

**Deschutes National Forest
Bend-Ft. Rock Ranger District
Charlie Brown Environmental Assessment
For the Area Surrounding Crane Prairie and Wickiup Reservoirs**

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The Responsible Official has identified Alternative 3 as the Preferred Alternative.

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Last Update: 11/26/01

R.A. Jensen

Charlie Brown Environmental Assessment

Bend-Fort Rock Ranger District

Deschutes National Forest

Introduction

The Bend-Ft. Rock Ranger District of the Deschutes National Forest has initiated an Environmental Assessment (EA) process to analyze vegetative health, dispersed camping, boat ramp improvements, access (roads), and wildlife habitat in the area surrounding Crane Prairie and Wickiup Reservoirs. The area includes major portions of Charlton and Browns subwatersheds with smaller segments in Dilman, Fall, Snow and Wickiup. The analysis is called Charlie Brown for the largest subwatersheds. Cascade Lakes Highway (a Federally designated Scenic Byway) passes through the area. Totaling 65,780 acres, the majority of the project area lies within lands managed under the Northwest Forest Plan, or NFP (93% excluding water). Within the NFP, allocations include Matrix Lands (67%), Administratively Withdrawn (16%) and Late-Successional Reserves (16%) as seen on [Figure 1](#) (Deschutes National Forest Land and Resource Management Plan Areas) and [Figure 2](#) (Northwest Forest Plan Allocations). Reservoirs, lakes, and streams total approximately 15,000 acres of water. Thousands of people visit the area each year to pursue a variety of activities.

Management Direction

The following is a brief summary of each management allocation and the number of land-based acres located within the boundaries of the Northwest Forest Plan inside the Charlie Brown analysis area:

Matrix (31,805 acres) - Most scheduled timber harvest and other silvicultural activities would be conducted in this area, following general guidelines common to all allocations.

Late-Successional Reserves or LSR (7,495 acres) - Designed to maintain late-successional forest ecosystems and protect them from loss to large-scale fire, insect and disease epidemics, and major human impacts.

Riparian Reserves/Aquatic Conservation Strategy (710 acres within Matrix lands) - Developed to restore and maintain the ecological health of watersheds and aquatic systems contained within them on public lands. Riparian Reserves refers to riparian buffers within Matrix lands. Aquatic Conservation Strategy applies to all riparian areas within the boundary of the Northwest Forest Plan.

Administratively Withdrawn (7,475 acres) - Areas identified within the Deschutes National Forest Plan (Forest Plan) such as recreation, scenic views, and designated old growth where management emphasis precludes programmed timber harvest:

Dispersed Recreation - Manage to provide limited social contact and interaction with other visitors. Provide a setting of remoteness and vastness with no irreversible evidence of humans.

Intensive Recreation - Forest environments where settings accommodate large numbers of visitors. Widespread use of motorized vehicles and boats may be present.

Scenic Views - Managed to provide forest visitors with high quality scenery that represents the natural character of Central Oregon.

Old Growth - Managed to provide naturally evolved old growth forest ecosystems for habitat for plant and animal species associated with old growth, representations of landscape ecology, public enjoyment of large, old-tree environments, and the needs of the public from an aesthetic spiritual sense.

Purpose and Need For Action

An analysis (Browns/Wickiup Watershed Assessment) was completed in 1997 which identified vegetative health "at greatest risk" to loss. High stand densities, insect and disease infestations, and shifts in species compositions within the dry forest types has resulted from nearly 100 years of well-intentioned fire exclusion. These conditions pose a threat to public safety in some areas and to the Late-Successional Reserves (LSRs) of Browns and Round Mountains that are also located within the analysis area. The assessment also identified problems from recreational activities such as dispersed camping that cause loss of vegetation, soil compaction, erosion, and inappropriate disposal of human waste. Impacts that degrade water quality in the reservoirs may affect the Upper Deschutes (a Federal Wild and Scenic River), as well as the recreational experience for many users.

Fire as it Relates to Public Safety

There is a need to adjust stand conditions to levels that can better withstand potential large-scale disturbances from fire, insects and disease.

The southwestern shoreline of Crane Prairie Reservoir is one of the most popular areas for dispersed camping along both reservoirs (Allocation: Administratively Withdrawn, Osprey, Bald Eagle). Dispersed camping areas are generally located adjacent to stands with abundant ground fuels and excessively dense patches of dead or dying trees. Many stands are composed of fire-prone species, such as white fir or lodgepole pine. These species have encroached into stands that evolved from a history of low-intensity ground fire. Given the current condition in the watershed, a large crown-driven wildfire is likely within the near future. These events pose a threat to campers, firefighters, and important wildlife

habitat located upslope on Browns and Round Mountains. Several large fires have occurred in the area. The most recent events burned over 1,500 and 700 acres near the Crane Prairie Resort, in 1994 and 2001 (respectively), and required aggressive firefighting efforts to suppress. In areas where the risk of fire entrapment is high and there are ample ignition sources, there is a need to improve escape routes for campers as well as firefighters.

On the western slope of Lookout Mountain (Allocation: Matrix and Experimental Forest upslope), mistletoe-infected ponderosa pine trees are dying off. The landscape is slowly converting from ponderosa pine-dominated stands to more mixed conifer stands composed of white fir, lodgepole pine, and occasionally Douglas-fir as a result of effective fire suppression and deferred stand tending. There is a need to begin the slow process of rebuilding stands to more ponderosa pine-dominance, particularly in sites where frequent fire was once common. Dense conditions in the mixed conifer and ponderosa pine plant association groups have also affected the health and vigor of large trees in many areas throughout the watershed.

Disease/Dwarf Mistletoe

At North Twin Lake, there is a need to reduce dwarf mistletoe infections towards more historic levels, which generally occurred on a smaller scale across the landscape. To provide future replacement trees for scenery and habitat desires, new trees must be established and be allowed to grow unencumbered by dwarf mistletoe parasitism. Public education efforts that connect basic forest ecology principles of disease agents, fire, and the role of forest management in providing for desired conditions are necessary to keep visitors informed on issues such as short-term versus long-term trade-offs.

Western dwarf mistletoe is the most common disease agent infecting ponderosa pine trees in the analysis area due to fire suppression and deferred stand tending (e.g., thinning, mistletoe control). This is readily found at "hot spots" throughout the area, where dwarf mistletoe infects virtually every ponderosa pine tree, most notably at North Twin Lake (Allocation: Administratively Withdrawn, Bald Eagle, Dispersed Recreation), the western slopes of Lookout Mountain, and at several points in-between. Conditions in these areas present a long-term risk to desired scenery, habitat and public safety, as tree longevity will suffer as a result of heavy future mortality.

Between Lookout Mountain and North Twin Lake are isolated pockets of severe mistletoe infections. Within and adjacent to plantations of young trees, there is a need to reduce mistletoe infections in overstory ponderosa pine trees to arrest the spread of infection to understory pine trees. This would limit the continued spread of mistletoe, and allow the understory pine trees to remain healthy and develop into the large, old structures that are desired for the area.

Most-Recently Harvested Areas

There is a need to promote rapid, healthy stand development through stocking reduction and soil rehabilitation in order to achieve desired stand conditions.

Lodgepole pine stands throughout the watershed (Allocation: Matrix and others) were harvested in the 1980's in response to epidemic mountain pine beetle infestations. This caused fragmentation of habitat for dependent wildlife species. Although newly regenerated stands have filled in quickly, growth is beginning to slow in many of these areas as a result of competition among dense seedlings. In addition, some areas of compacted soils show poor tree regeneration.

In some areas, overstory lodgepole pines were saved to provide a seed source for a new stand. Most of these trees are infected with dwarf mistletoe and create ideal conditions for the spread to the advancing understory. This condition is becoming a concern for long-term management. Circumstances such as these rarely occurred when fire was integrated into the landscape and cleansed stands on a periodic basis.

Recreational Use and Dispersed Camping

There is a desire expressed by the public and land managers to find solutions that maintain high quality camping experiences and reasonable access while sustaining water quality and minimizing disturbance to wildlife. There is a need to encourage stewardship and low impact behaviors, especially around many of the recreation sites within riparian buffers.

A steady increase of visitors coupled with a rising population in central Oregon has contributed to an expansion of many dispersed camping areas (Allocation: Administratively Withdrawn and others). Recreation use in general, including dispersed camping, is bringing physical changes to the characteristic setting in some portions of the watershed, especially around the reservoirs. In some areas, riparian vegetation is disappearing where it once provided stability to riverbanks and reservoir shores. Favored dispersed camping spots that once provided solitude now can be found overcrowded and full of litter. Although these problems exist, the recreation experience for most campers generally remains a positive experience, even at relatively high use levels.

Public Access

There is a need to provide public access to existing recreational areas while maintaining water quality, riparian vegetation, and effective habitat for wildlife (e.g., bald eagles). OHV use is inappropriate in some areas where recreation use is concentrated, in BEMAs, and below the high water line of the reservoir.

Many existing roads provide access that the Forest Service has either built, or adopted as users have created them. The local terrain and soil types lend to establishing roads in some areas that may not provide the best access; or were created in areas that are inappropriate. The watershed contains many of these parallel, unauthorized and excess roads that are ecologically damaging to sensitive areas, allow disturbance to wildlife dependent upon solitude, and threaten water quality in the basin. The Forest Service must find a balance between providing motorized access and conserving limited resources.

Off Highway Vehicle (OHV) use which originates from a borrow pit used to build Wickiup Dam is expanding into the surrounding designated Bald Eagle Management Areas (BEMAs) on Wickiup and Eaton Buttes. User-created trails access the BEMA through shoreline travel and an undesignated trail system that originates from the pit. OHV use outside of the pit has resulted in disturbance to nesting bald eagles and has caused erosion in rutted portions of trails on adjacent steep terrain. Trails which lead to the main road (4260) have caused conflicts between users on secondary roads between the campground and the borrow area.

Bald Eagle Management Areas

There is a need to maintain functional bald eagle and osprey habitat, which includes large trees for nesting and perching, a vigorous understory, and relatively low level of harassment from motorized vehicles. The North Twin Lake BEMA boundary needs to be relocated in an area that would afford greater solitude, allow greater potential for eagles to utilize the BEMA, and ultimately allow conditions more advantageous for eagle reproduction and survival.

There are 11 BEMAs located in the project area. One of the areas includes a stand where conditions are not favorable for eagle nesting and roosting, and the potential for improvement is considered low. For the remaining ten, typical conditions include crowded forests and lack of solitude resulting from inappropriate vehicle access and hiking trails. Well-intentioned fire suppression has allowed an increased growth of dense, shade tolerant vegetation that has caused stress on overstory ponderosa pine and Douglas-fir trees, the preferred nesting tree species. These conditions also retard the growth of trees that are important replacements as older trees die. A high risk of a stand replacement wildfire is present and threatens public safety and valuable habitat for a variety of species, including bald eagles and osprey.

Reference Browns-Wickiup Watershed Analysis and Browns-Round Mountain Late-Successional Reserve Assessment (pages 6-6 through 6-9, 6-12, 6-13 and Tables 7-71 through 7-76, 7-78, and 7-79).

Riparian Buffers

There is a need established by the Browns-Wickiup Watershed Assessment to maintain the meadows, which are currently about 50% invaded by coniferous trees. Dependent wildlife species as well as meadow-associated plants would benefit.

In the meadows at Browns Creek (Allocation: LSR), encroachment of lodgepole pine seedlings threaten habitat for neotropical migratory birds, great gray owls, elk, and various amphibians. Although lack of a natural fire regime has provided some favorable habitat conditions such as down wood and a surrounding dense forest, continued succession would eventually eliminate grasses and forbs.

There is a need to meet objectives stated in the Northwest Forest Plan for aquatic conservation and the Inland Native Fish Strategy (east of the Northwest Forest Plan Area) which include maintenance and restoration of: 1) the physical integrity of shorelines, 2) species composition and structural diversity of

riparian vegetation, and 3) water quality necessary to support healthy riparian, aquatic and wetland ecosystems 4) timing, variability, and duration of floodplain inundation and water table elevation in meadows and wetlands.

In areas adjacent to water bodies (Allocation: Riparian Reserves, Riparian Habitat Conservation Areas and others), recreational activities such as dispersed camping has compacted soil, eliminated vegetation and changed the overall condition of many riparian areas. Old and deteriorating boat ramps are in need of replacement to allow access during seasonal low water conditions. It is common to see designated vehicle parking adjacent to the ramps at capacity during peak summer weekends and holidays, causing boaters to use unsafe and less appropriate areas. As the reservoirs fill for the next year's water needs, downstream water quality in the Deschutes River is threatened from poor sanitation of some campers and adverse resource impacts from vehicles which were operated below the high water mark.

Reference Browns-Wickiup Watershed Analysis and Browns-Round Mountain Late-Successional Reserve Assessment (page 6-5 "Meadow Habitats", pages 6-16 and 7-79 "Maintenance", and 6-25 "Prescribed Burning").

Late Successional Reserves

There is a need to maintain forest vegetation within late successional reserves at levels that are sustainable and resilient, and to manage native disturbances at endemic levels to provide forest defect needed for dependent wildlife.

The Northwest Forest Plan directs the management of reserves to protect and enhance conditions of late successional and old growth forest ecosystems, which serves as habitat for dependent species including the northwest spotted owl.

Currently, about 90% of the late-successional stands within the Charlie Brown area are classified as either moderate or high density and contain a large element of management risk in their current condition. This risk can result from insect and disease infestation, or wildfire above historic proportions.

Stands of large diameter, open-grown ponderosa pine and Douglas fir probably occupied as much as one-half of the mixed conifer sites at any one point in time. Now, there are less than 2% of these stands classified as Late and Single story.

Reference Browns-Wickiup Watershed Analysis and Browns-Round Mountain Late-Successional Reserve Assessment (pages 2-8, 5-19 through 5-22, 6-14 through 6-17, 7-2 through 7-13 and 7-74 through 7-76)

Proposed Action

This proposed action identifies measures to address the undesirable conditions found within the project

area watersheds. These actions were developed incorporating ideas from other agencies including the US Fish and Wildlife Service and public comment received prior to initiation of this phase of the process. Numerous concerned users have also informally expressed their opinions on how the reservoirs should be managed by the Forest Service. Using these sources, the following is proposed in summary. All acres are approximate. A more detailed description can be found in the [Alternatives Section](#).

Vegetative management actions are designed to meet the desired future conditions by moving stands towards conditions found in historic records. The following listing is by estimated acres and was included in the public scoping letter mailed in December of 1997. Refer to Tables 4 and 5 for a listing of actual acres that reflect site-specific circumstances (including Management Requirements and Mitigation measures):

- Culture trees by removing smaller diameter trees around large diameter "legacy" trees on 610 acres;
- Commercial thin to restore tree vigor on 405 acres;
- Group select outside of Late-Successional Reserves of mostly dwarf mistletoe patches to reduce disease presence on 205 acres;
- Remove overstory seed and shelter trees in established lodgepole pine plantations to release understory trees, as well as protect the developing understory from dwarf mistletoe infection on 2,780 acres;
- Salvage harvest outside of Late-Successional Reserves on 230 acres where mortality from insects and disease has already occurred;
- Thin young trees on 5,155 acres;
- Reduce risk of wildfire using mechanical treatment of shrubs, prescribed fire, and salvage harvest on 1,965 acres; and
- Restore Browns meadow by clipping encroaching lodgepole pine seedlings.
- In addition to vegetative actions designed to maintain functional habitat for a variety of wildlife species, the boundary of a Bald Eagle Management on the west side of North Twin Lake is proposed to be relocated to a more suitable area on the east side of the lake to an area more advantageous for eagle survival ([Figure 6b](#)). A non-significant Forest Plan amendment would be required.

In order to improve the recreation experience, maintain water quality, and restore riparian vegetation, the following actions are proposed:

- Reconstruct boat ramps at Crane Prairie and Wickiup Reservoir to improve safety and alleviate parking in inappropriate areas;
- Maintain access (including seasonal) on 240 miles of roads within the project area;
- Reconstruct or improve ten miles of roads which have seasonal-related problems, such as water that causes users to create roads around the hazards;
- Close and decommission 151 miles of excess, and/or ecologically damaging roads throughout the analysis area;

- Close and rehabilitate 15 dispersed camping sites and eliminate motor vehicle access to 23 dispersed camping sites; and
- Prohibit pit toilets for human waste disposal within 150' of the high water mark of either reservoir.
- Close road 4290 and convert to a trail leading to Johnny Lake.

Decision To Be Made

The Deciding Officer is the Deschutes National Forest Supervisor. The decision is whether to authorize the actions proposed in this Environmental Assessment, and if so, under what conditions.

Documents Incorporated By Reference

The following documents were used in this analysis and are incorporated by reference. These documents are available for public review at the Bend-Ft. Rock Ranger District Office:

- All specialists reports, including their literary references.
- 1988 General Water Quality Best Management Practices - Developed to facilitate understanding of Best Management Practices for protection of water quality in Pacific Northwest.
- 1990 Deschutes National Forest Land and Resource Management Plan - This plan was developed to guide all natural resource management activities and establish standards/guidelines on the Deschutes National Forest.
- 1994 Record of Decision for Amendments to the Forest Service and Bureau of Land Management Planning Documents Within the Range of the Northern Spotted Owl - Developed to adopt a common management approach to the administration of lands throughout an entire ecological region.
- 1993 Region 6 Interim Old growth Definition (Hopkins et al.) - used to describe the important ecological features of old growth systems.
- 1995 Interim Management Direction Establishing Riparian, Ecosystem and Wildlife Standards for Timber Sales - Used as necessary interim guidelines until a long-term strategy is developed. This is for lands managed outside the boundary of the northwest Forest Plan.
- 1995 Inland Native Fish Strategy - Designed to preserve management options for inland native fish by reducing potential negative impacts to aquatic habitat of resident fishes for an interim period.
- 1997 Browns/Wickiup Watershed Analysis and Browns/Round Mountain Late-Successional Reserve Assessment, which identified conditions, trends, and possible actions to maintain and restore ecosystem components within the Browns and Wickiup subwatersheds.
- April 2001 - March 2003 Joint Aquatic and Terrestrial Programmatic Biological Assessment for Federal Lands Administered by the Deschutes National Forest
- 2000 Interior Columbia Basin Ecosystem Management Project Final EIS - Developed to implement a scientifically sound, ecosystem-based management strategy for lands located in the Interior Columbia Basin. No Record of Decision is final at the time of this assessment.
- 2001 Record of Decision and Standards and Guidelines for Amendments to the Survey and

Manage, Protection Buffer, and other Mitigation Measures and Standards and Guidelines

Public Involvement/Scoping Process Used

A Forest Service letter requesting public involvement was provided to approximately 100 individuals, businesses, and organizations that have an interest in the process. Announcement of the proposed action was included in the central Oregon Schedule of Projects starting in the winter of 1998/1999. This notification reaches approximately 3,200 interested people. The Proposed Action for the Charlie Brown Project was posted on the Deschutes National Forest website starting December 1998. Areas affected by the proposed action (especially dispersed camping) within the area were posted with notices of proposed activities and Forest Service "Field Rangers" distributed informational flyers. A question and answer fact sheet as it relates to camping and road access was available on the Deschutes National Forest website starting in August 2001. The local newspaper, The Bulletin, has published various articles and public opinion relating to the Charlie Brown area and its environs (January 1999, September 1999, September 2000, August 2001).

Approximately 30 people have responded and the following comments were grouped and summarized by topic. Reference "Issues and Units of Measure" below for a discussion on how these comments were used.

Dispersed Camping

- Maintain dispersed camping opportunities and access surrounding Wickiup and Crane Prairie Reservoirs.
- Consider changing some dispersed camping areas into day use only.
- Enforce stay limits for all dispersed campers.
- Acknowledge the efforts of most campers who regularly leave a clean campsite.
- Environmental degradation of dispersed camping areas has been slight over the last several decades.
- Human waste disposal adjacent to the reservoir is inadequate.
- Consider a public education program intended to encourage good stewardship and low impact behavior.

Road Closures/Access

- The Charlie Brown area has too much access; more roads need to be closed.
- Leave all roads in the Charlie Brown area open.
- Avoid road construction and reconstruction in areas that have substantially revegetated.
- Use appropriate signing to inform users why certain roads are closed.
- Prioritize restoration of roads that pose the highest risk to aquatic resources and large blocks of interior habitat.
- Design a system of roads, trails, for OHV use to help reduce the conflicts with other user group.

Use signing and barrier placement to restrict OHV use in Bald Eagle Management Areas, riparian areas, and high use recreation areas.

- Ensure proposed road reconstruction activities are consistent with Bald Eagle Management Area objectives.
- Proposed activities such as reduction of road densities in areas that are otherwise remote, such as Johnny Lake, should improve habitat suitability for forest carnivores sensitive to human disturbance.
- Consider the economic and environmental benefits of closing Road 4290 west of its intersection with road 4296.
- Improve boater access at times when the reservoir is low in order to maintain closures in sensitive areas, such as Browns Creek.
- Boat launching facilities are in a state of disrepair and need improvements.

Wildlife and Fish Habitats

- Consider favorable environments and home ranges for insectivorous birds when addressing long-term forest health objectives for the area.
- When developing a strategy to initiate the process of rebuilding stands to more ponderosa pine dominance, consider the needs for wildlife species that favor mosaic patterns of vegetative conditions.
- Consider habitat conditions for species and their prey that favor dense thickets of coniferous regenerations, such as the lynx.
- Improve fish rearing habitat near Round Swamp campground at the south end of Wickiup Reservoir.

Wildfire/Prescribed Fire

- The Forest Service is urged to consider alternatives to prescribed burning and or other burning of forest residues.
- Prioritize the cautious use of prescribed fire to accomplish vegetation management objectives.
- Excessive stand mortality within the Charlie Brown area must be reduced to lower the risk of high intensity wildfires. Stand replacement fires would destroy many of the other resource values, including eagle and Late-Successional Reserve habitat.

Vegetative Treatments

- Consider an alternative that retains mistletoe-infected overstory trees when mortality is imminent and of low risk for continued spread of the disease.
- Competition from understory trees must be reduced in order to maintain the ponderosa pine component and large trees within the Charlie Brown area.
- Avoid any activities that would preclude wilderness designation in roadless areas greater than 1,000 acres.

- Avoid management activities that disturb the soil resource. Limit entry wherever possible.
- Avoid thinning that will perpetuate homogenous forest characteristics.
- Drop all overstory removal activities. It would be better to leave 'decadent' overstory trees as wildlife habitat.
- Avoid management activities that fragment large blocks of mature forest habitat and other ecologically significant areas.
- Avoid clear-cutting or any harvest method involving large canopy openings.
- Avoid all salvage activities.
- Avoid activities in late-successional forest greater than or equal to 80 years.

Socio-economic

- Consider the jobs created by this project as well as the dollars returned to counties and the U.S. government.

Firewood

- Increase firewood areas designated for personal use as a tool for reducing the risk of a stand-replacement wildfire.

Issues and Units of Measure

Many of the relevant comments received were used to focus the analysis in areas where the public desired a specific resource to be addressed. Some were used to explore alternatives that were not developed further. The remaining comments were used to formulate issues, which could not be otherwise addressed by the proposed action. The following issues were the basis for designing Alternative 3, an alternative to the proposed action. Each issue statement is followed by a more detailed explanation. Each issue has a unit of measure developed for the reader to easily distinguish between each alternative and how it responds to the issue. See comparison table (Table 11).

Issue #1: The proposed action did not adequately provide habitat conditions for species and their prey that favor dense thickets of regeneration, such as the Canadian lynx.

Discussion: The Canadian lynx is listed as threatened under Section 7 of the Endangered Species Act. Recent concerns for their decline in populations has prompted the U.S. Fish and Wildlife Service and the Forest Service to formulate a conservation assessment strategy to address risk factors which affect lynx productivity. Within the Charlie Brown area, many factors are important to consider for the recovery of the lynx; but foraging and denning habitat for snowshoe hare are the limiting factors. This important prey lives in dense young trees that are abundant within the subwatershed. The Proposed Action would thin approximately 4,035 acres of these trees to ensure a healthy stand and to provide late and old structure into the future. There is a need to retain sufficient foraging habitat for the lynx while promoting healthy and rapid stand development in dense young stands.

Note: As of March 2001, the Charlie Brown analysis area no longer contains areas designated for Canadian lynx conservation. Alternative 3 was developed prior to the change in Lynx Analysis Unit (LAU) and Key Linkage Area (KLA) designation and would retain foraging habitat above recommended minimum guidelines. This issue was brought forward into alternative development.

Measure:

- Acres per alternative of young, dense forests retained in an unthinned condition for Canadian lynx foraging habitat ([see footnote 1](#)).

Issue #2: Alternative 2 (the Proposed Action) does not adequately address protection from an uncontrollable wildfire in two key areas, Round and Lookout Mountains.

Discussion: Round Mountain lookout provides an important link to early detection of fire ignitions within the Cascade Lakes area. The lookout not only affords protection to the recreating public around the base of the mountain, but it provides security to the values associated with intact Late-Successional Reserve forests. The lookout was built in 1933 and since then, trees have continued to grow and obstruct the detection of fires in the surrounding area. Dead and live fuels surrounding the mountain have increased beyond thresholds for containing wildfires that start at the base of the mountain. This condition obstructs views and places detection personnel at great risks to a fast-moving fire burning uphill towards the lookout structures. Near the lookout tower, there is a helispot designed for a rotary-winged aircraft in case evacuation of lookout personnel and the public is necessary. Trees have grown to a height where it is dangerous or impossible for a helicopter landing and take-off.

Lookout Mountain is valued for high quality scenery as viewed from Cascade Lakes Highway and from the reservoirs. Also, there is a communication site and valuable research stands associated with the Pringle Falls Experimental Forest. Large diameter trees classified as "Late and Old Structure" (or LOS) cover much of the mountain. Dwarf mistletoe has increased its presence to where it would allow a less severe ground fire to move into the upper portions of trees where it is more lethal. This condition combined with surrounding areas with high fuel loadings and crowded forests contribute to the high likelihood of sustaining a crown fire from the base to the top of Lookout Mountain.

Measure:

- Acres and location of fuel treatments providing protection to Lookout and Round Mountains.

Other Issues

Other issues listed here served as the basis for developing mitigation measures for alternatives. Comments that were not used to develop alternatives or mitigation measures are addressed in the environmental consequences section.

1. Proposed activities may spread or introduce noxious and exotic weeds.
2. Proposed activities may affect soils and water quality.
3. Objectives for scenery management could be compromised by vegetative treatments.
4. Proposed activities including treatments designed to reduce risk of a severe wildfire may harm dependent wildlife habitat.

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Alternatives

This section presents a detailed description of the alternatives responding to the "Purpose and Need" that are considered to be reasonable and viable by the decisionmaker (i.e., the Deschutes National Forest Supervisor). This section also includes a brief discussion of alternatives that were considered but eliminated from detailed study.

Alternatives Considered but Eliminated From Further Detailed Study

An alternative was considered that created fish rearing habitat near the south end of Wickiup Reservoir. This alternative was dropped from further consideration because seasonal drawdown of the water in the reservoir would render improvements ineffective.

An alternative was considered that would restore East Browns Quarry by creating wet meadow habitat, 1.5 acres of seasonal pond habitat, and an interpretive parking and trail area, restore the stream banks of Browns creek at the road 4280 and improve fish habitat for rearing and migration in Wickiup Reservoir near Sheep Bridge campground. At Sheep Bridge Campground, approximately 22 campsites would be designated and constructed along with associated facilities. These projects were analyzed under another document to take advantage of funding opportunities and partnerships. For a brief description of these activities and proposed activities adjacent to the project area see the end of the [Environmental Consequences](#) Section.

An alternative was considered that lowered the risk of stand replacement wildfire across the landscape greater than as proposed in the action alternatives. This alternative was not considered further due to the short-term need for retaining viable habitat for late-successional species including the northern spotted owl and the Canadian lynx.

An alternative was considered that would change some dispersed camping areas into day-use only and install a permit/fee entry system for the reservoirs. This alternative was not considered further in order to maintain the current dispersed camping experience as long as possible. Problems with sanitation and improper behavior of some campers using the reservoirs would be addressed by public education and other measures proposed in this analysis. There are currently ample opportunities around the reservoirs for day-use activities within an undeveloped setting.

An alternative was considered that would close road 4290 west of its intersection with road 4296. This alternative was not considered further. Road 4290 serves as a critical link to the Willamette National Forest and the Charlton Lake area where numerous trail systems intersect. Closing this portion of the road would affect access to a large segment of trail users who either do not have the time or the physical ability for longer hikes to reach the same areas. Also, both forests have an agreement to maintain this open road in a primitive condition to maintain the recreational experience for solitude.

Alternatives Considered in Detail

Alternative 1 - No Action

Under this alternative, the Forest Service would continue to manage the area under current direction afforded by the Forest Plan. Much of the existing condition discussion was included on page 4 under the heading "Purpose and Need for Action". The discussion that follows describes the remaining existing conditions and resources of the area by summarizing detailed specialist reports that are available upon request from the Bend-Ft. Rock Ranger District. No vegetation treatments, reduction of risk of stand-replacement wildfire, relocation or closure of dispersed camping sites in sensitive areas, access (road closures), boat ramp improvements, projects to improve water quality, or activities to restore natural processes to soil would occur. This will provide a baseline from which to compare the other alternatives and their effects.

Vegetation

Historic Vegetation Conditions: Vegetation in the project area has been influenced by two major factors over the past several decades

that has caused a pronounced shift in forest structure, density, and species composition. Timber harvest has periodically occurred throughout the area, and has reduced the amount, extent, and distribution of large diameter ponderosa pine. Perhaps more influential has been the result of active and well-intentioned fire suppression that has effectively modified the composition of forest stands across the entire landscape. This is most pronounced in the drier forest communities, where frequent, low-intensity fires were thought to have played a major role in shaping species, structural and density composition. Within the last century, these once stable and fire-tolerant forest communities have been replaced by dense, multi-storied stands of fire susceptible species (Hann et al. 1996). In summary, this landscape, once dominated by relatively open stands of large trees, has been replaced by crowded stands of all sizes of trees.

The net result of these two dominant management actions has become more visible over the past several decades. In addition to the replacement of open stands of large trees by dense stands, there has also been an increase in shrub density in the more open stands, increased mortality in the aging lodgepole pine stands, and increased density competition in the mixed conifer stands. As insects, disease pathogens, and wildfires are all native disturbances, they now reflect these changed conditions at the landscape-scale (i.e., greater intensity). It is with these changed conditions of increased stand densities and decreased stand health and vigor that the vegetation management portion of this project is being focused.

Estimate of Historic Range of Variability (HRV): In the project area, most areas are currently outside of the historic range of variability for the dry forest plant communities. Although the HRV is not in itself a management goal, it is a reference for understanding the processes that have shaped the forested landscape, namely forest succession and disturbance regime. As fire was once the dominant modifier of vegetation, the greatest change in species composition, stand density, and structural composition from the historic range is now seen in those plant associations that once frequently burned. These are the drier forest communities (dry mixed conifer and ponderosa pine plant associations), which represent over 50% of the project area.

The change in species composition, structure and density has been subtle from year to year, but dramatic when viewed over the past 50 years or more. With effective suppression of fire and selective harvesting of ponderosa pine trees, the domain of the large, single-storied ponderosa pine stand has been greatly reduced. However, unlike many project landscapes, large-sized structural stages are relatively common throughout the project area, although densities are greatly increased, and species have shifted away from ponderosa pine to more of white fir and lodgepole pine dominance.

Analysis of existing conditions: The current landscape, as compared to the historic range of structural conditions, is indicative of several changed conditions (reference Tables 1 and 2, Estimates of Historic Range of Variations and Current Forest Structural Stage by Plant Association Group). Most pronounced is the 10-fold departure from late, single-storied stands. Where stands of large diameter, open-grown ponderosa pine once occupied as much as one-half of the analysis area ([see footnote 2](#)), they now represent approximately 2 percent of the area. Although approximately 40% of the area is currently classified as within late structural stages, the great majority exists as multiple canopy forest conditions. Increased stand densities have resulted since active fire suppression efforts began in the early part of the 20th century, resulting in species shifts to later seral (i.e. shade tolerant species dominance) stages in addition to the density change.

Plant Association Groups (PAGs): The following discussion centers around the plant association groups (Volland, 1985) found within the project area ([Figure 3](#)). Table 1 lists the conceptual historic range of structural stages across the project area, by proportion of plant association groups. This estimate is used to establish a baseline for comparison of alternative management approaches. For more information on the derivation of HRV, see the Browns/Wickiup Watershed Analysis (December 1997), Vegetation Characteristics Report pages 16-20 and Addendum J, available at the Bend-Ft. Rock Ranger District.

Table 2 lists a summary of the major PAGs, along with structural composition of the existing conditions. In order to establish a picture of the current condition relative to the native or historic condition, structural stage, stem density and species composition are added to the underlying plant community foundation. The utility of this approach is seen in the estimation of a baseline of the most likely past structures, densities, and species composition, which provides a view into the probable historic landscape conditions. Secondly, by comparing the current conditions to the historic, an estimate of the extent the landscape has departed from the naturally evolved landscape of the past is provided. In all estimates, PAGs are assumed to be constant, a classification of potential (i.e., climax) vegetative communities, whereas structures, density, and species composition are constantly changing over time (i.e. seral conditions).

Table 1. Estimate of Historic Range of Variation (HRV) Summary.

Plant Association Group (PAG) (see note 1)	PAG acres (% of area)	Open	Early Structural Stage	Mid Structural Stage	Late-Multi Structure Stage	Late-Single Structural Stage
LPD & LPW	17,776 (35%)	0-10%	15-35%	40-50%	5-40%	0-5%
MCD & MCW	20,974 (41%)	0-10%	0-10%	10-50%	10-60%	10-80%
PPD & PPW	6,930 (14%)	0-5%	0-5%	0-12%	5-15%	60-90%
MHD	4,662 (9%)	---	10-20%	40-70%	20-30%	0-10%
MDW & RIP	312 (<1%)	100%	---	---	---	---
CINDER & LAVA	118 (<1%)	100%	---	---	---	---
WATER & LAKE	308 (<1%)	100%	---	---	---	---
AREA TOTALS	51,080 (100%)	2-10%	10-20%	20-40%	15-40%	20-50%

NOTES

1. LPD = Lodgepole Pine Dry, LPW = Lodgepole Pine Wet, MCD = Mixed Conifer Dry, MCW = Mixed Conifer Wet, PPD = Ponderosa Pine Dry, PPW = Ponderosa Pine Wet, MHD = Mountain Hemlock Dry, MHW = Mountain Hemlock Wet

From Plant Associations of the Central Oregon Pumice Zone (Volland, 1985), as modified by Hopkins (1994); Species = dominant (and secondary) tree species generally found within each plant association group; Structural stage = stand architecture estimates, based on the work of O'Hara et al. (1996)

Table 2. Current Forest Structural Stage Summary, by Plant Association Group

Plant Assoc. Group	Dominant (minor) species (see note 1)	Structural Stage in acres (proportion of PAG)				
		Open	Early	Mid	Late Multi	Late Single
Total PAG acres (PAG in % of area)						
LPD & LPW 17,776 ac. (35%)	LP (PP, WF, ES, MH, WP)	24 (<1%)	3634 (21%)	11,246 (63%)	2872 (16%)	0 (--)
MCD 20,956 ac. (41%)	WF, PP (LP, DF, WP, MH)	10 (--)	2084 (10%)	8178 (39%)	10,012 (48%)	672 (3%)
MCW 18 ac. (<1%)	PP (LP)	0 (--)	0 (--)	18 (100%)	0 (--)	0 (--)
PPD & PPW 6,930 ac. (14%)	PP (LP, WF)	0 (--)	230 (3%)	3488 (51%)	2910 (42%)	302 (4%)
MHD 4,662 ac. (9%)	MH (WP)	0 (--)	6 (<1%)	1011 (22%)	3645 (78%)	0 (--)
MDW & RIP 312 ac. (<1%)	Riparian species, LP (ES)	213 (68%)	11 (4%)	79 (25%)	9 (3%)	0 (--)

CINDER & LAVA 118 ac. (<1%)	ROCK	118 (100%)	0 (--)	0 (--)	0 (--)	0 (--)
WATER & LAKE 308 ac. (<1%) (see note 2)	North & South Twin Lakes and open water	308 (100%)	0 (--)	0 (--)	0 (--)	0 (--)
AREA TOTALS 51,080 ac. (100%)		673 (1%)	5965 (12%)	24,020 (47%)	19,448 (38%)	974 (2%)

NOTES

1. LP = Lodgepole Pine, PP = Ponderosa Pine, WF = White Fir, ES - Engleman Spruce, MH = Mountain Hemlock, WP = White Pine
2. Wickiup and Crane Prarie Reservoirs were not included in this total

Structural classification: Over the last several decades, there has been a pronounced shift in forest structure, density and species composition for much of the project area. Particularly for the dry forest PAGs that support ponderosa pine (PPD and MCD), the shift in fire regimes from frequent, low-intensity fires to prolonged fire absence has resulted in greatly changed vegetation compositions. Within the last century, these once resilient stands of ponderosa pine have been replaced by dense, multi-storied stands of fire susceptible species. Landscapes once dominated by open stands of ponderosa pine have been replaced by crowded stands of all sizes.

Additionally, species composition of these forest types has shifted from the fire tolerant ponderosa pine to the less resilient lodgepole pine and white fir species. To aggravate this shift from sun-loving species (ponderosa pine and Douglas-fir) to shade-loving true firs, selective harvests often removed the ponderosa pine, allowing the firs to flourish. Shifts in composition, for both structure (tree sizes and arrangement) and density, as well as species, has largely been the result of an active fire exclusion program, in addition to the selective harvesting pattern during the past 80 years.

Survey and Manage Plant Species

An appropriate survey for survey and manage plant species was completed prior to the 2001 Record of Decision for Amendments to the Survey and Manage, Protection Buffer, and other Mitigation Measures Standards and Guidelines. Prior to 2001, survey protocols for many species were more extensive than currently required. Since then, based upon new information, the survey status for some species was reassigned. The following species are known or suspected to occur in the project area:

Category A (Rare, Predisturbance Surveys Practical)

Botrychium minganense (Mingan moonwort)
Botrychium montanum (mountain grapefern)
Schistostega pennata
Tetraphis geniculata
Pseudocyphellaria rainierensis
Bridgeoporus nobilissimus

Category B (Uncommon, Pre-disturbance Surveys Not Practical)

Tritomaria exsectiformis (a liverwort),
Bondzarzewia mesenterica
Otidea leporine
Otidea smithii
Polyozellus multiplex
Sowerbyella rhenana

Category D (Uncommon, Pre-disturbance Surveys Not Practical, or not Necessary)*Buxbaumia viridis*Category F (Uncommon, or Concern for Persistence Unknown, Status Undetermined)*Otidea onotica*

Surveys in the Charlie Brown project area have determined presence of the bryophyte *Buxbaumia viridis*. Known sites would be protected. No other plant species listed as Survey and Manage were found within areas proposed for ground disturbing activities.

Threatened, Endangered, and Sensitive Plant Species

The following species are known or suspected to occur in the project area: *Carex hystericina* (porcupine sedge), *Cicuta bulbifera* (bulb-bearing waterhemlock), *Collomia mazama* (Mt. Mazama collomia), *Lycopodiella inundata* (bog club-moss), *Pilularia americana* (American pillwort), *Rorippa columbiae* (Columbia cress), *Scheuchzeria palustris ssp. Americana* (*scheuchzeria*), *Scirpus subterminalis* (water clubrush), and *Thelypodium howellii ssp. Howellii* (Howell's thelypody).

Surveys were conducted during appropriate times for plant identification in probable habitat. None of the species listed above were located in the Charlie Brown project area.

Competing and Unwanted Vegetation/Noxious weeds

Overall, the project area has a relatively low occurrence of noxious weeds. There are four isolated populations (12.5 acres) of spotted knapweed along the major travelways (40, 42, 44, 46) and on Wickiup Dam. There are four known sites of bull thistle on Browns Mountain totaling approximately five acres. Three populations of Canada thistle are growing on the south shore of Wickiup Reservoir and the east side of South Twin Lake, totaling 2.5 acres. St. John's wort is growing on three sites along Wickiup Dam and Cascade Lakes Highway, totaling two acres. Treatment on the Canada thistle and spotted knapweed populations occurred in 1999 and will continue in the year 2001, under the Decision Notice and Finding of No Significant Impact for the 1998 Deschutes National Forest Noxious Weed Control Environmental Assessment.

Aquatic Resources

The Upper Deschutes River is the principal drainage within the area. Major tributaries include Charlton Creek and Browns Creek. The Deschutes River below the Crane Prairie Reservoir Dam is on the Oregon Department of Environmental Quality 303(d) list for water quality impaired streams because of high summer water temperatures. The Deschutes River below Wickiup Reservoir Dam is listed for dissolved oxygen, flow modification, habitat modification, sediment, and turbidity. The water quality in the upper Browns/Wickiup watershed influences the water quality in the river. The water quality of Johnny Lake is considered excellent and there is no apparent degradation related to recreational use. The lake is chemically comparable to Waldo Lake, famous for its water quality and considered to be one of the most dilute large lakes in the world (Larson and Salinas, 1995). The water chemistry of the two lakes resembles distilled water. Although vulnerable to human activities, the water quality of the remaining lakes and streams within the watershed are probably similar to historic conditions (1998 Browns/Wickiup Watershed Analysis).

Waste from pit toilets and dispersed campsites located near water contributes nutrients to Wickiup and Crane Prairie Reservoirs. The volume of nutrients and the effects they are having on water quality within the reservoirs is not well understood. Research on other lakes has shown that an increase in nutrients can lead to altered water chemistry, transparency, and biological conditions within a lake. Under this alternative, nutrient loading would increase over time as recreational use increases. Water chemistry, transparency, and biological conditions would likely be affected, but changes may be difficult to trace to dispersed camping use on the reservoirs, as there are other influences to water quality from developed camping, day use, and other upstream uses.

Fish populations are predominantly non-native game species introduced by the Oregon Department of Fish and Wildlife, and in some cases illegally by the public. Native species are limited to mountain whitefish, sculpin, and redband trout, which have some genetic mixing with stocked rainbow trout. Historically, bull trout inhabited the project area, but have since become extirpated. A variety of factors such as overfishing, interspecific competition, habitat degradation, and lack of fish passage at Wickiup and Crane Prairie dams are thought to have led to the elimination of the bull trout within the project area. Genetic analysis was done recently on the redband population in Deer

Creek, a tributary to Crane Prairie Reservoir. The redbands had 22% genetic hatchery rainbow introgression, i.e., 78% of the genetic make-up of the fish on average was redband. Illegal introductions into lakes within the project area include brown bullhead, tui chub, three-spined stickleback, largemouth bass, black crappie, and bluegill. Species introduced by the State of Oregon include rainbow trout, kokanee salmon, coho salmon, brown trout, and brook trout. One of the non-native species, brook trout, have been known to inhabit some of the intermittent stream channels and are suspected to originate from Found Lake. There are no anadromous species and no Essential Fish Habitat established by the Marine Fisheries Service within the project area. The lakes within the area are well known for good fishing, and receive high fishing pressure, especially Crane Prairie and Wickiup reservoirs. Browns Creek and the Deschutes River between the reservoirs support a large amount of spawning activity by fish that reside in Wickiup Reservoir.

Soil Resources

The existing condition of the soil resource is described by the percentage currently in a detrimental state as a result of past management practices and wildfire. These soils within the project area have had a variety of impacts incurred on them both from harvest and recreational activities. A definition of the process used to define a detrimental condition is available upon request from the Bend-Ft. Rock Ranger District. Four condition classes describe the range of present impacts:

- A. None to slight disturbance which results in less than 10% of the area classified as within a detrimental condition;
- B. Disturbance resulting in 10-20% of the area classified in a detrimental condition;
- C. Disturbance resulting in 20-40% of the area classified in a detrimental condition; and
- D. Disturbance resulting in an area greater than 40% classified as in a detrimental condition.

Soils in class C and D are found (generally) in areas where previous management activities have occurred. Soils condition class A and B are considered to be in an acceptable condition and are (generally) found in areas where nominal management activities have occurred. Current standards design management practices (i.e., pre-designated skid trails) so that 80% of the area is an acceptable condition of soil productivity (condition class A and B). The following table summarizes the existing condition:

Table 3. Existing Soil Condition

Condition Class	Acres	Percent of Project Area
A	5,037	8%
B	22,262	34%
C	14,396	22%
D	9,318	14%
Water	14,767	22%

Wildlife

Historic Range of Conditions

The historic population levels for wildlife in the project area are unknown. It is likely that those species that are closely associated with wildfire disturbance were more abundant (e.g. black-backed woodpecker, northern three-toed woodpecker, white-headed woodpecker, flammulated owl). The northern spotted owl and northern goshawk, however, are species that may have increased due to the reduction of fire frequency. Species such as wolverine and fisher are known to have declined because of adverse effects associated with road construction and trapping. Amphibians have also declined, but the causes are largely unknown. Ospreys have probably increased over historic levels due to the increases in fish habitat in Wickiup and Crane Prairie reservoirs. The reservoirs, however, have also inundated riverine riparian habitats, which has impacted associated species (e.g. mink, beaver, great blue heron, harlequin duck). The numbers of elk are known to have increased, while mule deer have declined since population monitoring was initiated, but neither could be described as

considerable.

Big Game Habitat

The entire project area is classified as summer range for deer and elk. The Clover Meadow Key Elk Area in the northwest portion of the project area provides important calving/summer habitat. The relative population level for deer is considered low to moderate and for elk it is low, as compared to habitats on the east side of the Cascade Mountain range. Cougar and black bear occupy the area and numbers are likely low. One adult black bear was observed east of Crane Prairie Reservoir. Tracks of cougar were observed on Browns Mountain and near Charlton Creek in the last three years.

The 2001 Crane Complex fire resulted in the reduction of 350 acres of vegetation or about 66% of the fire's area. From a local perspective, loss of vegetation within the fire area has resulted in a reduction in hiding and thermal cover. This result would be minor in the context of the entire project area. Currently there is an estimated 35,912 acres of cover within the project boundary. Therefore, the fire has eliminated less than 1% of cover.

Raptor Sites and Habitat

There are two osprey management areas within the project. Osprey are very common near both Crane and Wickiup Reservoirs, the Twin Lakes, and the Deschutes River. Northern goshawk, Cooper's hawk, sharp-shinned hawk, red-tailed hawk, and American kestrel occur across the project area in suitable habitats. One occupied northern goshawk nest was located near Lookout Mountain, and occupied Cooper's and red-tailed hawks nests were found on Browns Mountain. Golden eagles have not been observed in the area. A variety of owls occupy the area but no occupied nests have been located.

Threatened, Endangered, Sensitive and Species of Concern

The following species are known or suspected to occur in the project area: spotted frog, Canada lynx, northern bald eagle, northern spotted owl, greater sandhill crane, California wolverine, and western big-eared bat. There are approximately 13 known bald eagle nest sites within the analysis area. Surveys were performed for the great gray owl and northern spotted owls, with no confirmed observations or responses. There is limited documentation of the spotted frog within the project area.

Survey and Manage Mollusks

An appropriate survey for survey and manage mollusk species was completed prior to the 2001 Record of Decision for Amendments to the Survey and Manage, Protection Buffer, and other Mitigation Measures Standards and Guidelines. Prior to 2001, survey protocols for many species were more extensive than currently required. Since then, based upon new information, the survey status for some species was reassigned.

Surveys determined presence of the Crater Lake tightcoil terrestrial snail *Pristiloma arcticum crateris* (documented on the Deschutes National Forest) that now require less intensive Category B (Uncommon, Pre-disturbance Surveys Not Practical) with a footnote for equivalent effort pre-disturbance surveys. No other aquatic mollusks designated as Survey and Manage species are known to occupy the Deschutes National Forest. No other aquatic mollusks designated as Survey and Manage were found within the Charlie Brown project area.

Protection Buffer Species

Note: As of January 2001, there are no longer species considered "Protection Buffer Species". The great gray owl is now considered a Survey and Manage Species (Category C). The remaining species now are protected by Standards and Guidelines and Management Recommendations designed to maintain sufficient numbers for 100% potential population levels. Reference the Record of Decision and Standards and Guidelines for Amendments to the Survey and Manage, Protection Buffer, and Other Mitigation Measures Standards and Guidelines for more details.

Six species that occur on the Deschutes National Forest have been designated by the Northwest Forest Plan for extra protection through standards and guidelines including: white-headed woodpecker, black-backed woodpecker, pygmy nuthatch, flammulated owl, great gray owl (also a Survey and Manage species), and Canada lynx. Based upon habitat descriptions and protocol requirements, pre disturbance surveys are required and were completed for the great gray owl. None were observed or responded. The remaining species were do not require surveys and none were completed.

Riparian/Wet Meadow/Springs Habitat

Narrow riparian zones are associated with all the stream drainages, lakes and reservoirs within the project area. Condition is variable but in general it is as follows: Browns Creek-excellent ([see footnote 3](#)); Charlton Creek-good to excellent; Deschutes River-good; North Twin Lake-fair; South Twin Lake-fair; Johnny Lake-excellent; Wickiup Reservoir-poor to good; Crane Prairie Reservoir-good to excellent; Upper Browns Creek wet meadow-excellent; Clover wet meadow-excellent; Browns Creek springs-excellent; and un-named ponds and

springs-generally good. Those sites with conditions less than excellent have been impacted by a variety of factors including dispersed recreation camping, vehicle and OHV impacts, timber harvest and road construction. Waterfowl and shorebird Management Indicator Species (MIS) are abundant in the project area. The Cascade frog is not abundant in the area and is restricted to high quality riparian habitats associated with ponds and marshy areas near streams and wet meadows. The Survey and Manage mollusk species (Northwest Forest Plan) are often associated with riparian habitats. Surveys for these species were conducted in the spring and fall of 1999, 2000, and 2001. The results are described in the Survey and Manage species section of the Wildlife Report found at the Bend-Ft. Rock Ranger District. Other species that have been documented to prefer riparian habitats include: American marten, fisher, elk, several bats, mink, beaver, bald eagle, and a variety of passerine birds.

Snags and Coarse Woody Materials

Woodpeckers, nuthatches, several bats and some owls are directly dependent upon snags. American marten, some woodpeckers, and the various terrestrial snails are closely associated with large down wood. Extensive field reconnaissance indicates that snag and coarse woody material are generally low across a considerable portion of the project area due to past timber harvest, salvage (insect mortality and wildfire), and firewood cutting. Five subwatersheds analyzed for snags and coarse woody material indicates deficient quantities as defined by Standards and Guidelines exist ranging 9-32% of the acres. Exceptions include the mountain hemlock zone, late successional reserves, and several old growth management areas.

Although the Crane Complex Fire consumed snags and coarse woody materials over 700 acres of the fire, there will be a net increase in the numbers of future snags and logs because the fire directly or indirectly caused mortality to green trees. Direct kill of thin barked species including white fir and lodgepole pine resulted where ground fuels flames killed the cambium of the tree boles and/or killed the majority of the trees' crowns. Indirect kill would result from partial cambium or crown destruction, due to insects, disease and competition in the future. The nearly total mortality of trees in the high severity fire areas will be valuable for foraging for many woodpeckers and other birds, but may not provide future nesting habitats. This is particularly true for the small sized snags, e.g. lodgepole pine. Many of these snags will have a short life span and will fall within several years due to weakened boles and roots.

Late Successional Old Growth (LOS)

Late and old stands (LOS) structurally classified as Stage VI (multi-storied, old) and Stage VII (single-storied, old), including lodgepole pine plant association groups, were classified as LOS within the project area. These stands totaled approximately 11,800 acres in lands allocated to Matrix out of a total of 20,422 acres within all management areas. The American marten and fisher are both associated with LOS habitats. Surveys were not conducted for either species. Marten prefer mesic coniferous forest with complex structure and are likely to occur in the project area.

Connectivity/Fragmentation

Connectivity Corridors (Figure 12) were designated and evaluated by the Browns/Wickiup Watershed Analysis and Browns/Round Mountain Late Successional Reserve Assessment. The Crane Complex fire caused a realignment of the existing corridor that traverses the west side of Round Mountain in order to connect to Browns Mountain. The corridor was mapped to maintain the best possible connection, however past timber harvest, wildfire, and road construction have considerably fragmented a large portion of the area. A coarse scale fragmentation analysis was completed for the Charlie Brown project area and is displayed on a map in the wildlife analysis files.

Recreation

Developed Camping

Within the Charlie Brown area, there are 11 developed campgrounds providing a total of 435 individual overnight campsites. Use of developed recreation facilities in the Wickiup Reservoir area has considerably increased over the past two decades. Deschutes National Forest monitoring has indicated an average forest-wide occupancy rate of 35% from 1982 through 1995 and 44% from 1995 through 1998. Average occupancy rate is calculated by averaging use over an entire camping season (late April through mid-September). A visitor is likely to find the most popular campgrounds such as Rock Creek, North Twin, South Twin, Sheep Bridge, West South Twin, and Gull Point nearly full for most peak weekends of the camping season.

Dispersed Camping

Approximately 242 sites have been inventoried around Wickiup and Crane Prairie Reservoirs, including some of the most popular and heavily used sites within the area. Generally, sites are located in upland vegetation such as bitterbrush, ponderosa pine, and lodgepole pine. A few sites have been developed within riparian buffers valued for plant diversity and aquatic-dependent wildlife habitat. A typical site can accommodate large groups (greater than six people) as well as several vehicles. Most display compacted soil throughout the immediate area, loss of some vegetation through trampling and fuelwood gathering, and numerous trails that access the shoreline. These trails often include primitive user-made access for vehicles to launch and retrieve boats. This has caused some surface run-off and loss of

soil at more heavily impacted sites. Pit toilets for disposal of human waste are common; some within 50 feet of the high waterline. Most sites are relatively free of garbage, because many campers pick up litter upon their arrival and on adjacent sites.

The Forest Service has collected data from dispersed campers in the area to identify concerns related to the change over the years in the dispersed camping experience. Data collected over the last two years has indicated an average occupancy rate for dispersed sites is between 30% and 50%. Although not statistically valid, this indicates it is likely popular sites are occupied up to one-half of the time over a camping season. In general, those who have previously camped in the area acknowledge a change in character due to an increase in visitors. These visitors adjust their arrival time to ensure they secure their "favored" camping spot. Some campers also express a desire for the Forest Service to leave the area alone and to continue with the current policy for dispersed camping around the reservoirs. Others believe the Forest Service needs to take stronger action to mitigate concerns for overuse and to limit adverse effects to resources.

Scenic Resources

The primary viewsheds within the project area are visible while traveling on the Cascade Lakes Scenic Byway (Highway 46) and while recreating on and around Crane Prairie and Wickiup Reservoirs, and North and South Twin Lakes. Classified as **Partial Retention** (foreground and middleground) under the previous Visual Management System, most of the project area is classified as **Moderate Scenic Integrity** (slightly altered) under the objectives for the newer Scenery Management System to be met for the desired landscape character of the project area. Noticeable deviations must remain subordinate to the landscape character being viewed over the long-term.

Changes in forest health are most pronounced in foreground and middleground views from Highway 46 where dense thickets of dead and dying lodgepole pine are fronted by small diameter green lodgepole pine. At Crane Prairie Reservoir, views from the shoreline are backed by dense stands of dead and dying lodgepole pine, as well as two recent wildfires totaling over 2,000 acres. At North Twin Lake, the dominant scenery on the eastern shoreline includes a landscape of large dying trees from the spread of western dwarf mistletoe.

The gathering places of the campgrounds, both dispersed and developed, as well as trailheads, trails, and boat ramps are where one would expect to see more of the visible impacts of use and heavier traffic. Some areas receive heavier use than others resulting in loss of vegetative cover and widespread dust and compaction. However, the majority of the changes to scenic views are a result of past timber harvest and the effects of insect, disease, wildfire and associated suppression activities, and windthrow.

Fire and Fuels

Over the last 15 years, there have been three large wildfires within the analysis area that have burned greater than 100 acres. They were the 1985 Lookout Mountain fire that was human caused (533 acres); and the 1994 Four Corners fire (1,523 acres) and 2001 Crane Complex Fire (720 acres) that were both caused by lightning. Adjacent to the analysis area, the 1996 Charlton fire (lightning caused) burned 1,019 acres. All of these fires were very intense and caused widespread tree mortality on most of the burned acreage.

In the Charlie Brown area, lightning has been the cause for 64 fires from 1987 through 1996. There were 66 human-caused fires over the same period. Most of these fires were suppressed at less than an acre in size, and were concentrated around the reservoirs, lakes and rivers. With increasing recreational use, human-caused fire occurrences are predicted to increase. Early detection from Round Mountain lookout and timely suppression actions are the primary reasons most fire ignitions were held to less than one acre.

Well-intentioned fire suppression over the last 100 years has been the cause for a pronounced shift in live and dead vegetation, especially in the dry forest types. These conditions do not allow naturally occurring fires to burn with the lower intensities than in the past. Instead they burn with high intensities and move into crowns of trees causing stand-replacement conditions that spread rapidly.

Action Alternatives

The following is a detailed description of the action alternatives. First, a list of activities and monitoring common to both Alternatives 2 and 3 is provided. Generally, most of the activities proposed in the earlier public scoping are common. Next, are the activities unique to Alternative 2 followed by activities unique to Alternative 3. Alternative 3 is similar to Alternative 2, except it was developed to respond to issues that resulted from public comment on Alternative 2 and further analysis. Alternative 3 provides additional habitat for the Canadian lynx and affords more protection from wildfire to Round, Lookout, and Browns Mountain. Mitigation measures, a table that compares alternatives and a listing of projects under the authority of the Knudsen/Vandenburg Act are detailed at the end of the section.

Activities Common to Alternatives 2 and 3

The following common activities for Alternatives 2 and 3 described in detail were the actions proposed to the public in December 1997:

Public Access

Maintain vehicle access (including seasonal) on approximately 240 miles of roads within the project area ([Figure 4](#)). Due to the complexity of the road system, only mapped and open roads are shown. Reconstruct or improve 10 miles of roads which have seasonal-related hazards to improve access to dispersed camping sites along the reservoirs. These actions would occur on the eastern shore of the Deschutes Arm and along the western shore between the Deschutes and Davis Arms at Wickiup Reservoir, and on the eastern shore of the southwest arm at Crane Prairie Reservoir. Reconstruction includes spot resurfacing and installation of drain dips. These actions would reduce rutting, erosion, and breaching of closed roads especially during the springtime season.

Approximately 151 miles of excess, and/or inappropriate roads throughout the analysis area would be closed and decommissioned. All user-created OHV trails which access BEMAs, lead to sensitive riparian buffers adjacent to the reservoir, and compromise public safety on road 4260 ([Figure 4](#)) which originate from the Wickiup borrow pit would be eliminated and rehabilitated. Close road 4290-200 and convert to a trail leading to Johnny Lake.

More detail on open road status can be found in Figures 5-9.

- [Figure 5 - Southwest part of Crane Prairie Reservoir](#)
- [Figure 6 - Proposed Action Details](#)
- [Figure 7 - Southeast part of Crane Prairie Reservoir](#)
- [Figure 8 - Southern part of Deschutes Arm of Wickiup Reservoir](#)
- [Figure 9 - Northern part of Deschutes Arm of Wickiup Reservoir](#)

Water Quality/Boating

Boating access during seasonal low water and maintenance of water quality would occur using reconstruction of boat ramps at Wickiup Butte and North Wickiup at Wickiup Reservoir, and Browns Mountain at Crane Prairie Reservoir. Improvements would include installment of a new ramp for more efficient launching and retrieval of watercraft and replacement of the docks. Also, parking areas would be redesigned to improve traffic flow and to increase capacity. Toilets would be upgraded or replaced to improve accessibility, eliminate leakage, and reduce odors. Funding would occur through partnerships with the Oregon State Marine Board and others.

All proposed improvements would stay within the existing areas except for North Wickiup boat ramp where the parking area would be expanded to the east by less than one acre. Vegetation consisting of lodgepole and ponderosa pine averaging 10" diameter at 4.5 feet in height would be cleared.

Water quality and public sanitation would be maintained by prohibiting pit toilets for human waste disposal within 150' of the high water mark.

Dispersed Camping

A total of fifteen (15) dispersed campsites would be closed ([see footnote 4](#)) and rehabilitated at Crane Prairie and Wickiup Reservoirs. Eight other campsites will be converted to hike- or boat-in access only. These measures are proposed to move impacts away from the water, restore vegetation, and to enhance and protect bald eagle nesting habitat. Restoration activities would include soil decompaction and plantings of native vegetation. In some of these cases, all camping would be discouraged through the removal of user-made facilities (i. e. fire rings, tables, etc.). In others, fire rings would remain in place or be moved to a more appropriate location to accommodate hike-in or boat-in use. Refer to Figures 5 through 9 for more information.

The following is a site-specific listing of the proposed closures and road reconstruction activities:

Crane Prairie Sites:

Eliminate motor vehicle access to ten sites and associated user-created roads south of Rock Creek Campground on the 4600-699 spur to address problems with unimpeded expansion into sensitive riparian areas and the associated impacts of vehicular traffic ([Figure 5](#)). Close and rehabilitate three sites while retaining seven sites for boat-in and hike-in only. Another site on

the point below Rock Creek Campground would also be closed because it is below high water in the spring and remains wet and muddy into the summer. Road reconstruction would occur on 4600-701 and 702 ([Figure 5](#)) to improve seasonal access to the remaining sites.

Close a user-created road off of Road 4270-200 to eliminate vehicular access to 3 campsites on the southeast shore of the reservoir ([Figure 7](#)) below the high water line. The current access traverses a steep bank to access the campsites on the shoreline below the seasonal high water. Some users have been expanding the site by falling trees to accommodate larger camping spots. These sites would be closed because of soil erosion, impacts to vegetation and concerns for potential impacts to water quality.

Install barriers on Road 4270-470 to prevent overnight camping at sites below the high water mark along this stretch of the reservoir ([Figure 6a](#)). Design a barrier system that would allow boat launching during the high water season, but does not allow vehicle access during low water season. This would eliminate approximately 3 campsites.

Close the user-created section of spur 4285-200 (north of Browns Mountain Boat Ramp) at the high water mark to reduce erosion and to retain/restore riparian vegetation ([Figure 7](#)). A turnaround for vehicles would be provided at the terminus. This closure would eliminate 2 campsites. Road reconstruction activities would occur on adjacent spurs 4285 310, 315, and 320 to improve seasonal access to the remaining dispersed sites. These roads access dispersed sites along the east shore of the southwest arm of the reservoir.

Wickiup Sites:

To reduce soil erosion and impacts to vegetation, close four dispersed campsites and their access on the west side of the Deschutes arm ([Figure 8](#)). One of the sites would be relocated to a more appropriate area outside of a wet meadow. Adjacent sites and their access originating from road 4280-120 would remain. Reconstruct portions of 4600-100 and 120 to improve seasonal access.

Additional activities to improve access to dispersed sites include the reconstruction a portion of roads 4260-070 & 4260-074, near Sheep Bridge Campground ([Figure 9](#)). Also, reconstruct a portion of road 4400980 on the southern shore of Wickiup Reservoir near "Fat Man Point" ([Figure 6d](#)).

Monitor dispersed campsites along the shores of Crane Prairie (200 spur, Rock Creek dispersed, Browns Mountain Boat Ramp area) and Wickiup Reservoirs (Deschutes arm, Davis Arm) that receive the most use. Provide an educational program through Field Ranger contacts and other means to encourage stewardship of the area. Inform campers how their cumulative actions directly affect the recreational experience, wildlife habitat, and water quality in the area.

Wildlife Habitat

Vegetative actions described in the following section are designed to maintain functional habitat for a variety of wildlife species, including the bald eagle. In addition to these actions, move the area of a Bald Eagle Management emphasis on the west side of North Twin Lake to a more suitable area on the east side of the lake that is more advantageous for eagle survival ([Figure 6b](#)). Close a user-created hiking trail to enhance nesting potential and to reduce disturbance by recreationists. A non-significant Forest Plan amendment would be required.

Restore Browns Meadow to an earlier successional stage by cutting encroaching lodgepole pine seedlings ([Figure 6c](#)). Prescribed fire is not an option due to surrounding high fuel loadings and risk of escape.

Forest Health/Resilience

Vegetation treatments in the Charlie Brown Area were proposed in a December 1998 letter mailed to the public and were designed to restore stand resiliency in dry forest communities where they are overstocked to the point of instability, at high risk of stand-replacement events, or shifting away from historic stand conditions. Photo #1 shows current conditions in unit DEN-07 prior to treatment. Photo #2 portrays a similar post-treatment condition as anticipated under implementation of Alternatives 2 or 3. Note the treatments retained the

same structural stage (mid, Table 4) while reducing likelihood of a wildfire progressing to a crown fire event.



Photo #1 Before Treatment For Density



Photo #2 After Treatment For Density

The following Tables (4 and 5, common to both Alternatives 2 and 3) provide site-specific details for treatments with the management objective for big trees, density control, control of dwarf mistletoe, and reduction of wildfire potential. The tables include unit acres, treatment summary, existing condition, and post-treatment conditions expected under Alternatives 2 and 3. [Figure 10](#) shows specific locations of treatments in the Proposed Action, Alternative 2. Units were adjusted due to the 2001 Crane Complex Fire.

Table 4. Treatment Unit Summary For Common Action Alternative Activities: Post-Treatment Conditions Following Harvest Activities

Unit # (see note 1)	Net Acres	NWFP Mgmt Area (see note 2)	Deschutes LRMP Mgmt Area (see note 3)	Treatment Summary (see note 4)	Current Structure (see note 5)	Structure Post-Treatment	Current Density (see note 6)	Density Post-Treatment
BIG-01	36	AWD	INR	HSP/HTH	MID	MID	MOD	MOD
BIG-02	35	LSR	EAG	HSP	LATE-M	LATE-M	HIGH	MOD
BIG-03	152	LSR	SV2	HTH/SDR	LATE-M	LATE-S	HIGH	MOD
BIG-04	42	LSR	WSA	HSL/SDR	LATE-M	LATE-S	HIGH	MOD
BIG-05	51	LSR	EAG	HSL/SDR	LATE-M	LATE-S	HIGH	MOD
BIG-06	32	MAT	SV4	HSP/SPC	MID	MID	MOD	LOW
BIG-07	59	MAT	SV4	HSP/SDR	LATE-M	LATE-M	HIGH	MOD
BIG-09	54	MAT	SV4	HSL/HSP	LATE-M	LATE-M	HIGH	MOD
BIG-10	88	LSR	EAG	HTH/HSP	LATE-M	LATE-M	HIGH	MOD
BIG-11	56	MAT	EAG	HTH/SDR	LATE-M	LATE-S	HIGH	MOD
BIG-12	14	MAT	EAG	HSV/SDR	LATE-M	LATE-S	HIGH	MOD
BIG-13	26	LSR	EAG	HSP	LATE-M	LATE-S	HIGH	MOD

DEN-01	25	MAT	SV4	HTH	MID	MID	HIGH	MOD
DEN-02	24	MAT	SV2	HTH	LATE-M	LATE-S	HIGH	MOD
DEN-03	38	MAT	SV4	HTH	LATE-M	LATE-S	HIGH	MOD
DEN-04	71	MAT	GFO	HTH	LATE-M	LATE-S	HIGH	MOD
DEN-05	30	MAT	GFO	HSP/HSV	LATE-M	LATE-S	HIGH	MOD
DEN-06	17	MAT	SV4	HTH/HSV	LATE-M	LATE-S	MOD	MOD
DEN-07	78	MAT	GFO	HTH	MID	MID	MOD	MOD
DEN-08	28	AWD	INR	HTH	LATE-M	LATE-S	HIGH	MOD
DEN-09	44	MAT	SV4	HTH	MID	MID	HIGH	MOD
DEN-10	18	MAT	SV2	HSV	MID	MID	MOD	MOD
DEN-11	31	MAT	GFO	HTH	LATE-M	LATE-S	HIGH	MOD
DMT-01	36	MAT	GFO	HSL/HSP	LATE-M	LATE-M	HIGH	MOD
DMT-02	15	MAT	GFO	HCC (see note 7) /RPL	LATE-M	EARLY	HIGH	LOW
DMT-03	85	MAT	SV2	HOR/SPC	LATE-M	MID	HIGH	MOD
DMT-04	16	MAT	EAG	PRUNE	LATE-M	LATE-M	HIGH	MOD
FT-01	66	LSR	OSP	HTH/SDR	LATE-M	LATE-S	HIGH	MOD
FT-03	86	LSR	SV2	HTH/SDR	LATE-M	LATE-S	HIGH	MOD
FT-04	103	MAT	OSP	HTH/SDR	MID	MID	MOD	MOD
FT-05	11	MAT	OSP	HTH/SDR	MID	MID	HIGH	MOD
FT-06	10	MAT	EAG	HSV	MID	MID	HIGH	MOD
FT-07	24	MAT	EAG	HTH	MID	MID	MOD	MOD
FT-08	41	LSR	SV2	HSP/SDR	LATE-M	LATE-S	HIGH	MOD
FT-09	49	LSR	OGR	HTH/SDR	LATE-M	LATE-S	HIGH	MOD
FT-11	80	MAT	GFO	PB	LATE-S	LATE-S	HIGH	MOD
FT-12	57	MAT	EAG	PB	LATE-M	LATE-S	HIGH	MOD
FT-13	185	MAT	EAG	PB	MID	LATE-S	HIGH	MOD
FT-16	229		EAG	MOW/PB	MID	MID	MOD	LOW
FT-17	351		EAG	MOW/PB	MID	MID	MOD	LOW
FT-18	249 (see note 8)	LSR	WSA	HTH/PB	LATE-M	LATE-S	HIGH	MOD
PLT-01	15	MAT	GFO	HSL/RPL	MID	EARLY	MOD	LOW
SAL-01	38	MAT	GFO	HCR/RNP	LATE-M	LATE-S	HIGH	LOW
SAL-02	36	MAT	GFO	HSV	LATE-M	MID	HIGH	MOD

SAL-03	33	MAT	GFO	HCR/RNP	LATE-M	LATE-S	HIGH	LOW
SAL-04	23	MAT	SV2	HSV	LATE-M	MID	HIGH	MOD
SAL-07	50	MAT	SV2	HSV	MID	MID	HIGH	MOD

NOTES

1. See Table 8 to determine the objective for treatment
2. As designated by the Northwest Forest Plan: AWD = Administratively Withdrawn; LSR = Late-Successional Reserve; MAT = Matrix
3. Although the Northwest Forest Plan amended the 1990 Deschutes Land and Resource Management Plan, Underlying Management Areas are sometimes more restrictive than the Northwest Forest Plan Management Allocations. EAG = Bald Eagle; INR = Intensive Recreation; GFO = General Forest; SV = Scenic Views
4. See Table 8 for the key to treatment codes
5. Early = Forested areas dominated by new trees. Mid = Usually a younger forest; often an established second generation of trees under an overstory. Late - M = A late-successional forest lacking frequent disturbance and exhibiting multi-story crown layers; shade-tolerant species are often in the understory. Late - S = A late-successional forest resulting from non-lethal prescribed or natural underburning or other management resulting in a single-storied forest; a classic example would be an open, park-like ponderosa pine stand.
6. Low, Moderate, and High are used to classify conditions of stands as it relates to Stand Density Index (SDI). Basically, it is a relative measure of the ability to support a vegetated condition (e.g., a "High" condition would be at the greatest risk for a stand-replacement disturbance).
7. Alternative 3 would commercially thin (harvest code HSH) this stand. In Alternative 2, in this circumstance, clearcutting has been determined to be the optimum harvest method to achieve desired objectives {16 USC 1604(k)}.
8. Commercial thinning in FT-18 would not occur in Alternative 2

Risk of Wildfire

Included in the treatments listed above are various fuels treatments (coded FT) such as thinning, salvage, and mechanical brush reduction to reduce hazardous conditions on approximately 1,541 acres. Also included is the restoration of a frequent-low intensity fire regime by prescribed burning on 990 acres. The target return interval would be every 8-15 years. Areas with high fuel loadings would require several prescribed fire entries in 2-5 year intervals until conditions no longer have the potential to cause high levels of mortality in trees that are desired for retention. In areas where shrubs like greenleaf manzanita (*Arctostaphylos patula*) and snowbrush (*Ceanothus velutinus*) exist and are not desired, a two-burn strategy would be used to kill plants that sprout from seed prior to producing seed of their own.

Photo #5 shows the existing condition in a unit proposed for fuel treatment (FT-25). Photo #6 shows the predicted conditions following treatment.



Photo #5 Before Fuel Treatment



Photo #6 After Fuel Treatment

The following photos show a typical stand proposed for non-commercial thinning, before and after treatment.



Photo #3 Non-Commercial Thinning Before



Photo #4 Non-Commercial Thinning After

Table 5. Unit Summary for Non-Commercial Thinning Following Treatment Common to Alternatives 2 and 3

Unit #	NWFP Mgmt Area	Deschutes LRMP Mgmt Area	Net Acres	Treatment Summary	Current Structure	Current Density	Future Structure	Future Density
PCT-001	MAT	GFO	65	SPC	MID	HIGH	MID	LOW
PCT-002	MAT	GFO	88	HSA/SPC	MID	HIGH	EARLY	LOW
PCT-003	MAT	SV2	21	HOR/SPC	EARLY	HIGH	EARLY	LOW
PCT-004	MAT	SV2	6	SPC	MID	HIGH	MID	LOW
PCT-005	MAT	GFO	48	SPC	MID	HIGH	MID	LOW

PCT-006	MAT	SV2	27	HOR/SPC	MID	HIGH	EARLY	LOW
PCT-007	MAT	GFO	18	SPC	MID	HIGH	MID	LOW
PCT-008	MAT	GFO	14	SPC	MID	HIGH	MID	LOW
PCT-009	MAT	GFO	14	SPC	MID	HIGH	MID	LOW
PCT-010	MAT	GFO	18	SPC	MID	HIGH	MID	LOW
PCT-011	MAT	GFO	23	SPC	MID	HIGH	MID	LOW
PCT-012	MAT	GFO	19	SPC	MID	HIGH	MID	LOW
PCT-013	MAT	GFO	26	SPC	MID	HIGH	MID	LOW
PCT-014	MAT	EAG	64	HOR/SPC	MID	HIGH	MID	LOW
PCT-015	MAT	EAG	37	HOR/SPC	MID	HIGH	MID	LOW
PCT-016	MAT	EAG	10	SPC	MID	HIGH	MID	LOW
PCT-017	AWD	INR	17	HOR/SPC	MID	HIGH	MID	LOW
PCT-018	MAT	INR	130	HOR/SPC	MID	HIGH	MID	LOW
PCT-019	MAT	OSP	42	HOR/SPC	MID	HIGH	MID	LOW
PCT-020	MAT	SV2	138	HOR/SPC	MID	HIGH	MID	LOW
PCT-021	MAT	SV2	28	HOR/SPC	MID	HIGH	MID	LOW
PCT-024	MAT	GFO	21	SPC	MID	HIGH	MID	LOW
PCT-025	MAT	GFO	4	HOR/SPC	MID	HIGH	MID	LOW
PCT-026	MAT	GFO	3	SPC	MID	HIGH	MID	LOW
PCT-027	MAT	SV4	115	SPC	MID	HIGH	MID	LOW
PCT-028	MAT	GFO	61	HSA/SPC	MID	HIGH	MID	LOW
PCT-030	LSR	SV4	6	SPC	EARLY	MOD	EARLY	LOW
PCT-031	LSR	EAG	8	SPC	MID	HIGH	MID	LOW
PCT-032	LSR	EAG	6	SPC	EARLY	MOD	EARLY	LOW
PCT-033	LSR	SV4	4	SPC	EARLY	MOD	EARLY	LOW
PCT-034	LSR	SV4	14	SPC	MID	MOD	MID	LOW
PCT-035	LSR	SV4	4	SPC	MID	MOD	MID	LOW
PCT-036	LSR	SV4	11	SPC	EARLY	MOD	EARLY	LOW
PCT-037	LSR	SV4	13	SPC	MID	HIGH	MID	LOW
PCT-038	LSR	SV2	6	HOR/SPC	MID	MOD	MID	LOW
PCT-039	MAT	GFO	70	SPC	MID	HIGH	MID	LOW
PCT-040	MAT	GFO	27	HOR/SPC	EARLY	HIGH	EARLY	LOW

PCT-041	MAT	GFO	59	HOR/SPC	MID	HIGH	MID	LOW
PCT-042	MAT	SV4	138	HOR/SPC	MID	HIGH	MID	LOW
PCT-043	MAT	EAG	33	HOR/SPC	MID	MOD	MID	LOW
PCT-044	LSR	SV2	58	SPC	EARLY	HIGH	EARLY	LOW
PCT-046	MAT	GFO	18	SPC	MID	MOD	MID	LOW
PCT-048	MAT	GFO	16	HOR/SPC	MID	HIGH	EARLY	LOW
PCT-049	MAT	SV2	30	SPC	MID	HIGH	MID	LOW
PCT-050		EAG	44	SPC	MID	HIGH	MID	LOW
PCT-051		INR	32	SPC	MID	HIGH	MID	LOW
PCT-052	LSR	WSA	46	HSA/SPC	EARLY	HIGH	EARLY	LOW
PCT-053	LSR	GFO	38	HOR/SPC	EARLY	HIGH	EARLY	LOW
PCT-054	LSR	GFO	23	SPC	EARLY	HIGH	EARLY	LOW
PCT-055	AWD	WSA	15	SPC	MID	HIGH	MID	LOW
PCT-056	LSR	GFO	22	HSA/SPC	MID	HIGH	EARLY	LOW
PCT-057	LSR	GFO	24	HSA/SPC	EARLY	HIGH	EARLY	LOW
PCT-058	AWD	INR	13	SPC	MID	HIGH	MID	LOW
PCT-059	MAT	EAG	22	SPC	MID	HIGH	MID	LOW
PCT-060	MAT	GFO	10	SPC	EARLY	MOD	EARLY	LOW
PCT-062	LSR	WSA	9	SPC	EARLY	HIGH	EARLY	LOW
PCT-063	AWD	INR	6	SPC	EARLY	HIGH	EARLY	LOW
PCT-064	LSR	GFO	10	SPC	MID	HIGH	MID	LOW
PCT-065	MAT	EAG	24	HOR/SPC	MID	HIGH	EARLY	LOW
PCT-066	MAT	GFO	2	SPC	MID	MOD	MID	LOW
PCT-067	MAT	GFO	2	SPC	MID	HIGH	MID	LOW
PCT-068	MAT	EAG	4	SPC	MID	HIGH	MID	LOW
PCT-069	MAT	EAG	10	SPC	EARLY	HIGH	EARLY	LOW
PCT-070	MAT	GFO	6	SPC	EARLY	HIGH	EARLY	LOW
PCT-071	LSR	GFO	6	HSA/SPC	MID	HIGH	MID	LOW
PCT-072	LSR	SV2	7	SPC	EARLY	MOD	EARLY	LOW
PCT-073	AWD	INR	3	SPC	MID	HIGH	MID	LOW
PCT-074	AWD	INR	33	HOR/SPC	MID	HIGH	MID	LOW
PCT-075	AWD	INR	7	HOR/SPC	MID	HIGH	MID	LOW

PCT-076	AWD	INR	20	SPC	MID	HIGH	MID	LOW
PCT-077	AWD	INR	6	SPC	MID	HIGH	MID	LOW
PCT-078	AWD	INR	5	HSA/SPC	MID	HIGH	MID	LOW
PCT-079	AWD	INR	2	SPC	MID	HIGH	MID	LOW
PCT-080	AWD	INR	39	SPC	MID	HIGH	MID	LOW
PCT-081	AWD	INR	35	SPC	MID	HIGH	MID	LOW
PCT-082	LSR	OGR	10	HOR/SPC	MID	MOD	EARLY	LOW
PCT-083	AWD	INR	14	SPC	MID	HIGH	MID	LOW
PCT-084	AWD	INR	42	SPC	MID	HIGH	MID	LOW
PCT-085	AWD	INR	39	SPC	MID	HIGH	MID	LOW
PCT-086	AWD	INR	26	SPC	MID	HIGH	MID	LOW
PCT-087	AWD	INR	22	SPC	MID	HIGH	MID	LOW
PCT-088	AWD	INR	14	HSA/SPC	MID	HIGH	MID	LOW
PCT-089	AWD	INR	16	HOR/SPC	MID	HIGH	MID	LOW
PCT-090	MAT	GFO	38	HOR/SPC	EARLY	HIGH	EARLY	LOW
PCT-091	MAT	GFO	42	SPC	EARLY	MOD	EARLY	LOW
PCT-092	MAT	GFO	8	HOR/SPC	EARLY	HIGH	EARLY	LOW
PCT-093	MAT	GFO	23	SPC	MID	HIGH	MID	LOW
PCT-094	MAT	GFO	22	SPC	MID	HIGH	MID	LOW
PCT-095	MAT	GFO	24	SPC	MID	HIGH	MID	LOW
PCT-096	MAT	GFO	70	SPC	MID	MOD	MID	LOW
PCT-097	MAT	GFO	21	SPC	MID	HIGH	MID	LOW
PCT-098	MAT	GFO	53	SPC	MID	HIGH	MID	LOW
PCT-099	MAT	SV2	4	SPC	MID	HIGH	MID	LOW
PCT-100	MAT	GFO	101	SPC	EARLY	MOD	EARLY	LOW
PCT-101	MAT	GFO	34	SPC	EARLY	MOD	EARLY	LOW
PCT-102		GFO	32	SPC	MID	HIGH	MID	LOW
PCT-103	MAT	SV2	71	SPC	MID	HIGH	MID	LOW
PCT-104		INR	26	SPC	EARLY	MOD	EARLY	LOW
PCT-105		INR	25	SPC	MID	HIGH	MID	LOW
PCT-106	MAT	SV2	18	SPC	MID	HIGH	MID	LOW
PCT-108	MAT	GFO	24	HSA/SPC	MID	HIGH	EARLY	LOW
PCT-109	MAT	GFO	29	SPC	EARLY	HIGH	EARLY	LOW

PCT-110	MAT	GFO	22	SPC	MID	HIGH	MID	LOW
PCT-111	MAT	GFO	19	SPC	MID	HIGH	MID	LOW
PCT-112	LSR	INR	6	HOR/SPC	MID	HIGH	MID	LOW
PCT-113	LSR	INR	18	HOR/SPC	MID	HIGH	MID	LOW
PCT-114	LSR	INR	115	HOR/SPC	MID	HIGH	MID	LOW
PCT-115	AWD	INR	132	HOR/SPC	MID	HIGH	MID	LOW
PCT-116	AWD	INR	14	HOR/SPC	MID	HIGH	MID	LOW
PCT-118	MAT	GFO	11	SPC	MID	HIGH	MID	LOW
PCT-119	MAT	GFO	24	SPC	MID	HIGH	MID	LOW
PCT-120	MAT	GFO	16	SPC	MID	HIGH	MID	LOW
PCT-121	MAT	GFO	6	SPC	MID	HIGH	MID	LOW
PCT-122	MAT	GFO	34	SPC	MID	HIGH	MID	LOW
PCT-123	MAT	EAG	9	SPC	MID	HIGH	MID	LOW
PCT-124	MAT	EAG	14	HOR/SPC	MID	HIGH	MID	LOW
PCT-125	MAT	GFO	35	HOR/SPC	MID	HIGH	MID	LOW
PCT-126	MAT	GFO	44	HOR/SPC	MID	HIGH	MID	LOW
PCT-127	MAT	GFO	16	SPC	EARLY	HIGH	EARLY	LOW
PCT-128	MAT	SV2	8	HOR/SPC	MID	HIGH	MID	LOW
PCT-129	MAT	SV2	55	HOR/SPC	EARLY	MOD	EARLY	LOW
PCT-131	MAT	GFO	22	SPC	MID	MOD	MID	LOW
PCT-132	MAT	GFO	95	HOR/SPC	EARLY	MOD	EARLY	LOW
PCT-133	MAT	GFO	26	HSA/SPC	EARLY	MOD	EARLY	LOW
PCT-134	MAT	GFO	82	HSA/SPC	EARLY	HIGH	EARLY	LOW
PCT-135	MAT	GFO	31	SPC	EARLY	MOD	EARLY	LOW

Monitoring

Large Tree Survival - The objective is for monitoring the effectiveness of treatments where the management objective is listed as "Big" in units and the prescription is to culture around the individual overstory trees. The method used would be to pair both treated and untreated (control) plots for an estimated 20-years.

Stocking Surveys - Implementation monitoring in units planted with seedlings for survival on the first and third year.

Water Quality - Initial baseline monitoring for water quality has been completed recently for the following lakes and reservoirs: Johnny, North Twin, Wickiup, Lemish, and Found. The water quality of these waterbodies as well as Crane Prairie, and South Twin would be monitored in the future to establish trends. The following monitoring stations within the project area streams have been established to measure water quality:

- Deschutes River near Browns Crossing bridge for temperature and macroinvertebrate communities
- Browns Creek near road 4280 crossing measuring temperature, sediment, and macroinvertebrate communities
- Two stations on Browns Creek above road 4280 crossing measuring sediment
- Reference reach with cross-sections on Browns Creek

In addition, there are three gauging stations on the Deschutes River, Browns Creek, and Charlton Creek measuring stream flows.

For more details, contact the District Fisheries Biologist at the Bend-Ft. Rock Ranger District.

Activities Unique to Alternative 2

The following vegetative treatments shown in Tables 6 and 7 are exclusive to Alternative 2 (the Proposed Action):

Table 6. Treatment Unit Summary For Alternative 2 Activities: Post-Treatment Conditions Following Harvest Activities.

Unit # (see note 1)	Net Acres	Treatment Summary (see note 2)	Current Structure (see note 3)	Current Density (see note 4)	Structure Post-Treatment	Density Post-Mgmt	Area Treatment
DMT-05	58	HSL/HSP	LATE-M	MOD	MID	LOW	GFO
FT-02	21	HTH/SDR	LATE-M	HIGH	LATE-S	MOD	LSR
FT-14	54	PB	LATE-M	MOD	LATE-S	LOW	MAT/GFO
FT-15	34	PB	MID	MOD	MID	LOW	MAT/GFO

NOTES

1. See Table 8 to reference objective for treatment
2. See Table 8 for the key to treatment codes
3. Early = Forested areas dominated by new trees. Mid = Usually a younger forest, often an established second generation of trees that can be with or without an overstory. Late - M = A late-successional forest lacking frequent disturbance and exhibiting multi-story crown layers; shade-tolerant species are often in the understory. Late - S = A late-successional forest resulting from non-lethal prescribed or natural underburning or other management resulting in a single-storied forest; a classic example would be an open, park-like ponderosa pine stand.
4. Low, Moderate, and High are used to classify conditions of stands as it relates to Stand Density Index (SDI). Basically, it is a relative measure of the land's ability to support a vegetated condition (e.g., a "High" condition would be at the greatest risk for a stand-replacement disturbance).

Table 7. Unit Summary for Non-Commercial Thinning Following Treatment in Alternative 2

Unit #	Net * Acres	Treatment Summary	Current Structure	Current Density	Future Structure	Future Density	Mgmt Area
PCT-022	17	HOR/SPC	MID	HIGH	MID	LOW	MAT/SV2
PCT-023	89	HOR/SPC	MID	HIGH	MID	LOW	MAT/GFO

PCT-029	23	SPC	MID	HIGH	MID	LOW	MAT/GFO
PCT-045	31	HOR/SPC	EARLY	HIGH	EARLY	LOW	MAT/SV2
PCT-047	25	SPC	MID	HIGH	MID	LOW	MAT/GFO
PCT-061	10	SPC	MID	HIGH	MID	LOW	AWD/INR
PCT-107	14	SPC	MID	MOD	MID	LOW	MAT/GFO
PCT-117	19	SPC	MID	HIGH	MID	LOW	MAT/GFO
PCT-130	119	HSA/HOR	EARLY	MOD	EARLY	MOD	MAT/GFO

* Net acres are calculated at 80% of gross treatment acres, allowing for rounding to whole numbers. During the layout phase of project implementation, opportunities would be afforded to locate treated areas to provide travel connectivity, snags, green tree replacements, and overall biodiversity for terrestrial species.

The following table (Table 8) summarizes treatment codes, acres, and estimated volumes by management objective for Alternative 2 (Proposed Action)

Table 8. Alternative 2 Proposed Vegetation Treatments by Management Objective

Objective (see note 1)	Treatment Code (see note 2)	Net Acres	Est. Volume (MMBF) (see note 3)
Maintain Big Trees (BIG)	HSL, HSP, SDR, HTH	645	3.2
Reduce High Stand Densities (DEN)	HSP, HSV, HTH	335	2.8
Arrest the Spread of Dwarf Mistletoe (DMT) and Plant	HCC, RPL, HOR, SPC, HSL, HSP, HSA, GPR	178 (Includes 16 acres of planting of Western White Pine)	1.5
Fuels Treatment (FT)	HSP, HTH, SDR, SPC, FPR, FMT	1,620	1.7
Salvage Dead and Dying Lodgepole (SAL)	HCR, HSH, RNP, HSV	155	3.0
Thin Young Trees (PCT) Overstory Trees	HOR/SPC	2,032	3.1
Thin Young Trees (PCT) No Overstory	SPC	2,002	0
Plant Pine Trees	RPL	13	0.1
Total		6,980	15.4

NOTES

1. **Maintain Big Trees** = Grow and maintain big trees through reduction of understory competition. The objective is to maintain habitat for dependent species such as the bald eagle, spotted owl, and white-headed woodpecker. **Fuel Treatment** = Reduce heavy fuel concentrations (using prescribed burning and mechanical manipulation) and reduce multiple canopies to increase the chance of a successful fire suppression effort on a wildfire, should one occur. This objective is to increase safety for the public and firefighters as well as decrease the risk of a stand replacement wildfire event entering the late-successional reserves. **Reduce High Stand Densities** = Thin trees, particularly in ponderosa pine-dominated stands. The objective is to both reduce the risk of western bark beetle attack and accelerate the development of Late and Old Structural characteristics. **Arrest the Spread of Dwarf Mistletoe** = Removal of infected trees and/or pruning and planting. Treatments would occur within and adjacent to treated stands. **Thin Young Trees** = Reduce high stand densities, particularly in tree plantations. **Plant Conifer Seedlings** = Plant seedlings resistant to infected overstory trees. **Salvage Lodgepole** = Salvage dead and dying lodgepole in stands affected by mountain pine beetle.
2. **HSL** = Individual or group selection harvest, **HSP** = Special harvest, such as cutting a pre-determined radius of understory trees competing with larger trees that are desired for retention, **SDR** = removal of non-commercial stand in order to regenerate with the desired species. **HTH** = Thinning of intermediate trees. **SPC** = Understory thinning of trees. **FPR** = Prescribed burning to reduce accumulated natural hazard. **FMT** = mechanical fuels treatment such as mechanical shrub treatments. **HSV** = Salvage. **HCC** = Clear cut. **RPL** = Reforestation by planting of conifer seedlings. **HOR** = Overstory removal. **GPR** = Prune limbs infected with dwarf mistletoe plants. **HCR** = clear cut with reserve trees. **HSA** = Removal of trees to improve stand health by stopping or reducing actual or anticipated spread of insect and disease.
3. **MMBF** = Million Board Feet

Vegetation Management Objectives (Categories)

Treatments would be applied within the following management areas ([Figure 1](#)): Late-Successional Reserves (1,515 acres), Administratively Withdrawn (905 acres), Matrix Lands (5,220 acres), Bald Eagle (1,505 acres), Osprey (365 acres), Wild and Scenic River ([see footnote 5](#)) (275 acres), Old Growth (75 acres) and Browns Meadow Rehabilitation in Late Successional Reserves ([see footnote 6](#)) (65 acres). Within riparian buffers, approximately 467 acres would be non-commercially thinned and hazardous fuel loadings would be reduced using prescribed burning on 50 acres.

Alternative 3

Alternative 3 ([Figure 11](#)) is similar to Alternative 2 as listed on page 26. This Alternative was further refined from Alternative 2 after additional analysis and public comment led to the development of the issues listed in the [Introduction Section](#). Also, units were adjusted due to the 2001 Crane Complex Fire. Here is a listing of issues and how this alternative was designed to respond:

Issue #1: The proposed action did not adequately provide habitat conditions for species and their prey that favor dense thickets of regeneration, such as the lynx.

Alternative #3 responds by: Modifying boundaries and (in some cases) eliminating Alternative 2 units to provide for favorable habitat.

Issue #2: Alternative 2 (the proposed action) does not adequately address problems associated with limited fire detection capabilities and protection of personnel and structures on Round and Lookout Mountains.

Alternative #3 responds by: Proposing treatments to improve detection and to protect the safety of Round Mountain personnel as well as the visiting public by:

- Increase the role of fire in dry pine ecosystems by prescription on approximately 375 acres

- Implement commercial thinning on 35 acres prior to burning (FT 026, FT 025);
- Mechanically treat shrubs on 30 acres to improve the chances of the successful suppression of a wildfire, or to allow time for evacuation of the lookout (FT 027);
- Top or fell approximately 30 trees averaging in diameter 10" on ten acres on the top of the mountain in the immediate vicinity of the lookout to improve detection capabilities in the surrounding watersheds. Topping would be the preferred treatment to maintain values associated with late-successional forests; and
- Salvage 200 acres of dead and dying lodgepole pine at the base of the mountain (FT 040, FT 041).

Proposed treatments to protect **Lookout Mountain**, the communications site, and experimental forest:

- Non-commercially thin small trees on 75 acres (FT 020);
- Increase the role of fire in dry pine ecosystems by prescription on approximately 255 acres. Implements commercial thinning on 130 acres and salvage dead and dying lodgepole pine on 90 acres prior to burning (FT 021, FT 022, FT 023, FT 024);
- Salvage dead and dying lodgepole pine on 92 acres with no prescribed burning post treatment (FT 039); and
- Mechanically treat shrubs and thin young trees on 75 acres (FT 020).

Additional Proposed Activities in Alternative 3:

A gate would be installed on the north side of the junction of roads 4260-070 and 4260-072 to replace an existing barricade to allow seasonal access to the Deschutes arm of Wickiup Reservoir during waterfowl hunting season. This would allow hunters a place to launch boats when the boat ramp at Sheep Bridge is frozen and not available.

Install a parking area for 3-4 vehicles at road 4600-690 and Cascade Lakes Highway to provide safety at a popular access point for angling on Crane Prairie Reservoir.

The following vegetative treatments shown in Table 9 are exclusive to Alternative 3:

Table 9. Treatment Unit Summary For Alternative 3 Activities: Post-Treatment Conditions

Unit # (see note 1)	Gross Acres	Mgmt Area (see note 2)	Treatment Summary (see note 3)	Current Structure (see note 4)	Current Density (see note 5)	Structure Post- Treatment	Density Post- Treatment
BIG-14	46	MAT	HSP/HTH	LATE-M	HIGH	LATE-M	MOD
BIG-15	10	EAG	HSP/HTH	LATE-M	HIGH	LATE-M	MOD
BIG-16	107	EAG	HSP/HTH	LATE-M	MOD	LATE-M	MOD
BIG-17	19	MAT	HSP/HTH	LATE-M	HIGH	LATE-S	MOD
DMT-06	37	MAT	HSA	EARLY	LOW	EARLY	LOW
DMT-07	37	MAT	HSA	EARLY	LOW	EARLY	LOW
FT-20	74	MAT	SPC/MST	EARLY	MOD	EARLY	LOW
FT-21	132	MAT	HTH/PB	MID	MOD	MID	LOW
FT-22	89	MAT	HSV/PB	MID	MOD	MID	LOW
FT-23	18	MAT	PB	MID	MOD	MID	LOW

FT-24	14	MAT	PB	MID	LOW	MID	LOW
FT-25	29	MAT	HTH/PB	LATE-M	MOD	LATE-S	LOW
FT-26	232	MAT	PB	MID	LOW	MID	LOW
FT-27	30	MAT	MST	LATE-S	MOD	LATE-S	LOW
FT-28	10	LSR	TOP/PILE	MID	MOD	MID	LOW
FT-29	104	LSR	PB	LATE-M	HIGH	LATE-S	MOD
FT-30	38	MAT	MST	MID	MOD	MID	MOD
FT-31	88	MAT	SDR/MST	MID	MOD	MID	LOW
FT-32	38	GFO	MOW	MID	LOW	MID	LOW
FT-33	116	SV	HSP/SDR	MID	MOD	MID	LOW
FT-34	203	MAT	PB	LATE-M	MOD	LATE-S	LOW
FT-35	64	INR	MST/PB	MID	MOD	MID	LOW
FT-36	164	EAG	MST/PB	LATE-M	HIGH	LATE-S	MOD
FT-37	28	MAT	MST	MID	MOD	MID	LOW
FT-38	27	MAT	MST	MID	LOW	MID	LOW
FT-39	92	MAT	HSV	LATE-M	HIGH	LATE-M	MOD
FT-40	59	MAT	HSV	MID	MOD	MID	LOW
FT-41	124	MAT	HSV	LATE-M	HIGH	LATE-M	MOD

NOTES

1. See Table 8 to determine the objective for treatment
2. See Table 4 for the key to Management Allocation
3. See Table 8 for the key to treatment codes
4. Early = Forested areas dominated by new trees. Mid = Usually a younger forest; often an established second generation of trees under an overstory. Late - M = A late-successional forest lacking frequent disturbance and exhibiting multi-story crown layers; shade-tolerant species are often in the understory. Late - S = A late-successional forest resulting from non-lethal prescribed or natural underburning or other management resulting in a single-storied forest; a classic example would be an open, park-like ponderosa pine stand.
5. Low, Moderate, and High are used to classify conditions of stands as it relates to Stand Density Index (SDI). Basically, it is a relative measure of the land's ability to support a vegetated condition (e.g., a "High" condition would be at the greatest risk for a stand-replacement disturbance).

The following table (Table 10) summarizes treatment codes, acres, and estimated volumes by management objective for Alternative 3:

Table 10. Proposed Vegetation Treatments For Alternative 3

Activity (see note 1)	Treatment Code (see note 2)	Net Acres	Est. Volume (MMBF) (see note 3)
Maintain Big Trees	HSL, HSP, SDR, HTH	827	3.8
Reduce High Stand Densities	HSP, HSV, HTH	335	2.8
Arrest the Spread of Dwarf Mistletoe and Plant Trees	RPL, HOR, SPC, HSL, HSP, HSA, PRUNE	192 (Includes 16 acres of planting of Western White Pine)	1.1
Fuels Treatment	HSP, HTH, SDR, SPC, FPR, MST	2,880	3.9
Salvage Dead and Dying Lodgepole	HCR, HSH, RNP, HSV	180	2.9
Thin Young Trees (With Overstory)	HOR/SPC	1,895	2.6
Thin Young Trees (No Overstory)	SPC	1,911	0
Plant Pine Trees	RPL	13	0.1
Total		8,233	17.2

NOTES

- Maintain Big Trees** = Grow and maintain big trees through reduction of understory competition. The objective is to maintain habitat for dependent species such as the bald eagle, spotted owl, and white-headed woodpecker. **Fuel Treatment** = Reduce heavy fuel concentrations (using prescribed burning and mechanical manipulation) and reduce multiple canopies to increase the chance of a successful fire suppression effort on a wildfire, should one occur. This objective is to increase safety for the public and firefighters as well as decrease the risk of a stand replacement wildfire event entering the late-successional reserves. **Reduce High Stand Densities** = Thin trees, particularly in ponderosa pine-dominated stands. The objective is to both reduce the risk of western bark beetle attack and accelerate the development of Late and Old Structural characteristics. **Arrest the Spread of Dwarf Mistletoe** = Removal of infected trees and/or pruning and planting. Treatments would occur within and adjacent to treated stands. **Thin Young Trees** = Reduce high stand densities, particularly in tree plantations. **Plant Conifer Seedlings** = Plant seedlings resistant to infected overstory trees. **Salvage Lodgepole** = Salvage dead and dying lodgepole in stands affected by mountain pine beetle.
- HSL** = Individual or group selection harvest, **HSP** = Special harvest, such as cutting a pre-determined radius of understory trees competing with larger trees that are desired for retention, **SDR** = removal of non-commercial stand in order to regenerate with the desired species. **HTH** = Thinning of intermediate trees. **SPC** = Understory thinning of trees. **FPR** = Prescribed burning to reduce accumulated natural hazard. **FMT** = mechanical fuels treatment such as mechanical shrub treatments. **HSV** = Salvage. **HCC** = Clear cut. **RPL** = Reforestation by planting of conifer seedlings. **HOR** = Overstory removal. **GPR** = Prune limbs infected with dwarf mistletoe plants. **HCR** = clear cut with reserve trees. **HSA** = Removal of trees to improve stand health by stopping or reducing actual or anticipated spread of insect and disease.
- MMBF = Million Board Feet

Mitigation Measures, Management Requirements, and Recommendations Common to Alternatives 2 and 3

Alternatives are designed to be consistent with the desired condition specified in the *Deschutes National Forest Land and Resource Management Plan* (Forest Plan, LRMP) and with the standards and

guidelines contained within. Direction contained in the Regional Forester's amendment #2 to *The Interim Management Direction Establishing Riparian, Ecosystem and Wildlife Standards For Timber Sales (Eastside Screens), Inland Native Fish Strategy (INFISH), and the Standards and Guidelines for Management of Habitat for Late-Successional and Old-Growth Forest Related Species Within the Range of the Northern Spotted Owl (Northwest Forest Plan, NWFP) and General Water Quality Best Management Practices (BMP)* are cited after the Mitigation Measure (MM), Management Requirement (MR) or Recommendation where applicable. In many cases, more than one standard and guideline applies. In these cases, the more restrictive standard and guideline would generally apply and/or one that provides greater benefits to late-successional forest-related species. The *Interior Columbia Basin Ecosystem Project Final EIS (ICBEMP)* is also cited where applicable.

The following measures highlight some of the specific applications to be applied to all the action alternatives whenever the applicable site-specific conditions are present. Mitigation Measures usually are applied to reduce potential adverse impacts when a quantifiable threshold is identified. Management Requirements represent Standards and Guidelines from the Forest Plan.

Mitigation Measures (MM), Management Requirements (MR), or Recommendations Common To All Management Areas:

Soil

1. Design management practices (i.e., pre-designated skid trails) so that 80% of the area is an acceptable condition of soil productivity (condition class A and B) with the least amount of subsoiling for restoration. This includes system and temporary roads, landings, spur roads, and all trails. Stabilize skid trails, landings and temporary roads after management activity. Systems may include seasonal operations over snow and/or frozen ground, boom mounted harvesting equipment, and selective hand felling. (LRMP SL-1, SL-3); (Timber Management BMP T-2, T-3, T-13); (Fuels Management BMP F-2, Timber Management BMP T-11 & T-16) **MM**

2. After treatment, if post harvest monitoring shows an activity area to have more than 20 percent detrimental soil conditions then initiate appropriate rehabilitation efforts within these activity areas to reduce detrimental conditions. (LRMP SL-4); (Watershed Restoration BMP W-1) **MM**

3. The objective is to maintain fine organic matter in an undisturbed condition over at least 65 percent of an activity area in both harvesting and post harvesting operations to avoid nutrient cycle deficits (short term nutrient cycling). If the soil and potential natural plant community of a site is not capable of producing fine organic matter over 65 percent of the area, maintain 65 percent over the portion of the site that is capable (LRMP SL-6); (Fuels Management BMP F-2); (Timber Management BMP T-13) **MM**

4. Keep landings to a minimum size necessary for safe and efficient operations. Landing sizes would not be allowed to expand for the purposes of slash disposal under whole tree yarding prescription. Landing locations should utilize existing areas of impact where possible. **MM**

5. Avoid mechanical operations during periods of excessive soil moisture conditions. **MM**

6. Restrict ground-based equipment to slopes less than 30 percent. (LRMP SL-5); (Vegetation Manipulation BMP VM-1); (Timber Management BMP T-3, T-9 & T-13) **MM**

7. Decompact soils prior to plant restoration activities in dispersed camping areas. Place organic material on exposed bare ground to protect planted material from temperature extremes (micro-siting). **MR**

Scenery and Recreation Management

8. Complete slash treatment for lands within Management Area 9 (Scenic Views) within two years after creation in areas that are seen from campgrounds and main roads (Roads 40, 42, 44, 4262, 4270, 4290) and Highway 46 (Cascade Lakes Scenic Byway). This should be done with low impact machinery or hand piling including the removal of any safety hazards close to or within existing dispersed or developed campsites. (LRMP M9-8, M9-18, M9-44) **MM**

9. Within Management Area 9 (Scenic Views), the objective is to minimize visible impacts to the landscape resulting from vegetation management activities. Within foreground and middleground areas having Scenic Integrity Levels of Moderate (Partial Retention) along major roads and Highway 46, 75% of visible slash within 300 feet should not be evident within two years after it is created. Post-sale treatments should be designed to lessen impacts to scenery, including evidence of mechanical treatments and prescribed pile burning. (LRMP M9-4, M9-8, M9-18) **MR**

10. Stumps are to be flush cut to a maximum height of 6 inches or less within 100 feet of main roads and within 300 feet from Highway 46. Add dirt to lessen the visibility of a fresh-cut stump. **MR**

11. Within Management Area 9 (Scenic Views), design non-commercial thinning units of young trees along main roads and Highway 46 to meet Scenery Management Objectives for Scenic Integrity Levels of Moderate (Partial Retention). **MR**

12. Within Management Area 9 (Scenic Views), a Landscape Architect would assist in establishing marking guides and with unit layout for all treatments along main roads (Roads 40, 42, 44, 4262, 4270, 4290), adjacent to developed and dispersed campsites, and Highway 46 in foreground areas having Scenic Integrity Levels of Moderate (Partial Retention). (LRMP M9-7, M9-26) **MR**

13. The objective of the landscape as viewed from main roads and Highway 46 is to mimic natural patterns. Design vegetation prescriptions and treatments to emulate disturbances such as those created by wildfire. (LRMP M9-15, M9-51, M9-64) **MM**

14. The objective is to minimize the evidence of human activities as viewed from travel corridors. Designate trees to remain by using paint on the side away from the road (orange paint); use markings on trees to be cut (blue paint) as much as possible in order to minimize the quantity of painted trees that remain; utilize contract designation by contract description where practical (no paint); remove all ribbons, signs, tags, and all other markers following post treatment and project completion. **MR**

15. Where possible, pile and dispose of slash generated from vegetation treatments in recreational areas in previously compacted or disturbed areas. **MR**

16. Design the North Wickiup Boat Ramp improvement project to include restricted vehicle access to the shoreline and the adjacent Bald Eagle Management Area. **MR**

17. Protect trails in units PCT-129 and PCT-134 using a 50-foot buffer with commercial activities. Non-commercial activities such as thinning may occur adjacent to the trail using tree spacing consistent with the use of the trail. Contact the District trail specialist prior to implementation. **MR**

Wildlife

18. In units where the management objective is listed as non-commercial thinning, salvage, or density reduction, retain 20% of the unit in an untreated condition. Patch size may vary within deer summer range habitat from 1/2 to six acres (WL-54) and from two to six acres in elk habitat (WL-47). These areas may also provide snags and meet Green Tree Replacement requirements. **MM**

19. Within lands allocated to Matrix, retain a minimum of 15% of the area associated with

each fiber harvest EA unit for snags, green tree replacements and biodiversity. As a general rule, 70% (i.e., 10.5% of each EA unit) should be retained in patches larger than 0.2 hectares (0.5 acres), with the remaining 30% (4.5% of each EA unit) as individual trees or clumps less than 0.2 hectares. This can be included in the portion (20%) retained in an untreated condition for units with management objectives for density control, fuel treatment, and salvage (Mitigation Measure #19). Include rock outcrops in EA units where feasible. This limitation does not apply to intermediate harvests (thinning) in even-age young stands (NWFP C-41 to C-42). **MM**

20. Retain unthinned buffers along roads and trails to provide big game escapement and hiding cover. Vary the width to meet the site conditions (WL-58). Apply to thinning treatments in Bald Eagle Management Areas in order to provide security and to prevent establishment of new user created roads (i.e. to shoreline camping sites) or to prevent vehicles from going around current closures. Retain an untreated buffer between units PCT 027, 028, 130, 131, 132, and 133. **MM**

21. Create snags where harvest activities (through safety requirements) result in deficient quantities as referenced in Mitigation Measures 23, 24 and 39-43 where guidelines are listed for snags and down logs. One method to avoid felling of snags that pose a safety hazard would be to include them within areas or patches designated for retention. Reference the Sale Improvement (K-V) Plan for more information. **MR, MM**

22. Where feasible, provide sufficient numbers of dead and live replacement trees (where available) at 100% Maximum Population Potential for the white-headed woodpecker, black-backed woodpecker, pygmy nuthatch, and the flammulated owl in all management areas. Maintain snags and green replacement trees of greater than or equal to 21" diameter at chest height (or whatever is representative of the overstory layer if less than 21. Although the Final EIS has been released, reference the Interior Columbia Basin Ecosystem Management Project Draft EIS Chapter 3, page 151 for a display of the new science reflected in this measure. The desired numbers of snags and sizes per Plant Association Group are as follows: (NWFP C-46). **MM**

Plant Association Group	Target Density	Trees per Acre 8-11.9" dbh	Average Diameter (Inches)	Trees per Acre 12-20.9" dbh	Average Diameter (Inches)	Trees per Acre >21" dbh	Average Diameter (Inches)
Lodgepole Wet and Dry	Total of 1.8 per Acre	1.21	>10"	.59	>12"	N/A	N/A
Ponderosa Pine Wet and Dry	Total of 2.25 per Acre	N/A	N/A	2.11	>15"	.14	>20"
Mixed Conifer Dry	Total of 2.25 per Acre	N/A	N/A	2.11	>15"	.14	>20"

23. Within Late Successional Reserves, use the following specified sizes and levels for snags and coarse wood debris found in Browns-Round Mountain LSR Assessment:

Management Strategy Area	Snags/ CWM per ac. (min.)
NSO/N/R/F Northern Spotted Owl (BIG-02, BIG-10, PCT-31, PCT-32, PCT-33, PCT-34, PCT-35, PCT-36)	11-21 snags 10-22 logs
NSO/D/F Northern Spotted Owl	4-11 snags 5-14 logs
BE/N/R Bald Eagle (BIG-05, BIG-13, FT-09 except portion in GP/LT)	3-5 snags 7-15 logs
BE/F/P Bald Eagle	2- 6 snags

LSOG/NGH Late Successional Old Growth Habitat. Northern Goshawk, pileated woodpecker (BIG-04, PCT-037, PCT-038, PCT-044, PCT-135)	11-21 snags 10-22 logs
LSOG/WHW White-headed Woodpecker, flammulated owl, olive-sided flycatcher (BIG-03, FT-03 except portion in GP/LT, FT-18 except portion in LSOG/NGH, FT-29)	2-6 snags 2-5 logs
LSOG/BBW Black-backed Woodpecker (PCT-056, PCT-057, PCT-071, PCT-72)	12 snags 12 logs
LSOG/AM. American Marten, black-backed woodpecker (PCT-003, PCT-004, PCT-052, PCT-053, PCT-054, PCT-62, PCT-64, PCT-112, PCT-113, PCT-114, PCT-115, PCT-116)	4-27 snags 19-62 logs
GP/LT General Protection for LSR (FT-01, FT-04, FT-08)	Retain existing down logs and snags, except selectively retain those within 100' of road 4270

24. Within units prescribed as Big Tree and Dwarf Mistletoe, protect large snags (>20" diameter at chest height). If necessary when needed, modify marking to avoid areas that would necessitate felling of large snags under OSHA safety guidelines. **MM**

25. The objective for this measure is to minimize the spread of dwarf mistletoe infection while meeting objectives for snags, green tree replacements, and Coarse Woody Material. Within non-commercial thinning units with dwarf mistletoe-infected overstory trees outside of the LSR, retain a minimum of two snags per acre greater than or equal to 10 inches if available; or two live overstory lodgepole trees per acre, when sufficient snags are absent. Select the least infected trees available. Retain all snags of other species. Inside the LSR, use Mitigation Measure #23 for snag and down log levels within MSAs. **MR**

26. The objective is to supplement the snag replacements as well as future coarse woody material. Within non-commercial thinning units with dwarf mistletoe-infected overstory trees, retain a minimum of three Green Tree Replacements per acre in addition to those selected to meet snag objectives. **MR**

27. To protect elk during calving season, restrict disturbing activities within non-commercial thinning units 015, 016, 024, 025, 046, 047*, 118, 119, 120, 121, 122, 130*, 131, 132, 133, 134 from May 1 to July 1 (WL-44). **MM** *Not included in Alternative 3.

28. Avoid the location of new temporary roads within nest site stands for northern goshawk, Coopers hawk, and sharp-shinned hawks. Include appropriate contract provisions to protect an active goshawk nest within the sale area. For other accipiters hawks found after commencement of operations, negotiate protection with contracted operators (LRMP WL-1 to WL-34, TE-6, TE-7) (**MM**)

29. For any raptor nest found during management activities, active nest stands will be protected from disturbing activities within 1/4 mile (1 mile for the use of explosives) of the nest by restricting site disturbing operations during the period April 15-August 31 (LRMP WL-19). **MR**

30. For red-tailed hawks, protect any new active nest sites by maintaining the forested character of an area at least 300 feet in radius around the nest. While timber management may occur, maintain an average of at least 4 dominant overstory trees per acre suitable for nest and perch trees. Favor ponderosa pine where possible (LRMP WL-2). **MR**

31. The objective is to protect unique and special habitats for bats that may not be

known. Report any cave found within or adjacent to a unit scheduled for management activities to a Bend-Fort Rock Ranger District wildlife biologist. **MR**

32. Rehabilitate all skid trails utilized to remove materials within wildlife connectivity corridors identified within the Wildlife Report and Figure 12 to prevent firewood cutting access. **MR**

33. Where feasible, avoid conducting green tree harvest activities during the period April 1 - August 15. The objective is to avoid potential nest destruction and loss of broods for neotropical migrant birds. **MR**

34. Restrict public access by Special Closure Order on roads that are maintained open to facilitate winter logging. **Recommendation**

35. Decommission roads that traverse designated, potential lynx denning or foraging habitats should be planted with trees unless: 1) natural regeneration is likely; 2) dense lodgepole stands (pole size or larger) will likely close the road through windthrow; or 3) funding is unavailable. The objective of this measure is to reduce snowmobile access to winter habitats, where snow compaction could potentially allow access by competitors/predators of lynx. **Recommendation**

36. Prior to implementation of proposed treatments adjacent to the Round Mountain Lookout, contact a District biologist and reference the attached Round Mountain Report and tree topping/falling photos (Biological Evaluation/Assessment). The report contains specific direction in conducting activities such as prescribed fire, smoke dispersal/control, and protection of special habitats (e.g. cave, rock formation). **MM**

37. Retain/protect snags, logs and green tree replacements in both patches and individual trees/structures. Refer to the Supplemental Snag/CWM/GTR Guidelines in the Wildlife Report for specific needs by management area and PAG. Hand pile slash and mark for retention using a sign or other method in areas where deficient in coarse woody materials (WL 37, 72, M-15-9; NWFP, C-40-42; R6 memo 3500/1900, 8/99). **MM**

38. Within Late-Successional Reserves (BIG-02, BIG-03, BIG-04, BIG-05, BIG-10, BIG-13), maintain stand diversity for dependent wildlife species within the radius of tree culturing. Retain healthy (i.e. robust, no disease), 16" or larger diameter at chest height white fir trees unless the primary objective of reducing stress on large, overstory ponderosa pine and Douglas-fir can not be achieved. Retain all healthy, understory white pine and Douglas fir where feasible, unless they are over-stocked and/or causing stress the larger overstory consisting of ponderosa pine or Douglas fir trees. **MR**

39. Within lands allocated to Matrix in regeneration harvests, retain snags and down logs to ensure a minimum of 120 lineal feet of logs per acre greater than or equal to 16 inches in diameter in decay class 1 and 2. When logs of the recommended size and density are not available, leave 12 snags or logs larger than 10" diameter. In areas of partial harvest, numbers would be modified to reflect the timing of stand development cycles. (NWFP C-40, LRMP TM-4, WL-38, 72, 73, SL-1). **MM**

40. Maintain all remnant late and old seral and/or structural live trees greater than or equal to 21" diameter at chest height that currently exist within stands proposed for harvest activities in BIG-15 and BIG-16. (Eastside Screens, B-7). **MM**

41. The objective is to provide roosting habitat for bats within exfoliated bark of the trees. Where possible, retain existing large diameter (>21" diameter at chest height) ponderosa pine and Douglas fir in all treatment units within one mile of the summit of Round Mountain. **MR**

42. Outside of the Northwest Forest Plan boundary, existing down logs (Eastside Screens, B-9) may be removed only when they exceed the following quantities: **MM**

Species	Pieces Per Acre	Diameter @ Small End	Piece Length and Total Lineal Length
Ponderosa Pine	3-6	12"	>6 ft. 20-40 ft.
Mixed Conifer	15-20	12"	>6 ft. 100-140 ft.
Lodgepole Pine	15-20	8"	>8 ft. 120-160 ft.

43. To maintain connectivity between LOS stands in designated wildlife corridors ([Figure 12](#)), in PCT-105, and DMT-03 retain at least 30% canopy cover; in FT-13 and FT-34 (Alternative 3) wherever available, retain at least a minimum amount of coarse woody material identified in Mitigation Measure #42.

Fire/Fuels

44. Minimize soil disturbance associated with prescribed fireline construction by adjusting boundaries to take advantage of existing roads, skid trails, subsoiled areas, riparian buffers and natural barriers such as rock outcroppings. **MR**

45. When constructing prescribed firelines, construct and maintain water control structures to channel water outside the prescribed burning unit. On slopes with gradients of 5.0 percent and greater, place waterbars at a minimum of 150-foot intervals and at a 45 degree. (LRMP SL-1, BMP T-16) **MM**

46. Avoid construction of firelines in riparian buffers. Ground disturbing activities, such as digging fireline in riparian areas is almost certain to intercept ground water and concentrate surface flows. Design prescribed burning prescriptions to retain riparian-associated vegetation and to restore vegetation composition and structure to more native conditions. See the table at the end of this section for a listing of overlap units within riparian buffers. **MR**

47. When firelines are constructed, assure that water control structures such as water bars, are installed and maintained to avoid excessive water runoff and accelerated soil erosion. **MR**

48. Within units designated for prescribed fire, limit litter and duff consumption on at least 50% of the area. The objective is to conserve sufficient litter/duff to assure sufficient nutrients remain on site. Conserving some of the litter/duff layer is also important for preventing soil erosion, mitigating soil compaction, and preserving habitat for soil microorganisms. (LRMP SL-6, Fuels Management BMP F-2, Timber Management BMP T-13) **MM**

49. Where possible, avoid piling of slash prior to broadcast burning. The objective is to minimize areas where fire intensity is concentrated, adversely affecting mineral soil organic matter and soil microorganisms. **MR**

50. Mop-up activities in prescribed fire units should be limited to necessary levels for fire containment. The goal is to minimize site disturbance. **MR**

51. Minimize soil displacement caused by excessive wheel/track turning during mechanical shrub treatments. Within Unit FT-35 (Alternative 3) utilize equipment that has a relatively low ground pressure, such as rubber-track mounted tractors **MR**

52. Avoid mechanical shrub treatment during periods of excessive soil moisture conditions. **MR**

53. Advise the soil scientist when mechanical shrub treatments are to occur on slopes

greater than 30 percent. The goal is to monitor for soil disturbance and to adjust accordingly. (LRMP SL-5, Vegetation Manipulation BMP VM-1, Timber Management BMP T-3, T-9 & T-13) **MM**

54. Provide a buffer to all prescribed fire (including pile burning) and mechanical shrub treatments of 150 feet around the entrance of any newly discovered cave. Conduct prescribed burning in a manner to minimize the amount of smoke that reaches the cave entrance (LRMP CV-3). **MM**

55. To avoid negative impacts to nesting goshawks, prescribed burning of activity-generated fuels must be conducted under wind conditions that do not carry smoke loads within one mile of T 20, R 09, S 24 at ground level during the period April 20 - July 31. **MR**

56. Retain 20% of each unit in the oldest, tallest structure shrub habitat available (Integrated Fuels Management Strategy; ecological indicator species). Co-locate with other mitigation patches if available and objective is met. Areas of rock, steep slopes, down logs, etc. are suitable provided good distribution is attained. Patch sizes can range from one-tenth to six acres. **MR**

57. Retain 20% of each fuel treatment unit in cover patches (i.e. tree cover) for deer and elk and for snowshoe hare habitat. Patch size may vary within deer habitat from one half to six acres (WL-54) and from two to six acres in elk habitat (i.e. Key Elk Area; WL 47). **MM**

58. Within units that contain bitterbrush, conduct mechanical treatment of brush and burning when the shrubs are dormant in order to improve sprouting response and survival (Integrated Fuels Management Strategy). **MR**

59. The objective is to minimize the cumulative impacts to the soil in fuels treatment units where pre-treatment is required before prescribed burning. Use treatments such as hand felling and hand piling, especially in units currently within condition class C and D Units as identified in the Soil Management Report on file at the Bend-Ft. Rock Ranger District. **MR**

60. Retain/protect snags, logs and green tree replacements in both patches and individual trees/structures. Refer to the Supplemental Snag/CWM/GTR Guidelines listed in the Wildlife Appendix A for specific needs by management area, PAG, and long-term structural objectives and Mitigation Measures #22, #23 and #40. (WL 37, 72, M-15-9; NWFP, C-40-42; R6 memo 3500/1900, 8/99). **MM**

61. Fire prescription parameters will ensure consumption will not exceed 3" total (1 1/2" on each side) of diameter reduction of featured logs (Screens B-12, WL 72). **MM**

62. Retain machine or hand piled material where sufficient coarse woody material is deficit as listed in the Forest Plan, Eastside Screens (corridors between Late and Old Structure). **MR**

63. Where possible, maintain a 25-50 foot untreated buffer around lava outcroppings in treatment units. **MR**

64. Yard with tops attached in all fiber harvest units to reduce fuel loading. If areas do not meet the Forest Plan Standards and Guidelines for residual fuels following completion of activities, use an interdisciplinary review to determine additional treatment. (SL-1, SL-5, FH1-FH5) **MM**

65. Ensure minimum amounts of Coarse Woody Material (reference Mitigation Measure #42) and shrubs (20% of the area in an untreated condition) remain within identified wildlife connectivity corridors that intersect units FT-13 and FT-34 in Alternative 3 (Figure 12

and Wildlife Report p. 15, map Appendix B). This is needed to meet the Eastside Screens for connectivity between late and old stand structure that originates from the Dilman Project Area. **MR**

Noxious Weed Management

66. The objective is to limit accidental transport of weed seed and to provide early detection and control. Use contract and permit provisions to prevent the introduction or spread of noxious weeds by contractors and permittees. Ensure vehicles conform to the cleaning provision in the Noxious Weed Risk Assessment prior to entry. Monitor areas disturbed by activities and document and map any newly discovered sites. **MR**

Cultural Resources

67. Protect any unknown cultural resource sites found by avoidance (CR-4). There are approximately 18 cultural sites eligible for the National Register for Historical Places located within 11 of the proposed activity units and on portions of 10 road locations. In most cases, unit boundaries would be revised to exclude these sites. In others, specific portions would be flagged for avoidance. Details on individual units and cultural resource sites are available for appropriate personnel in the Sale Implementation Plan. **MM**

Botany

68. Maintain a buffer of 25 feet around known populations of *Buxbaumia viridis*. Check with the Implementation Plan and District Botanists for locations prior to commencement of management activities ((January 2001 Record of Decision and Standards and Guidelines for Amendments to the Survey and Manage, Protection Buffer, and other Mitigation Measures Standards and Guidelines pages 48, 51). **MM**

69. Increase buffers in conjunction with riparian buffers to include cover areas for terrestrial species where feasible. If wet seeps are found during project layout, include them in cover areas or riparian buffers to protect potential habitat for the liverwort *Tritomaria exsectiformis* (January 2001 Record of Decision and Standards and Guidelines for Amendments to the Survey and Manage, Protection Buffer, and other Mitigation Measures Standards and Guidelines pages 48, 64). **MM**

Aquatic Resources

70. Harvest activities would be excluded within riparian buffers, including areas designated as Riparian Reserves and Riparian Habitat Conservation Areas. Non-commercial activities such as hand thinning of small diametered trees within riparian buffers are allowed under site-specific circumstances. The following widths were used:

	Inside the Northwest Forest Plan Area Riparian Buffers	Eastside Riparian Habitat Conservation Areas	
		Priority Watershed	Non-Priority Watersheds
Streams			
Class 1	300	300	300
Class 2	300	300	600
Class 3	150	150	150
Class 4	100	100	50
Wetlands			
Greater Than 1 acre	150	150	150

Less Than 1 acre	100	100	50
Waterbodies			
Lakes	300	150	150
Ponds	150	150	150
Reservoirs	150	150	150

The following table identifies units that border riparian buffers managed for either Aquatic Conservation Strategy or Riparian Management Objectives. Ensure commercial harvest boundaries match the distance requirements as listed in Mitigation Measure #70.

Unit	Alternative	Boundary Overlap (Acres)	Treatment Code (see note 1)	Riparian Objective (see note 2)	Comments (see note 3)
BIG-12	2,3	1	HSV/SDR	ACS	Buffer 150'
BIG-14	3	12	HSP/HTH	ACS/RMO	Buffer 150'
BIG-15	3	7	HSP/HTH	RMO	Buffer 150'
BIG-16	3	25	HSP/HTH	RMO	Buffer 150'
BIG-17	3	1	HSP/HTH	ACS	Buffer 150'
DMT-04	2,3	5	PRUNE	ACS	Buffer 300', Activities such as pruning, hand felling, girdling, and planting may occur in buffer
FT-12	2,3	15	PB	ACS	Prescribed burn in buffer
FT-13	2,3	26	PB	ACS	Prescribed burn in buffer
FT-18	2,3	8	PB (Alt. 2) HTH/PB (Alt. 3)	ACS	In Alternative 3, buffer harvest 300', Hand fell/burn small trees within buffer to assist underburn
FT-34	3	15	PB	ACS	Prescribed burn in buffer
FT-35	3	18	MST/PB	RMO	Prescribed burn and mow shrubs in buffer
PCT-001	2,3	25	SPC	ACS	SPC in buffer
PCT-002	2,3	Less than 1 acre	HSA/SPC	ACS	Buffer harvest 100', SPC in buffer
PCT-005	2,3	28	SPC	ACS	SPC in buffer
PCT-006	2,3	8	HOR/SPC	ACS	Buffer harvest 100', SPC in buffer
PCT-010	2,3	2	SPC	ACS	SPC in buffer
PCT-014	2,3	2	HOR/SPC	ACS	Buffer harvest 150', SPC in buffer
PCT-015	2,3	15	HOR/SPC	ACS	Buffer harvest 150', SPC in buffer
PCT-016	2,3	13	SPC	ACS	SPC in buffer
PCT-017	2,3	Less than 1 acre	HOR/SPC	ACS	Buffer harvest 150', SPC in buffer
PCT-018	2,3	3	HOR/SPC	ACS	Buffer harvest 150', SPC in buffer

PCT-019	2,3	2	HOR/SPC	ACS	Buffer harvest 150', SPC in buffer
PCT-021	2,3	4	HOR/SPC	ACS	Buffer harvest 100', SPC in buffer
PCT-022	2	2	HOR/SPC	ACS	Buffer harvest 300' on southern extent, 150' on northern extent, SPC in buffer
PCT-023	2	9	HOR/SPC	ACS	Buffer harvest 150', SPC in buffer
PCT-024	2,3	6	SPC	ACS	SPC in buffer
PCT-025	2,3	3	HOR/SPC	ACS	Buffer harvest 300', SPC in buffer
PCT-027	2,3	16	SPC	ACS	SPC in Buffer
PCT-039	2,3	41	SPC	ACS	SPC in buffer
PCT-040	2,3	2	HOR/SPC	ACS	Buffer harvest 150', SPC in buffer
PCT-042	2,3	8	HOR/SPC	ACS	Buffer harvest 100', SPC in buffer
PCT-046	2,3	15	SPC	ACS	SPC in buffer
PCT-047	2	Less than 1 acre	SPC	ACS	SPC in buffer
PCT-050	2,3	9	SPC	RMO	SPC in buffer
PCT-051	2,3	5	SPC	RMO	SPC in buffer
PCT-052	2,3	1	HSA/SPC	ACS	Buffer harvest 100', SPC in buffer
PCT-054	2,3	10	SPC	ACS	SPC in buffer
PCT-055	2,3	3	SPC	ACS	SPC in buffer
PCT-056	2,3	13	SPC	ACS	SPC in buffer
PCT-057	2,3	Less than 1 acre	HSA/SPC	ACS	Buffer harvest 100', SPC in buffer
PCT-058	2,3	3	SPC	ACS	SPC in buffer
PCT-059	2,3	2	SPC	ACS	SPC in buffer
PCT-062	2,3	3	SPC	ACS	SPC in buffer
PCT-064	2,3	Less than 1 acre	SPC	ACS	SPC in buffer
PCT-072	2,3	3	SPC	ACS	SPC in buffer
PCT-083	2,3	3	SPC	ACS	SPC in buffer
PCT-084	2,3	7	SPC	ACS	SPC in buffer
PCT-085	2,3	1	SPC	ACS	SPC in buffer
PCT-086	2,3	6	SPC	ACS	SPC in buffer
PCT-089	2,3	3	HOR/SPC	ACS	Buffer harvest 150', SPC in buffer
PCT-090	2,3	14	HOR/SPC	ACS	Buffer harvest 300' on west side of unit. Use road 4292 as extent of fish-bearing; otherwise buffer harvest activities 100' on southern extent, SPC in buffer
PCT-091	2,3	14	SPC	ACS	SPC in buffer

PCT-102	2,3	2	SPC	RMO	SPC in Buffer
PCT-111	2,3	5	SPC	ACS	SPC in buffer
PCT-114	2,3	12	HOR/SPC	ACS	Buffer harvest 150', SPC in buffer
PCT-115	2,3	10	HOR/SPC	ACS	Buffer harvest 150', SPC in buffer
PCT-118	2,3	14	SPC	ACS	SPC in buffer
PCT-119	2,3	20	SPC	ACS	SPC in buffer
PCT-120	2,3	2	SPC	ACS	SPC in buffer
PCT-121	2,3	Less than 1 acre	SPC	ACS	SPC in buffer
PCT-122	2,3	13	SPC	ACS	SPC in buffer
PCT-126	2,3	4	HOR/SPC	ACS	Buffer harvest 100', SPC in buffer
PCT-127	2,3	5	SPC	ACS	Buffer harvest 100', SPC in buffer
PCT-128	2,3	2	HOR/SPC	ACS	Buffer harvest 100', SPC in buffer
PCT-129	2,3	29	HOR/SPC	ACS	Buffer harvest 300', SPC in buffer
PCT-130	2	6	HSA/HOR	ACS	Buffer harvest 100', SPC in buffer
PCT-131	2,3	Less than 1 acre	SPC	ACS	SPC in buffer
PCT-132	2,3	4	HOR/SPC	ACS	Buffer harvest 150', SPC in buffer
PCT-133	2,3	Less than 1 acre	HSA/SPC	ACS	Buffer harvest 100', SPC in buffer
PCT-134	2,3	13	HSA/SPC	ACS	Buffer harvest 100', SPC in buffer
SAL-02	2,3	3	HSV	ACS	Buffer harvest 300'
SAL-03	2,3	Less than 1 acre	HCR/RNP	ACS	Buffer harvest 300' on fish-bearing stream on southern extent; all others buffer 100'

NOTES

1. Reference Table 8 for key to treatment codes
2. Aquatic conservation strategy (ACS) or Riparian Management Objective (RMO)
3. Treatments would occur under site-specific circumstances, where connectivity objectives can be accomplished.

Comparison of the Alternatives

The following table provides a brief comparison of similarities and differences between alternatives:

Table 11. Comparison of Alternatives

Activity	Alternative 1 (No Action)	Alternative 2 (Proposed Action)	Alternative 3
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Issue #1 Measure: Retains young, dense forests in an unthinned condition for Canadian lynx foraging habitat (see note 1)	8,028 acres	5,267 acres	5,557 acres
Issue #2 Measure: Acres and location of fuels treatments designed to protect Round and Lookout Mountains	0	0	975 acres on Lookout and Round Mountain
Number of Remaining Inventoried Dispersed Sites	242	228	228
Miles of Open Roads (including seasonal access)	390	240	240
Miles of Road Reconstruction	0	10	10
Resulting Stand Density Classified as "High" (Acres) (see note 2)	26,100	17,700	16,400
Arrest the Spread of Dwarf Mistletoe and Plant (Acres) (see note 3)	N/A (40-55% of the lodgepole and ponderosa pine stands are classified as high levels of dwarf mistletoe)	178 (38-41% of the stands would remain classified as a high level of dwarf mistletoe)	192 (38-43% of the stands would remain classified as a high level of dwarf mistletoe)
Treatment Objective for Fuels (Acres)	N/A 28,900 acres are classified as high or extreme condition for fire behavior potential	360 (Does not include 6,544 acres of other treatment activities that would also reduce fire behavior potential)	1,280 (Does not include 6,795 acres of other treatment activities that would also reduce fire behavior potential)
Salvage Dead and Dying Lodgepole (Acres) (see note 4)	N/A	155	180
Thin Young Trees (Overstory Trees)	9,257 existing with or without overstory trees	2,151	1,895
Thin Young Trees (No Overstory)	9,257 existing with or without overstory trees	2,002	1,911
Number of acres where no vegetation treatments are planned	51,080	44,176	43,005

NOTES

1. The Program Design Criteria (PDCs) for the Canadian lynx within the Charlie Brown have changed since the development of alternatives; however, the PDCs from the 1999 Deschutes National Forest Programmatic Biological Assessment were used to maintain options. All alternatives are consistent with the PDCs found in the 2001-2003 Biological Assessment.
2. This is the primary treatment objective. Other treatments may accomplish this objective also.
3. Alternative 2 treats more severely infected stands.
4. 2,872 acres of lodgepole pine stands within the analysis area are classified as stage VI (Late-Multistory)

The following table is a summary of harvest volume estimates:

Table 12. Harvest Volume Summary Estimates, by Alternative.

	Alternative 1	Alternative 2	Alternative 3
Harvest volume (MMBF)	0	15.1	17.2
Harvest volume (MMCF)	0	29.1	33.0
Commercial harvest acres	0	3794 (see note 1)	4574
NOTES			
1. The total commercial harvest treatment area is 7% of the project area in Alternative 2, and 9% in Alternative 3			

Projects Under the Authority of the Knudsen/Vandenberg (K-V) Act

The following projects are listed in general order of priority for the Charlie Brown project. Some treatments have different priorities based on site-specific attributes, or ongoing data gathering. Listed projects would be implemented after financial obligations, such as payments to County Governments, are met. In most cases, mitigation measures would be prioritized for funding over enhancement projects.

Required K-V: These are required activities and related to reforestation.

1. Regeneration of harvest units where residual trees of acceptable nature are below minimum stocking levels. Estimate of 123 acres of natural regeneration, 63 acres artificial.
2. Reforestation activities that include undesirable tree whip felling, site preparation (including subsoiling), vegetation control, stocking surveys, planting and animal damage control.

Non-required K-V: These activities are not required for full funding under K-V and may be funded from other sources.

1. Snag creation where harvest activities to ensure safety result in snag numbers below desired levels (Mitigation).
2. Subsoiling of harvest units where current management activities result in detrimental soil conditions exceeding Forest Plan Soil Quality Standards and Guidelines (Mitigation).
3. Survey, monitoring, and control (manual hand pulling of weeds) if needed, of noxious or exotic weed populations in areas where current management activities have occurred (Mitigation).
4. Post-activity treatments designed to improve scenic quality on roads 42, 44, 46, 4260, 4262 and 4270 where outside of Bald Eagle Management Areas; where user-created roads are not likely to result; and where roadside vegetation is not desired for big game cover. Treatments may include roadside cleanup and removal of slash (Mitigation).
5. Hand pile slash and mark for retention using a sign or other method in harvest areas deficient in coarse woody materials (Mitigation).
6. Road closures using various techniques, including gate relocation (Enhancement).
7. Sanitation of dwarf mistletoe infections remaining after harvest treatments. Methods may include pruning, felling, girdling, topping, or snag creation (Enhancement).
8. Non-commercial thinning and related mechanical slash treatment (Enhancement).
9. Snag creation where current management activities are not the cause of deficient snag levels (Enhancement).
10. Subsoiling of harvest units where past management activities result in detrimental soil conditions exceeding Forest Plan Soil Quality Standards and Guidelines (Enhancement).
11. Browns Meadow enhancement to remove encroaching lodgepole pine (Enhancement).
12. Removal of barbed wire fencing in Browns Meadow and surrounding upland areas (Enhancement).
13. Signing of Designated Old Growth area (#65) on the headwaters of Browns Creek (Enhancement).

14. Installation of wood duck boxes on the southeast shore of Crane Prairie Reservoir (Enhancement).
15. Installation of an interpretive site that promotes public education on healthy forests and explains the role of western dwarf mistletoe at North Twin Lake (Enhancement).

GOTO

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[Deschutes and Ochoco National Forests Website](#)

<http://www.fs.fed.us/centraloregon/manageinfo/nepa/documents/bendfort/charliebrown/cbea-2alternatives.html>

Last Update: 11/26/01

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Charlie Brown Environmental Assessment Bend-Fort Rock Ranger District Deschutes National Forest

Environmental Consequences

This section discloses environmental consequences expected as a result of Alternative 1 (No Action), Alternative 2 (Proposed Action) and Alternative 3. All action alternatives are designed to be consistent with the desired conditions specified in the *Deschutes National Forest Land and Resource Management Plan (LRMP)* standards and guidelines, along with direction found in *The Interim Management Direction Establishing Riparian, Ecosystem and Wildlife Standards for Timber Sales ("Eastside Screens")*, *Inland Native Fish Strategy (INFISH)*, the *Standards and Guidelines for Management of Habitat for Late-Successional and Old-Growth Forest Related Species Within the Range of the Northern Spotted Owl (Northwest Forest Plan, NWFP)* and *General Water Quality Best Management Practices (BMPs)*.

This section provides the scientific and analytic basis for comparison of the alternatives. It also describes the indirect, direct, cumulative, duration and intensity of effects of the alternatives and related issues as discussed in the [Introductory Section](#).

A wildfire (i.e., Fire #1169, main fire of the Crane Fire Complex including 3 spot fires) ignited within the project's boundary on August 12, 2001. The fire complex burned approximately 720 acres of forested habitats. Additionally, Fire #1162 adjacent to Wickiup Reservoir burned 6 acres. The effects of these fires as related to the Charlie Brown analysis are summarized where conditions have changed.

Vegetation

The Crane Complex fire within the Charlie Brown analysis area burned 720 acres, or approximately 1% of the overall area. The fire resulted in a reduction of 118 acres of late/old structure and 328 acres of mid structure, while resulting in an increase of 354 acres of open structural stages. In the context of the project area, this is a minor change in landscape condition, as the fire has resulted in less than a 1% change to any structural stage. The following vegetation changes are summarized in Table 13.

Table 13. Vegetation Condition Changes as a Result of the Crane Prairie Complex Fire

Structural Stage Change (acres)	Density Class Change

Plant Association Group	Open	Early	Mid	Late/M	Late/S	Low	Moderate	High
Lodgepole Pine Wet	24 / 228	3,634 / 3,634	11,246 / 11,066	2,872 / 2,848	0 / 0	1,500 / 1,700	6,400 / 6,400	10,200 / 10,000
Mixed Conifer Dry	10 / 252	2,084 / 2,084	8,178 / 8,030	10,012 / 9,802	672 / 788	2,200 / 2,550	8,000 / 7,700	10,400 / 10,350

Alternative 1 (No Action)

This Alternative would continue to show the effect of increasing stand densities, as successional processes advance over time. White fir and lodgepole pine would increase their dominance across the landscape, and ponderosa pine would continue to decline proportionately. In the absence of stand disturbances, late-single structural stages would slowly yield to multiple canopy structures, in the continuing shift to later seral conditions over time. This later seral shift means more white fir and hemlock, not necessarily bigger ponderosa pine and Douglas fir trees.

Alternative 2

Alternative 2 would essentially double the current acreage of late single-storied ponderosa pine stands, through understory manipulation of roughly 900 acres of late multiple-canopied stands. Late-multiple-canopied stands would be reduced by approximately 1,150 acres. Eighty percent of this would be related to the shift to late-single story stands, with the remaining 20% going to mid and early structural stages. At the landscape level, the percentages of open, early, and mid structural stages would in sum remain the same as current conditions. Late-multi structures would be reduced by two percent (37% to 35%) and late-single structures would gain by the same amount (2% to 4%).

Alternative 3

Alternative 3 would roughly triple the current acreage of late single-storied ponderosa pine stands, through understory treatment of about 2,000 acres of late, multiple-canopied stands. Corresponding to the increase in park-like pine stands, late multi-canopied stands would be reduced by approximately 2,000 acres. Over ninety percent of this shift from late, multi-storied stands would be related to the shift to late, single-storied stands, with the remaining 10% going to mid and early structural stages. At the landscape scale, the percentages of open, early, and mid-structural stages would in sum remain about the same as currently. Late multi-structured stands would be reduced by 3% (37% to 34%) and late, single-storied structures would gain by nearly the same amount (2% to 6%).

Susceptibility to bark beetle attack is summarized using plant association groups in Table 14.

Approximately one-half of the project area is currently classified as imminently susceptible (Alt. 1). This is not an unusual situation in the interior West, and many other landscapes have similar conditions

related to bark beetle susceptibility (Hessburg et al. 1994, Fuzzy EA 2000, ICBEMP 1997). The last column titled "High Density/High Susceptibility" and the acre figures in bold type are the most important information represented in this table. As the action alternative treatments reduce the number of acres listed as in a density and susceptibility class considered as "High", a corresponding increase of acres are moved to the categories classified as "Low" and "Moderate".

Insect and Disease Agents

Table 14. Bark Beetle Susceptibility Within Plant Association Group (gross acres to nearest 100, not reduced for untreated buffers (including riparian), and connectivity corridors):

Plant Assoc. Group	Low Density Low Susceptibility			Moderate Density Moderate Susceptibility			High Density High Susceptibility		
	Alt.1	Alt. 2	Alt. 3	Alt. 1	Alt. 2	Alt. 3	Alt. 1	Alt. 2	Alt. 3
Total PAG acres (see note 1)									
LPD & LPW 17,776 ac.	1,500	5,200	5,100	6,400	6,900	6,900	10,200	6,000	6,200
MCD & MCW 20,974 ac.	2,200	3,700	4,100	8,000	9,100	9,300	10,400	7,800	7,300
PPD & PPW 6,930 ac.	500	1,200	1,700	4,700	5,600	5,800	1,900	500	200
MHD 4,662 ac.	---	---	---	900	900	900	3,500	3,500	3,500
MDW & RIP, CINDER & LAVA, WATER & LAKE 738 ac.	<100	<100	<100	<100	<100	<100	<100	<100	<100
AREA TOTALS 50,600 ac. (100%)	4,400 (9%)	10,400 (21%)	11,200 (22%)	20,100 (40%)	22,500 (44%)	23,000 (46%)	26,100 (52%)	17,700 (35%)	16,400 (32%)

NOTES

1. LPD = Lodgepole Pine Dry; LPW = Lodgepole Pine Wet; MCD = Mixed Conifer Dry; MCW = Mixed Conifer Wet; PPD = Ponderosa Pine Dry; PPW = Ponderosa Pine Wet; MHD = Mountain Hemlock Dry; MDW = Meadow; RIP = Riparian.

The potential for bark beetles to modify existing stand structures would be reduced under Alternatives 2 and 3 relative to the current condition. Alternative 2 would reduce ponderosa pine dominated stand conditions imminently susceptible to bark beetles (i.e., Mixed Conifer Dry, Mixed Conifer Wet, Ponderosa Pine Dry and Ponderosa Pine Wet Plant Association groups at high density as indicated in boldface type in Table 14) by approximately 4,000 acres; Alternative 3 by approximately 4,800 acres. Note that these figures are for gross treatment areas. Actual acres treated under either action alternative would be less, as provisions for untreated buffers would apply to approximately 20% of the gross acres.

Alternative 1 would not immediately lessen bark beetle risk in any stands within the project area. Over time, beetle populations would likely build in areas of high host conditions, with resulting tree mortality. In addition to the most imminent risk conditions as indicated by boldface type in Table 14, Alternative 2 would reduce risk of bark beetle attack in high-density lodgepole pine dominated stands by approximately 4,200 acres (gross). Along with the reduction in risk of bark beetle attack in ponderosa pine dominated stands, Alternative 2 would reduce the proportion of high-risk stands from 52% to 35% of the project area (17% change in gross, 13% in net acres). Similarly, Alternative 3 would reduce bark beetle risks in high density lodgepole pine dominated stands by approximately 4,000 acres (gross) and would reduce the total proportion of high risk stands from 52% to 32% project-wide (19% change in gross, 15% in net acres). Correspondingly, the action alternatives would roughly double the occurrence of low-density stands and slightly increase the proportion of stands of moderate density.

For more information on bark beetle analysis of effects, see the Silviculture Report located at the Bend-Ft. Rock Ranger District.

Listed in Table 15 are the acres and percentage by level of dwarf mistletoe (DMT) infection following alternative treatment.

Table 15. Dwarf Mistletoe (DMT) Changes Resulting From Alternative Implementation (in acres):

Ponderosa pine dominated stands	Alternative 1 (0 acres treated)	Alternative 2 (1,536 acres treated)	Alternative 3 (1,481 acres treated)
No DMT observed	4,465 (16%)	5,049 (18%)	5,117 (18%)
Low DMT (1-9%)	6,139 (22%)	5,893 (21%)	5,813 (21%)
Mod DMT (10-25%)	6,139 (22%)	6,415 (23%)	6,406 (23%)
High DMT (>25%)	11,161 (40%)	10,547 (38%)	10,568 (38%)
Lodgepole pine dominated stands	Alternative 1 (0 acres treated)	Alternative 2 (4,385 acres treated)	Alternative 3 (4,038 acres treated)

No DMT observed	1,422 (8%)	1,992 (11%)	1,947 (11%)
Low DMT (1-9%)	2,311 (13%)	2,793 (16%)	2,755 (15%)
Mod DMT (10-25%)	4,266 (24%)	5,626 (32%)	5,518 (31%)
High DMT (>25%)	9,777 (55%)	7,365 (41%)	7,556 (43%)

(Sample basis: analysis of stand examinations taken in 1990, 1991, 1995, 1996 extrapolated to project area)

Alternative 1 (No Action)

This alternative represents the existing condition as displayed in Table 15. Implementation of Alternative 1 would not immediately affect dwarf mistletoe conditions within the project area. Mistletoe levels would continue to advance throughout the area, with stands increasing in DMT severity over time. Those host stands that are in close proximity to DMT-laden stands of the same host type would most likely also increase in DMT severity. Long-term DMT reduction would be the least of all alternatives considered, in the absence of stand-replacing events such as fire.

Alternative 2

This alternative would reduce the greatest amount of high and moderate DMT levels throughout the project area, a direct result of greater stand regeneration treatment emphasis within stands of the highest DMT levels. Long-term DMT reduction would also be the highest of the action alternatives, a result of the treatments focused on severing the DMT host connection to nearby host plantations.

Alternative 3

This alternative would reduce the greatest amount of low DMT levels, a direct result of increased sanitation treatment, particularly within the fuel treatment units. High and moderate DMT levels would be reduced in a similar amount as Alternative 2. Long-term DMT reduction would be somewhat less than in Alternative 2.

At the landscape scale, DMT populations would not be substantially reduced within the project area with any alternative, as the action alternatives would treat only 5% of all ponderosa pine dominated stands. Effectively, only about 2% (40% of the 5%) of the ponderosa pine stands having high DMT levels would be treated under Alternatives 2 or 3. Rather than making great quantitative reductions in DMT levels, the two action alternatives are designed to focus on more strategic reductions around host plantations, which would increase Late- and Old-Structure stand building opportunities in the long term. Lodgepole pine stands would receive a greater dwarf mistletoe reduction proportionally, related to stand cultural treatments within newly established plantations (e.g., overstory removals of seed trees, girdling, felling, pruning, topping), thus would provide greater growth and vigor over the next several decades.

For more information on dwarf mistletoe analysis of effects, see the Silviculture Report located on file in

the Bend-Ft. Rock Ranger District.

Threatened, Endangered and Sensitive Plants

None of the plant species in this category were located during surveys. There would be no direct, indirect, or cumulative adverse or beneficial effects upon implementation of Alternatives 1, 2, or 3.

Survey and Manage Plant Species

Alternative 1 (No Action)

There would be no direct effects on populations of Survey and Manage plant species, because there would be no disturbance to known population sites. In this alternative, a stand-replacement wildfire is more likely to create loss of habitat for several species.

Alternatives 2 or 3

Based upon implementation of mitigation measures and avoidance (as discussed in the [Alternatives Section](#)), there would be no direct, indirect, or cumulative effects. Known populations of *Buxbaumia viridis* would be protected. The Crane Complex was surveyed prior to the fire and no Survey and Manage species were located within proposed units. The likelihood of a stand-replacement wildfire and the associated loss of habitat for Survey and Manage plant species would be reduced.

Competing and Unwanted Vegetation/Noxious Weeds

Alternative 1 (No Action)

There would be no change in the current risk of weeds expanding beyond existing levels. The Charlie Brown project area is relatively weed-free, but spotted knapweed (and others) is starting to invade primarily along the major transportation corridors. Conditions are present that favor establishment of competing and unwanted vegetation, especially from the Crane complex fire that removed vegetation and exposed soils, creating an ideal seedbed for noxious weeds. Measures to control this risk include an area closure to motor vehicles until rehabilitation efforts are successful. Also, based upon a pending environmental review to assess the fire area, existing strategies for control of noxious weeds may be adjusted. Early treatment, correction, and maintenance strategies have already been implemented in the area. Under implementation of this alternative, it is likely the invasion of weeds would be controlled under implementation of this alternative, due to the current and future efforts described in the 1998 and the proposed 2001 Deschutes National Forest Noxious Weed Control Environmental Assessments.

Alternatives 2 and 3

The strategy for managing competing and unwanted vegetation associated with the Charlie Brown project activities is prevention. Design elements and site-specific recommendations for preventing introduction and spread have been incorporated into all action alternatives. These prevention strategies would alleviate most potential problems dealing with competing and unwanted vegetation. However, if monitoring indicated that these prevention measures are not adequate in preventing the introduction and

spread of noxious weeds, early treatment would be implemented under existing or future noxious weed management plans.

In areas where weeds currently exist, there would be a "high" risk associated with the implementation of the action alternatives. This is due to an assumption that additional ground disturbing activities would contribute to a higher risk than in Alternative 1. Proposed reductions in access by closing parallel roads that lead to the same areas, and roads that traverse environmentally sensitive areas such as wet zones and seeps would offset this risk. A combination of ongoing measures to reduce noxious weed presence in the area combined with proposed monitoring and Mitigation Measures listed in the [Alternatives Section](#) would reduce the current "high" risk of noxious weed introduction and spread over the entire project area.

Aquatic Resources

Cumulative Watershed Effects/Equivalent Clearcut Areas were evaluated for each watershed within the Charlie Brown analysis area. The Crane Prairie Complex Fire caused an increase of 1-2% in openings, using a worst-case scenario, across the entire project area. The following post-fire discussion of effects remains the same as analyzed prior to the fire event.

Alternative 1 (No Action)

This alternative does not meet six of the nine Aquatic Conservation Objectives for riparian buffers contained within page B-9 of the Northwest Forest Plan Standards and Guidelines. A discussion is included under the heading "Aquatic Conservation Strategy".

Although limited monitoring has shown no measurable degradation of water quality from current activities within the watershed, it is likely current road management, camping with few restrictions in riparian buffers, and setbacks for disposal of human waste would result in a very high potential for harm to the physical integrity to the basin-wide aquatic system.

In this alternative, there would be no management actions taken to reduce the potential risk for large intense stand-replacement wildfires. Wildfires of this extent have recently occurred within the watershed and could threaten water quality by removing vegetative cover along stream courses, resulting in sediment movement, an overall increase in water yields, and an increase in stream temperatures.

Aquatic Conservation Strategy for All Alternatives ([see footnote 7](#))

Action alternatives meet all of the Aquatic Conservation Objectives for riparian buffers contained within page B-11 of the Northwest Forest Plan Standards and Guidelines. The Browns-Wickiup Watershed Analysis recommended actions to improve aquatic conditions within the Charlie Brown analysis area on pages 6-4 through 6-17. The following is a discussion including recommended actions in the watershed analysis for all alternatives:

ACS Objective 1: Objective 1 is written to consider whole watershed and landscape scale features. Through road obliteration, closures and vegetative manipulation, this alternative would help restore and maintain distribution, complexity, and diversity. The action alternatives in the Charlie Brown Project will have no measurable adverse effects to the system at the watershed scale. On a watershed and landscape scale, Alternatives 2 and 3 are consistent with the Aquatic Conservation Strategy Objective 1. Alternative 1 does not meet this objective.

ACS Objective 2: Connectivity Corridors ([Figure 12](#)) were designated and evaluated by the Browns/Wickiup Watershed Analysis and Browns/Round Mountain Late Successional Reserve Assessment. All alternatives maintain the current connectivity between watersheds. No species are blocked by changes in connectivity. Overall, action alternative treatments were designed with the objective to maintain forest health and reduce fuels to reduce the chance of a large wildfire fragmenting designated corridors. Alternative 3 would provide the greater protection for linkage to Round and Lookout Mountains.

All alternatives would meet the intent of ACS Objective 2.

ACS Objective 3: Alternative 1 could lead to a degrading of the shorelines and banks if restoration through revegetation is not carried out on the bare ground sites. If management does not change, excess sediment now entering the system would continue leading to degradation of the aquatic system. The possibility of a stand replacing wildfire would remain which could lead to loss of riparian buffers. Alternative 1 does not meet the intent of the Aquatic Conservation Strategy.

Alternatives 2 and 3 would provide increased protection to the aquatic system by restoring shorelines and banks through the replanting of native riparian vegetation and eliminating sediment sources from roads. Current dispersed camping in sensitive areas would be moved away from water to improve the overall physical integrity of the aquatic system. Both alternatives meet the intent of ACS Objective 3.

ACS Objective 4: Alternative 1 would continue to affect water quality through sedimentation. Alternative 1 does not meet the intent of Aquatic Conservation Strategy 4.

Alternatives 2 and 3 would restore and revegetate disturbed sites to increase filtering capacity and riparian vegetation. Road obliteration and vegetative manipulation would improve water quality by reducing sediment routing to streams and reducing the risk of high intensity wildfire. Both Alternatives meet the intent of ACS Objective 4.

ACS Objective 5: Alternative 1 would not maintain and restore the sediment regime under which the aquatic ecosystem evolved. Field observation indicates excess sediment is currently entering the system during storm events. Alternative 1 does not meet the intent of ACS Objective 5.

Alternatives 2 and 3 meet the intent of Objective 5 by reducing sediment from roads through road obliteration, road maintenance, and road to trail conversion at Johnny Lake.

ACS Objective 6: Alternatives 1, 2, and 3 have no measurable effects on in-stream flows and meet the intent of ACS Objective 6.

ACS Objective 7: The proposal has no measurable effects on flood plains and water table elevations in meadows and wetlands. All alternatives would meet ACS Objective 7.

ACS Objective 8: Alternative 1 would maintain current condition and does not meet this objective to maintain or restore the species composition and structural diversity of plant communities in riparian areas.

Through road rehabilitation, planting riparian vegetation, and moving impacts away from water, Alternatives 2 and 3 would meet the intent of Objective 8 by restoring riparian vegetation in disturbed areas and reducing sediment inputs to lower levels than present.

Improvements in parking and launching facilities and replacement of toilet would be consistent with the ACS objectives 5 and 8. Proposed boat ramp improvements would stay within the existing parking and dock areas except for North Wickiup boat ramp where the vehicle parking area would be expanded to the east by less than one acre. Vegetation consisting of non-riparian associated species such as lodgepole and ponderosa pine averaging 10" diameter at 4.5 feet in height would be cleared and is not expected to increase sediment into the reservoir. The expanded parking area would provide room for vehicles that otherwise would park in less appropriate areas. Vehicle access to the shoreline would be restricted (Mitigation Measure #16)

ACS Objective 9: Alternative 1 does not meet this objective. Native plants and other riparian dependent species will not improve as riparian buffers would continue to degrade from sediment from roads, changes in species composition, and high use of current dispersed recreation sites.

Both Alternatives 2 and 3 meet the intent of ACS Objective 9. Both Alternatives will restore habitat at the proposed project area through revegetation of native plants. Opportunities exist to improve and restore habitat for other riparian dependent species. One opportunity is to restore native fish habitat by improving the amount of riparian vegetation along streams and reservoirs in the project area. Opportunities to restore fish and other riparian dependent species would benefit the entire watershed.

Silvicultural practices are allowed within riparian buffers to reestablish and manage stands, and to acquire vegetation characteristics needed to obtain Aquatic Conservation Strategy Objectives (NWFP Standard and Guideline TM-1(c)). The riparian buffer widths for streams, reservoirs, and wetlands greater than one acre were evaluated with the proposed activities. Reserves would follow guidelines found within page C-30 of the Northwest Forest Plan and as recommended within the 1997 Browns/Wickiup Watershed Analysis.

Management activities included in these alternatives are an important component of the watershed restoration process. Treatments are designed to increase forest resilience that eventually benefits aquatic

systems by limiting the scope of insect, disease and fire occurrences within the watershed to endemic levels.

The following are specific vegetation activities planned that could potentially affect riparian buffers. On the east side of the Cascade Mountains, although riparian buffer distances are specified as lineal measures from areas designated as the high waterlines and riparian vegetation, most treatments would not occur in areas that would be obvious as riparian because of the lack of riparian-associated vegetation. Mitigation measures have been developed to address the desired attributes of this objective; including retention of biomass to limit surface and bank erosion and coarse woody debris sufficient to sustain physical complexity and stability.

Alternative 2 proposes to non-commercially thin small-diametered trees on 467 acres and treat hazardous fuel loadings using prescribed burning on units (FT-12, FT-13, and FT-18,) on 50 acres that are within riparian buffers where both Aquatic Conservation Standards and Riparian Management Objectives apply. Approximately 20% of the acres targeted within for non-commercial thinning would be excluded from treatment to provide wildlife cover or connectivity.

Planned activities in **Alternative 3** focus on greater protection of Round, Lookout, and Browns Mountain and greater use of prescribed fire. **Alternative 3** proposes to non-commercially thin small-diametered trees on 416 acres and treat hazardous fuel loadings using prescribed burning on units (FT-12, FT-13, FT-18, FT-34, and FT-35) on 83 acres that are partially within riparian buffers where both Aquatic Conservation Standards and Riparian Management Objectives apply. Approximately 20% of the acres targeted within for non-commercial thinning would be excluded from treatment to provide wildlife cover or connectivity.

Commercial thinning activities would occur in FT-18 outside the riparian buffer prior to implementation of prescribed fire. Also, thinning of non-commercial material, handpiling, and disposal would occur within the buffer to facilitate a controllable burn.

Alternatives 2 and 3 would be consistent with all ACS objectives, including #2 and #4. No commercial harvest within riparian buffers would occur. Activities would occur primarily along intermittent channels on the west side of the project area (Charlton and Browns subwatersheds), near Browns Creek, and adjacent to the reservoirs and the Twin lakes. Treatments are designed to provide healthier stands within riparian buffers, which contribute to soil stability, shade, and future instream large woody material recruitment. In all riparian buffers, non-commercial thinning would slightly reduce shade in the short-term, but is not anticipated to result in measurable changes in water temperature.

Slopes adjacent to streams in the project area are generally gentle and soils are generally permeable. Sediment inputs from management activities would be minimized through riparian buffers and the implementation of BMPs to limit turbidity increases. Any increases in turbidity and fine sediments above what would occur naturally would likely be immeasurable in the streams. The effects to aquatic resources in **Alternative 3** are similar to Alternative 2, except there would be greater potential for

overland flow of sediments due to a greater amount of treatment acres outside of the riparian buffers surrounding Twin lakes, and Wickiup Reservoir in the short term.

Riparian Habitat Conservation Area Consistency ([see footnote 8](#))

Most of the project area activities lie within the boundary of riparian areas managed under the Aquatic Conservation Standards listed in the previous section. There would be no measurable change to riparian Management Objectives upon implementation of Alternatives 1, 2, or 3. However, Alternatives 2 and 3 have the greater potential to promote the health of Riparian Habitat Conservation Areas (RHCA's). Activities within the action alternatives include approximately 2 miles of redundant and unneeded motor vehicle access below the high waterline at Wickiup Reservoir to benefit soil resources, retain/restore riparian vegetation, and lessening the potential impacts to water quality. Included area closure and rehabilitation of Off Highway Vehicle trails that radiate out of the Wickiup Pit borrow source for the dam.

In Alternatives 2 and 3, approximately 16 acres (PCT-050, PCT-051, PCT-102) of small-diametered trees would be non-commercially hand thinned within riparian buffers. Also, mechanical treatment of shrubs and prescribed burning would occur on 18 acres (FT-35). Within this buffer, machinery with relatively low ground pressure would be utilized (Mitigation Measure #51). No other ground disturbing activities within overlapping mapped RHCA areas would occur. Deposit of sediment from Unit FT-35 is unlikely because it is located on the opposite side of road from the reservoir and vegetation would be retained, providing an intercept of potential movement of soil. The overlapping area does not contain riparian vegetation and the treatments would reduce the likelihood of an uncontrollable wildfire to ignite adjacent to the travelway and continue up Wickiup Butte. A wildfire of this magnitude would have greater potential to adversely affect water quality.

303(d) Parameters

Alternative 1 (No Action)

The Deschutes River below Wickiup Reservoir Dam is the only reach within the Charlie Brown area 303 (d) listed, and it is quality impaired for the following parameters: dissolved oxygen, flow modification, habitat modification, sediment, and turbidity.

There has been no measurable water quality degradation attributed to the Charlie Brown transportation system, recreation activities, or forest health condition. However, Alternative 1 would not maintain and restore the sediment regime under which the aquatic ecosystem evolved. Field observation indicates excess sediment is currently entering the system during storm events. It is assumed the cumulative effect of inappropriate access, sanitation, and landscape-scale potential for wildfire would become more pronounced over time and has the potential to become a measurable effect on the water quality in the Deschutes River and the 303(d) parameters for which it is listed.

A lake becomes naturally eutrophic as it ages over time. The water chemistry and biological conditions

change - the lake becomes more biologically productive, until it eventually evolves into a marsh. This successional process can be accelerated by introduction of nutrients from human wastes associated with dispersed camping. The nutrients that usually influence an increase in algae blooms are phosphorus and nitrogen, which are present in soaps and human waste. Increased recreational use at Johnny Lake could affect the water chemistry and biological conditions. Johnny Lake is classified as ultra-oligotrophic (Sweet, 1996), which is a measure of its chemical and biological make-up. The lake contains some of the purest water of any lake in Oregon. Ultra-oligotrophic lakes are susceptible to changes in transparency brought on by inputs of nutrients, primarily nitrogen and phosphorus (Johnson, et al 1985).

Waste from pit toilets and dispersed campsites located near water contribute nutrients to Wickiup and Crane Prairie Reservoirs. The volume of nutrients and the effects they are having on water quality within the reservoirs is not well understood. Research on other lakes has shown that an increase in nutrients can lead to altered water chemistry, transparency, and biological conditions within a lake. Under this alternative, nutrient loading would increase over time as recreational use increases. Water chemistry, transparency, and biological conditions would likely be affected, but changes may be difficult to trace to dispersed camping use on the reservoirs, as there are other influences to water quality from developed camping, day use, and other upstream uses.

With no scheduled vegetation management activities, there would be no adverse effects to aquatic resources in the short term. Although shade surveys have not been conducted on streams within the project area, shade is judged to approximate historical conditions, with minor exceptions where past harvest units were proximal to streams.

Alternative 1 would not reduce shade or increase turbidity in the short term. Changes to water quality and the aquatic resources in lakes, streams, and reservoirs would be a result of natural causes or other management activities. The Charlie Brown analysis area contains 4.8 miles of intermittent and ephemeral channels in riparian buffers. In the long-term scenario, some stands located near streams could become overcrowded, diseased, or become vulnerable to insect attack. Large stands of dead and dying trees would then reduce shade as well as have the potential to increase peak flows in the stream. Decreased shade leads to increases in water temperatures. Increased peak flows can lead to increased streambank erosion and an increase in fine sediments and turbidity. In addition to the effects attributed to an unhealthy stand of trees adjacent to waterbodies, they become vulnerable to a large and uncontrollable wildfire event. In the event of wildfire, there would be temporary increases in water temperature during the fire, and long-term reductions in shade, increasing water temperatures even further. Large losses of vegetation after a wildfire would contribute to a situation where potential peak flows and water yields are increased, especially if the soils become hydrophobic which is usually the condition after a high intensity wildfire event. Fine sediments would then be introduced at an increased rate until revegetation occurs.

In the likely event of a widespread decline of forest health and resulting large wildfire west of Road 46, the effects to the fisheries resource would be limited because of the scarcity of fish in the streams. Widespread fire or stands of dead timber adjacent to Browns Creek or the Deschutes River (on the east side of 46) would have a more pronounced adverse effect to fish and their habitat. This includes the

more desired resident population of redband/rainbow trout. These events would cause a loss of shade, an increase of water temperatures and sediment. This scenario would increase large wood recruitment to the channel and provide hiding cover in the short term. Long-term recruitment of instream wood would be adversely affected until the stands matured. The Biological Evaluation (found in the analysis file) concluded that, in the case of large fires within the riparian buffers, that this alternative "**May Impact Individuals or Habitat**" (MIIH) of redband trout.

Alternatives 2 and 3

Proposed activities would have no measurable effects on the parameters for which the Deschutes River and its tributaries are listed under 303(d). Proposed management activities that would have a beneficial effect over the long-term includes: close and decommission of 151 miles of unneeded or inappropriate roads, stabilization of 10 miles of access leading to popular dispersed camping sites, modification and relocation of some recreation sites in sensitive areas, and restoration of riparian vegetation in impacted areas. Implementation of either alternative would not contribute to a measurable increase in water yields.

The Biological Evaluation for Alternatives 2 and 3 (available at the Bend-Ft. Rock Ranger District) determined there would be "**No Impact**" (NI) to redband trout.

The following is a site-specific summary of effects of activities proposed in Alternatives 2 and 3:

Browns Creek

Four (4) acres of non-commercial thinning and eight (8) acres of prescribed burning would occur within the riparian buffer system adjacent to Browns Creek, a perennial fish-bearing stream. Some intermittent channels contributing to Browns Creek may contain non-native species such as kokanee and brook trout in some reaches. The non-commercial thinning activities (PCT) would be primarily in lodgepole pine approximately 4" diameter and less and would be accomplished with hand crews. No heavy equipment would be utilized. Treatments surrounding Browns creek and the remainder of thinning in riparian buffers are designed to improve long-term riparian buffer conditions by improving the health of the stands and potentially allowing trees to become larger and provide greater shade. Prescribed burning prescriptions would be designed to retain riparian-associated vegetation and to restore vegetation composition and structure to more native conditions.

Twin Lakes and the Reservoirs

Prescribed burning would occur within two fuel treatment units located adjacent to the Twin lakes (FT-12, FT-13). This may result in some overland flow of sediment into Twin Lakes in the short term, but turbidity changes would be immeasurable. Most sediment would settle to the lake bottom soon after entering the lake. Some sediment of high specific gravity may stay suspended temporarily. In the long term, there would be a reduced chance of stand replacing wildfires that pose a greater risk to water quality. Implementation of mitigation measures and Water Quality Best Management Practices are designed to follow Aquatic Conservation Strategy and Riparian Management Objectives during implementation of treatments.

Closure or relocation of 15 dispersed campsites and prohibiting pit toilets within 150' of water at Crane Prairie and Wickiup Reservoirs would reduce nutrient inputs to the water from dispersed camping use. The change in water quality would likely be immeasurable, but research has shown that an increase in nutrients can change a lake's water chemistry, transparency, and biological status (Johnson, et al 1985, and Wetzel, 1983).

Johnny Lake

Conversion to trail of road 4290-200 into the trailhead at Johnny Lake would increase the hike-in distance to the lake from approximately 0.5 mile to 1.5 miles. This action would likely reduce recreational use of the lake, including fishing. Reduced recreational use of the lake would reduce the inputs of nutrients and limit eutrophication from human sources. The recreational experience may be improved for the individuals who would continue to visit the lake because of a reduced likelihood of encountering other people. For others, the longer hike may discourage use of the lake. However, on the Bend/Ft. Rock Ranger District, there are approximately 10 other fish-bearing lakes that can be driven to or require a hike of less than 0.5 mile to reach.

Road 4290-200 has extensive erosion in the area east of Johnny Lake. Closure and rehabilitation in this section of the road would limit further erosion.

Differences in turbidity or sediment deposition between the 2 action alternatives would be immeasurable in the lakes and reservoirs. In the long term, Alternative 3 would have greater potential to reduce the risk of stand replacement wildfire over and above Alternative 2, reducing the adverse effects previously discussed. For a more details, reference the Hydrology and Fisheries Report available at the Bend-Ft. Rock Ranger District.

Soil Resources

Alternative 1 (No Action)

There would be no immediate additional physical impacts to the soil resource. No vegetative management would occur, resulting in no new areas of detrimental compaction or displacement. The existing condition would remain as described in Table 3. Rehabilitation of existing impacts to restore soil health where dispersed camping has impacted sensitive areas and efforts to restore approximately 150 miles of road closure by decommission would not occur.

Levels of fine organics such as litter and duff as well as coarse woody debris would increase in the next twenty years, especially in the dry pine forests. This alternative would benefit the soil resource the most by providing greater moisture retention, microbial habitat, and long-term nutrient storage. This alternative has an increased chance of an uncontrollable wildfire; one capable of incurring detrimental burn damage to mineral, biological, and chemical components as more biomass accumulates over time. The recent and adjacent 1994 Four Corners wildfire and the 2001 Crane Complex fire are examples of typical stand-replacement wildfire in an overcrowded and fuel-laden stand in a dry pine forest. As a result of this wildfire, approximately 10% of the soil resources within the fire perimeters are considered

to be in a detrimental condition.

Alternatives 2 and 3

Under implementation of these alternatives, ground-based harvest and yarding operations, along with the existing condition, are planned to retain at least 805 acres of the soil in the area in a productive state. This would be accomplished using a number of techniques: use of the existing transportation system; limits to the number of passes of ground-based equipment over a common area; ground-based equipment restrictions; timing of entry; and selective hand felling.

It is estimated approximately 108 acres would need to be subsoiled to allow "natural" soil functions to return, including existing areas that are currently in a detrimental state. Proposed units currently in condition class A or B would have a greater increase in detrimental impacts than those in Class C or D in which existing skid trails and landing systems can be utilized.

A total of approximately .50 acres of riparian soil types would be restored through relocation and closure of dispersed sites. In these areas, activities would include exclusion of motor vehicle access, decompaction of the soil and revegetation with native plants. Approximately 150 miles of roads would be decommissioned and restored to natural processes by decompaction of the road bed, restoration of hydrologic function by removal of structures such as culverts and ditches, and then camouflage to maintain the integrity of the closure. Relieving compaction on these roads would return them to a state more capable of supporting vegetative growth due to increased infiltration rates and decreased soil strength.

Effects from proposed prescribed underburning would generally be negligible given prescriptions can meet the objective for consuming no more than 70% of existing litter and duff.

Minor detrimental effects to the soil resource would result from mechanical treatment of brush due to relatively low ground pressure and limited travel over the same piece of ground. Mulching of plant material on the soil surface is generally regarded as a benefit to the soil resource, especially for the microbial populations involved in organic matter breakdown and assimilation.

Wildlife

Animal Species Listed as Threatened, Endangered and Sensitive

A biological evaluation/assessment was completed for species known to exist on the Deschutes National Forest and their essential habitat. The following is a listing of the findings:

Threatened/Endangered Species:

Spotted frog: All alternatives = No effect

Canada lynx: Alternative 1 = No effect; Alternatives 2 and 3 = May affect, Not likely to adversely affect

Northern bald eagle: Alternative 1 = No effect; Alternatives 2 and 3 = Beneficial effect

Northern spotted owl: No effect; Alternatives 2 and 3 = May affect, Not likely to adversely affect

Sensitive - Region 6 Species:

Greater sandhill crane, long-billed curlew, yellow rail, wolverine, and western big-eared bat: No impact

For a complete listing of species, their survey protocols, and habitat evaluations, see the Biological Evaluation, the Forest Biological Assessment, and the US fish and Wildlife Service Biological Opinion resulting from formal consultation on the Northern spotted owl located at the Bend-Ft. Rock Ranger District.

Effects Common to All Species

Alternative 1 (No Action)

Alternative 1 would not change the current condition. Areas that are currently deficient in number of snags are generally those that have had past harvest treatments or wildfires with salvage. Time and snag recruitment by natural processes will adequately recruit future snags in these areas. In the short-term, habitat would remain fairly static. As stand conditions deteriorate and trees fall down, circumstances would favor vertical-structured forage species (e.g., squirrels) would change to species that prefer horizontal structure (e.g., mice, voles).

Currently, there are adequate levels of Green Tree Replacements except in some older lodgepole pine salvage units where the western bark beetle attack has resulted in areas where there are few green trees available.

In late and old-structured forests, the No Action alternative would result in deferred stand tending that would have the greatest effect on stands classified as late and old single story. These stands would gradually change to multi-storied, likely increasing the risk of stand replacement through a crown fire event.

Big Game Habitat (Deer):

Alternative 1 (No Action)

Currently, the entire project area contains more hiding and thermal cover than the optimum percentage described in the Forest Plan (e.g., 30% cover and 70% forage). Under implementation of this alternative over time, the vegetation over the entire area would continue to become denser, diminishing foraging habitat. This would cause big game to either forage elsewhere outside the project area, forage on less palatable vegetation such as young tree seedlings, or concentrate animals in areas where forage is

available. This effect, coupled with the disturbance resulting from the current road density, could affect reproduction and diminish the overall health of the herd as they prepare for the next winter.

Alternatives 2 and 3

Alternatives 2 and 3 would benefit big game by maintaining more optimum balance (30%) of deer hiding cover over each subwatershed. Road densities would also be managed to reduce effects from disturbance. See the section titled "Public Access" on page 89 for a discussion.

Proposed treatments for Alternatives 2 and 3 in addition to the Crane Complex Fire would retain cover in excess of the Forest Plan standards and guidelines for 30% in both the Browns and Snow subwatersheds.

Big Game (Elk)

Alternative 2

All proposed treatments within the Clover Meadow Key Elk Area would be non-commercially thinned and are designed to retain the current forest structure. Stands with a high density would be lowered on 255 acres, and moderate density stands would be lowered on 121 acres. This would create a loss of 255 acres of hiding cover (54% to 44%), and a reduction of 153 acres of thermal cover (38% to 32%). Forage would be increased from 30% to 45%. Overall, proposed treatments would move the project area closer to desired conditions of 30% hiding cover, 20% thermal cover and 50% forage as specified by the Forest Plan Standard and Guidelines (WL 47, 50). Road closures proposed in Alternative 2 would reduce the density to 0.25 mile per square mile for a 91% reduction from the current condition of 2.72 mile per square mile. Connectivity (Forest Plan WL-48) is generally acceptable. However, non-commercial thinning units PCT-130, PCT-131, PCT-132 and PCT-133 create a potential barrier to movement and Mitigation Measure #20 was developed to retain buffers between treatment units. In total they treat 325 acres.

Alternative 3

Alternative 3 is similar to Alternative 2 except non-commercial thinning unit #130 was dropped to provide better connectivity and to benefit the lynx.

Raptor Sites and Habitats

Alternative 1 (No Action)

Habitat for raptors would remain static over time for most species. However, species such as the northern goshawk and sharp-shinned hawks would potentially be most affected because of their preference for dense forests. As forest health continues to decline in the area, the likelihood of a large-scale wildfire and the subsequent removal of suitable habitat becomes more prevalent across the landscape.

The Bald Eagle Management Area at North Twin Lake would continue to be located in an area that was

not advantageous to the survival of eagles. It is traversed by a high-use hiking trail south of the campground. Further, it is visible from a heavily traveled, paved road to the west. Past timber harvest has opened the forest from the road and the BEMA.

Alternatives 2 and 3

Proposed thinning activities would promote favorable habitat (i.e., larger diameter trees and single-storied stands) for most species. For those raptors whose habitat requirements favor patches of dense stands (e.g. sharp-shinned hawks), Mitigation Measures #28-30 were developed to neutralize the effect of thinning in stands where these species are likely to be present.

A Non-Significant Forest Plan Amendment would eliminate the western (#E2) portion of the BEMA ([Figure 6b](#)) by adding onto BEMA #E3 on the eastern side of the lake. Stands within both existing and proposed areas have similar proportions of late stages. The proposed eastern BEMA has both existing and potential nest trees with less occurrence of dwarf mistletoe infection.

The existing BEMA is currently located in lands allocated to Matrix/Intensive Recreation. The new BEMA location would be placed in lands mostly allocated to Matrix/Scenic Views 4 (Partial Retention), with a minor portion in Intensive Recreation (Administratively Withdrawn). Although no net change in acres would occur, the change in allocations would remove 69 acres (or less than 1%) from programmed harvest or Probable Sale Quantity specified in the Northwest Forest Plan.

Replacement of the western portion of the North Twin Lake BEMA would afford greater solitude, allow greater potential for eagles to utilize the BEMA, and ultimately allow conditions more advantageous for eagle survival. For more discussion, the Bald Eagle Management Plans for all eleven BEMAs within the Charlie Brown Project Area is located on file at the Bend-Ft. Rock Ranger District.

Snags and Coarse Woody Material

Alternative 1 (No Action)

Snag and coarse woody material are generally low across a considerable portion of the project area due to past timber harvest, salvage (insect mortality and wildfire), and firewood cutting. Exceptions include the mountain hemlock zone, late successional reserves, and several old growth management areas.

Under implementation of this alternative, the effect to cavity dependent species would remain unchanged. Alternative 1 would favor natural processes over time to adequately recruit snags in the deficient areas. In areas where dense, younger forests are deficient in snags and coarse woody material, sufficient diameters of snags may not be realized for several rotations of the forest through catastrophic events. Snags desired for retention would continue to be removed through illegal or misinformed firewood cutting assisted by a high density of roads and less likely detection from enforcement personnel.

Alternatives 2 and 3

The action alternatives are similar in effects and would create an overall loss of snags by: 1) removal for safety purposes during harvest operations; 2) salvage of snags created by insect/disease vectors; and 3) loss to fuel treatments (e.g. prescribed fire, firewood). All snag retention measures would use the 100 percent potential population level, which would be adjusted to accommodate multiple species, i.e. intra-species competition (Refer to the Supplemental Snags/CWM/GTRs Guidelines in the Wildlife Report found at the Bend-Ft. Rock Ranger District). A list of the desired number of snags can be found on pages 53-54, Mitigation Measures #22 and #23. Existing snag numbers post-activity may be less than the 100% population level, which would invoke the required Mitigation Measure #21 to create snags within or adjacent to units to meet this level. The proposed activities have incorporated mitigation measures that would prevent all but minor losses of snags below desired condition levels.

It is likely there would be snag recruitment within units proposed for prescribed fire. If available, funds would be allocated via the Sale Area Improvement (K-V) plan to create snags in deficit areas after the project completion. Forest health prescriptions will eventually recruit large diameter snags of desired species (e.g. ponderosa pine, Douglas-fir, white fir). Thinning of lodgepole pine would also benefit future snag recruitment by accelerating growth to produce larger diameter trees in a shorter time frame.

Coarse woody material would primarily be reduced by prescribed fire applications. As with snags, it is likely that prescribed fire would kill some standing green trees that would then enter the cycle from snag to down log. Reduction of levels of down log material would only occur in the units designated for salvage. Mitigation Measure #22 (page 53) would be applied to meet standards for the Northwest Forest Plan (i.e. Matrix, pages C-40, 41). Where possible and needed to meet minimum coarse woody material levels, activity fuels may be piled (or retained in untreated concentrations) and left on site to meet wildlife habitat needs. The forest health processes described for snags will eventually produce larger down logs of desirable species. Within Late-successional Reserves, specified sizes and levels for snags and coarse wood debris found in the Browns-Round Mountain Late-Successional Reserve Assessment, pages 7-33 through 7-34.

In summary, using the following rationale, the effect of the action alternatives to species dependent on coarse woody debris and snags would not change or be beneficial because:

- The proposed activities have incorporated mitigation measures that would prevent all but minor losses of snags below desired condition levels.
- Forest health prescriptions will eventually recruit large diameter trees of desired species for future recruitment of snags (e.g. ponderosa pine, Douglas-fir, white fir). Thinning of lodgepole pine would also benefit future snag recruitment by accelerating growth to produce larger diameter trees in a shorter time frame.
- Although coarse woody material would primarily be reduced by prescribed fire applications, it is likely that prescribed fire would kill some standing green trees that would then enter the cycle from snag to down log.
- Planned reductions in access would reduce the likelihood of losing firewood through illegal or mistaken firewood cutting.

Green Tree Replacements (GTRs)

Alternative 1

There would be no change in the level of green tree replacements over time. However, many replacements would not achieve desired sizes in some areas due the limited potential of the site to grow large trees in crowded, densely forest conditions.

Alternatives 2 and 3

The majority of the treatment areas have prescriptions such as uneven-aged management and/or thinning smaller-diametered trees to improve resiliency of larger-diametered trees that would retain trees in excess of requirements for green tree replacements. Action alternatives would have the greatest potential reduction of GTRs in the units designated for salvage, dwarf mistletoe control, density, fuels treatment and thinning with overstory removal.

Implementation of these alternatives would potentially benefit species that depend on larger trees because treatment prescriptions are generally designed to favor retention and accelerate growth of trees to produce greater diameters in a shorter time frame.

All of the proposed units for both alternatives would require the retention at the 100% maximum potential population level.

Late and Old Structure (LOS) Forest

Alternative 1 (No Action)

The Charlie Brown project area is within its historical range for acres of forests that display late and old characteristics. However, the area is not within its historical range for single storied stands with large trees that were primarily comprised of the species Douglas fir and ponderosa pine. This Alternative would continue to increase stand densities, as successional processes advance over time. White fir and lodgepole pine would increase their dominance across the landscape, and ponderosa pine would continue to decline proportionately. In the absence of stand disturbances, late-single structural stages would slowly yield to multiple canopy structures, in the continuing shift to later seral conditions over time. This later seral shift means LOS forests would contain more white fir and hemlock, which would develop instability to disturbance over time.

Alternatives 2 and 3

The following documents were reviewed to provide direction on late and old structure: 1) Forest Plan Management Area 15 for Old Growth; 2) Region 6 Interim Direction Establishing Riparian, Ecosystem and Wildlife Standards for Timber Sales (i.e. "Eastside Screens") for LOS; 3) the Northwest Forest Plan Standards and Guidelines for the Matrix allocation; 4) Browns/Round Mountain Late Successional Reserve Assessment; and 5) the October 7, 1998 Regional Ecosystem Office letter of finding of consistency for risk reduction and silvicultural activities within the Charlie Brown analysis area.

Treatments proposed in Old Growth Management Area OG2 (designated Late-Successional Reserve in the Northwest Forest plan) include the use of prescribed fire to reduce stand density and natural fuel loadings to minimize the risk of catastrophic fire. This would promote large diameter ponderosa pine and benefit the white-headed woodpecker, flammulated owl and other species dependent upon mature, single-story pine stands with relatively frequent fire intervals. Old Growth Management Area OG 3 would use tree culturing and non-commercial thinning to perpetuate old growth characteristics. The "Big Trees" prescription would culture around large ponderosa pine to reduce potential loss to insect or diseases. Non-commercial thinning would occur in a former regeneration treatment unit to accelerate development of structure.

Treatments proposed in stands that currently exhibit late and old structure within lands managed under the Eastside Screens would use vegetative manipulation to maintain or to improve structural conditions. The affected areas include: Units FT-017 (both alternatives) and FT-036 (Alternative 3) on Eaton Butte. Although FT-017 provides merely a connection between late and old stands, both units would reduce understory tree density and shrubs, which are competing with desirable ponderosa pine overstory trees. Following thinning, mechanical brush manipulation would be completed prior to implementation of prescribed fire to lower the risk of exceeding the desired fire intensity. Exceeding the desired fire intensity would cause conditions to exist that would favor insect and disease attack.

Units FT-016 (both alternatives) and FT-035 (Alternative 3) on Wickiup Butte, use mechanical brush manipulation and prescribed fire. Both proposed treatments promote late and old-structured characteristics, although Unit FT-016 currently does not have them (i.e. "black bark" ponderosa pine). As with the Eaton Butte treatments, there is some risk of loss of larger trees to prescribed fire.

Proposed treatments in late and old-structured stands surrounding Wickiup Reservoir shoreline includes Big Trees units 015 and 016. Both promote large tree structure in the long-term by culturing around ponderosa pine. The removal of competing understory lodgepole pine would reduce future risks to insect/disease epidemics and catastrophic wildfires.

At least 15% of late-successional forest in 5th and 6th field watersheds in all land allocations was retained within lands managed under the Northwest Forest Plan (C-44 and 45 of the Standard and Guidelines). Refer to Table A2 in the Wildlife Report and Silviculture Report found at the Bend-Ft. Rock Ranger District for more detail and a summary of existing condition and changes per alternative.

Connectivity/Fragmentation

Alternative 1

Connectivity Corridors (Figure 12) were designated and evaluated by the Browns/Wickiup Watershed Analysis and Browns/Round Mountain Late Successional Reserve Assessment. The Crane Complex fire burned through an existing corridor, affecting its ability to function as a corridor. Under implementation of this alternative, there would be no immediate change to connectivity and fragmentation. However, over a longer term, it is likely large fires would continue to play a role in fragmenting corridors,

especially those close to the buttes where the linkage is most important.

Alternatives 2 and 3

The 2001 Crane Complex Fire occurred in lands designated as Matrix and burned across the width (i.e. 1 mile) of Connectivity Corridor #2 that linked the Browns Mountain LSR to the Round Mountain LSR. However, the southern half of this original corridor was dominated by moderate and light intensity fire effects. Units proposed (cumulative for both alternatives) by the project within the corridor that were affected totally or partially included: FT 09, 011, 022, 026, 027, 029, 030, 037, and 040; DMT 02, 06, and 07; Sal 05; and Big 08. The corridor ([Figure 12](#)) has been realigned and mapped to a more southerly route using approximately 1/2 of its 1-mile width within the fire's perimeter with the balance to the south in the adjacent unburned area. This alignment has a higher level of existing fragmentation than the original route. A review of the proposed treatments for Alternatives 2 and 3 gave the following results:

Five (5) proposed treatment units are within the revised Corridor #2 perimeter in Alternative 2. None would eliminate the minimum of 1,000 feet of canopy connectivity through the corridor.

Fourteen (14) proposed treatment units (note: including 05 for alternative 2) are partially or entirely within the revised Corridor #2 perimeter in Alternative 3. None would eliminate the minimum of 1,000 feet of canopy connectivity through the corridor.

In conclusion, the revised alignment of Corridor #2 is more fragmented than the original orientation. The southern portion of the main fire #1169 is included within it because the other potential options for the corridor's alignment would be even more highly fragmented. As noted, the proposed units in both alternatives maintain the minimum connections, however the areas outside the units and within the fire's perimeter had canopy degradation. Future actions within the light and moderate burn areas should strive to maintain adequate green tree canopy (i.e. minimum of 30%) where needed for the 1,000-foot width of connection through the burn. The effects analysis of the proposed alternatives assumes fuels treatments would maintain existing green canopy cover.

Overall, treatments designed with the objective to maintain forest health and reduce fuels would reduce the chance of a large wildfire fragmenting designated corridors. Alternative 3 would provide the greater protection for linkage to Round and Lookout Mountains.

Recreation

Alternative 1 (No Action)

Under this alternative, routine maintenance of trails and recreation facilities would continue. Developed recreation occupancy rates would continue to increase at an average yearly rate of 12%. Sites such as Rock Creek, Gull point, and Sheep Bridge would remain occupied during the summer months at levels of 40-45% average daily occupancy. At these levels, a visitor can expect these campgrounds and associated day use areas to be nearly filled to capacity during peak season weekends. When this happens, competition for the more desirable sites would displace visitors to lesser-used campsites in

developed campgrounds and some dispersed camping sites.

Busy campgrounds would be congested with visitors, while slower-paced settings and campgrounds could change to a more active pace and setting. Crowding would likely become more of a factor in determining which campground or area people select to recreate. Visitors would likely have to wait to use prime facilities, boat ramps and the most desirable (lakeside) sites; or use less desirable sites or areas.

Effects to riparian vegetation and impacts to soil would vary per dispersed site. In most areas, dispersed camps are located on areas least impacted by trampling and with minimal effects to water quality, as most campers are good stewards. However, this alternative continues a policy of dispersed camping with few restrictions in riparian buffers around the reservoirs. This causes the highest potential of all the alternatives to affect water quality and to accelerate possible future restrictions such as area closures to camping, due to the expected growth.

In this alternative, Off Highway Vehicle (OHV) trails would continue to traverse a main entry/exit road (4260) along the reservoir and access user-created trails that climb steep terrain on Wickiup Butte. Trails also radiate out of the borrow pit to seasonally wet areas on the shoreline of Wickiup Reservoir. These trail networks would continue to cause unsafe conditions on well-traveled road 4260, although there have been no documented accidents. On Wickiup Butte, evidence of water channeling into the trails increases the possibility of an event that could lead to failure of road 4260 and deposition into the reservoir ([see footnote 9](#)).

Access to open water for waterfowl hunters who use boats during winter months when boat launch facilities are frozen would not be available.

Improvements to boat ramps and associated facilities (parking area, toilets) would not occur under implementation of Alternative 1. Launching, retrieval, docking, and parking at most ramps during peak season would continue to be crowded and inefficient. This condition causes unsafe conditions as well as frustration while people wait to use the facilities.

Boat ramps, docks, and toilets would continue to be non-compliant with the American Disabilities Act.

Alternatives 2 and 3

Many of the dispersed camping sites proposed for access changes or for closure are popular with many visitors. Of the approximately 242 inventoried sites, it is likely new sites are created about at the same rate as the closure of inappropriate sites. Some visitors have the perception that there are diminishing dispersed camping opportunities as they encounter restricted access to areas they formerly have camped. This perception is amplified due to a dispersed camping closure order implemented in 1986 (Deschutes National Forest Order 86-15) that prohibits camping within 1/4 mile of developed sites such as Rock Creek Campground on Crane Prairie Reservoir. In many cases, these area closures have been ineffective and the Forest Service continues to enforce the restriction by maintaining or upgrading barriers.

An estimated 2,100 (7%) out of 30,000 ([see footnote 10](#)) visitors would be displaced by proposed closures. Campers that cannot use the closed sites are likely to be displaced to adjacent unrestricted areas, develop a camp on a new site, or some would illegally breach the closure and continue to camp in the closed area. Including measures implemented in the surrounding Cascade Lakes area that limit or restrict dispersed camping, proposed measures surrounding Crane Prairie and Wickiup Reservoirs would have little to no effect on finding alternative sites with similar attributes.

Closure of the Johnny Lake access road with a gate (4290-200) would eliminate motor vehicle access to (generally) a day use lake. This would likely result in lower use than current levels. Proposed activities would eliminate a short relatively easy hike into a "Wilderness-like" lake for those that could not hike an additional mile. Visitors who are displaced from Johnny Lake can find a similar experience at Lemish Lake to the north and other lakes within the wilderness off of 4636 (Irish/Taylor road). However, access to this lake is on a rougher road, which could make it more difficult for low clearance 2-wheel drive vehicles. Also, Lemish Lake receives more use ([see footnote 11](#)) due to closer proximity to other trails and trail loop opportunities to other destinations.

Proposed road reconstruction improvements would facilitate vehicle access to key dispersed camping areas, eliminating the need for visitors to forge new routes around seasonal hazards. Also, it would make it easier for large recreational vehicles to access the areas. This could lead to an increase in use and competition for sites on those roads. Also, improved access may lead to an undesired indirect effect of new campsites being developed.

Within an estimated 3-5 years, successful restoration activities would return closed sites to a vegetated condition. Some would find these areas enjoyable to visit as conditions around the reservoirs become more crowded. These areas would also provide "buffers" or a less crowded setting adjacent to busy sites.

Closure of OHV trails radiating out of the Wickiup Butte quarry would allow restoration efforts to be successful, including restoration of natural hydrologic processes to prevent channeling of water. Also, there is potential to benefit eagles by limiting disturbance during critical times, as there are historic nests in the designated Bald Eagle Management Area. Motor vehicle safety on Road 4260 would be improved as closures discourage haphazard OHV use on the roadway.

Proposed restoration activities of user-created OHV trails near Wickiup Butte would have little effect on most riders, as most trails within the quarry would remain open and riders would be able to continue using the area. Closure of trails that access Wickiup Butte and Road 4260 would reduce the opportunity for some seeking a hill climb experience at this site. Most riders would likely go to other areas to find a similar experience. Unfortunately, a few riders would continue to ignore restoration efforts and illegally use the closed areas or create new unauthorized trails to give them the experience they seek. A limited law enforcement staff would be available to address this problem.

Proposed boat ramp improvements at North Wickiup, Wickiup Butte, and Browns Mountain boat ramps would rectify the overcrowded conditions at these sites. The parking areas associated with these

facilities will be expanded to accommodate the use at these sites, making it safer for motorist and pedestrians to maneuver and access trailers and other vehicles. Overflow parking along access roads would be minimized, thereby reducing impacts to vegetation. All facilities would be barrier free. Failing vault toilets would be replaced, reducing them as a source of pollution.

Planned activities are designed to improve the existing condition and are not expected to increase the overall number of watercraft in the reservoirs above the current rate.

Scenic Resources

Alternative 1 (No Action)

Overall scenic views from the Cascade Lakes Scenic Byway and other travel corridors would gradually change over time. The visual effects of changes to lodgepole pine stands would be more noticeable in the short-term (0-10 years) in terms of density and more of the standing dead falling to the ground. Increased mortality rates would add to this. In the long-term time frame (10-50 years), there would be fewer trees standing and more dead on the ground creating a very dense understory. The most visible and dominant feature would be the amount of fallen dead lodgepole on the forest floor. Increasing stand densities of both lodgepole pine and white fir would result in fewer open park-like stands of large diameter ponderosa pine. With a high scenic value placed on views to the large diameter ponderosa pine by those traveling through the forest, in the long-term, the scenic views would diminish.

Scenic views from developed recreation sites at both Crane Prairie Reservoir and Wickiup Reservoir would remain fairly static. Expansion of dispersed sites along the shoreline would not adversely change views from the water although there would be noticeable changes visible at camping sites such as lack of riparian vegetation and more compacted soil areas.

Overall, noticeable impacts to scenic quality would occur within dispersed camping sites and boat ramps as use increases causing greater losses of vegetation through unrestricted vehicle access and parking in sensitive areas. Noticeable soil erosion and compaction would result from expansion of existing sites and continued deterioration of roads that are not designed for seasonally wet conditions.

Alternatives 2 and 3

In the short term, overall scenic views from the Cascade Lakes Scenic Byway and well-traveled roads such as 4270 would appear more open. Young lodgepole pine stands would be thinned and much of the dense understory surrounding larger ponderosa pine trees would be removed. From a long-term perspective, standing and fallen dead trees would not dominate scenery as in Alternative 1. Scenic quality and the general recreational experience would be maintained through greater protection of riparian vegetation, road and boat ramp improvements, and closure of many unnecessary non-maintained user-created roads leading to camping sites along the water.

Public Access

Alternative 1 (No Action)

Currently, there are 350 miles of open roads within the project area, or a density of 4.4 miles per square mile. The Crane Complex fire has a temporary closure order for approximately 28 miles of roads on Round Mountain in order to reduce the effects to public safety, inappropriate motorized access of firelines, and to lower the risk from noxious weed invasion until rehabilitation efforts are completed.

Many of the roads around the reservoirs were user-created and then "adopted" for maintenance by the Forest Service and would remain in a substandard condition. Although effects from road density are measured from a watershed level and not from a project perspective, the overall density is well above the threshold identified in the Deschutes National Forest Plan for deer summer range at 2.5 miles per square mile. Most of these roads are categorized as "secondary", which provide important historic or potential sources of dispersed recreation such as camping, hunting, and driving for pleasure. These roads would continue to provide important linkage to primary networks and high-use entry points from county, state, and federally designated roads.

Primary roads would continue to receive first priority for maintenance funds unless safety issues or resource damage are imminent on secondary roads. Although many of these roads are designated "open", diminishing maintenance due to funding priorities would have the effect of closing the road over time. Some of the roads would deteriorate to a condition where they would not be passable due to windfall, seasonal erosion, and vegetative growth.

Although it is almost impossible to quantify the amount of sediment contribution to Browns Creek and the reservoirs, roads, access points, and dispersed camps continue to be the primary sources.

Approximately ten miles of road providing access to key dispersed camping areas surrounding Wickiup Reservoir would continue to be a barrier, especially early in the season during wet periods. In these areas, campers would continue to either bypass difficult sections of road by creating new roads that circumnavigate through adjacent sensitive areas, or risk passage.

Current road densities have allowed ground suppression forces to quickly respond to most fire starts, although a correlation can be made between high road densities and an increase in human-caused fire occurrences (1997, Columbia Basin Scientific Assessment).

Current road densities have also contributed to forest fragmentation by adding edge habitat and disturbance to solitude-dependent species such as lynx, wolverine, bears and American marten.

Alternatives 2 and 3

Approximately 240 miles of roads would remain open with an overall density of 2.0 miles per square mile (including water). One hundred and ten (110) miles of road would be decommissioned, including approximately 1.3 miles of roads within the Crane Prairie Fire Complex. Actions would include soil decompaction, restoration of hydrologic function by removing culverts and structures designed to alter the natural water course, camouflage to maintain integrity, and spot planting of vegetation. Average

costs for these actions would be \$1,200-\$1,300 (see footnote 12) per mile. Annual maintenance has generally been deferred on these secondary roads, but a savings on maintenance costs would be incurred in the first year. This includes expenditures to upgrade the "adopted" roads to appropriate standards including such activities as creating intervisible turnouts, brushing, blading, and drainage structures. Other roads designated as "open" would get more use.

There would be a social impact from changing transportation and access patterns. Approximately one third of the roads would be decommissioned. This would reduce driving opportunities. Motor vehicle access to 228 inventoried dispersed sites out of 242 would remain. Most motor vehicle (e.g., car, Recreational Vehicle) access to the shorelines of the reservoirs would remain relatively unchanged. It is likely road closures would result in dissatisfaction among some visitors, especially those that perceive a cumulative effect from road closures in the surrounding Cascade Lakes area. It is expected most of the visitors would comply with road closures. However, some motorists who are accustomed to few driving restrictions and want to access closed areas, would continue to illegally breach closed roads. Most closures would be effective using techniques such as proper signing that explains the reason for closure, decompaction, and camouflage. Some closures would need continuous monitoring and repair until natural processes create an impenetrable barrier.

Proposed activities such as road decommissioning surrounding Browns Creek and restoration of riparian vegetation would decrease a mechanism for erosion and sediment delivery. Reconstruction on ten miles of road providing access to key dispersed camping areas surrounding Wickiup Reservoir would also benefit water quality and reduce visitor frustration by providing safe and approved access to desired camping areas.

Interdisciplinary team members skilled in fire suppression have designed the proposed road closure arrangement with a focus on public/firefighter safety and access efficiency. However, proposed road density reductions have the potential to increase response time of ground-based suppression resources, especially lightning-caused fire starts which may occur in areas where access was once provided. Road density reductions may also lead to less opportunity for human-caused fires.

Planned road management activities in these alternatives would reduce disturbance effects to solitude-dependent species. Reference the Wildlife Report for individual road densities by subwatershed.

The following table summarizes miles of roads and their status as shown on Figure 4:

Table 16. Road Status in the Charlie Brown Project Area in Miles

	Alternative 1 (No Action)	Alternative 2	Alternative 3
Access (Open Roads) on a Year-long Basis	390	215	215

Decommission	0	110	110
Reconstruct	0	10	10
Seasonal Closure W/ Gate	23	23	23
Year-long Closure W/ Gate	42	42	42
Trail Conversion at Johnny Lake	0	1	1

Placement of a gate at 4260-073 would provide access November 1 through January 31 for waterfowl hunters who use boats.

Temporary Roads

Temporary roads are constructed for a specific short-term purpose such as logging spurs for a timber sale. In order to prevent low-level casual use, such roads and landings are decommissioned at the completion of their intended use. In Alternatives 2 and 3, due to the high density of the existing road system, the need for construction of temporary roads to access the interior of proposed units is relatively minor. Less than ten miles of temporary road construction would be required. At the completion of the sale, all temporary roads would be decommissioned and the existing road system would be reduced as described in Mitigation Measure #1 page 51.

Inventoried Roadless and Unroaded Areas

An analysis of roadless attributes was completed for the Charlie Brown analysis area. The boundary of the project is within and adjacent to Charlton and Maiden Peak identified by the Forest Plan as "Inventoried Roadless Areas" (IRA). No activities such as commercial harvest or road building are planned within the IRA. However, closure and decommissioning of road 600 in sections 8 and 17 and conversion of the access road to Johnny Lake into a trail system would enhance the IRA characteristics.

Adjacent to the IRA, an analysis has shown no proposed activities that would change the unroaded characteristics of areas equaling 1,000 acres or greater. Also, within the area planned for activities, there are no unroaded, roadless, or wilderness areas as defined by Forest Service Manual 7712.16a "Contiguous Unroaded Areas". In Alternatives 2 and 3, units proximal to the boundary of the IRA include PCT 129, 131, and 134. These units are designated for non-commercial thinning and removal of dwarf mistletoe infected overstory trees in areas formerly harvested and currently roaded. Actions common to Alternatives 2 and 3 would also decommission parallel roads unneeded for public or administrative access adjacent to inventoried roadless areas. Implementation of either of the action alternatives does not affect wildlife movement or change unique ecological values associated with the inventoried roadless areas. These alternatives provide an overall effect to attributes associated with unroaded characteristics, such as a reduction of road density in the watershed and an increase in the long term development of late and old structured stands.

Fire/Fuels

Alternative 1 (No Action)

Under implementation of this alternative, no management activities would occur outside of custodial duties such as wildfire suppression. Ground fuels, species composition and disease above endemic levels would facilitate conditions that elevate less intense ground fires into more destructive crown fire events. These types of fires would now be lethal to most fire resistant species such as large ponderosa pine. Using the current condition projected through time, few young stands would survive and develop desired attributes of older and larger stands. Although the Crane Prairie Complex Fire eliminated approximately 700 acres of vegetation considered as a high hazard for an uncontrollable wildfire on Round Mountain, the remaining fuel profile from a landscape perspective is relatively unchanged. There remains an elevated risk of entrapment to the personnel and the public on Round Mountain.

Wildfire suppression actions would continue to be extremely hazardous for fire fighters and some suppression strategies would be eliminated due to lack of adequate escape routes and safety zones. This alternative would be the most hazardous to the public due to limited evacuation routes from areas where conditions are favorable for a large wildfire such as the southeastern shoreline of Crane Prairie Reservoir.

Particulate matter generated by fire that measures 10 microns and less in size (PM-10) is small enough to affect human health. During a high intensity wildfire, estimates of smoke emission could range from 1,000 pounds per acre to 2,000 pounds or more per acre of PM-10s.

Alternative 2 (Proposed Action)

Alternative 2 reduces the risk of a wildfire causing severe damage to portions of forest around North and South Twin lakes, Wickiup and Eaton Butte, and approximately 3 miles of defensible space along road 4270 to Crane Prairie Resort. In addition to providing a safer evacuation route for the public, this "defensible space" would also reduce the risk of wildfire entering the north portion of the Browns Mountain Late-Successional Reserve from the west. Proposed treatments along road 42 at the base of Browns Mountain would also provide protection to the adjacent Late-Successional Reserve and scenic views. Prescribed fire is proposed on approximately 990 acres to reduce natural fuels accumulations and begin restoring the role of fire in ponderosa pine ecosystems. In most cases, the density of trees in areas where natural fire once played a role would need to be reduced to provide a forest structure where prescribed fire can be used. It is assumed that once areas are within their appropriate fire return interval, they would be sustained through time by periodic prescribed underburning and mechanical brush treatments.

The 17 fuel treatment units within this alternative reduce risk from intense wildfire for specific areas only and does little for landscape scale fire risk reduction. The summits of Round and Lookout mountains remain prone for a large wildfire originating from either a human-caused ignition from the southeastern side of Crane Prairie Reservoir, or from a lightning strike at the base of the mountain. The risk of a large wildfire greater than 100 acres would still be prevalent across the landscape.

Implementation of this alternative would release 94 tons of particulate matter (PM-10).

Alternative 3

Alternative 3 is similar to Alternative 2 except for the following differences:

Proposed treatments such as prescribed burning, mechanical brush manipulation and thinning around the slopes of Round Mountain would improve safety of the fire lookout personnel and the visiting public. After implementation, a threatening fire would have a greater chance of a successful initial attack. In addition, if a fire escapes initial attack, treatments would provide additional safety zones and escape routes as well as affording longer timeframe for personnel to be evacuated.

Prescribed fire is proposed on approximately 1,980 acres (990 acres greater than in Alternative 2) to reduce natural fuels accumulations and begin restoring the role of fire in ponderosa pine ecosystems.

Tree topping and felling activities on the top of Round Mountain would enable wildfires to be detected at an earlier stage, especially in areas closer to the base of the butte where current conditions allow a fire to grow much larger before discovery. Also, rotary aircraft would have a safe place to land and take-off.

The Four Corners fire burned in heavy accumulations of dead and dying lodgepole pine near Crane Prairie Resort. This wildfire and an August of 2001 lightning-caused wildfire on Round Mountain (Crane Complex) illustrate the potential threat to public safety in the area. The wildfire originated in a unit proposed for salvage and escaped initial attack and threatened the Lookout personnel and structures. The wildfire was suppressed at 700 acres due to a combination of successful suppression tactics and a break in the continuity of the crown closure as a result of prior treatments that reduced the density of the stand. Proposed activities in this alternative would reduce the chance of a similar fire burning onto Lookout and Round Mountain, important for scenic values and species that depend on late and old forests.

Implementation of this alternative would release 144 tons of particulate matter (PM-10).

Public Health and Safety

Proposed activities in Alternatives 2 and 3 would improve public health and safety by reducing the risk of entrapment from wildfire, especially surrounding Crane Prairie Reservoir. Installation of a parking area at road 4600-690 and Cascade Lakes Highway and improvements at boat ramps would alleviate a hazardous condition by separating parking areas from the flow of traffic traveling at disproportionate speeds. In addition, reconstruction of 10 miles of seasonally wet roads would benefit public safety by eliminating hazardous and muddy depressions where vehicles can become disabled. All other proposed activities would not expose the public to an elevated risk of injury above hazards associated with routine forest practices such as tree felling and operation of mechanized equipment that are regulated by the Oregon Occupational Safety and Health Division.

Public/Commercial Firewood Gathering

The goal of the Deschutes National Forest is to maintain a supply of firewood while protecting other resources. Forest-wide areas for personal use firewood gathering are coordinated between Ranger Districts and designated after the appropriate level of analysis to consider all resources such as wildlife, soil, fuels/fire management, cultural resources and botany. The objective for these areas can serve more than one purpose such as for personal fuelwood and to reduce fuel loadings in a given area. However, the firewood gathering program does not sufficiently reduce the slash that causes the greater risk of loss from fire. Firewood gathering areas usually require additional cleanup and restoration activities when they are closed.

Several criteria are applied before designating an area for firewood gathering. These include accessibility and distance from town, size and species of material, public safety, consistency with other uses in the area, and timing that relates to the reduction of risk relative to a wildfire.

Applying these criteria to the action alternatives, a fuelwood component is not likely to be available in Alternative 2. In Alternative 3 within Fuel Treatment Units #39-#41, approximately 1,900 cords of firewood may be offered either as personal use or commercial product.

Economics

The following table summarizes the economic effects from each alternative. The main factors that affect these values are the amount of fiber removed (0 to 17 Million Board Feet), planning and layout costs, required mitigation and required reforestation. It does not include mechanical shrub treatments and prescribed burning, nor does it attempt to place a value on the benefits that may occur due to a possible future reduction of road maintenance and fire suppression costs. Amenity values such as dispersed recreation were not included in this analysis.

Table 17. Economic Effects of the Alternatives

Alternative	1 (No Action)	2 (Proposed Action)	3
Present Net Value @ 4%	0	\$1,221,670	\$1,585,470
Benefit Cost Ratio @ 4%	0	2.4	2.6
Returns to the Federal Government (see note 1)	0	\$1,821,650	\$2,248,920
Returns to the County Government (see note 1)	0	\$607,220	\$749,640

Jobs Supported (9 per Million Board Feet) (see note 2)	0	136	155
Harvest Volume	0	15.4 Million Board Feet	17.2 Million Board Feet

NOTES

1. Assumes 3/4 of the revenues from stumpage of the Charlie Brown project to the Federal Government and 1/4 of the revenues to Deschutes County for roads and schools.
2. From the 1995 Timber Sale Program Information Reporting System.

Cultural/Tribal Trust Resources

The Charlie Brown project area is within ceded lands for the Confederated Tribes of Warm Springs according to the Middle Oregon Treaty and the treaty boundaries as depicted in the Royce Indian Land Cessions circa 1778-1883. The Bend-Ft. Rock Ranger District is responsible for protection and management of the Tribe's cultural resources and materials as part of the trust responsibilities.

Government to government consultation with the tribes has been occurring with the tribes early on in the process since December 1998 in the format of scoping letters and dialogue from the tribes providing feedback to the proposed activities within the Charlie Brown analysis area. No special concerns about Tribal resources were identified and the project and implementation of Alternatives 2 or 3 is anticipated to have beneficial effects to most elements of the ecosystem. It is acknowledged that the Tribes may have lost the verbal history and they may not know where desired plant species and resources may be found. This affects their ability to tell Federal agencies where Tribal trust resources can be located on Federal lands.

An appropriate inventory has been conducted for this undertaking to determine properties eligible for the National Register for Historic Places (NHRP). All evaluated and unevaluated sites would be avoided; therefore, the undertaking meets the criteria given in Stipulation III.B.1 of the Programmatic Agreement among the USDA Forest Service, the Advisory Council on Historic Preservation, and the Oregon State Historic Preservation Officer. There would be no known direct, indirect, or cumulative effects to these resources.

Irretrievable/Irreversible Commitment of Resources

In Alternatives 2 and 3, expansion of North Wickiup boatramp is expected surrounding Wickiup and Crane Prairie Reservoirs would remove less than one acre of vegetation to a non-productive vegetated

condition.

Prime Lands

There are no lands within the project 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".

Executive Orders 11988 (Floodplain Management) and 11990 (Protection of Wetlands)

Executive Orders 11988 and 11990 direct Federal agencies to avoid, to the extent possible, both short-term and long-term adverse impacts associated with the modifications of floodplains and wetlands. All alternatives have no specific actions that adversely affect wetlands and floodplains. Proposed activities in Alternatives 2 and 3 are compliant with the orders and USDA Departmental Regulation 9500-3.

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. A primary purpose of the action alternatives is to provide for the health and safety of all members of the public by reducing the risk of entrapment from wildfire. Provision of these benefits does not discriminate between subsets of the general population. Known non-fee dispersed camping opportunities surrounding the reservoirs would be reduced by less than 6%, but it is likely this reduction in sites would be offset by campers creating new non-fee sites. Therefore, these potential disparate effects are minor. For these reasons, Alternatives 2 and 3 would not pose disproportionately high or adverse effects to minority communities or to low income groups.

Compliance With State and Local Laws

Implementation of Alternatives 1, 2, or 3 would be consistent with State and local laws, land use, and environmental policies.

Alternatives 2 and 3 follow State of Oregon requirements in accordance with the Clean Water Act for protection of waters. Application of Best Management Practices (BMPs) are selected and designed on site-specific conditions for waters potentially impacted in the Charlie Brown area. While not always referenced as "BMPs" in the environmental analysis, the interdisciplinary team has reviewed and incorporated applicable BMP water quality objectives in the design of Alternatives 2 and 3 and their mitigation measures. Standards and Guidelines for the Northwest Forest Plan (Aquatic Conservation

Strategy) and the Inland Native Fish Strategy where developed (in part) to maintain and restore aquatic ecosystems for dependent species. These standards and guidelines afford the same or greater protection of stream courses as direction found in the 1988 USDA publication "General Water Quality - Best Management Practices". Protection of water quality is also provided by incorporation of BMPs in timber sale contract provisions, prescribed burning plans, Oregon Department of Environmental Quality oversight on recreational facility design, and direction for road maintenance and reconstruction.

Discussion of Reasonable Foreseeable Future Actions Within and Adjacent to the Project Area

Sheep Bridge Campground Environmental Assessment (EA)

Designated approximately 22 campsites and parking for day users and boaters. Travel surfaces are designed to reduce dust. Vegetation would be planted to restore loss of vegetation and to provide screening between campsites. This project is currently being implemented.

West Twin Lake EA

Constructs an amphitheater, fish cleaning station, expands parking and replaces a restroom.

Twin Lakes Resort Drain Field Project Categorical Exclusion (CE)

Authorizes the addition of approximately 1,000 feet of drain field, septic tank, and grease trap at Twin Lakes Resort to upgrade the overall septic system for the facility. This project has been completed.

Cascade Lakes Overlay Project EA

The Federal Highway Administration has completed overlaying asphalt on approximately 30 miles of Cascade Lakes Highway from Elk Lake to Davis Lake. The project included some culvert replacement and/or extension.

Cascade Lakes Scenic Byways CE

A project is proposed which would construct three sites to provide visitor orientation and interpretation on the Cascade Lakes Scenic Byway: the North Portal Entry located five miles west of Bend, the South Portal Entry located two miles east of the junction with county road 61, and the Elk Lake Guard Station. In addition, parking areas and entry roads would be paved, interpretive signs added, and a toilet relocated to enhance the Blue Lagoon Trailhead and Osprey Point/Quinn River interpretive site. This project has a signed decision but has not been implemented.

East Browns Quarry Restoration Project CE

Restoration activities have been completed for East Browns Quarry, including creation of wet meadow habitat, 1.5 acres of seasonal pond habitat. An interpretive parking and trail area has not been completed.

Wickiup Reservoir Fish Habitat Restoration CE

Selectively places 100 trees weighted with boulders into Wickiup Reservoir near Sheep Bridge Campground. The objective is to improve: 1) hiding cover for both rearing and migrating fish, and 2) increase invertebrate (insects) production to provide forage. This project has been completed.

Riparian Planting Project CE

Activities have been completed, include restoration of a vehicle pullout and user-made trail by placing boulders and planting riparian vegetation at Browns Creek where road 4280 crosses. This project has been completed.

Hosmer Lake EA

Reduces the effects of human activities to wetland and wildlife habitats by closing approximately 3-4 sites or moving some campsites away from riparian buffers as well as improving vehicle parking and restrooms. This project has a signed decision but has not been implemented.

Cultus Demo EA

Proposed actions include thinning, fuels reduction, and prescribed burning on 455 acres surrounding Cultus Lake. This project does not have a signed decision.

Wickiup Safety of Dams Project EA

Modifications to Wickiup Dam are proposed by the Bureau of Reclamation to correct safety deficiencies. The modifications are designed to add stability to foundation and embankment materials during seismic events, and include construction of a filter blanket and stability berm along the downstream toe of the dam. An identified site to be considered for source materials is located within the reservoir area near the dam. This project is currently being implemented over the next two years.

Seven Buttes Return EA

Proposes a range of management activities on the Crescent Ranger District to maintain or restore forest health conditions within a 160,000-acre planning area. Treatments would occur over approximately 16,000 acres and would consist of tree culturing, thinning from below, thinning of young stands, and various treatments designed to lower the risk of wildfire and restore forest resilience. This project is currently being publicly reviewed with a 30-day comment period.

Dilman EA

Proposed actions to implement the Upper Deschutes Wild and Scenic Plan would reduce the number of existing dispersed camping sites from approximately 73 sites to 31, close approximately 63 miles of roads, resurface road 44 and maintain access to Bull Bend and Wyeth campgrounds, armor the stream crossing at road 4370, prescribed burn or mechanically treat shrubs on 1050 acres, and thin 2760 acres of trees to reduce risk of stand replacement wildfire and for forest health. This project is currently being publicly reviewed with a 30-day comment period.

Deschutes River Bioengineering Project EA

Nearly 1,000 feet of riverbanks are currently undergoing restoration using native materials such as large trees, sedges, and willows to be completed by May 2002. The project area is 1/4 mile downriver from Wickiup Dam.

Seventh Mountain Pit Expansion EA

Authorizes the expansion of an existing rock pit by 10 acres, located near The Inn of the Seventh Mountain off of Cascade Lakes Highway. This project has been implemented.

Crane Fire Salvage EA

As a result of the 2001 Crane Fire Complex within the Charlie Brown analysis area, Crane Fire Salvage proposes to recover commercial fiber value by salvaging dead and dying trees, reforest severely burned areas by hand planting ponderosa pine seedlings, reduce future fuel accumulations resulting from the fire, and restore wildlife habitat by re-establishing vegetation. Activities would occur on 547 of 720 acres, all in lands designated Matrix in the Northwest Forest Plan. This project is scheduled to be publicly reviewed in December 2001.

GOTO

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[Deschutes and Ochoco National Forests Website](http://www.fs.fed.us/centraloregon/manageinfo/nepa/documents/bendfort/charliebrown/cbea-3consequences.html)

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Last Update: 11/26/01

R.A. Jensen

Charlie Brown Environmental Assessment Bend-Fort Rock Ranger District Deschutes National Forest

List of Planning Participants and Consultation With Others

This section identifies the Forest Service and other agency 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

Bill Peterson - Silviculturist
James Lowrie - Wildlife Biologist
Tom Walker - Fisheries
Pat Joslin - Botanist
Les Moscoso - Recreational Planner
Gini Stoddard - Geographic Information Systems Specialist
Randy Gould - Hydrologist
Robin Lee - Landscape Architect
Leslie Hickerson - Archeologist
Jim Schlaich - Presale Forester
Steve Bigby - District Road Manager
Dale Birch - Fire/Fuels Specialist
Peter Sussmann/Terry Craigg - Soil Specialists
Chris Mickle - Team Leader/Writer

Agencies Contacted and Persons Consulted

Glen Ardt - Oregon Department of Fish and Wildlife
Chris Carey - Oregon Department of Fish and Wildlife
Jeffrey Dillon - US Fish and Wildlife Service
Dede Steele - US Fish and Wildlife Service

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[Deschutes and Ochoco National Forests Website](#)

<http://www.fs.fed.us/centraloregon/manageinfo/nepa/documents/bendfort/charliebrowncbea-4participants.html>

Last Update: 11/20/01

R.A. Jensen