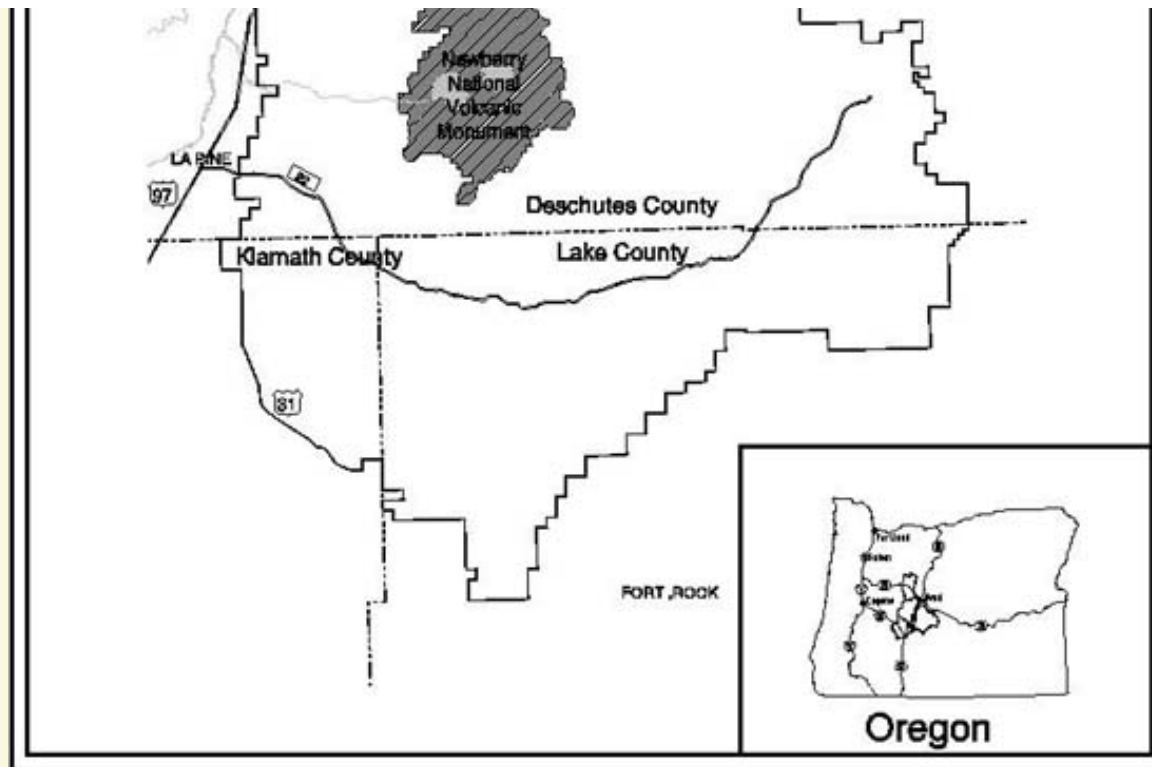
INTRODUCTION

The Bend-Ft. Rock Ranger District of the Deschutes National Forest has analyzed for the development of a logical, non-motorized trail within the Wild and Scenic River Corridor of the Kelsey planning area (Figure 1). The project was originally a part of the larger Kelsey Environmental Assessment.

The project area is located within a portion of the Newberry National Volcanic Monument and the Upper Deschutes Wild and Scenic River Corridor. The elevation ranges from approximately 4,200 to 4,500 feet. The project area is located in Township 19 South, Range 11 East, Sections 15-17, 20, and 22-24. There are no inventoried (RARE II) roadless areas or threatened or endangered species known to occur in or adjacent to the project area. Within or adjacent to the project area there are 1) bufflehead ducks and redband trout, both listed as sensitive on the Region 6, Regional Forester's Sensitive Species Wildlife List; 2) *Artemisia luucoviciana* ssp. *estesii* listed as sensitive on the Region 6, Regional Forester's Sensitive Species Plants List; 3) populations of noxious weeds; and 4) cultural resources. The planning area lies outside the range of the Northwest Forest Plan (NFP) boundaries. **All measurements are approximate.**

Figure 1





PURPOSE OF AND NEED FOR ACTION

The project area encompasses approximately 4.5 miles of the east bank of Deschutes River frontage from Sunriver to the Benham Falls day-use area. The Upper Deschutes Wild and Scenic River Management Plan (**River Plan**), 1996, encompasses this area and is designated as Scenic with the intent of protecting its largely undeveloped character. The River Plan allows the development of a designated trail from the Boundary with Sunriver to the southern urban growth boundary of Bend. The Newberry National Volcanic Monument Comprehensive Management Plan (**Monument Plan**), 1994, guides management activities within its boundary. Opportunities that would enhance the recreational experience for visitors to the Monument have been recognized. Along the wildland/urban interface boundary, population density has increased substantially with an associated increase in various forest recreational uses. An intermittent, undeveloped, undesignated, non-motorized trail parallels the lava flow from Lava Lands Visitor Center to Benham Falls day-use area. The trail continues to the north urban boundary of Sunriver, paralleling the Deschutes River. Current use from Bend and Sunriver is substantial and increasing, particularly bike use, and is presently conflicting with the quality of riparian habitat and elk calving habitat. The purpose and need of the Kelsey Non-motorized Trail plan is to address and balance recreation access and use with natural resource management objectives.

PROPOSED ACTION

The proposed action would develop and designate approximately 9 miles of non-motorized trail from the northern boundary of Sunriver to Benham Falls Day Use Area to Lava Lands Visitor Center.

DECISION TO BE MADE

Based on this analysis, the District Ranger of the Bend-Fort Rock Ranger District, Deschutes National Forest, will decide whether to designate and construct a new non-motorized trail that connects Sunriver to Benham Falls day use area and Benham Falls Picnic Area to Lava Lands Visitor Center.

DOCUMENTS TIERED TO

- 1990, Deschutes National Forest Land and Resource Management Plan (Forest Plan) and its accompanying Final Environmental Impact Statement as amended by the Revised Continuation of Interim Management Direction Establishing Riparian, Ecosystem, and Wildlife Standards for Timber Sales (Eastside Screens).
- 1994, Newberry National Volcanic Monument Comprehensive Management Plan (Monument Plan).
- 1995, Inland Native Fish Strategy (INFISH).
- 1996, Upper Deschutes Wild and Scenic River and State Scenic Waterway Comprehensive Management Plan (River Plan).

MANAGEMENT ALLOCATIONS AND DIRECTION

The following is a summary of the Management Allocations (MA) that are associated with the project and as allocated in the Deschutes National Forest Land and Resource Management Plan (Forest Plan):

- Special Interest (MA-1): To preserve and provide interpretation of unique geological, biological, and cultural areas for education, scientific, and public enjoyment purposes.
- Wild and Scenic Rivers (MA-17): To protect the outstandingly remarkable values identified and maintaining the free flowing nature of the Deschutes River.
- Ryan Ranch Key Elk Habitat Area: Management will provide conditions needed to support summering and wintering elk.

The Monument Plan guides management and restoration activities within the Monument and is consistent with the intent of the Wild and Scenic Rivers Act within the river corridor. A portion of the project area is located within the Lava Butte Zone of the Monument. This zone serves a large number of day-use visitors with a variety of short-term, day oriented interpretive programs and recreation opportunities. The facilities are managed to support a comprehensive theme-based interpretive program.

The River Plan designates the section of river forming that portion of the western boundary of the Kelsey planning area from the north boundary of Sunriver to the southern urban growth boundary of Bend to be within section 4a and 4b of the Recreational Opportunity Spectrum. Sections 4a and 4b are designated as "Scenic."

- Scenic is defined as "Those rivers or sections of rivers that are free of impoundments, with shorelines or watersheds still largely primitive and shorelines largely undeveloped, but accessible in places by roads."
- Section 4a - The Recreational Opportunity Spectrum (ROS) classifies this area as Roded Natural: A small portion of land may be privately owned. The landscape appears natural, but roads and trails access the area, and some facilities are present. Visitors can expect less interaction with other people. Modifications to the landscape generally harmonize with the environment.

The Inland Native Fish Strategy (**INFISH**) delineated Riparian Habitat Conservation Areas (**RHCAs**) in order for riparian-dependent resources to receive primary emphasis during management activities. These RHCAs include traditional riparian corridors, wetlands, intermittent streams, and other areas that help maintain the integrity of aquatic ecosystems. These areas are to be managed to maintain or restore water quality, stream channel integrity, channel processes, sediment regimes, instream flows, diversity and productivity of plant communities in riparian zones, and riparian habitats to foster unique genetic fish stocks that evolved within the specific region.

AVAILABILITY OF THE PLANNING RECORD

Specialist reports used in the preparation of this Environmental Assessment are on file at the Bend/Fort Rock Ranger District office, 1230 NE Third Street, Suite A-262, Bend, Oregon 97701..

PUBLIC INVOLVEMENT/SCOPING PROCESS USED

Announcement of the proposed Kelsey project, and subsequent planning stages, was included in the Central Oregon Schedule of Projects (SOP) beginning in the summer of 1999. This notification, through quarterly mailings, reaches approximately 3,200 interested individuals and groups. A Forest Service public scoping letter requesting public involvement was provided to approximately 220 individuals, businesses, and organizations that have expressed an interest in the project development process. Included in the mailing was The Bulletin, the local newspaper that reported on the proposed actions. The scoping letter was also placed on the United States Forest Service (**USFS**) web site.

COMMENTS RECEIVED

Comments received are assessed for their relevance to resources being addressed. Three (3) scoping comments were received in support of the construction/designation of the proposed non-motorized trail. No comments were received in opposition to the proposed project.

ISSUE USED IN ALTERNATIVE DESIGN

The following issue was identified as a result of further analysis and was the basis for designing Alternative 3, an alternative to the proposed action. The statement of the issue is then followed by a more detailed explanation. Units of measure were developed for the reader to easily distinguish between each alternative, and how they respond to the issue. An alternative comparison table (Table 1) is presented.

Issue: The proposed trail is located within Key Elk Habitat and is partially located within habitat that has been identified as high quality for elk calving. The proposed action is in conflict with the Standards and Guides of the Forest Plan.

Discussion: The proposed non-motorized trail is located within the Wild and Scenic Corridor which is also included within the Ryan Ranch Key Elk Habitat Area on the east side of the Deschutes River. Forest Plan management direction states: *"The management of riparian areas will incorporate elk calving needs to the extent they do not conflict with the needs or objectives of riparian-dependent resource management. Management of adjacent upland areas does not need to incorporate elk needs unless they are within a key area" (WL-44)*. Ryan Ranch: *"Public use will be encouraged on travel routes which will minimize conflicts with elk."* *"Facilities will not be developed nor activities promoted which would encourage public use during the winter" (WL-45)*. The proposed trail would parallel the river and could disrupt elk/calving activities in areas that have been identified as key habitat for elk calving. Relocating a portion of the proposed trail to avoid areas of key habitat would likely reduce the risk of disruption to elk/calving activities.

Units of Measure: 1) Trail distance within elk habitat; 2) Trail distance within hiding and thermal cover.

ALTERNATIVE DISCUSSION

This section presents a detailed description of a No Action Alternative and two (2) action alternatives that respond to the "Purpose and Need" and are considered to be reasonable and viable by the Decision Maker (District Ranger, Bend-Fort Rock Ranger District). Alternatives, other than the No Action Alternative, are designed to move towards the desired condition consistent with the standards and guidelines of the Forest Plan. **All measurements are approximate.**

Alternatives Considered But Eliminated From Further Analysis

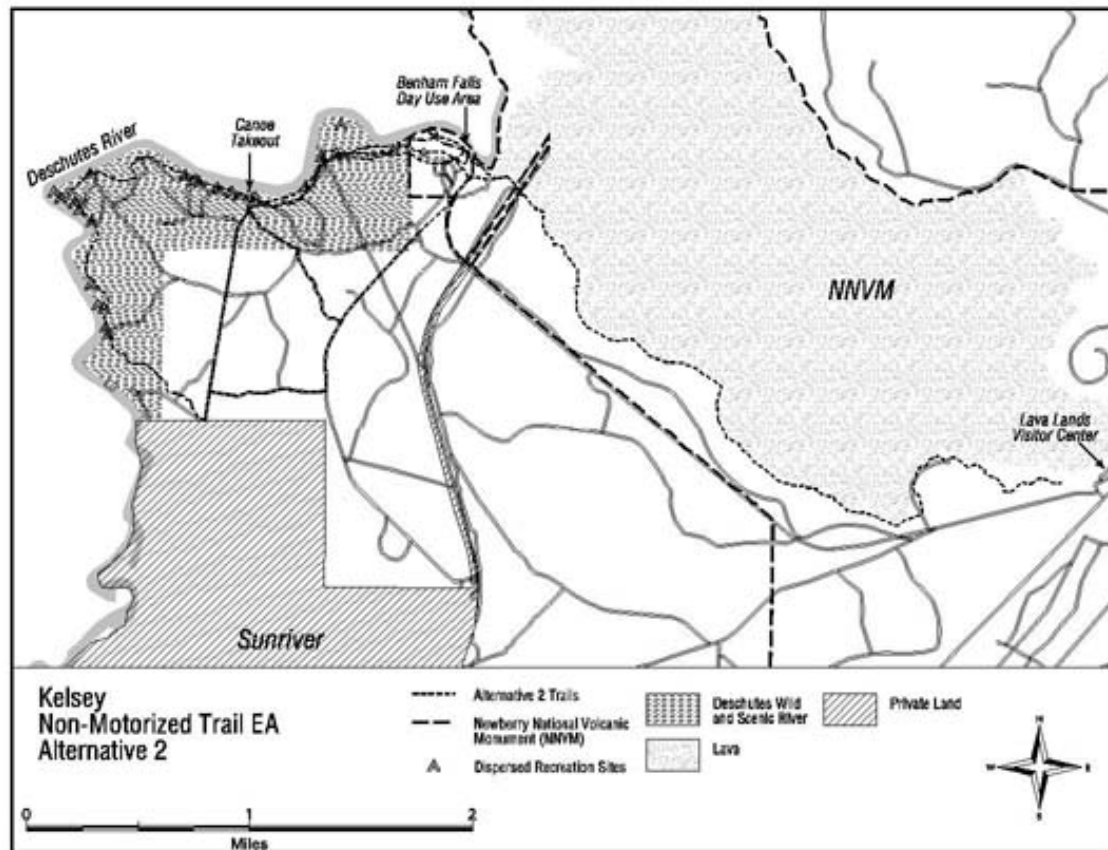
No additional alternatives were considered that were eliminated from further analysis. Due to the limitations of the north boundary of Sunriver Resort, the following alternatives that were considered in detail provide logical locations for the proposed actions.

Alternatives Considered In Detail

Alternative 1 (No Action): The primary user-created trail, located adjacent to the Deschutes River, would continue to provide non-designated access within the riparian zone and in elk calving habitat. Enhancement of visitor opportunities and experiences within the Newberry National Volcanic Monument would not occur. Bike and hiking use would continue on roads and user created trails.

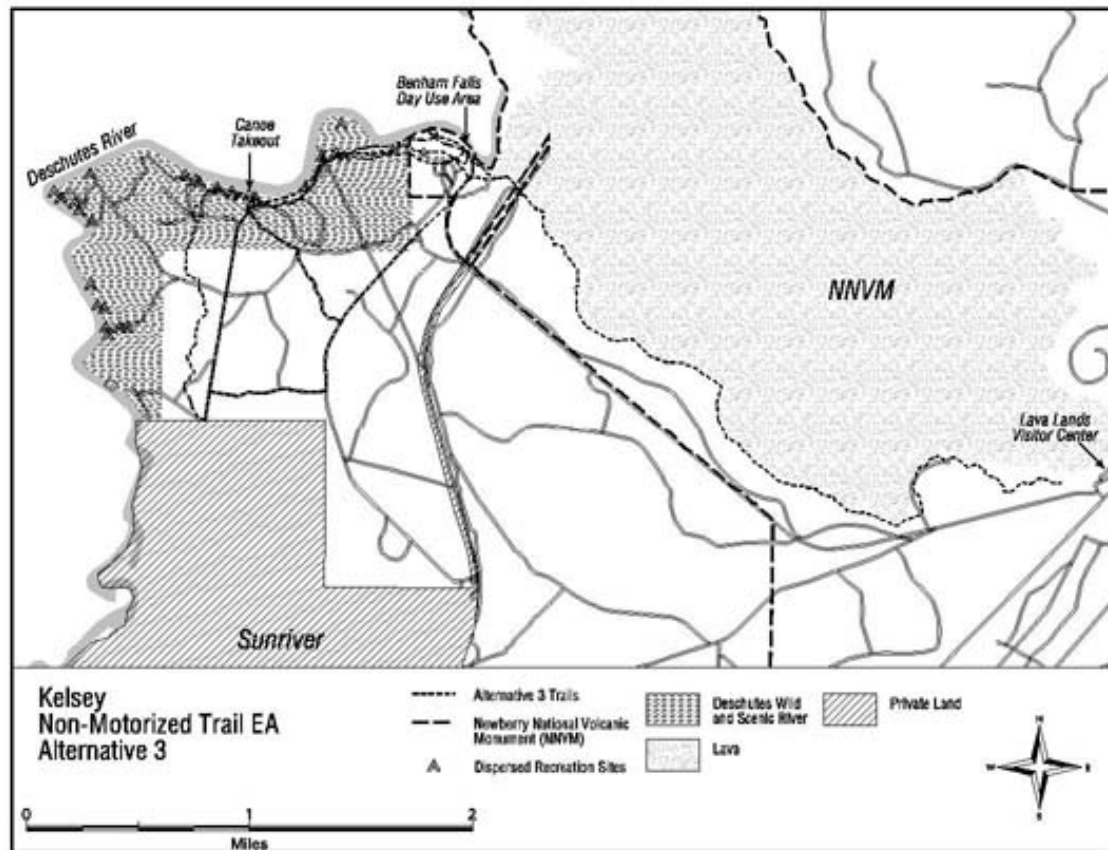
Alternative 2 (Proposed Action): Designate and develop a non-motorized trail that is approximately four and one-half (4.5) miles and parallel to the Deschutes River from the north boundary of Sunriver to Benham Falls Day Use Area and approximately four and one-half (4.5) miles from Benham Falls day use area to Lava Lands Visitor Center (Figure 2).

Figure 2



Alternative 3: Designate and develop a non-motorized trail that is approximately four (3.9) miles from the north boundary of Sunriver to the Benham Falls day use area and approximately four and one-half (4.5) miles from Benham Falls day use area to Lava Lands Visitor Center. This Alternative would design the trail to bypass areas providing high quality elk calving habitat (Figure 3).

Figure 3



Alternative Comparison

Table 1 compares the existing condition and the alternatives in relation to the activities proposed in Alternatives 1 (No Action), 2 (Proposed Action), and 3. **All numbers are approximate.**

Table 1: Alternative Comparison - Miles of Existing Trail Miles and Proposed Designated Trail Miles				
	Existing Trail Miles	Alternative 1 (No Action)	Alternative 2 (Proposed Action)	Alternative 3
Key Elk Habitat		0	9.0	8.4
Hiding Cover	5.3	0	6.1*	4.6*
Thermal Cover	5.5	0	5.5*	4.4*
Selected Raptors				
Great Gray Owl	0.8	0	2.5	1.2

Northern Goshawk	0.9	0	2.5	1.3
Copper's Hawk	0.9	0	2.6	1.4
Riparian and Aquatic Habitat	1.8	0	3.8	1.7

* Miles of proposed trail within Hiding and Thermal cover is overlapped and does not equal more than the total miles in each alternative.

MITIGATION MEASURES COMMON TO ALTERNATIVE 2 (PROPOSED ACTION) AND ALTERNATIVE 3

Alternatives are designed to be consistent with the desired condition specified in the Forest Plan and the standards and guidelines contained within. Many Forest Plan standards and guidelines were applied in the design of the alternatives and are not listed here. The following measures would be applied to reduce potential adverse impacts of Alternatives 2 and 3. If implementation or layout problems or opportunities are encountered, the appropriate specialist will be consulted.

Wildlife

1. To avoid negative effects to birds including nest destruction, loss of broods, and direct mortality of adults - trail construction would not occur from April 1 - August 15. If this time period must be compromised, consult the wildlife biologist to coordinate and schedule project implementation.
2. In the event that raptor nests are discovered during project preparation or implementation, active nest sites would be protected from disturbing activities within ¼ mile of the nest by restricting operations during the nesting period (based on LMRP Standard and Guideline WL-3). Consult with a wildlife biologist to evaluate whether activities are site disturbing.

March 1 - August 31: Red-tailed hawk & northern goshawk
February 1 - July 31: Golden Eagle
April 15 - August 31: Cooper's hawk

3. To prevent disturbance of wintering elk in the Ryan Ranch Key Elk Area, use of the Sunriver-Benham Falls-Lava Lands Visitor Center trail would be prohibited from December 1 - March 31 of each year. Trail signing would either indicate that the trail is closed to winter use or be constructed in such a manner that the trail would not be noticeable during winter months. Special use permits to allow organized events (snowshoeing, cross-country skiing, etc.) would not be allowed (based on LMRP Standard and Guideline WL-45).

Botany

4. Begin project operations (i.e. vegetation management, prescribed fire) in uninfested areas before operating in weed-infested areas.
5. Prior to entering the project area require all personnel (Forest Service employees, contractors, or volunteers) involved in trail construction and maintenance to inspect shoes, clothing, vehicles, and equipment to ensure that they are free of soil, seeds, vegetative matter or other debris that could contain or hold seeds. When working in an area infested with weeds clean equipment, vehicles, shoes and clothing that hold soil, seeds, or vegetative matter before entering sites that are not infested with weeds.
6. Annually inspect trailheads, trails, day use areas, and visitor center area for weeds and treat

infestations. Consider high use recreation areas as high priority for weed eradication; maintain these areas in a weed-free condition.

7. Improve the effectiveness of prevention practices by posting weed awareness messages, including weed identification and prevention practices, at strategic locations, such as the trailheads at Sunriver, Benham Falls day use area, and Lava Lands Visitor Center. Include information about how and where to report weed infestations. Inform users of appropriate ways to help with weed control along the trail.
8. Encourage public land users, before recreating on the trail, to inspect and clean mechanized trail vehicles, shoes, clothing, and pets of weeds and their seeds.

Fisheries

9. Whenever possible, slope water bars to drain away from the Deschutes River. If waterbars must drain toward the river, choose drainage areas that allow settling of sediment prior to water entering water body, i.e., areas that are well-vegetated, areas with downed wood, or areas that have a valley bottom or floodplain relatively wide and gently-sloped to allow settling of sediments.
10. Any waste areas from excess materials generated during trail construction should be deposited and stabilized in areas that would not contribute sediments to the Deschutes River.
11. Locate new trail construction and reroutes in areas that would avoid adverse effects to water quality. Areas likely to have adverse effects are: in riparian areas or areas adjacent to the river, steep slopes, and areas devoid of vegetation upslope of the river.

Cultural Resource

12. Modify the trail route to avoid building the trail through two of the prehistoric sites. Use trail that currently exists through the other two prehistoric sites (preliminary route) or the other prehistoric site (alternate route). Do not "improve" the trail at these locations with signs, stops, or side trails. Reroute the trail to avoid exposing historic artifacts along the Huntington Road.
13. An archaeologist should assist in trail layout to avoid impacting cultural site locations. The trail route should be monitored after construction and approximately a year later to determine if additional resources are exposed and to check on the effectiveness of avoidance measures.

Hydrology

14. No mechanized equipment would be used in Riparian Habitat Conservation Areas.
15. Water control structures would be installed and maintained on portions of trail that have gradients of 10 percent or greater.
16. Ground disturbance would be minimized as is possible.
17. Avoid ground-disturbing operations during periods of high soil moisture.
18. Best Management Practices (BMPs) would be implemented to prevent water quality degradation, primarily from sediment delivery to aquatic ecosystems. BMPs should be selected and tailored for site-specific conditions to arrive at the project level BMPs for the protection of water quality. A complete explanation of the BMPs is found in General Water Quality Best Management Practices (USDA, 1988) and is available at the District or Supervisor's Office. Consult the Fisheries Report for BMP's that apply to watershed health/fisheries for this project.

AFFECTED ENVIRONMENT AND ENVIRONMENTAL CONSEQUENCES

This section describes the present condition of the affected environment and discloses environmental

consequences expected as a result of Alternative 1 (No Action), Alternative 2 (Proposed Action) and Alternative 3. The action alternatives are designed to be consistent with the desired conditions specified in the Forest Plan standards and guidelines, along with direction found in Interim Management Direction Establishing Riparian, Ecosystem and Wildlife Standards for Timber Sales (Eastside Screens). This section provides the scientific and analytic basis for comparison of the alternatives. Probable effects are discussed in terms of environmental changes from the current condition. This section also describes the indirect, direct, cumulative, duration and intensity of effects of the alternatives. **All measurements are approximate.**

Recreation Resource

AFFECTED ENVIRONMENT: Two (2) non-signed, not well-defined, user-created trails connect with the Benham Falls Day Use Area, one from Sunriver and the other from Lava Lands Visitor Center. They total approximately 9 miles. Much of the trail from Sunriver to the Day Use Area is located on roads although the route generally parallels the river. The route from Benham Falls day use Area to Lava Lands Visitor Center follows the lava flow. A fisherman's trail parallels most of the River. One (1) signed bike route exists along Forest Roads from Sunriver to the Benham Falls day use Area. The River Plan provides direction for the establishment of a trail from Sunriver to the southern urban growth boundary of Bend.

ALTERNATIVE 1 (NO ACTION): There would be no change to non-motorized recreation access. Non-motorized use would remain the same or increase. Adverse impacts from undesignated trails, in the form of trampled vegetation and compacted soils, would be maintained in the current condition or increase. There would be no change of location of any user-created trail, although trails would continue to develop where routes are used repeatedly. Day use activities would most likely continue to increase adjacent to the urban interface zone.

ALTERNATIVE 2 (PROPOSED ACTION): The construction of the trail from Sunriver to the Benham Falls day use area and continuing to Lava Lands Visitor Center would provide designated, non-motorized access routes to the Deschutes River.

ALTERNATIVE 3: The trail from Sunriver to Benham Falls Day Use Area would be constructed further to the East from the Deschutes River to avoid high quality elk calving habitat. The trail would be shortened from that proposed in Alternative 2 (Proposed Action), from approximately 9 miles to 8.4 miles. The location of the proposed Alternative 3 trail would have more of the length included within upland areas away from the river rather than adjacent to the river as proposed within Alternative 2.

COMMON TO ALTERNATIVES: Recreation use is expected to rise at approximately 5 percent per year. This is due to a similar increase in the population of Central Oregon as well as the popularity of the area as a recreational destination. Users on foot or bikes would possibly continue to develop user-created routes nearer the river. Parking pressure at the day use area would be reduced. The need for user-created trails would be reduced. Trail access would be designated, signed, and easy to follow.

Wildlife Resource

AFFECTED ENVIRONMENT: Numerous wildlife species are known or suspected to occur within the project area. Osprey are frequently observed near the river and there are historic nest sites in the area. Currently, there are no known active nests in close proximity to the project. Dense stands of lodgepole pine adjacent to the Deschutes River provide suitable habitat for the great gray owl, northern goshawk, and Cooper's hawk. Surveys for the great gray owl and northern goshawk have been conducted but no detections have been made. Great blue heron, Canada geese, and numerous species of waterfowl including mallard, bufflehead, golden-eye, and widgeon ducks are regularly observed in the area. Small mammals regularly observed in the area include the golden mantle ground squirrel, yellow pine chipmunk, western gray squirrel, and coyote. Porcupine, raccoon, and river otter are seen infrequently.

The project area is within the biological winter range of mule deer, deer are known to winter in the area although the Forest Plan does not designate the area as Deer Habitat (winter range). Mule deer are

observed in the area during all seasons. The area is within the Ryan Ranch Key Elk Habitat Area, as designated by the Forest Plan. The Forest Plan places special emphasis on minimizing conflicts with elk, particularly in calving habitat and during the winter periods. Areas along the Deschutes River provide high quality hiding cover and fawning/calving habitat, particularly in dense lodgepole pine stands between Sunriver and Benham Falls Day Use Area.

Table 2 displays wildlife/habitats that have been reviewed to determine if the project/activity would have negative effects on them including Forest Plan Management Indicator Species (MIS), ecological indicator species, and special habitats (include: caves, old-growth forest, riparian, wetlands, and snags) A X in the table indicates potential negative effect to species/habitat.. The wildlife report does not evaluate the effects upon federally listed, proposed or candidate species. It also does not evaluate the effects upon Region 6 designated sensitive species. Refer to the biological evaluation, in the District files, for the analysis of those species.

Table 2: Wildlife and Habitats Potentially Affected by Proposed Activities				
Species	Species Potentially Affected	Management Indicator Species	U.S. Fish and Wildlife Service Species of Concern	Ecological Indicator Species - Neotropical Migratory Birds*
Mule Deer -	X	X		
Transition Range				
Summer Range	X			
Winter Range	X			
Fawning Habitat	X			
Elk -	X	X		
Transition Range				
Summer Range				
Winter Range	X			
Calving Habitat	X			
Raptors -				
Osprey	X	X		X
Great Gray Owl	X	X		
Northern Goshawk	X	X	X	X
Cooper's hawk	X	X		X
Ferruginous Hawk			X	
Woodpeckers	X	X		
Great Blue Heron	X	X		
Waterfowl -	X			
Harlequin Duck (see BE)			X	
California Wolverine (see BE)		X		
American Marten		X		

Western Big-eared Bat		X		
Logs/Down Wood spp.	X	X		
Special Habitats - Riparian	X	X		
Black Tern			X	
Olive-Sided Flycatcher	X		X	X
Tri-Colored Blackbird (see BE)			X	
Western Sage Grouse (see BE)			X	

*Neotropical Migratory Birds include: Osprey, Cooper's Hawk, Red-tailed hawk, Brewer's blackbird, western tanager, yellow-rumped warbler, Swainson's thrush, hermit thrush, American robin, tree swallow, and violet-green swallow.

ALTERNATIVE 1 (NO ACTION): The undeveloped, undesignated trail system would continue as a source of disturbance to wildlife species in the area. Some trails are on forest roads and lead to developed areas that receive high levels of human use. The No Action Alternative does not affect high quality habitats adjacent to the Deschutes River between Sunriver and the Benham Falls day-use area.

Deer and Elk: The No Action alternative would maintain the current undeveloped, undesignated trail system. There would be approximately 4.4 miles of signed, although not officially designated, biking trail on Forest Service roads between Sunriver and the Benham Falls day-use area and approximately 5.0 miles of unsigned, undeveloped trail between Benham Falls and the Lava Lands Visitor Center. Bike and hiking use of trails would continue. Disturbance to deer and elk from trail use would continue to occur, particularly on those portions of trail that pass through hiding and thermal cover that are not on forest roads. Biking and hiking use of roads is a minor source of disturbance since roads presently have high levels of disturbance from motor vehicle use. High quality hiding and thermal cover and fawning/calving habitat provided by dense lodgepole pine stands along the Deschutes River would remain unaffected by the existing trail system. Refer to **Table 3** for approximate miles of trail that pass through hiding and thermal cover.

Osprey, Great Gray Owl, Northern Goshawk, Great Blue Heron, Waterfowl, Neotropical Migrant Birds: Biking and hiking use of trails in habitat of the osprey, great gray owl, great blue heron, waterfowl and various species of neotropical migratory birds would continue. Trail use and human activity in these areas would continue as a source of disturbance. The greatest negative effects are and would continue to be between the canoe takeout (at the end of Forest Road 600) and the Benham Falls day-use area, areas that already receive high levels of human disturbance. Dense stands of lodgepole pine that provide suitable nesting habitat for the great gray owl, northern goshawk, and Cooper's hawk that are relatively free of human disturbance would remain unaffected by the user-created and signed trails. Refer to **Table 3** for existing miles of trail that pass through habitat of the great gray owl, northern goshawk, and Cooper's hawk.

Logs/snags: There would be no direct, indirect, or cumulative effects to the amount or arrangement of log and snag habitat, or to wildlife species associated with these habitats. Trails would not be developed or designated and trail maintenance to clear down logs or snags would not occur. There would be minor disturbance effects to log and snag associated wildlife given that nearly half of the existing trail system is located on forest roads and in areas that already receive high levels of human use.

Riparian: There would be no direct effects to riparian habitat or riparian-associated wildlife species. Indirect effects include continued human access to the riparian area, potentially increasing the risk of damage to riparian vegetation and disturbance of riparian-associated wildlife. The area between the canoe takeout and the Benham Falls day-use area is readily accessible to motor vehicles and receives high human use. Continued use of the riparian user created trail would have minor effects to riparian habitats and associated wildlife species. Refer to **Table 3** for existing miles of trail that pass through riparian and aquatic habitat.

Miles of Trail through Habitat	Elk		Raptors			Riparian and Aquatic Habitat
	Hiding Cover	Thermal Cover	Great Gray Owl	Northern Goshawk	Cooper's Hawk	
"Signed" Trail	2.2	2.5	.5	.5	.5	
"User-created" Trail	3.1	3.0	.3	.4	.4	
Total Non-Motorized Trail	5.3	5.5	.8	.9	.9	1.8

ALTERNATIVE 2 (PROPOSED ACTION): The Proposed Action would develop and designate a trail that would affect the greatest amount of wildlife habitat (**Table 1**) including deer and elk cover, fawning and calving habitat, and nesting habitat of the great gray owl, northern goshawk, and Cooper's hawk. Disturbance to wildlife would increase and habitat effectiveness would be decreased. The effects would be most substantial between Sunriver and Benham Falls where there is relatively little human disturbance. The proposed action is the least compatible with Forest Plan direction regarding recreation management in key elk areas.

Deer and Elk: The proposed trail would be developed through high quality hiding and thermal cover, and calving and fawning habitat in the area between Sunriver and the Benham Falls day-use area. This habitat area currently receives relatively little human use, in context of the surrounding areas, and provides an area of seclusion from human activity. A developed trail would decrease the cover and habitat value of this area. Big game, particularly elk, would likely be displaced from habitat close to the river. Human activity during the fawning/calving season (May 1 to July 31) could preclude deer and elk from utilizing the area for fawning/calving. The portion of proposed trail from Benham Falls to the Lava Lands Visitor Center would have less effect to big game due to the greater distance from the river and the close proximity to the lava flow and Forest Road 9702. The cumulative effects from human activities resulting from the Proposed Action, town of Sunriver, dispersed recreation use along the river, canoe takeout, and the Benham Falls day-use area would be to decrease the quality of hiding and thermal cover and fawning and calving habitat between Sunriver and Benham Falls day-use area. With the development of the trail along the river there would be no habitat in close proximity to the river that would be free of human disturbance. Refer to Table 1, for the approximate miles of trail in Alternative 2 that would affect hiding and thermal cover.

Osprey, Great Gray Owl, Northern Goshawk, Great Blue Heron, Waterfowl, Neotropical Migrant birds: The portion of proposed trail between Sunriver and the Benham Falls day-use area that closely parallels the Deschutes River passes through suitable habitat of numerous bird species. Included are osprey, great gray owl, northern goshawk, Cooper's hawk, great blue heron, waterfowl, and neotropical migratory birds. Dense stands of mature lodgepole pine provide nesting habitat for the great gray owl, northern goshawk, and Cooper's hawk, while riparian and aquatic habitat along the river provide habitat for osprey, great blue heron, and waterfowl. Trail associated human activity in these areas, including dogs, would disturb wildlife. Disturbance during the breeding and nesting season (March - September) could potentially preclude the use of these stands for nesting, particularly the more territorial and reclusive birds such as the great gray owl, northern goshawk, and Cooper's hawk. Human activity and dogs in riparian habitats would be especially disturbing to ground nesting riparian

and aquatic associated species, including many species of waterfowl and neotropical migrant birds. Disturbance could result in nest abandonment or failure, or direct mortality of these birds and bird groups. **Table 1** displays miles of trail through nesting habitat of the great gray owl, northern goshawk, and Cooper's hawk. Refer to **Table 1** for the miles of trail that would affect riparian and aquatic associated wildlife species.

Logs/snags: Developing and designating a trail would have minor effects to log and snag habitat and wildlife species associated with these habitats. Potential negative impacts include the redistribution (cutting and moving aside) of logs and down wood to clear the path for the trail and felling snags that pose a hazard to trail users. These activities would have minor site-specific negative effects. These effects could include disturbance to wildlife, particularly during breeding seasons (spring and early summer), habitat and species such as tree and ground squirrels, chipmunks, other small mammals, amphibians, cavity excavators, and secondary cavity users. The cumulative effects of trail construction, user created trails, felling hazard trees along roads, wood cutting for dispersed camping, and developed sites, and forest improvement activities such as thinning to decrease bark-beetle risk and underburning to decrease fire risk are an overall reduction in the number of snags and logs in the area. In context of the other presently occurring activities, the effects of the proposed trail construction would be negligible. The project may negatively impact individuals, but would not be expected to have substantial negative effects to wildlife populations.

Riparian: There are no anticipated direct effects to riparian habitat. The proposed trail would not be located within or directly affect the riparian area. Potential indirect effects include: 1) site-specific damage to riparian vegetation and stream banks from trail users accessing the river and 2) riparian-associated wildlife, including disturbance, particularly during the breeding season, as discussed in the previous sections. Providing designated human access to nearly the entire distance of river from Sunriver to Benham Falls would have a negative cumulative effect to riparian habitat and riparian-associated wildlife species. **Table 1** displays the miles of trail that would affect riparian and aquatic associated wildlife species.

ALTERNATIVE 3: Increased negative effects would occur as result of implementation of this alternative. These effects would be more than the No Action Alternative but fewer than Alternative 2 (Proposed Action). Fewer miles of developed trail would affect fewer acres of hiding and thermal cover, fawning and calving habitat, riparian habitat, and habitat of the great gray owl, northern goshawk, and Cooper's hawk. The trail would also be routed around high quality habitat in the area between Sunriver and the Benham Falls day-use area.

Deer and Elk: This alternative would avoid areas of high quality hiding and thermal cover adjacent to the Deschutes River. It would minimize conflicts between recreational use of trails and deer fawning and elk (Ryan Ranch Key Elk Habitat) calving habitat. This alternative would develop and designate approximately 1.4 fewer miles of trail through hiding and thermal cover than the proposed action. Dense lodgepole pine stands along the river would be maintained and continue to provide areas of seclusion for big game. The trails that would be developed would be located in areas that currently have high levels of human use. The amount of disturbance to big game from a designated trail would not be much greater than the current condition. Refer to **Table 1** for the approximate miles of trail in Alternative 2 that would affect hiding and thermal cover.

Osprey, Great Gray Owl, Northern Goshawk, Great Blue Heron, Waterfowl, Neotropical Migrant birds: Potential negative effects from implementation of Alternative 3 include disturbance and disruption of breeding activities. Disturbance and disruption could result in nest abandonment and failure, and direct mortality of birds. Potential negative effects are substantially less than the proposed action. This alternative would substantially reduce conflicts with nesting habitat. The proposed trail from Sunriver to the Benham Falls day-use area would border rather than pass through nesting habitat. The trail would also have fewer trail miles adjacent to the Deschutes River. **Table 1** displays the miles of trail through nesting habitat of the great gray owl, northern goshawk, and Cooper's hawk. **Table 1** also displays the miles of trail that would affect riparian and aquatic associated wildlife species.

Logs/snags: Alternative 3 would affect less area of log and snag habitat but would be similar to the proposed action. Developing and designating a trail would have minor effects to log and snag habitat and wildlife species associated with these habitats. Potential negative impacts include the redistribution (cutting and moving aside) of logs and down wood to clear the path for the trail and felling snags that

pose a hazard to trail users. These activities would have minor site-specific negative effects. These effects could include disturbance, particularly during breeding seasons, to wildlife habitat and species such as tree and ground squirrels, chipmunks, other small mammals, amphibians, cavity excavators, and secondary cavity users. The project could negatively impact individuals, but would not be expected to have substantial negative effects to wildlife populations. There are abundant down logs and snags throughout the area. Cumulative effects would be similar to Alternative 2 (Proposed Action), with fewer miles affected in Alternative 3.

Riparian: There are no anticipated direct effects to riparian habitat, as the trail would not be located within riparian vegetation. Potential indirect effects include site-specific damage to riparian vegetation and stream banks from trail users accessing the river and disturbance to riparian associated species. As previously discussed, disturbance during the breeding season would have the greatest negative effects to wildlife potentially resulting in displacement from habitats near trails, nest abandonment and failure, destruction of nests, and direct mortality of birds. This alternative would have fewer negative effects than the proposed action, as it would affect approximately 2.0 miles less and not be located adjacent to riparian habitat between Sunriver and the canoe takeout at the end of the Forest Road 600. From the canoe takeout to Benham Falls the trail would be in an area that currently has road access and receives high levels of human use.

Soils Resource

AFFECTED ENVIRONMENT: Soils in the Kelsey planning area are strongly influenced by materials deposited from volcanic eruptions, including volcanic ash, pumice and cinders. Mount Mazama erupted 6,000 years ago and was the primary volcanic event that influenced the present soils in this area. The Mazama pumice and ash have depths generally ranging from 20 to 40 inches. Newberry Crater, a great shield volcano, was another volcanic event, approximately 1,300 years ago, which shaped the landscape in the planning area. The gentle lava-covered slopes on the north and south flanks of Newberry Crater are punctuated with numerous cinder cones. Ash and pumice from these cinder cones covered the area.

The dominant land types within the project area exhibit high water infiltration rates and are classified as well to excessively drained. Surface soils are pumiceous loamy sands and sands. Underlying soils are loams to gravelly loamy sands and sands. Permeability is very rapid in surface soils and moderate to rapid in buried soils. The water table can be encountered within two (2) to five (5) feet from the surface in some of these soils. Underlying bedrock in the planning area is composed mostly of basalts and andesites. This bedrock has a high to moderate capacity to store water and a low to moderate rate of water transmission unless storage capacity is exceeded. **Table 4** displays the soils mapping units that occur within the project area and their key interpretation.

Mapping Unit	% Slope	Natural Stability	Erosion Potential	Compaction Potential	Displacement Potential	Sedimentation Yield Potential
14	25-80	Stable	Moderate	Low	High	Low-Moderate
15	0-10	Very Stable	Low	Low-Moderate	Low-Moderate	Low
25	10-40	Stable	Low	Low- Moderate	Moderate	Low
63	0-10	Very Stable	Low	Low-Moderate	Low	Low
64	0-30	Very Stable	Low-Moderate	Low	Moderate	Low
65	10-20	Very Stable	Low-Moderate	Low	Moderate	Low
93	0-30	Very Stable	Low	Low	Low to Moderate	Low

Existing Soil Quality: The existing soil quality within the project area can be evaluated by looking at the inherent soil quality (productivity), sensitivity (susceptibility and resiliency to disturbances), and soil condition class (% area of detrimental impacts from previous activities). **Table 5** displays the existing soil quality class or classes for the various Mapping Units within the project area.

Mapping Unit	Inherent Soil Quality	Existing Soil Quality	Sensitivity	* Soil Condition Class
14	Moderate	Moderate	Yes	A, B, C
15	V. Low	V. Low	No	A, B, C
25	Mod- High	Moderate	No	A, B
63	Moderate	Moderate	No	A, B, C
64	Moderate	Low (45 ac.)	No	A, B, C, D
65	High	Moderate (18 ac)	No	A, B, C, D
93	Moderate	Moderate	No	B

*Soil Condition Class: A= 0-10% (area with detrimental impacts); B= 11-20%; C= 21-40%; and D= 41+%.

ALTERNATIVE 1 (NO ACTION): There would be no immediate change in the physical character to the soil resource. Use of the non-designated trail from Sunriver Resort to Benham Falls would increase with increases in population. As a result there would be an anticipated increase in user-created trails along the Deschutes River. A decrease in soil productivity would continue along these trails. An indirect effect from increased soil compaction from user-created trails is a potential increase of sediment into the Deschutes River. A decrease in streamside vegetation would result in stream bank instability.

ALTERNATIVE 2 (PROPOSED ACTION): Approximately 2.2 acres of soil would be taken out of production from the proposed trail construction. The construction and designation of a non-motorized trail and closure of present user created trails would improve the overall soil condition. A designated non-motorized trail would help reduce the development of other user-created trails and the cumulative impacts to soils associated with trail development. The proposed trail construction project would not have a substantial cumulative effect to the soil resource with implementation of foreseeable future activities in the immediate area.

ALTERNATIVE 3: Approximately 2.0 acres of soil would be taken out of production from the proposed trail construction. Fewer acres impacted would benefit the soils resource. A beneficial cumulative impact would occur with closure of other user created trails. A designated non-motorized trail would help reduce the development of other user-created trails and the cumulative impacts to soils associated with trail development. The proposed trail construction project would not have a substantial cumulative effect to the soil resource with implementation of foreseeable future activities in the immediate area.

Botany Resource

AFFECTED ENVIRONMENT

Proposed, Endangered, Threatened, and Sensitive (PETS) Species: No plant species listed on the Region 6 Forester's Sensitive Plant List (May 13, 1999) were found during recent surveys of the project area. Records of surveys show that two (2) species of PETS plants, *Castilleja chlorotica* and *Artemisia lucoviciana* ssp. *estesii*, have sites near the project area. *Artemisia lucoviciana* spp. *estesii*, a sensitive plant, sites has been documented adjacent to the Deschutes River. *Castilleja chlorotica* has potential habitat in some units in the Kelsey planning area, but no sites were found during surveys in the project area. No habitat for Threatened or Endangered plant species appears to exist within the planning area.

Refer to **Table 6** for the Regional Forester's Sensitive Species List for the Deschutes National Forest.

Table 6: Regional Forester's Sensitive Plants (1999); Deschutes National Forest			
Scientific Name	Common Name	Listing Status*	Codes**
<i>Agoseris elata</i>	Tall agoseris	ONHP List 2	D
<i>Arabis suffrutescens</i> var. <i>horizontalis</i>	Crater Lake rockcress	SOC; ONHP List 1	S
<i>Arnica viscosa</i>	Shasta arnica	ONHP List 2	D
<i>Artemisia ludoviciana</i> ssp. <i>estesii</i>	Estes' artemisia	SOC; ONHP List 1	D
<i>Aster gormanii</i>	Gorman's aster	SOC; ONHP List 1	S
<i>Astragalus peckii</i>	Peck's milk-vetch	SOC; ONHP List 1	S
<i>Botrychium pumicola</i>	Pumice grape-fern	SOC; ONHP List 1	D
<i>Calamagrostis breweri</i>	Brewer's reedgrass	ONHP List 2	S
<i>Calochortus longebarbatus</i> var. <i>longebarbatus</i>	Long-bearded mariposa lily	SOC; ONHP List 1	S
<i>Carex hystricina</i>	Porcupine sedge	ONHP List 2	S
<i>Carex livida</i>	Pale sedge	ONHP List 2	S
<i>Castilleja chlorotica</i>	Green-tinged paintbrush	SOC; ONHP List 1	D
<i>Cicuta bulbifera</i>	Bulb-bearing water-hemlock	ONHP List 2ex	S
<i>Collomia mazama</i>	Mt. Mazama collomia	SOC; ONHP List 1	S
<i>Gentiana newberryi</i> var. <i>newberryi</i>	Newberry's gentian	ONHP List 2	D
<i>Lobelia dortmanna</i>	Water lobelia	ONHP List 2	D
<i>Lycopodiella inundata</i>	Bog club-moss	ONHP List 2	D
<i>Lycopodium complanatum</i>	Ground cedar	ONHP List 2	S
<i>Ophioglossum pusillum</i>	Adder's-tongue	ONHP List 2	S
<i>Penstemon peckii</i>	Peck's penstemon	SOC; ONHP List 1	D
<i>Pilularia americana</i>	American pillwort	ONHP List 2	S
<i>Rorippa columbiae</i>	Columbia cress	SOC; ONHP List 1	S
<i>Scheuchzeria palustris</i> var. <i>americana</i>	Scheuchzeria	ONHP List 2	D
<i>Scirpus subterminalis</i>	Water clubrush	ONHP List 2	D
<i>Thelypodium howellii</i> ssp. <i>howellii</i>	Howell's thelypody	ONHP List 2	S

***Species of Concern (SOC)** = Federal Designation; neither Endangered or Threatened; **Oregon Natural Heritage Program (ONHP) List 1:** Species which are endangered or threatened throughout their range or which are presumed extinct; **ONHP List 2:** Species which are threatened, endangered or possibly extirpated from Oregon, but more common or stable elsewhere.

****D**=Documented; **S**=Suspected

Competing or Unwanted Vegetation: Portions of the project area are within the Newberry National Volcanic Monument, the Upper Deschutes Wild and Scenic River Corridor, Benham Falls day use area, and Lava Butte Geological Area, all high-use recreation areas. The Sunriver/Benham Falls/Lava Lands Visitor Center non-motorized trail project area is accessed through Sunriver (via Road 40 or Cottonwood Road), Benham Falls day use area, and the Lava Lands Visitor Center which all have known infestations of noxious weeds. The following **Table 7** displays the Deschutes National Forest Noxious

Weed List.

Table 7: Deschutes National Forest Noxious Weed List		
SCIENTIFIC NAME	COMMON NAME	PRESENCE
<i>Agropyron repens</i>	Quackgrass	Documented
<i>Cardaria (=Lepidium) draba</i>	Whitetop	Potential
<i>Carduus nutans</i>	Musk thistle	Potential
<i>Carduus pycnocephalus</i>	Italian thistle	Potential
<i>Centaurea diffusa</i>	Diffuse knapweed	Documented
<i>Centaurea maculosa</i>	Spotted knapweed	Documented
<i>Centaurea pratensis</i>	Meadow knapweed	Potential
<i>Centaurea repens</i>	Russian knapweed	Potential
<i>Centaurea solstitialis</i>	Yellow star-thistle	Potential
<i>Centaurea virgata</i> spp. <i>squarrosa</i>	Squarrose knapweed	Potential
<i>Cirsium arvense</i>	Canada thistle	Documented
<i>Cirsium vulgare</i>	Bull thistle	Documented
<i>Conium maculatum</i>	Poison hemlock	Potential
<i>Cynoglossum officinale</i>	Common houndstongue	Documented
<i>Cytisus scoparius</i>	Scot's broom	Documented
<i>Dipsacus sylvestris</i>	Teasel	Potential
<i>Euphorbia esula</i>	Leafy spurge	Potential
<i>Hypericum perforatum</i>	St. Johnswort	Documented
<i>Isatis tinctoria</i>	Dyer's woad	Documented
<i>Kochia scoparia</i>	Kochia	Potential
<i>Linaria dalmatica</i>	Dalmation toadflax	Documented
<i>Linaria vulgaris</i>	Butter and Eggs	Documented
<i>Lythrum salicaria</i>	Purple loosestrife	Potential
<i>Onopordum acanthium</i>	Scotch thistle	Documented
<i>Phalaris arundinacea</i>	Reed canarygrass	Documented
<i>Ranunculus repens</i>	Creeping buttercup	Potential
<i>Salvia aethiopsis</i>	Mediterranean sage	Potential
<i>Senecio jacobaea</i>	Tansy ragwort	Documented
<i>Taeniatherum caput-medusae</i>	Medusahead	Potential

Verbascum thapsus, common mullein, is not on the Oregon State noxious weed list. It is of concern on the Deschutes National Forest because it invades disturbed sites and may compete with young trees and other desirable native plants.

ALTERNATIVE 1 (NO ACTION), ALTERNATIVE 2 (PROPOSED ACTION), AND ALTERNATIVE 3 Proposed, Endangered, Threatened, and Sensitive (PETS) Species: Alternative 1 (No Action) and the proposed Sunriver/Benham Falls/Lava Lands Visitor Center trail project would have no direct, indirect, or cumulative impacts to the habitat, sites, or cause a loss of viability or a trend toward

Federal listing for *Artemisia ludoviciana* var. *estesii* or for *Castilleja chlorotica*. None of the alternatives in the non-motorized trail project would have direct, indirect, or cumulative impacts to habitat, sites, or cause a loss of viability or a trend toward Federal listing of any other species on the Regional Forester's Sensitive Plant List.

Competing or Unwanted Vegetation: The level of disturbance would be relatively low to construct the proposed trail. Disturbance from frequent use by recreationists would increase the risk of the introduction and spread of noxious weeds. Travel to and from the project area and recreational activities would not be able to avoid known weed sites. Weeds could be introduced or spread along the proposed trail by personnel and equipment used for trail maintenance and by recreationists such as hikers and bikers and their pets coming from weed infested areas (**Refer to Mitigation Measures, Botany**). Weed sites at the Benham Falls day use area, Lava Lands Visitor Center, and roads that provide access (Highway 97, Cottonwood Road, Road 40) to trailheads (Sunriver, Benham Falls day use area, Lava Lands Visitor Center) for the proposed trail would continue to be treated. There is a low probability of eradication of existing populations or prevention of further introductions of weeds.

Analysis of these factors indicates a **High Risk** for the introduction and spread of noxious weeds in the project area for all three alternatives without mitigation measures. If mitigations are implemented, the risk of the introduction and spread of noxious weeds may be reduced to a **Moderate** level for the Sunriver/ Benham Falls/ Lava Lands Visitor Center trail project. This determination is made, instead of low risk, due to the difficulty of eradicating existing weed populations, preventing future introductions along access routes, and from the anticipated increase in recreational use of the trailheads and along the proposed trail.

Cultural Resource

AFFECTED ENVIRONMENT: Three (3) historic sites and four (4) prehistoric sites are located in the proposed project locations. Two (2) of the historic sites are considered not significant or eligible for the National Register of Historic Places. The prehistoric sites and other historic site are either eligible or unevaluated and potentially eligible.

ALTERNATIVE 1 (NO ACTION): Effects to cultural sites would continue as is presently occurring. The user-created trail system would continue to allow disturbance to present and potential cultural sites.

ALTERNATIVE 2 (PROPOSED ACTION) AND ALTERNATIVE 3: The trail project has potential to effect present eligible and unevaluated sites by: 1) creating a trail tread; 2) installing signs or markers; and 3) routing non-motorized trail use through sites. These actions could change artifact distribution, cause artifact breakage, and expose surface and belowground artifacts to collection by trail users. These changes to site conditions could reduce or destroy information by the distortion or removal of data including activities and time and duration of these activities. Alternative 3 would protect one (1) site by rerouting the trail. One (1) historic site and three (3) prehistoric sites would continue to be at risk.

Fisheries Resource

None of the alternatives would result in further degradation of the parameters for which the Deschutes River is listed on the ODEQ 303(d) list. There is no essential fish habitat within the project area, therefore there would be no adverse effects. The biological evaluation for redband trout determined that the three (3) alternatives would have **No Adverse Impact** to redband trout or their habitat.

The proposed non-motorized trails as described in both Alternative 2 (Proposed Action) and Alternative 3 would enter the Riparian Habitat Conservation Area (**RHCA**) of the Deschutes River between the north boundary of Sunriver and the Benham Falls Day Use area.

AFFECTED ENVIRONMENT: A modified flow regime, a result of water releases from Wickiup Dam, has led to increased riverbank erosion, widening of the stream channel, and reduced water quality and fish habitat (Deschutes National Forest, 1996). Additional discharge provided by Fall River, Spring River,

and the Little Deschutes River tempers the effects of the modified flow regime in this segment of the Deschutes River. The Oregon Department of Environmental Quality (ODEQ) lists the Deschutes River as a water quality impaired river (303(d) list). The parameters for which it is listed are dissolved oxygen for salmonid spawning, turbidity, flow modification, habitat modification, and sedimentation. Management direction regarding 303(d) listed rivers is that any project activity should not further degrade the parameters for which it is listed (Forest Service and Bureau of Land Management Protocol for addressing Clean Water Act Section 303(d) Waters). A network of official and unofficial roads, trails, and dispersed campsites are located adjacent to the river. Activities within the riparian area have been associated with compacted soils, river sediments, and riverbank trampling.

The Federal Wild and Scenic River and State Scenic Waterway Act established an overriding goal to protect and enhance the Outstandingly Remarkable Values for which the river was designated (Deschutes National Forest, 1996). The trophy brown trout (*Salmo trutta*) fishery is regarded as an Outstandingly Remarkable Value (River Plan). Redband trout, (*Oncorhynchus mykiss gairdneri*) a subspecies of rainbow trout, were native to the river, but have since interbred with various hatchery stocks of rainbow trout. The river supports natural reproduction of several fish species and stocked rainbow trout.

ALTERNATIVE 1 (NO ACTION): No trail would be constructed. The user created trail along the river would continue to provide various dispersed recreational activities that are presently occurring. Any real and potential adverse environmental impacts to fisheries from user created trails would not change.

In the absence of a defined non-motorized trail system, there could be expansion of user-made trails adjacent to the river, potentially leading to increased trampling of riparian vegetation and overland flow of sediments into the river. Fine sediments that accumulate in riverbed substrates could limit the survival of developing fish embryos and the production of aquatic macroinvertebrates, which provide forage for fish (Bjornn and Reiser, 1991, in Meehan, 1991). Suspended sediment could be abrasive to fish gills and decrease foraging ability. The volume of sediments that enter the river in this segment would not be substantial and would provide a minor cumulative component of instream sediments.

ALTERNATIVE 2 (PROPOSED ACTION): Present adverse effects to fish habitat and stream quality would not be increased with Alternative 2. Trail relocation/construction would be beneficial to fish habitat.

There are approximately 2.64 miles of trail proposed within the RHCA of the Deschutes River. Most of the trail sections within the RHCA would be along rimrock and areas high above the river. Very little to no potential exists for overland flow of sediments into the Deschutes River during trail construction or future use of the trail. The trail would not be built through riparian vegetation.

A designated trail would likely increase visitor use in the area. User-created trails off of the official, defined trail could occur. This could lead to trampled riparian vegetation and potential overland flow of sediments into the Deschutes River.

Designating a trail away from the river would decrease potential adverse effects. A decrease in sediment flow and streambank degradation would improve riparian habitat. Previous fish habitat restoration projects have improved fish habitat and water quality. Upstream, recreational, and private activities, and stream flow regulation have adversely affected fish habitat. These include modified flow and habitat, increased sedimentation of substrates, increased turbidity, and decreased dissolved oxygen. The volume of sediments that enter the river in this segment are not substantial and provide a minor cumulative component of instream sediments. Construction of this trail would reduce the present and potential for increased sediment flow into the river.

ALTERNATIVE 3: Present adverse effects to fish habitat and stream quality would not be increased. Trail relocation/construction would be beneficial to fish habitat.

There are 1.25 miles of trail proposed within the RHCA of the Deschutes River. Most of the trail sections within the RHCA would be along rimrock and areas high above the river. Very little to no potential exists for overland flow of sediments into the Deschutes River during trail construction or future use of the trail. The trail would not be built through riparian vegetation. There would be less potential for damage to riparian vegetation and overland flow of sediments into the Deschutes River than Alternative 2 because of less trail within the RHCA.

Riparian Management Objectives Compliance: Management of RHCAs are intended to achieve Riparian Management Objectives (RMOs). According to INFISH, not all of the described features may occur within a specific stream segment of a stream within a watershed, but all generally should occur at the watershed scale for stream systems of moderate size. The RMOs applicable to a forested system include pool frequency, water temperature, large woody debris, and width/depth ratio. Under existing conditions, water temperature and large woody debris objectives are being met, and pool frequency and width/depth ratio objectives are not being met. The large woody debris feature is met under existing conditions, but most of the large woody debris in the project area is limited to two accumulations near the Benham Falls Day Use area. The frequency of debris over 20" diameter is likely less than historical as a result of log drives. Water temperature monitoring near Benham Falls in recent years has revealed that the water temperature feature is not met for a short duration during the summer. Maximum daily temperatures may exceed 59° F. for short durations. State water quality standards for water temperatures are being met. The alternatives neither enhance nor prevent attainment of the RMOs.

Hydrology Resource

AFFECTED ENVIRONMENT: All 6th-field subwatersheds in the project area have been evaluated using stream surveys, watershed analyses, scientific-based hydrologic research, field observations, general engineering and silvicultural interpretations, Geographical Information System (GIS), aerial photo interpretation, and cumulative watershed effects analysis.

Trail construction would occur within three 6th-field subwatersheds, Coyote Springs, Kiwa, and Lava Butte. Proposed trail construction miles within each subwatershed are listed in **Table 8**. The Kiwa Subwatershed has been designated as an A2 subwatershed, which is critical for maintaining quality red band trout habitat. A2 subwatersheds should receive restoration priority over other subwatersheds (Interior Columbia Basin Ecosystem Management Project, unsigned). Recommended management direction in A2 subwatersheds includes watershed restoration, noxious weed treatments, prescribed fire, thinning, and road restoration.

6th Field Subwatershed	Alternative 1 (No Action)	Alternative 2 (Proposed Action)	Alternative 3
Coyote Springs	0	4.2	3.2
Kiwa	0	1.8	1.8
Lava Butte	0	2.2	2.2

No perennial streams exist within the project area, although the Deschutes River borders the project area. Existing swales within the 3 subwatersheds are predominately old ephemeral channels that flow only during high precipitation events. These swales rarely exhibit a defined channel and rarely join perennial flow, primarily because of high soil infiltration rates. In the proposed Kelsey trail area, soils are very porous, and overland flow is very rare in un-compacted areas.

Past impacts have occurred from road construction, timber harvesting, recreational activities, and wildfire. The main source of present hydrologic disturbance is from user-created roads and dispersed recreation in the form of soil compaction and displacement along the Deschutes River with riparian conditions varying from good to poor. Some riparian areas have a high degree of conifer encroachment in addition to soil compaction, and decreasing hydrologic function. Activities to enhance riparian areas will be incorporated into the Kelsey Vegetation Management EA. A complete description of existing condition can be found in the Environmental Impact Statement for the Upper Deschutes Wild and Scenic River (USDA 1996).

The Clean Water Act and Sections 319 and 303(d): The objective of the Clean Water Act (CWA) of 1972 is to restore and maintain the chemical, physical, and biological integrity of all waters. States are required to determine waters that will not meet the goals of the CWA, determine non-point source

activities that are contributing pollution, and develop a process on how to reduce pollution to the "maximum extent practicable". Section 303(d) of the CWA requires that a list be developed of all impaired or threatened waters within each state.

The proposed project area borders the Deschutes River, a 303(d) stream. The segment of the Deschutes River bordering the Kelsey planning area is listed for dissolved oxygen, flow modification, habitat modification, sedimentation, and turbidity (Oregon Department of Environmental Quality, 1998). ODEQ data for dissolved oxygen from water years 1985 through 1995, for the months of October through July, have shown that 39 percent of the samples exceeded the spawning dissolved oxygen standard (11mg/l or 95 percent saturation). U.S. Forest Service data from the spring and summer of 1995 shows that turbidity is increased as much as 30 fold when irrigation water is released in early spring and remains to twice background until late July. An Upper Deschutes River Instream Flow Assessment in 1994 revealed that low flows significantly affect the Brown Trout spawning habitat in the river (only 24 percent is useable) and high flows limit suitability for trout, hence the 303(d) listing for flow modification. The same assessment also revealed that there was a lack of large woody debris in the channel, which limits the cover and protection (habitat modification) from the velocity of high flows for trout. The spawning gravels contained a high percent of fines (sedimentation) that limit embryo survival rates for trout.

ALTERNATIVE 1 (NO ACTION): No short-term impacts due to trail construction would occur. Problem trail areas would continue to contribute to watershed degradation. This alternative would not designate a trail system that would minimize soil compaction, displacement, and sediment flow into the Deschutes River. Existing soil erosion from dispersed trails would continue with the possibility of increased sediment flow with adverse effects to watershed health.

ALTERNATIVE 2 (PROPOSED ACTION): This alternative would incorporate approximately 9 miles of trail construction. Approximately 2.64 miles would be within the RHCA (300ft). The majority of the trail within the RHCA would be located along rimrock areas above the river, with very little potential for overland flow of sediments into the Deschutes River. None of the trail would be built through riparian vegetation. A new trail could potentially attract more visitors to the area. There is potential of dispersed trails being created off of the designated trail. This could adversely affect riparian vegetation and soils and increase the risk of overland flow of sediment into the Deschutes River although the risk of substantial sediment flow would be low.

ALTERNATIVE 3: This alternative is similar to Alternative 2. Approximately 8.4 miles of trail would be constructed, of which approximately 1.25 miles would be within the RHCA. Most of the trail system would be located along rimrock areas above the river, with very little to no potential for overland flow of sediments. The trail would not be constructed through areas with riparian vegetation.

Discussion: There would be no measurable adverse effects on water yield, stream temperature, sediment yield, or overall watershed health from either Alternative 2 (Proposed Action) or Alternative 3. Alternative 3 would have less potential for adverse impacts to watershed health than Alternative 2 because less trail length would be constructed within the RHCA. Both Alternatives 2 and 3 would benefit watershed health by moving the trail out of riparian vegetation into more upland vegetation. Implementation of either alternative could attract more visitors to the area. This could potentially lead to user-created trails into riparian habitat and damage to riparian vegetation and overland flow of sediment into the Deschutes River. Riparian Management Objectives (RMOs) were discussed under Fisheries.

Existing Cumulative Watershed Effects: The Equivalent Clearcut Area (ECA) methodology was used to determine where cumulative watershed effects might occur. The ECA methodology is defined as a watershed index of snowmelt and evapotranspiration rates relative to baseline condition where tree stands are considered fully canopied. The influential factor in computing ECA is the amount of area altered by land management activities or factors, such as wildfires or timber harvest. A recovery rate factor (50 years), derived from local recovery rates, is included to achieve the final ECA determination. The physical characteristics of a watershed will determine whether or not increased water yield will increase sediment production. The location of the proposed trail is where soils are very porous and generally not compacted. These are areas that overland flow is very rare. Values obtained from ECA computations determined that there would be no change in values with the implementation of this project under either action alternative. Neither of the action alternatives would have any expected

measurable adverse cumulative effects.

Public Health and Safety

No significant adverse effects to public health or safety have been identified. The effects of implementation of the alternatives are well known, not highly controversial, and do not involve any unique or unknown risks. Effects meet or exceed state water quality standards.

Prime Lands

There are no lands within the planning area that are classified as prime farm or rangelands. Proposed activities in Alternatives 2 and 3 would not change areas classified as prime forestland. There would be no direct, indirect, or cumulative adverse effect to these resources and thus are in compliance with the Farmland Protection Act and Departmental Regulation 9500-3, "Land Use Policy".

Civil Rights and Environmental Justice

Civil Rights legislation and Executive Order 12898 (Environmental Justice) direct an analysis of the proposed alternatives as they relate to specific subsets of the American population. The subsets of the general population include ethnic minorities, disabled people, and low-income groups. The purpose of the analysis is to determine whether adverse civil rights impacts are anticipated on an underrepresented population. The analysis is to determine also whether disparate or disproportionate impacts associated with the alternatives are anticipated. Provision of these benefits does not discriminate between subsets of the general population.

Compliance With State and Local Laws

Implementation of Alternative 1, 2, or 3 would be consistent with relevant Federal, state and local laws, regulations, and requirements designed for the protection of the environment including the Clean Air and Clean Water Act. None of the alternatives establishes a precedent for future actions or a decision in principle about a future consideration.

Other Effects and Findings

Wetlands, fisheries, water quality and designated floodplains would not be adversely affected by any of the proposed management activities (Appendix B).

No designated roadless areas, old growth stands, prime farmland, wild and scenic rivers, or park land would be adversely affected by the proposed activities. No significant irreversible or irretrievable commitment of resources would occur under alternatives 2 and 3.

The alternatives are consistent with the goals, objectives and direction contained in the Deschutes National forest Land and Resource Management Plan and accompanying Final Environmental Impact Statement and Record of Decision dated August 27, 1990 as amended by the Regional Forester's Forest Plan Amendment #2 (June 1995) and the Inland Native Fish Strategy. The alternatives are in compliance with the Upper Deschutes Wild and Scenic River and State Scenic Waterway Comprehensive Management Plan and accompanying Final Environmental Impact Statement and Record of Decision dated July 25, 1996. The alternatives are consistent with the goals, objectives and direction contained in the Newberry National Volcanic Monument Comprehensive Management Plan and accompanying Final Environmental Impact Statement and Record of Decision dated August 1, 1994.

REASONABLE FORESEEABLE FUTURE ACTIONS ADJACENT TO OR WITHIN THE PROJECT AREA

Lava Lands Thinning: Proposes to improve public safety and protect Forest Service developments through the reduction of fuels on approximately 34 acres.

Kelsey Fish Habitat Enhancement: Proposes to enhance fish habitat on approximately 1.3 miles of river.

Kelsey Vegetation Management: Proposes to reduce tree density, shrub height and density, and risk of disease and fire through the use of thinning, prescribed fire, and mechanical treatment of shrubs. The proposed trail would have portions located within units proposed for treatment.

Kelsey Access Management: Proposes to eliminate unnecessary and redundant roads. Proposes to develop and designate an off highway vehicle (OHV) trail system and associated play area/trail head.

LIST OF PLANNING PARTICIPANTS

This section identifies the Forest Service personnel who participated in the analysis and the preparation of the EA. For a list of organizations and individuals contacted during the scoping process, refer to the project file located at the Bend-Ft. Rock Ranger District.

Interdisciplinary Team

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