Environmental Assessment

Rattlesnake Forest Health Project
EA No. OR-035-8-06

U.S. Department of Interior
Bureau of Land Management
Vale District
Baker Resource Area

U.S. Department of Agriculture
United States Forest Service
Wallowa Whitman National Forest
Unity Ranger District

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CHAPTER 1
PURPOSE AND NEED FOR ACTION
OBJECTIVES AND ISSUES

A. Introduction

This environmental assessment (EA) is a site-specific analysis of the proposed Rattlesnake Forest Health Project located in the Baker Resource Area of the Vale District, Bureau of Land Management (BLM) and the Unity Ranger District of the Wallowa-Whitman National Forest. This proposal is designed to be in conformance with the Baker Resource Management Plan Record of Decision (ROD, U.S. Department of Interior, Bureau of Land Management, Vale District Office, Baker Resource Area, July 1989). The ROD is available for review at the Baker Resource Area Office.

On lands administered by the Forest Service management direction is provided in the Wallowa-Whitman Land and Resource Management Plan, including the Regional Forester's Forest Plan Amendments #1 (Screens), #2 (Amendment of Screens), and #4 (Infish).

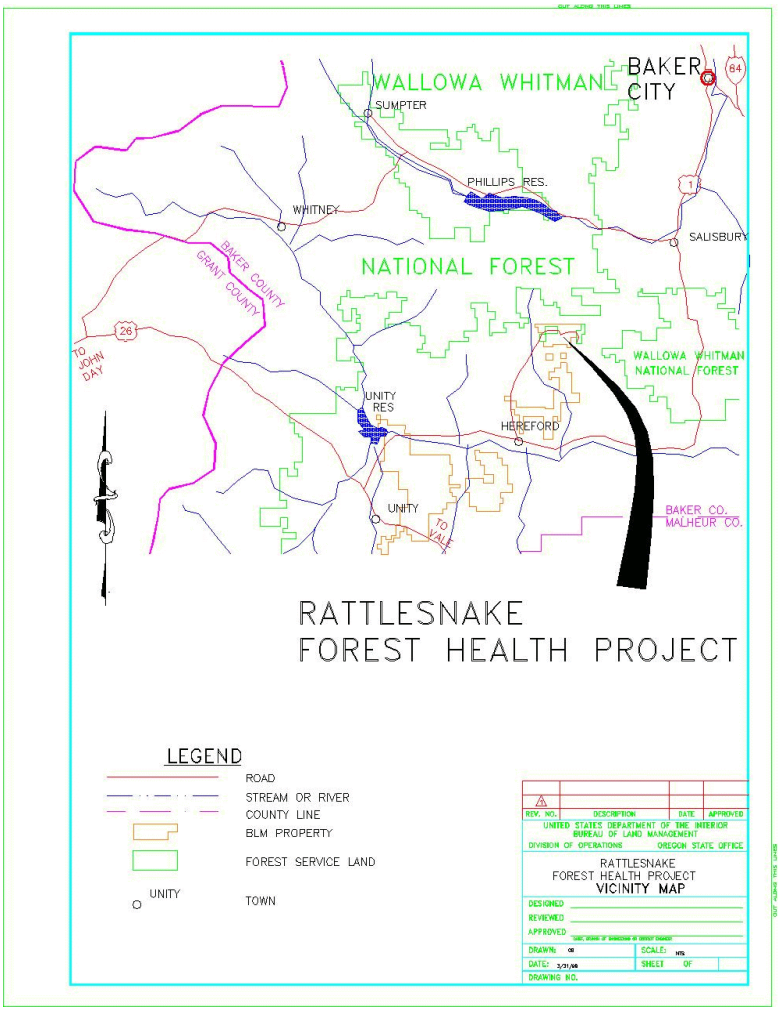
This project represents a joint planning effort between the two agencies. It was developed in this manner to reduce costs and to ensure proposed actions/issues associated with the project are addressed. It includes an evaluation of the possible effects of implementing the proposal. This includes assessment of possible cumulative effects of this project in conjunction with earlier and future activities in and around the area.

Although the analysis represents a joint planning effort each agency will be responsible for conducting it's own notice and comment period and for issuing the appropriate decision document.

The project area is within the area analyzed in the Interior Columbia Basin Ecosystem Management Project (ICBEMP) Eastside Draft Environmental Impact Statement. That project does not address site-specific resource management activities, but will assess landscape scale processes and long-term ecological health issues. Implementation of this proposal would not limit the choice of reasonable alternatives for the ICBEMP.

The proposed project is located in T. 11 S., R.. 38 E. Sec. 24, 25, 26, 36 & T. 11 S., R. 39 E., Sec 29, 30, 31 approximately 6 air miles north of Hereford, Oregon. The project is within the Whipple Gulch, Rattlesnake Gulch, and Jordan Creek subwatersheds, of the Big Creek drainage, within the Burnt River drainage (see attached vicinity map pg 2).

There are approximately 1,230 acres of BLM managed land and 480 acres of National Forest System (NFS) lands within the project area. Table 1 shows the acres of conifer and juniper woodlands on BLM and NFS lands. Most of the forested areas are densely stocked second growth ponderosa pine


WALLOWA WHITMAN
BAKER CITY
84
SUMPTER
PHILLIPS RES.
1
WHITNEY
SALISBURY
NATIONAL FOREST
BAKER COUNTY
GRANT COUNTY
26
TO JOHN DAY
WALLOWA WHITMAN NATIONAL FOREST
UNITY RES
HEREFORD
UNITY
TO VALE
BAKER CO.
MALHEUR CO.
RATTLESNAKE
FOREST HEALTH PROJECT
LEGEND
ROAD
STREAM OR RIVER
COUNTY LINE
BLM PROPERTY
FOREST SERVICE LAND
UNITY
TOWN
REV. NO.
DESCRIPTION
DATE
APPROVED
UNITED STATES DEPARTMENT OF THE INTERIOR
BUREAU OF LAND MANAGEMENT
DIVISION OF OPERATIONS
OREGON STATE OFFICE
RATTLESNAKE
FOREST HEALTH PROJECT
VICINITY MAP
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with a minor amount of Douglas-fir. Large diameter trees are scattered throughout the forested areas. Juniper stocking ranges from very low to very high levels.

Table 1 - Acres of Conifer and Juniper Woodlands on BLM & NFS Lands

	Conifer	Juniper Woodlands	Open	Total
BLM	402	753	75	1230
NFS	331	100	49	480
Total	733	853	124	1710

This EA examines alternatives for treating forest health concerns on this tract of BLM and NFS land located in the Baker County Geographic Unit described in the ROD, pg. 110. The project area is within the Big Creek drainage, a tributary to the Burnt River.

B. Need for Action

The forest stands fall into Forest Cluster 5 described in ICBEMP. This cluster is characterized by low-integrity, dry forests "...subbasins are dominated by dry-forest with approximately 60% of the area showing changes in fire frequency. They are extensively roaded and have little wilderness. Late-seral structure increased significantly in montane forests resulting from conversion of a variety of forest structures dominated by shade-intolerant conifers (such as pine), to forests dominated by shade-tolerant species (such as fir). Mid-seral structure increased in lower montane and montane settings...Habitat for species preferring more open, park-like structures (for example, white headed woodpecker, silver-haired bat, and flamulated owl) has declined. Nearly 80 % of the area in this cluster is classified as low forest and rangeland integrity. Hydrologic integrity of these subbasins is low to moderate...Forests are less productive than those associated with Forest Cluster 4, and historical disturbance regimes imply the need for more frequent silvicultural and prescribed fire treatments. These subbasins show moderate opportunities for restoration" (ICBEMP, DEIS, page 235).

The forest stands in the project area are in the ponderosa pine/mountain-mahogany/elk sedge (PIPO/CLE/CAGE), ponderosa pine/snowberry (PIPO/SYAL), and ponderosa pine/Idaho fescue (PIPO/FEID) plant associations. These plant associations fall into the warm/dry biophysical category. The sites were historically dominated by fairly open stands (park-like) of relatively large diameter ponderosa pine with a minor amount of Douglas-fir with a low shrub and grass understory. This condition was maintained by frequent low-intensity fires. Frequent low-intensity fire also maintained healthy aspen stands in upland areas. Fire killed older aspen trees and stimulated aspen regeneration. Without fire these stands have become decadent with very little regeneration.

Lack of frequent low-intensity fire in the project area since the late 1800's has allowed a dense understory of ponderosa pine and Douglas-fir to develop. The trees in the understory average 85

years old. Previous timber harvests have removed a majority of the large diameter overstory trees without thinning the understory. The understory is currently overstocked and susceptible to insect and disease infestation. Bark beetles (mountain pine beetle, western pine beetle, and IPS) are active in the project area and have killed understory and overstory trees. There are light to severe infections of dwarf mistletoe in the ponderosa pine and Douglas-fir. Decades of fire exclusion have allowed stands to become more densely stocked than these dry pine sites are able to support. This has led to a greater risk of attack by bark beetles, and an increase in dwarf mistletoe. Moreover, these conditions worsen with time, and stands develop higher risk to bark beetles, mistletoe infection, and gradually, higher potential for catastrophic stand-replacement fire. Stocking level control by thinning is needed in nearly all of these stands to protect them from future catastrophes related to bark beetle and fire risks.

Lack of frequent low-intensity ground fires has allowed juniper woodlands to increase. The juniper woodlands are currently dominated with trees less than 100 years old. Juniper trees older than 100 years are generally restricted to rocky areas that historically did not burn. Young juniper trees are also becoming established in pine stands.

C. Description of the Proposal

The Baker Resource Area and the Unity Ranger District propose management actions to revitalize the health of forest ecosystems in the project area. Implementation of the proposal would begin to shift stand stocking and composition toward more open stands dominated by large diameter fire climax species such as ponderosa pine with minor amounts of Douglas-fir.

The proposed actions that may be implemented include precommercial (175 ac) and commercial thinning (350 ac), prescribed burning (650 ac), and thin selected juniper stands (125 ac). In addition treatment within riparian areas would include placing large woody debris in stream channels, removing conifers from aspen stands, thinning aspen stands, planting hardwoods and/or sedges, and fencing sensitive areas. Road management would include road construction, road closures (1 mile), and road and skid trail rehabilitation (drainage ditching and seeding).

D. Objectives

Proposals were derived from the Baker Resource Area Management Plan ROD, current law, EA interdisciplinary team (ID) discussions, consultation with other public agencies, and private individuals and organizations. The objectives of the proposed actions are to:

1. establish healthy and diverse forest ecosystems (ROD, pg. 101).
2. enhance habitat for fish and wildlife consistent with BLM policy identified in the Fish and Wildlife 2000 Plan.
3 protect and enhance soil, air and water resources (ROD, pg. 18).
4. return fire to its natural role in the ecosystem (ROD, pg. 40).
5. protect and enhance native plant communities (ROD, pg. 32, 101).

The lands administered by the Wallowa-Whitman National Forest are allocated to Management Area 3 in the Forest Plan. The Wallowa-Whitman Forest Plan direction for Management Area 3 is: similar to Management Area 1, this management area provides a broad array of forest uses and outputs with emphasis on timber production. However, timber management is designed to provide near-optimum cover and forage on big game winter ranges (Management area 3) and selected summer ranges(Management Area 3a).

E. Key Issues to be Analyzed

The EA ID team developed the following consolidated list of issues from public and internal scoping. Public scoping consisted of letters to the public, tribes, and a news release. See Chapter 5.

1. How would the alternatives affect the existing forest and juniper woodland structure? The tree density, stand structure, and old-growth characteristics are analyzed.

2. How would water quality and fish habitat be impacted by the alternatives? Fish habitat, water temperature and sedimentation are analyzed.

3. How would riparian areas and aspen stands be impacted by the alternatives? The structure and species composition of the riparian areas are analyzed.

4. How would the alternatives impact wildlife habitat? Big game hiding and thermal cover, cumulative impacts including management of adjacent lands, large green trees, snags and down log levels, threatened and endangered (T&E) animal species, and animal species on the BLM-sensitive species list are analyzed.

F. Issues Considered and Eliminated from Detailed Analysis

The following issues were also developed in ID team discussions. They were eliminated from further analysis because they would not be impacted by any of the alternatives or were addressed in project design features (PDF):

1. What is the impact of the alternatives on T&E, US Forest Service, or BLM sensitive plant species?

There are no known populations of special status plant species in the Rattlesnake project area. Surveys for special status plants are required in areas proposed for ground disturbing activities because of the potential occurrence of populations of US Forest Service or BLM designated sensitive, assessment, or tracking species. Field surveys will be completed prior to ground operations, and the project proposal may be modified to mitigate or avoid such plant populations and their habitat as needed.

2. How would recreation and visual resources be affected by the alternatives?

The area is primarily used for dispersed recreational activities and driving for pleasure. Road access into the project area is more than adequate. The proposed road closures would not impact road access into the project area because the portions of roads closed are dead-end spurs. Access would be retained by through roads. The area is not viewable from recreation developments or use areas. It has no special recreation designation or VRM class that would preclude activities.

3. How would domestic livestock grazing be affected by the alternatives?
The project area is within the BLM administered Brown Rocks and U.S. Forest Service administered Whipple Gulch livestock grazing allotments. These allotments consist of 188 animal unit months (AUM) with variable season of use.

Prescribed burn areas would be "rested" from livestock use following burning. Depending on the location and timing of the prescribed burn, livestock would be fenced out or removed from the pasture or allotment for two to five growing seasons to ensure proper re-growth and establishment of perennial grasses and native forbs (ROD, pg 41). The rest period would impact the permittee by not authorizing the use of 72 AUM annually.

4. How would cultural resources be affected by the alternatives?
Cultural resource surveys located one large lithic scatter and historic mine tailings on BLM land within the project area. In addition, three known cultural sites have been previously recorded on the National Forest land within the project area, consisting of two lithic scatters and one historic earthen dam. Under all alternatives, sites would be avoided with appropriate buffers during ground disturbing activity. Historic features would be avoided by directional falling in precommercial thinning treatment areas. Archaeological sites located in riparian fencing areas would be protected by including the sites within the riparian exclosure. Sites would be monitored during project implementation to ensure protection and maintenance of buffers. With these design and avoidance measures, the project would have no effect on any listed or eligible National Register sites, as determined in consultation with the Oregon State Historic Preservation Office.

5. How would noxious weeds be impacted by the alternatives?
Several small populations of diffuse knapweed, bull thistle, and scotch thistle have been located within the project area (see analysis file). These and any new populations of noxious weed would be treated in accordance with The Vale District 5 Year Noxious Weed Control Program EA dated June 1994 under all alternatives.

6. How would air quality be impacted by the alternatives?
Smoke from prescribed burning has the potential to impact air quality. All prescribed burning would be done in accordance with the State of Oregon Smoke Management Plan which would mitigate impacts to air quality.

CHAPTER 2
AFFECTED ENVIRONMENT

Critical Elements to the Human Environment

This environmental assessment does not discuss impacts to the following resource values either because no site-specific impacts were identified or the resource value did not occur within the analysis area: Areas of Critical Environmental Concern, Prime or Unique Farmlands, Floodplains, Hazardous or Solid Wastes, Drinking or Ground Water Quality, Wild and Scenic Rivers, Wilderness, Cultural Resources, Native American Religious Concerns, and Treaty Rights, and Environmental Justice.

Affected Environment for Key Issues

1. How would the alternatives affect the existing forest and juniper woodland structure?
   The tree density, stand structure, and old-growth characteristics are analyzed.

Forest Stands - The project area is located mostly on southerly aspects with numerous small ridges and draws that provide a variety of other aspects. Slopes facing west and north are occupied by ponderosa pine, Douglas-fir, and scattered juniper trees. The southerly aspects are warmer and drier, and contain sagebrush and juniper woodlands with small pockets of ponderosa pine. The understory shrub vegetation is composed of mountain big sagebrush, curlleaf mountain-mahogany, squaw or wax currant, common snowberry, and creeping Oregon-grape. Grasses and sedges vary on different sites and include Idaho fescue, elk sedge, orchard grass, and bluebunch wheatgrass. There have been two previous timber sales on BLM managed land within the project area: one in 1962 and the second in 1975.

The forest land has the following plant communities: ponderosa pine/mountain-mahogany/elk sedge (PIPO/CLE/CAGE), ponderosa pine/snowberry (PIPO/SYAL), and ponderosa pine/Idaho fescue (PIPO/FEID). These plant associations fall into the warm/dry biophysical category. The sites were historically dominated by fairly open stands (park-like) of relatively large diameter ponderosa pine with a minor amount of Douglas-fir with a low shrub and grass understory. The open park-like stands were maintained by frequent low-intensity fires but fire suppression efforts have interrupted this element for nearly 100 years.

The juniper woodlands are primarily in the western juniper/Idaho fescue (JUCO/FEID) plant association. Stocking level of juniper trees varies considerably, depending on the productivity of the site. In areas where the juniper tree stocking is relatively low, there is a dense grass-forb-shrub component. Where the juniper trees are dense, the grass-forb-shrub component is sparse.

Tree Density - Since the turn of the century fire has been excluded from the project area. This has led to dense young stands developing in the forest areas. Previous timber harvesting removed most of the large overstory ponderosa pine and Douglas-fir trees. The current forest stands are dominated by early to mid-seral pine and Douglas-fir stands with scattered large

diameter overstory trees. Within historic pine stands, Douglas-fir and juniper are becoming established. Lack of fire in the juniper woodlands has allowed young juniper trees to become established and the stand density is much higher than historic levels. The juniper woodlands are dominated by stands of juniper trees less than 100 years old, with widely scattered, large diameter, older, juniper trees.

Frequent low-intensity ground fires naturally thinned the forest stands. With the lack of frequent fires, tree density in the forest stands has increased and the growth of individual trees has decreased. The decline of individual tree growth has made the stands susceptible to attack by mountain pine beetle (*Dendroctonus ponderosae*) or western pine beetle (*Dendroctonus brevicomis*). Both mountain pine beetle and western pine beetles have recently killed trees in the project area. Recent research by Cochran et al. (1994) recommends specific stocking levels to keep stands healthy and growing, avoid suppressed and stagnated trees, while maintaining the stand at low risk to bark beetle attack. For the plant associations in the project area, Cochran's guidelines recommend stocking levels of 40 ft^2 to 80 ft^2 of basal area per acre. The basal areas within the project area average 90 ft^2 of basal area per acre with a range of 0 ft^2 to 240 ft^2 per acre. In general, the current tree densities in the PIPO/FEID plant association range from 20 ft^2 - 60 ft^2, in the PIPO/CLE/CAGE plant association range from 40 ft^2 - 90 ft^2 and in the PIPO/SYAL plant association range from 120 ft^2 - 240 ft^2.

Stand Structure - There is a wide diversity of stand structures throughout the project area. The forest stands range from 40 to 100 years old. Stands range from even-sized trees to stands with a wide variety of tree sizes. Bark beetle infestations have killed pockets of trees throughout the project area over the last 20 years. This has created small diameter snags and down logs. Most of the recently killed trees are in the 5" - 16 " dbh range. There are widely scattered large snags, greater than 20" dbh, throughout the project area.

There are two ten-acre areas that were pine sites historically but are currently occupied by Douglas-fir. Within these stands virtually all of the pine overstory was removed in earlier timber harvest . The stands seeded to ponderosa pine and Douglas-fir. In the mid 1970's, mountain pine beetle killed all the ponderosa pine, leaving only Douglas-fir. These stands currently exceed the recommended stocking levels.

Old-Growth Characteristics - Previous timber harvesting removed a majority of the large diameter old-growth trees from the project area. Currently there are between 1 to 5 trees per acre greater than 20" dbh remaining in the forest stands. Most of these trees have old-growth characteristics. The high stocking level of the young stands has stressed many of the large trees in the project area. This competition for water and nutrients has recently killed several old-growth trees.

2. How would water quality and fish habitat be impacted by the alternatives? Fish habitat, water temperature and sedimentation are analyzed.

The Burnt River and its tributaries, including Big Creek, support wild populations of rainbow and redband trout. Historically anadromous fish and resident redband trout occupied the entire Burnt River basin. Dams built on the Snake River caused a blockage and loss of habitat for the anadromous fish. Currens looked at genetic variation within and among populations of trout in the Burnt and Powder Rivers and concluded that the Burnt River populations are inland redband trout (ODFW, 1997). Fish surveys have not been completed for the streams in the project area, but it is presumed the majority of fish observed are native redband trout. There may be some rainbow trout of hatchery origin in Jordan Creek that have migrated upstream from the Burnt River. The BLM has listed the redband trout as Bureau-sensitive. Redband trout is on the Region 6 Regional Forester's list of sensitive species. No other special status fish occur in the Burnt River drainage. The presence of bull trout has never been confirmed in the Burnt River system (ODFW, 1997) although surrounding subbasins all contain populations of bull trout.

STREAMS

Rattlesnake Gulch, Jordan Creek, and Whipple Gulch are sub-watersheds within the project area that flow into Big Creek, which flows into the Burnt River, a major tributary to the Snake River. Redband trout occur in Big Creek and Jordan Creek. Rattlesnake Gulch and Whipple Gulch are non-fish bearing streams, but supply perennial flow to Big Creek. There are approximately 5 miles of perennial and intermittent streams in the project area that drain into Big Creek. Streamflow is dependent on the amount of snow deposited in the watershed, the ability of the watershed to capture and hold snow, and the ability for soils, springs, bogs and wet meadows to store water and supply water during summer months. Much of the streamside shade has been removed on Big Creek due to fire, livestock grazing, and timber harvest. Big Creek, Jordan Creek, and Rattlesnake Gulch are actively downcutting, with areas of rapidly eroding banks.

Previous timber harvesting, juniper encroachment, wildfire, and livestock grazing in the upper watershed have contributed to impairment of proper riparian function in streams within the project area. The watershed has an increased ability to capture snowfall in openings and a decreased proficiency to maintain snowpack. Excessive removal of vegetation has caused greater snow accumulation in many areas but less in areas that are dominated with juniper. Snowmelt is subsequently released at a faster rate, and earlier than normal, in the openings. During the remaining portion of the year the occasional isolated, short-duration, high-intensity thunderstorm can produce high flows which exacerbate erosion problems. These high runoff events contribute to the severe erosion occurring downstream.

FISH

In 1991 the U.S. Forest Service conducted a Hankin and Reeves stream inventory for the main stem of Big Creek. Rattlesnake Gulch and Jordan Creek were not formally surveyed but ocular surveys were made of those creeks during reconnaissance of the Rattlesnake project area. Jordan Creek, a redband trout stream, has several tributaries, springs, seeps and bogs that provide water

to the main channel. Redband trout occur in the lower 4 miles of the main channel, 0.5 mile of which is on public land. Spawning may occur in the mouths of the tributaries or in the upper main channel. As water flow decreases in summer fry will rear in the main channel. Jordan Creek is well shaded, except at the lower end where the stream leaves public land. A portion of Jordan Creek, in Section 31, was burned in the Little Baldy fire. This caused a loss of riparian vegetation shading and it is anticipated that it will continue to lose canopy cover as dead trees fall. In this same area, heavy livestock grazing has caused a loss of vegetation, breakdown of streambanks and channel widening. Much of the desirable upland and riparian vegetation killed in the wildfire was replaced with noxious weeds. Active down-cutting has lowered original water table levels, promoting bank instability, loss of riparian vegetation, and decreased water storage capacity. The unburned, upstream portion of Jordan Creek, is in better condition than the area below affected by wildfire. Riparian canopy cover is adequate for good shading on upper Jordan Creek and its tributaries. Many springs and wet meadows in the upper watershed contribute to continual flow in Jordan Creek, which ranges from 0.5-1.5 cubic feet per second (cfs) at low flow. Several old roads built in ephemeral draws are intercepting snow-melt and channels are down-cutting through these roads.

Jordan Creek is not functioning appropriately for several fish habitat components, such as pool quality, sediment, temperature, and large woody debris. High sediment loads impact fish production by covering spawning gravels with silt and filling in pools. Hiding cover is limited because there is very little wood in the channel or overhanging vegetation. Water production for fish is limited during low flows due to the inability of the riparian areas to store water.

Rattlesnake Gulch flows directly into Big Creek. The stream is perennial except for a few areas on private land where the stream runs sub-surface. Of the 3 miles of the main channel approximately 1.6 miles in the upper headwaters is within the project area. Rattlesnake Gulch flows adjacent to the Rattlesnake Gulch road which impacts the stream in several areas. The road produces sediment due to inadequate drainage and water-barring, rapid snow melt, late season grazing, and drainage from nearby springs. Rattlesnake Gulch is deeply entrenched (up to 6-8 feet) on private land but less so (1-2 feet) within the project area. Much of the stream is actively down-cutting which has reduced riparian vegetation, bank stability, and water storage capacity. Rattlesnake Gulch has minimal shade on its east bank due to road construction and timber removal.

Rattlesnake Gulch currently does not support fish, but the potential for improved stream habitat does exist.

None of the Whipple Gulch stream channel is within the project area nor would be influenced by project implementation.

WATER CONDITION

Historical long-term, site-specific water quality data is quite scarce for the entire project drainage area. The BLM does not possess site-specific water quality data for Rattlesnake Gulch or Jordan Creek. During 1988 the Oregon Statewide Assessment of Nonpoint Sources of Water Pollution Report (ODEQ, 1988) rated several stream segments in the Burnt River drainage system as containing moderate to severe water quality problems affecting the desired and beneficial uses of these waters. Burnt River (with data) and Big Creek (without data) were identified as having severe nonpoint source problems impacting water quality and aquatic habitat. This report did not include all stream segments within the Burnt River Basin. Rattlesnake Gulch and Jordan Creek were identified as containing "no problems" and/or had "no data available". This does not infer that these streams and associated tributaries within the project area are necessarily free of nonpoint pollution problems. The report identified the most common cause of beneficial use degradation in the basin to be vegetation removal in the riparian area, resulting in loss of thermal protection for streams, and surface erosion. Land uses most commonly linked to these problems were livestock grazing, vegetation management, forestry-related road construction and timber management. Another nonpoint pollution problem identified in these drainages is sediment production from road construction, maintenance, and runoff.

In 1996 the Oregon Department of Environmental Quality (ODEQ, 1996) placed Burnt River on the 303(d) list of water quality limited water bodies. The Burnt River was listed for flow modification, summer-pH, summer temperatures and toxins. Big Creek and its major tributaries were not listed as 303(d) limited streams, which does not necessarily mean that Big Creek, Rattlesnake Gulch, and Jordan Creek meet all state water quality standards. The stream reaches within the project area may have varying degrees of nonpoint source problems with stream temperature, turbidity, nutrient loading, sediment, and low flow volumes affecting stream morphology and aquatic biota throughout the year at differing locations. The Bureau is a cooperating federal agency with the State of Oregon and has made a commitment to improve nonpoint source conditions impacting stream segments and to implement and evaluate best management practices on public land.

3. How would riparian areas and aspen stands be impacted by the alternatives? The structure and species composition of the riparian areas are analyzed.

Two types of riparian vegetation occur in the project area: obligate or "true" riparian species located along perennial and intermittent streams on streambanks, floodplains, and terraces; and facultative species located on moist upland inclusions. Vegetation along streams in the area include a diverse variety of age classes and species like alder, red-osier dogwood, birch, currant, several willow species, and herbaceous vegetation comprised of sedges, rushes, and grasses. Swales, depressional areas, and narrow drainages in the headwaters of all drainages support scattered clumps of aspen, Scouler's willow, and elderberry along with moist site adapted sedges and grasses.

Riparian vegetation along perennial and intermittent streams has been impacted by past and present activities such as road placement, harvesting, and livestock grazing. These affected areas

lack both standing and down large woody debris and desired woody and herbaceous species. Most herbaceous vegetation presently occurring along streams consists of shallow-rooted species like Kentucky bluegrass, cheatgrass and other annual grasses and forbs. The loss of woody and deep rooted herbaceous species in these easily eroded flood prone-areas has led to channel down-cutting and reduction of riparian habitat. Loss of this vegetation has reduced streambank and channel bottom stability, overhanging shade for controlling stream temperatures, filtering of sediment, and recharging of shallow groundwater tables and increased stream velocities.

Wildfire has disturbed riparian areas in the lower portion of Jordan Creek, which is perennial and located on public land. The main road is located in and adjacent to most of the main channel and some tributaries. This disturbance has released large quantities of sediment, permitted moderate down-cutting, and reduced quantities of large woody debris and shade-producing woody vegetation. Stream banks and channels in the upper portion of Jordan Creek and Rattlesnake Gulch are not as disturbed. Many drainages in these watersheds are only slightly entrenched and contain more vegetation that provide minimal though adequate shade and bank protection.

Upland aspen stands within the conifer forest associations occur as small clumps in moist upland swales and depressional areas along first-and second-order drainages. These are late-seral stands dependent upon openings generated by fire or some other disturbance. Most of the upland aspen stands within the project area have not been disturbed for many years and are currently in decadent condition. Only a few large aspen clumps contain new reproduction. These areas would need protection for successful regeneration and sprout survival. Ponderosa pine and juniper have become established in many of the upland aspen stands. Encroaching pine trees crowd and eventually shade out many of the aspen in these areas.

4. How would the alternatives impact wildlife habitat? Big game hiding and thermal cover, cumulative impacts including management of adjacent lands, large green trees, snags and down log levels, threatened and endangered (T&E) animal species, and animal species on the BLM sensitive species list are analyzed.

Big Game

Current habitat for big game animals (elk and deer) in the area consists primarily of hiding cover, with small areas of forage habitat. Thermal cover requirements for deer and elk in the area are being met with canopy closures of 40 to 70+ percent. Higher canopy closure provides higher effectiveness of thermal cover, with 70% or higher being optimal. Hiding cover in the area is adequate, as line-of-sight distance along most roads in the area is less than 200 feet. Hiding cover is defined as vegetation capable of hiding 90% of a standing adult deer or elk from the view of a human at a distance equal to or less than 200 feet. The area consists of approximately 80% hiding cover. Optimal cover to forage ratio for deer and elk is considered 60% forage to 40% cover. However, reducing the cover amount in some ponderosa pine forest communities (e.g.. PIPO/SYAL) can effectively eliminate the continued use of these areas by deer and elk.

Road densities in the area are approximately 1.3 miles/mi². These densities do not pose a threat to elk or deer habitat effectiveness in the area.

Scattered throughout the project area are small patches of curlleaf mountain mahogany. These patches are too small to be shown on Map 2. Plants within these patches are old and decadent, and there is very little regeneration. The curlleaf mountain-mahogany has been heavily browsed, primarily by big game. Juniper trees are becoming established in areas that historically were exclusively curlleaf mountain-mahogany.

Northern Goshawk

The northern goshawk is a Bureau Special Status Species that is included on the State threatened species list. There is an active northern goshawk nest located within the planning area. The nest is located within a dense stand of 80-year-old Douglas-fir trees. An additional nest, which is currently inactive, is located in the area and is likely an alternate nest for the goshawks. The remainder of the planning area is considered a goshawk post-fledgling family area. Current vegetation and structural components are consistent with providing protection for young prey habitat, and nesting habitat for goshawks (USDA, 1991).

Woodpecker Species

There are several species of woodpeckers that occupy the forested habitat in the project area. Lewis' woodpeckers, hairy woodpeckers, and white-headed woodpeckers, are among the species that are found in the area. These woodpecker species rely on snags in a hard decay class (decay class 2-3) to excavate for feeding and nesting. Most of these species require snags that are 10 inches dbh or greater and require 0.08 to 1.8 snags per acre to meet the 65% cavity nester population level requirement in the Baker RMP, depending on the species needs.

There are relatively few large snags in the project area. There are numerous small snags <6 inches dbh, however, this size class of snags is rarely used by snag-dependent wildlife for any portion of their life histories. Current numbers, sizes, and decay classes of snags in the area do not meet the requirements designed in the Baker Resource Area RMP (ROD, 1989).

Down logs in the project area are similar to the snags in the area. Many numerous small diameter logs are in the project area due to the mortality of small diameter trees in the area. The Baker RMP calls for retaining of at least 5 to 10 logs per acre on sale areas. Each log should have a minimum dimension of 12" - 17"X20'. Most of the small diameter logs in the project area do not meet the above size requirement. The large diameter logs are necessary for the prey species of northern goshawks. Current numbers, lengths, diameters, and decay classes of down woody material in the area are less than those specified by the Baker RMP.

There are other resources in the area as noted in the Issues Considered and Eliminated from Detailed Analysis section (Chapter 1 F). However, design features would minimize or eliminate impacts to these resources.

CHAPTER 3
ALTERNATIVES

Alternative A - No Action Alternative

Under the no action alternative, management actions as described in Alternative B would not be implemented within the project area. No attempt would be made to reduce stocking levels in forest stands, maintain, renovate or close existing roads, improve aspen stands, re-introduce fire to the landscape, or improve the condition of riparian areas.

The area would continue to be maintained at a custodial level. Other usual agency activities would continue such as fire suppression,.survey, and monitoring work. Noxious weeds would continue to be monitored and treated under the existing EA. Grazing would continue under the Terms and Conditions of the Grazing permit. Implementation of the Oregon/Washington Standards for Rangeland Health and Guidelines for Grazing Management may change the grazing system in the future.

Forest stands would continue to be overstocked and susceptible to insect, disease, and stand-replacing fires.

Alternative B - Proposed Action

Alternative B proposes commercial thinning, precommercial thinning, juniper treatments, and improving riparian conditions within streamside buffers in the project area, Map 2 shows where these treatments are located within the project area, and Table 1 details the number of acres proposed for each treatment.

Table 2 - Proposed Treatment Acres

	Commercial Thinning	Precommercial Thinning	Juniper Treatment	Riparian Treatments
BLM	194	158	126	59
NFS	161	28		14
Total	355	186	126	73

Commercial Thinning would consist of harvesting live trees from forest stands. In these areas larger trees would be retained and smaller trees would be removed. Approximately ½ of the basal area of the stands would be removed. No stand would be thinned to less than 40 ft^2 of basal area. A higher percentage of basal area would be removed from historic pine sites that are currently Douglas-fir stands. The trees selected to be harvested would range from 5" - 20" dbh. Juniper trees less than 14" dbh would also be cut.

Commercial thinning areas that remain overstocked following harvesting may be precommercially thinned to a 12-20 foot spacing. Commercial thinning areas would be underburned following harvest. No precommercial thinning or underburning would be done within 100 feet of the roads that would remain open.

Within the upland aspen stands, all pine and juniper trees less than 20" dbh would be cut and removed up to one tree length from the edge of the aspen stand. A buck and pole fence would be constructed around each treated upland aspen stand to protect regeneration from ungulate browsing.

Precommercial Thinning would consist of selectively cutting small diameter trees (generally less than 8" dbh). Larger trees would be retained and smaller trees would be cut. Ponderosa pine would be favored over any other species. The objective would be to reduce stocking levels within overstocked stands. Trees would be thinned to a 12 - 20 foot spacing, depending on stand diameters and plant communities. Juniper trees less than 14 " dbh would be cut. Most of the cut trees would not be removed. Cut trees could be removed for stream restoration, poles, or firewood. Areas would be underburned after thinning is completed.

Juniper Treatment would consist of hand cutting juniper trees. Leave trees would be spaced 40 feet apart. All trees greater than 14" dbh would be retained. Cut trees may be used in riparian restoration, or may be sold as special forest products. Areas may be underburned up to 5 years following treatment.

Riparian Treatments - Treatments within streamside buffers would be designed to protect and enhance riparian values. The boundaries of streamside buffers are 300 feet on each side of fish-bearing streams, 150 feet on each side of perennial non-fish-bearing streams, 150 feet on ponds, lakes, reservoirs, and wetlands greater than 1 acre, and 50 feet on each side of intermittent streams, and wetlands less than one acre. No commercial timber harvesting would be done within the streamside buffers. Activities within streamside buffers would include: placing large woody debris in stream channels to slow water velocity and prevent erosion, conifer trees would be felled to promote aspen regeneration, thinning riparian aspen stands to regenerate the stands, thinning conifers to grow larger trees faster, planting hardwoods and/or sedges, and fencing sensitive areas. A map of where riparian treatments would be done is located in the analysis file. Trees adjacent to streambanks that provide shade over the stream would not be cut. A fence would be constructed around the riparian area in Jordan Creek. Fences would be constructed around other sensitive riparian areas within the project area as needed. These would provide protection from livestock until riparian areas are fully established. The BLM would be responsible for maintaining these developments.

Curlleaf Mountain-Mahogany Treatment

Curlleaf mountain-mahogany stands in the project area would be treated in a array of methods to determine the best management technique for these stands to increase productivity and reduce depredation of young growth. Prescribed fire would be introduced in these stands using two

methods: 1) lightly burning around the base of mountain-mahogany plants and allowing the fire to burn away from the plant stems, clearing out the vegetation directly below the shrubs, and 2) allowing fire to slowly back through a stand of mountain mahogany, consuming all vegetation below the shrubs throughout the stands, including seedling and sapling juniper and pine trees. Additionally, protection of these areas could be done using the following methods: 1) barbed-wire fencing to prohibit livestock from the areas treated, 2) buck-and-pole fencing to prohibit all ungulates from the areas treated, restricting when and where livestock graze, or 3) a combination of these methods.

Project Design Features for the Action Alternative

This section describes project design features which would be implemented in conjunction with the action alternative to minimize adverse impacts on the environment.

Seasonal Restriction - Since the entire project area is within a goshawk post-fledgling family area (PFFA), no operations would take place within the project area between April 1 and August 30 if goshawks are actively nesting. This restriction may be waived if goshawks are not nesting within the project area. Surveys would be done every year to determine whether nesting is occurring. Additional seasonal restrictions may be implemented if other T&E species are using the area.

Slash Disposal - Slash created between December 1 and July 1 provides habitat for IPS bark beetles. Any timber harvesting done during this period would include a special provision requiring tops of trees down to 3" diameter to be yarded to the landing. Precommercial thinning would be done between July 1 and December 1, subject to the goshawk restrictions.

Timber Harvesting - Timber falling would be done by hand or mechanical harvesters. Limbs would be severed from the bole of the tree prior to yarding. Yarding would be done with small tractors or low ground pressure mechanical harvesters which are restricted to pre-designated skid trails spaced approximately 100 feet apart. Skidding operations would avoid noxious weed sites. Skid trails would be water-barred following operations. In areas where bare soil is exposed and it is determined that seeding is necessary, native grass seed would be used to rehabilitate the sites. Existing skid trails would be used wherever possible. Skid trails may need to cross intermittent stream channels. Crossings would be limited to the minimum necessary and would be protected by placing logs in the channel. These logs would be removed and disturbed areas would be seeded at the end of the harvest. The standard design features listed on pages 37-40 of the ROD would be implemented.

Streamside Buffers - No commercial timber harvesting would take place within 300 feet of fish-bearing streams, 150 feet of permanently flowing, non-fish-bearing streams, 150 feet of ponds, lakes, reservoirs, and wetlands greater than 1 acre, 50 feet of seasonally flowing or intermittent streams, wetlands less than 1 acre, landslides, and landslide-prone areas.

Road System Management - Each of the existing roads within the project area was examined to determine whether they should be closed in order to reduce open road densities, reduce erosion, and reduce adverse impacts to wildlife. Those existing roads that provide access to adjacent private land or would be needed for future operations (within 5-10 years) would remain open. Those that do not meet the above criteria would be closed. All closed roads would be seeded and water-barred to help protect water quality and to eliminate the risk of sediment production to the streams. Approximately 1.2 miles of existing roads would be closed. The roads to be closed are shown on Map 2, page 21.

Two roads would be constructed to implement the proposed treatments. The road on BLM land in Section 25 would be temporary and closed following project implementation. The road on NFS lands in Section 30 would be built to specification and added to the NFS road system. These roads total approximately 0.8 miles and are shown on Map 2, page 21.

The Rattlesnake road would be improved from the Big Cr. Road to the project area. Road improvements would include the construction of rolling water dips, placement of rock fans at water dip outlets, spot road surfacing, and replacing non-functional culverts. The rock fans would reduce surface water velocity and allow for sediment deposition prior to entering a stream channel. A rock source would be developed within the project area. To minimize adverse impacts to water quality, road construction and renovation would occur during the period July 15 to November 1, subject to the goshawk restrictions.

Approximately 4.2 miles of existing road would be maintained to allow log truck traffic. Maintenance would include surface blading, re-establishing ditchlines, and cleaning culverts. Only areas that need maintenance would be disturbed.

Several options were considered to access the Jordan Creek area in Section 31. These were rejected for a variety of reasons. The first option considered was to use the existing private road to the south of Jordan creek in section 31. This road was built many years ago and bisects a wetland area. Through the years the road has silted in and the wetland characteristics are recovering. If this road were used it would need to be graded which would damage the wetland characteristics. In addition several portions of the road would need to be rebuilt to allow log truck travel. The second option considered was to use an existing private road that accesses the area from Section 29. Approximately 0.4 mile of this road is located in the bottom of an intermittent stream channel that has downcut and is currently not usable by 4 wheel drive vehicles. If this road were used this segment would need to be rebuilt and additional sediment would be generated every spring during snowmelt. Several other new roads were considered and rejected because of water quality considerations.

Snags, Down Logs and Green Tree Retention - Snags, down logs and large green trees are important for wildlife habitat and long-term site productivity. All green trees greater than 21" dbh and all snags would be retained. Where available, 5-10 down logs greater than 12" in

diameter and 20 feet long would be retained. Down logs could be removed from areas where these numbers are exceeded.

Reforestation - Historic pine sites that are currently Douglas-fir stands would be planted with ponderosa pine following harvesting and underburning.

Prescribed Burning - Prescribed burning would be done in precommercial and commercial thinning and juniper treatment areas. All burning would be done in accordance with resource objectives specific to individual sites documented in plans written prior to burning. Objectives include natural and activity fuels reduction, re-introducing fire into the ecosystem, enhancement of nutrient recycling and soil microflora, and improved growth of shrub and herbaceous understory plants. Prescribed burning would occur when soil moisture is adequate in areas associated with springs or streams. These plans would comply with the parameters and the standard design features listed on page 41 of the ROD.

Currently, there is a Voluntary Smoke Management plan for Baker City, which would reduce the probability of any forest land burning contributing to non-attainment of air quality standards during the critical time period of late fall and winter. The BLM will comply with this plan.

Monitoring - During project implementation the project design features would be monitored to assure compliance. After the projects are completed, monitoring would be done to determine whether the objectives were met.

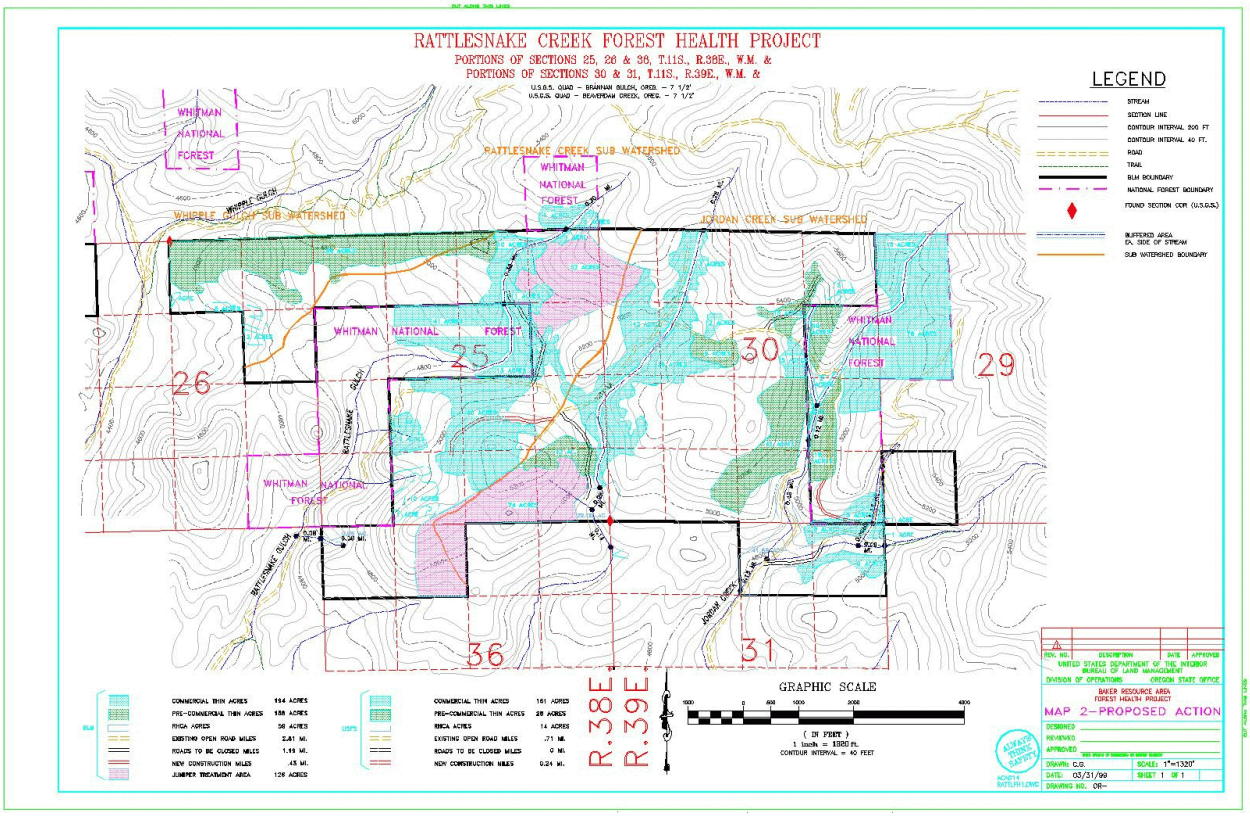
Alternatives Considered and Eliminated from Further Analysis

1) In the commercial thinning areas, reducing basal areas to the lower limits recommended by Cochran et.al. (1994) was considered. The density of existing forest stands is quite diverse. This diversity enhances wildlife habitat. Reducing stand densities to Cochran's guidelines would remove this diversity of stand structure. By removing ½ of the stand basal area, stand diversity could still be retained.

2) Commercial thinning the forest stands in the Whipple Gulch sub-watershed was considered. However, a goshawk nest was found in this area. This area would be precommercially thinned with an objective of retaining the stand characteristics needed for goshawk.

3) Several isolated stands within the project area were considered for treatment. These stands would be left untreated to retain dense stands needed for alternate goshawk nesting areas and dense cover for big game.

4) Alternatives which proposed other silvicultural treatments, such as clearcutting or shelterwood harvest, were not developed because they would not meet the objectives of the purpose and need for this project.


RATTLESNAKE CREEK FOREST HEALTH PROJECT
PORTIONS OF SECTIONS 25, 26 & 36, T.11S., R.38E., W.M. &
PORTIONS OF SECTIONS 30 & 31, T.11S., R.39E., W.M. &
U.S.G.S. QUAD - BRANNAN BUSH, OREG. - 7 1/2'
U.S.G.S. QUAD - BEAVERDAM CREEK, OREG. - 7 1/2'
LEGEND
STREAM
SECTION LINE
CONTOUR INTERVAL 200 FT.
CONTOUR INTERVAL 40 FT.
ROAD
TRAIL
BLM BOUNDARY
NATIONAL FOREST BOUNDARY
FOUND SECTION COR (U.S.G.S.)
BUFFERED AREA
EA. SIDE OF STREAM
SUB WATERSHED BOUNDARY
WHITMAN NATIONAL FOREST
WHIPPLE CREEK SUB WATERSHED
RATTLESNAKE CREEK SUB WATERSHED
JORDAN CREEK SUB WATERSHED
RATTLESNAKE CREEK
RATTLESNAKE GULCH
JORDAN CREEK
25
26
30
29
36
31
R.38E
R.39E
GRAPHIC SCALE
(IN FEET)
1 inch = 1320 ft.
CONTOUR INTERVAL = 40 FEET
COMMERCIAL THIN ACRES 194 ACRES
PRE-COMMERCIAL THIN ACRES 188 ACRES
RHCA ACRES 36 ACRES
EXISTING OPEN ROAD MILES 2.61 MI.
ROADS TO BE CLOSED MILES 1.19 MI.
NEW CONSTRUCTION MILES .43 MI.
JUNIPER TREATMENT AREA 126 ACRES
COMMERCIAL THIN ACRES 161 ACRES
PRE-COMMERCIAL THIN ACRES 28 ACRES
RHCA ACRES 14 ACRES
EXISTING OPEN ROAD MILES .71 MI.
ROADS TO BE CLOSED MILES 0 MI.
NEW CONSTRUCTION MILES 0.24 MI.
UNITED STATES DEPARTMENT OF THE INTERIOR
BUREAU OF LAND MANAGEMENT
DIVISION OF OPERATIONS OREGON STATE OFFICE
BAKER RESOURCE AREA
FOREST HEALTH PROJECT
MAP 2-PROPOSED ACTION
DESIGNED
REVIEWED
APPROVED
DRAWN: C.S.
SCALE: 1"=1320'
DATE: 03/31/99
SHEET 1 OF 1
DRAWING NO. OR-

CHAPTER 4
ENVIRONMENTAL CONSEQUENCES

This chapter describes the anticipated consequences of implementing the alternatives. Impacts are displayed in relation to the issues identified in Chapter 1. The analysis includes direct, indirect and cumulative impacts as appropriate.

Alternative A - No Action

1. How would the alternatives affect the existing forest and juniper woodland structure? The tree density, stand structure, and old-growth characteristics are analyzed.

Tree Density - Tree density within the forest stands would remain high. With the high tree density the forest stands would remain susceptible to bark beetle attack. Bark beetles would continue to kill trees throughout the forest areas. Douglas-fir and juniper trees would continue to grow in the pine sites. These dense stands would remain susceptible to stand-replacement wildfires.

Tree density in the juniper woodlands would remain high. As the tree canopy closes, the grass-forb-shrub component would be shaded out. These areas would be susceptible to excessive erosion during periods of heavy precipitation.

Stand Structure - The stands would continue to retain a wide of diversity of stand structure. The average stand diameter would slowly increase through time. The number of snags and down logs would remain at current levels or higher. These snags and down logs would have relatively small diameters.

The stocking levels of historic pine sites currently stocked with Douglas-fir would remain high. At these high stocking levels the stands would continue to be susceptible to Douglas-fir beetle and tussock moth attacks.

Old-growth Characteristics - The understory stocking levels around the large diameter trees would remain high. This would continue to stress these trees and they would be susceptible to bark beetle attack. This stress may cause the large diameter trees to die earlier than they would in open stand conditions.

2. How would water quality and fish habitat be impacted by the alternatives? Water temperature and sedimentation are analyzed.

STREAMS
The no-action alternative would do little to promote good water quality and fisheries habitat or stabilize eroding channels and sediment production while reducing downstream effects to Big Creek and the Burnt River. High velocity runoff and elevated levels of erosion would continue

to create head, vertical bank, and down cutting in most channels. Many old harvest and wildfire openings contain roadways or skid trails which are sparsely vegetated, heavily compacted and influence early snowmelt and high short-duration peak flows. These conditions are expected to improve slowly over time. Regrowth of vegetation and subsequent release of stored moisture throughout the year should aid in returning streams to more consistent levels with longer peak flow periods during spring runoff. Resumption of more normal flow patterns may take many years and would be influenced by existing uses, activities, and the increased frequency of unplanned wildfire.

FISH

Under this alternative effects downstream to fish populations from sediment production, passage blockage, habitat loss, and high stream temperatures would continue. Stream channel and fisheries habitat conditions would be affected by natural events (such as wildfire and peak runoff) and existing land uses and activities. Pine and juniper would further encroach upon aspen and hardwood stands, decreasing productivity, reproduction, and shade along stream courses. Deteriorating stream channel conditions and bank structure would persist in all drainages, increasing existing levels of sediment and water temperatures. Much of the large woody material component in streams would remain minimal in areas such as Little Baldy fire, upper headwaters of Rattlesnake Creek, and in lower portions of Jordan Creek.

TEMPERATURE & SEDIMENT

Streamside shading is expected to increase in old harvested units and burned areas as hardwoods and conifers slowly re-establish. As shading increases, stream temperatures should decline. Shade- deficient areas would receive no tree planting or other projects to promote healthier stands.

Rill erosion presently occurring on sparsely vegetated vertical streambanks and side slopes in upper watershed tributaries and ephemeral draws would continue to be the main source of sediment transport into streams. These drainage areas also contain compacted soils that restrict percolation in the soil profile, accelerate runoff, and increase the potential for slope failure and soil movement.

FIRE

Under this alternative potential wildfire hazards in untreated areas would have the potential to effectively remove streamside vegetation and large woody material needed for fish habitat and water quality. Threat of wildfire remains high with potential for catastrophic results on vegetation, water temperatures, and sediment production.

CUMULATIVE EFFECTS

The no-action alternative would do little to promote good water quality and fisheries habitat or stabilize eroding channels and sediment production while reducing downstream effects to Big Creek and the Burnt River. High velocity runoff and elevated levels of erosion would continue to create head, vertical bank, and down cutting in most channels. Effects downstream to fish

populations from sediment production, passage blockage, habitat loss, and high stream temperatures would continue. Overall stream conditions in this area are below potential for providing good fish habitat and water quality. Effects from recent fires in Big Creek watershed would continue to impact streamside vegetation conditions, reduce shading, elevate sediment production, and generate high stream temperatures for many years.

3. How would riparian areas and aspen stands be impacted by the alternatives? The structure and species composition of the riparian areas are analyzed.

Existing upland and stream conditions caused by grazing, harvesting, and wildfire and future potential wildfire would continue to allow streambank erosion and sediment delivery to drainages until riparian vegetation is re-established, soils stabilize and water tables rise.

Streamside shade would be expected to slowly increase in previously harvested units and in burned areas as hardwoods and conifers re-establish. As shade is produced, stream temperatures would decline, although this may take 15-25 years or more. In areas deficient in shade along streams and in moist upland areas there would be no riparian planting or any promotion of healthier aspen stands causing the current shade loss to occur for a longer period of time.

The existing replacement rate of large organic material input to streams would be dictated only by natural events. Large woody material would be minimal in areas of the Little Baldy fire, where trees once capable of providing organic input to streams have been reduced. This is especially true in the upper headwaters of Rattlesnake Creek and in the lower portion of Jordan Creek.

4. How would the alternatives impact wildlife habitat? Big game hiding and thermal cover, cumulative impacts including management of adjacent lands, large green trees, snags and down log levels, threatened and endangered (T&E) animal species, and animal species on the BLM sensitive species list are analyzed.

Impacts to Elk and Deer

There would be no direct impacts to deer and elk because there would be no additional disturbance to big game in the area or modification of the existing habitats. Indirect impacts would be the continued growth of the understory shrubs and seedlings within the forested areas which would increase the amount of hiding cover in the area and decrease the amount of suitable forage in the area.

Juniper stands would continue to increase in density and create a closed canopy above the grasses and shrubs required for forage for big game wildlife, decreasing the amount of forage in those areas but increase hiding cover. An increase in the use of the area by deer and elk during the hunting season would occur because of the hiding cover protecting these wildlife species from the hunting public.

The patches of curlleaf mountain-mahogany would continue to be heavily browsed primarily by big game. The patches may eventually disappear as the old plants die and no regeneration replaces them.

Impacts to Northern Goshawks

There would be no direct impacts to northern goshawks because there would be no alteration of the habitat and no disturbance in the area. Goshawks would continue to use the area for nesting and foraging. Indirect impacts would be the loss of some of the prey species available in the area because the continued closing the canopy in the area would decrease the availability of grasses and other vegetation used by small mammals for food sources. Goshawks would have to travel further distances for foraging, thus exposing the nest to predators for longer periods of time, potentially decreasing the productivity success by goshawks in the area. This would potentially cause the goshawks to relocate to an area with prey sources nearer to the nest site. However, with the potential for woodpeckers and other cavity-nesting wildlife to increase in numbers, goshawk productivity would remain stable or increase if these species became the major source of prey items for the goshawk.

Impacts to Woodpecker Species

There would be no direct impacts to woodpecker species in the project area because the existing density of trees in the area would not change. Mortality in smaller diameter trees would continue to occur, providing more of the smaller sized snags in the areas. However, this size class of snags does not remain standing long and does not meet the requirements of some of the larger woodpecker species, thus potentially eliminating these species from the area. There would be an increase in numbers of woodpeckers in the area, however the numbers of species that would occur would decrease.

Impacts to Special Habitat Features (Curlleaf mountain mahogany, Aspen, Snags and Down logs)

Curlleaf mountain mahogany stands would continue to be encroached upon and potentially shaded out by ponderosa pine and juniper. Reproduction from mountain-mahogany would decrease as competition for space and sunlight increases. This would cause winter forage for deer and elk to decrease.

Aspen stands in the area would continue to be encroached upon by pines and junipers and no protection of the young shoots of these clones would decrease the ability for these stands to replace themselves. Eventually, these aspen trees would die and fall, effectively eliminating that aspen clone from the area. This would eliminate a special habitat feature that is key to certain wildlife species life history needs.

There would be no direct impact to snags or down logs in the area as the area would remain undisturbed and there would be no risk of knocking down or destroying these habitat components. Continued mortality in the area would increase the numbers of snags and logs, however the size classes for these would be small and would not meet the requirements determined in the Baker RMP. Eventually, as all of the smaller diameter trees are eliminated by

the competition of resources, larger trees would dominate the area and larger snags and down logs would be introduced into the ecosystem. However, with competition from smaller diameter trees this process would take many years.

Without the introduction of prescribed fire into the ecosystem there would be a higher chance of a catastrophic fire. This would dramatically reduce hiding cover for deer and elk and habitat for nesting and foraging northern goshawks. However, there would be an increase in the amount of forage available to deer and elk in the area, but without a proper cover: forage ratio, there would potentially be less use by big game in the area.

B. Proposed Action

1. How would the alternatives affect the existing forest and juniper woodland structure?
   The tree density, stand structure, and old-growth characteristics are analyzed.

Tree Density - Implementation of the proposed action would reduce tree densities in most of the project area. Removing ½ of the basal area within the pine stands would lower the stocking level of most stands to within Cochran's guidelines to maintain stand health. Residual basal area would average 45 ft^2, with a range of 40 ft^2 - 120 ft^2. The small high density stands within the PIPO/SYAL plant association would remain above the upper limit of Cochran's guidelines. The diversity of stocking levels within the project area would be retained. Underburning the stands would kill most of the Douglas-fir and juniper reproduction in the pine stands.

Thinning the forest stands would increase the growth rate on the remaining trees. Rapidly growing trees are healthier and better able to resist bark beetle attack. Stand resistance to bark beetle attack would remain high for the short term. In the long term the stands would continue to grow until they become overcrowded. At that time the stands would need to be thinned again. Within the treated juniper woodlands tree density would be reduced to 25-30 trees per acre.

Stand Structure - The variety of stand structures within the project area would be retained. Removing the small trees would decrease the diversity within individual stands. The resulting pine and juniper stands would have fewer, but larger trees.

Over time the existing snags will fall and become down woody material. With the stands opened up there would be less insect activity and fewer dead trees for the short term. As the stands begin to close more snags would be created.

Old-growth Characteristics - Retaining all trees greater than 21" dbh within the pine stands and 14" dbh within the juniper stands would retain all of the existing old-growth characteristics within the project area. Thinning the understory around the large diameter live trees would reduce the stress and competition on these trees. They would remain a component of the stands for a longer period of time.

2. How would water quality and fish habitat be impacted by the alternatives? Water temperature and sedimentation are analyzed.

STREAMS

This alternative would promote upland and riparian treatments for future desired levels of water quality and fisheries habitat. Current forest stocking levels and juniper encroachment would be reduced to increase health, growth and vigor of stands and landscapes. As healthier upland, aquatic, and riparian habitats develop, eroding channels would become more stable, sediment production would be reduced, and downstream effects to fisheries habitats and water quality in Big Creek and Burnt River would decrease. High velocity runoff and elevated levels of erosion would not continue to cause head, vertical bank, and down cutting in most channels. Past harvest and unplanned wildfire openings that also contain roadways or skid trails when re-vegetated would delay snowmelt, store more moisture, and result in lower and extended peak flows. Existing degraded upland and stream conditions are expected to improve over time with an increase of vegetation and subsequent release of stored moisture aiding in the return of streams to more consistent levels throughout the year. Resumption of more normal flow patterns may take years.

Additional sediment production from thinning, juniper control, and prescribed fire prescriptions would be short term and minimal to streams and riparian areas. This short-term increase in sediment is expected to decrease rapidly when treatments are completed and vegetation flourishes. Design features have been developed to address potential adverse impacts from operations by restricting ground-based skidding activities to lessen potential soil compaction, soil erosion and sediment transport to stream systems.

Treatments proposed within riparian/wetland areas would be conducted for regeneration of aspen and managing for future multiple age classes of hardwoods within the stands. Treatment includes: 1) felling encroaching pine, juniper, or fir to open stands and reduce unwanted reproduction; 2) promote conditions for future low-intensity fire through aspen stands to prepare and stimulate the site for re-growth and expansion; and 3) fence stands following treatment, to prevent ungulate grazing, loss of soil, and streambank stability until existing degraded conditions recover.

FISH

Continuous degradation and loss of downstream fisheries habitat is at highest risk from on-going sediment production that occurs within the watersheds. Proposed treatments and minimal road construction and maintenance would produce additional short-term (1-5 years) sediment production into these stream systems. Existing effects on fish habitat conditions from lack of shade, high stream temperatures and short-term increases in sediment production would continue under this alternative until vegetation on hill slopes and in aquatic/riparian habitats re-establish and stabilize the area. High levels of sediment production from existing road systems would be reduced when road reconstruction and maintenance on Rattlesnake Gulch and Jordan Creek

tributaries occurs. Installation of culverts, re-vegetation of riparian/wetland areas, protection of riparian/wetland areas from grazing impacts and placement of large woody material would help reduce existing high levels of sediment now occurring. Reconstruction and maintenance of the Rattlesnake Gulch road would in time help reduce sediment production and stream temperatures.

TEMPERATURE & SEDIMENT

Degraded conditions on the uplands and in stream systems from overstocked stands and juniper encroachment currently elevate water temperature. Implementation of the proposed action would increase shading over streams which would help reduce existing stream temperatures. Prescriptions for both upland and riparian areas are not expected to increase stream temperatures above current levels during the initial phases of implementation. Specific treatments in riparian/wetland areas to increase aspen reproduction and stream shading are to be staggered over several years and would provide for minimal or no increase in water temperature from solar radiation. Riparian treatments would be designed to protect the shade already existing over stream channels. Any shade loss from removing overstory-encroaching pine and juniper trees would be minimized by placement of large woody material within streams. Upon attaining regeneration, the mature overstory trees may be cut. After treatment, riparian areas may be fenced to protect young aspen and promote establishment of regeneration.

As part of design features, large woody material would be retained in streamside buffers. Standing dead and dying trees and future downfalls within the buffers would be available for stream channel structure in riparian/wetland areas. Large woody material would remain available to streams and riparian areas because commercial harvest treatments would not occur within the buffers. All trees within the project area over 21" dbh would be left for future large woody material.

ROADS

Main haul road reconstruction, temporary road building, and road maintenance would cause additional sediment to streams over the short term. Long-term adverse impacts from sediment would be reduced by road maintenance, closure of roads, and the addition of culverts, water-bars and placement of large wood. Temporary roads needed for treatments would be located out of riparian/wetland areas and would be closed after activities have been completed. (Refer to soils and mitigation portion of the analysis file for specifics).

PRESCRIBED FIRE

Fire would be introduced into the project area to reduce fuels build-up, decrease understory reproduction of pines and juniper, and to promote future desired levels of herbaceous and shrub components throughout the watershed. Re-establishing healthy vegetation communities would help control timing of snowmelt and runoff, rill erosion on sparely vegetated slopes, and transport of sediment into streams. Since most aquatic and riparian habitats are presently in degraded condition there would be no prescribed fire within the stream channels or riparian areas. Using prescribed fire at this time would not be advantageous to re-vitalize vegetation within stream buffers, even when left to slowly back into these areas for desired restoration of

aquatic and riparian vegetation. Burn plans would incorporate protection for streams and riparian/wetland areas. Burning would occur when soil moisture conditions are adequate. Only one stream/riparian area, along the main access road in the northwest portion of Section 30, would have fire introduced into it at this time. This area is mostly void of all riparian shrub components and is encompassed by a thick canopy of mixed conifers. The understory of conifer reproduction requires thinning to remove competition with desired riparian woody vegetation. Areas where vegetation is non-existent would be planted and fenced to prevent grazing use and to stimulate growth.

CUMULATIVE EFFECTS

The proposed action would improve degraded conditions in uplands, streams, fisheries habitat, and riparian/wetland areas within the project and reduce impacts to water quality and to stream systems entering Big Creek. Implementation of treatments and projects would, over the long term, decrease stream temperatures by improving aquatic and riparian habitat, stream structure, vegetative cover within watersheds, increase shading adjacent to stream systems while providing future sources of large woody material, and alter seasonal runoff and peak flow regimes by effectively storing moisture in productive and revitalized soils. Proposed upland and aspen stand treatments over the long term would also reduce potential erosion sources and sediment transport and effects from existing road conditions. Road maintenance and reconstruction would cause some short-term sediment production until operations are completed and vegetation stabilize slopes.

3. How would riparian areas and aspen stands be impacted by the alternatives? The structure and species composition of the riparian areas are analyzed.

This alternative would emphasize the enhancement of aspen regeneration and other desirable riparian woody vegetation within streamside buffers and in moist upland sites. Restoration and mitigation measures within this alternative include the placement of large woody material, the planting of hardwoods and sedges, and the fencing of riparian areas. The purpose of the treatments would be to provide for diverse age class representation throughout the stands. Treatments include: (1) removal of encroaching conifers to open the stands, (2) creation of low-intensity fire through the stand to stimulate and prepare the site for re-growth, (3) the fencing of stands after treatment, to prevent any ungulate grazing, loss of soil, or streambank stability following prescriptions. Riparian treatments would be designed to protect existing shade over streams. Trees that are thinned from the area may be used in the stream channel, along the streambank, or in the riparian area to promote healing. Organic material would remain in streams and riparian areas because harvest treatments would not occur within the buffer areas.

Harvesting of commercial timber has been excluded 300 feet (slope distance) on both sides of any perennial and intermittent fish-bearing streams. The perennial non-fish-bearing streams are protected with a no-harvest buffer of 150 feet on both sides of the creek. Ponds and wetlands greater than 1 acre are protected with 150-foot buffer. Intermittent streams and wetlands less than 1 acre are protected with a 50-foot buffer (see analysis file)

Aspen treatments consisting of a total of only a few acres are planned adjacent to streams. Treatments to reduce pine encroachment into these aspen sites would be staggered over several years. Small conifers would be cut first to promote regeneration of the aspen. Next, larger conifers would be cut. If overstory trees are cut that would provide shade, additional large wood would be placed over the stream to protect the stream from solar radiation. After new aspen is re-generated, some of the more mature aspen may be cut. Conifers cut down would be left in place or moved to the creek to ensure shade loss is minimal. Upon completion of treatments the areas may be fenced to protect the young aspen and promote establishment of regeneration in the riparian areas.

Mitigation to improve the existing condition and any additional impacts from the proposed treatments would include the placement of large wood. Small conifer and juniper trees thinned from treatment areas may be used as woody debris for placement within eroding channels to actively catch sediment for rebuilding channels. Channels identified in the project area that have head-cutting, vertical streambanks and active erosion would be treated. As channel rebuilding occurs, the planting of native hardwoods may be conducted once a streambank or bar has been established. Large organic material from dead and dying trees would continue to fall in riparian areas, moist upland areas and stream channels, where available. Steamside buffers would protect and provide a future source of large organic material.

Road reconstruction, temporary roads and road maintenance would cause additional sediment to the streams over the short term. In the long term it is proposed to reduce the current level of sedimentation to the streams through road maintenance, the closure of roads, the addition of culverts, the construction of water-bars and the placement of large woody debris. All new temporary roads would be located out of riparian areas and would be closed after activities have been completed.

Burn plans would incorporate protection for streams, wet areas, and riparian areas. Riparian vegetation would not be enhanced at this time by burning. Fire, even when left to slowly back into these areas, would not be advantageous because of desired restoration for the aquatic and riparian vegetation. Burning would occur when soil moisture is adequate in areas associated with springs or streams. There should be no lighting of fires within the stream channels or riparian areas. Only one riparian area, along the main access road in the northwest portion of Section 30, would have fire introduced into it at this time. This area is almost void of all riparian shrub components and is encompassed by a thick canopy of mixed conifers. The understory of conifer reproduction needs to be thinned to remove competition with desired riparian woody vegetation. Areas where vegetation is non-existent would be planted and fenced for at least five years to prevent use and to stimulate growth as fast as possible.

4. How would the alternatives impact wildlife habitat? Big game hiding and thermal cover, cumulative impacts including management of adjacent lands, large green trees, snags and down log levels, threatened and endangered (T&E) animal species, and animal species on the BLM sensitive species list are analyzed.

Impacts to Elk and Deer

Commercial and Precommercial Thinning

Direct effects from commercial thinning and precommercial thinning the forested habitat would be the short term reduction of the amount of cover within the area that is used as snow intercept and hiding cover by elk and deer. By reducing the canopy closure to below 70%, the effectiveness of this habitat to provide cover would be reduced. Areas that maintain a canopy closure of 40% to 70% provide marginal cover habitat effectiveness, and those areas that maintain a 70% and greater canopy closure provide satisfactory cover habitat effectiveness (Thomas et. al. 1979). Following the thinning in the area, cover habitat would be reduced to approximately 800 acres (48%).

Thinning occurring within ponderosa pine/snowberry (PIPO/SYAL) and the ponderosa pine/curlleaf mountain mahogany/elk sedge (PIPO/CELE/CAGE) communities would potentially cause a decrease in the amount of use by elk and deer in the area. Thomas et. al. indicates that at least 75% of the PIPO/SYAL and 45% of the PIPO/CELE/CAGE communities should remain in cover habitat to maintain optimal cover forage ratio for elk. Reducing the cover to 48% in the PIPO/SYAL areas would result in a decrease in potential use by deer by 50% and elk would use the area very little, if at all. Reducing the cover to 48% in the PIPO/CELE/CAGE areas would result in no change in the potential use by deer or elk. The ponderosa pine/Idaho fescue (PIPO/FEID) community has a potential cover of 85% and can be reduced to 40% of the area and would result an increase in potential use by elk and deer. Potential use of these areas would increase 25% for elk and 50% for deer when the cover is reduced to 48% as in the proposed action.

These conditions are expected to last for approximately 30 years. Cover would increase once again following the growth of shrubs in the understory. Some areas that have a high basal area (120 - 240 ft^2/ac) would continue to provide small areas with the necessary components for thermal cover. In addition, riparian areas would be protected and would provide corridors and cover for travel and hiding. Forested stands that are between 2.5 and 10.5 acres in size provide the optimal range for hiding cover patches for elk (Thomas et.al., 1979). Additionally, stands that are less that 30 acres and greater than 60 acres in size are less effective in providing thermal cover for elk because of elk herd dynamics.

Because of the effort to limit precommercial thinning and prescribed fire to greater that 100 feet from existing main roads in the area, there would be a smaller impact to deer and elk hiding cover. A visual screen would allow these wildlife species to remain hidden from those people using the existing road system. Effects to hiding cover are expected to last approximately 30

years until the structure of the forest recovers to a state that provides additional hiding and thermal cover.

Indirect effects to the reduction of forested habitat within the area include: an increase in the amount of forage for elk and deer within the area by increasing the amount of area that is exposed to sunlight, eventually growing natural grasses that are associated with these habitat types. Additionally, with increased use of the roads during harvest operations, higher disturbance to elk and deer in the area would occur. Following the closure of approximately 1.2 miles of road after harvest operations, potential habitat effectiveness related to road densities would increase. However, this effectiveness is directly related to the available cover remaining in the area following harvest operations.

Prescribed Fire

Direct effects to big game habitat from prescribed fire in the project area would be the immediate reduction of shrubs and forbs in some areas that are used as forage by deer and elk. This impact would last approximately 1 to 2 years. With the introduction of fire into the ecosystem, the natural vegetation composition and age structure would provide an increase in more palatable and nutritious forage for deer and elk. This would have a potential increase in winter survival rates for these wildlife species.

Aspen, Juniper, and Curlleaf Mountain Mahogany Treatments

Direct effects to elk and deer from the proposed actions in the aspen, juniper, and mountain mahogany stands would be an immediate decrease in the amount of cover in those specific areas. In addition, by fencing out some of these areas and eliminating use by all ungulates, the amount of forage in the area would increase for the period of time that the fencing was in place. The proposed action would be to eliminate the excessive cover in the juniper areas and convert these areas to forage sites, thus these conditions would be maintained over time.

Indirect impacts to these areas would be the increase in forage available to these wildlife species in the area. By stimulating these habitats to produce young shoots that are more desirable and palatable to deer and elk, and by opening up the stands to allow sunlight to penetrate to the ground, more browse would become available to these wildlife species within the next 2 to 3 years.

Lands adjacent to the planning area are similar in forest communities and structure and provide similar habitat features for wildlife. South of the project area big sagebrush, annual grasses, and western juniper are the plant communities that dominate the landscape. This area is defined as a key seasonal big game range for elk and deer in the Baker RMP that extends from Bridgeport west to Unity Reservoir along the Burnt River valley.

Lands to the north and to the east managed by the US Forest Service are planned for commercial thinning harvest in the near future. Cumulative effects associated with those actions and the proposed action would continue to decrease the amount of cover habitat for elk and deer across

the landscape. This lack of cover forces wild ungulates to move to areas that are "quiet" and have little or no disturbance during hunting seasons. These areas are typically private lands that are not open to public hunting. These landowners find that as more and more elk and deer move onto their lands damage to their crops and land increases.

Impacts to Northern Goshawks

Direct effects to northern goshawks from commercially thinning the older forest stands would effectively eliminate these areas from nesting habitat for northern goshawks for approximately 30 years. At that time structural conditions would improve to provide protection to the nest site and nestlings from predators both above and below. There would be no disturbance to the nesting goshawks as operations would not be conducted within 0.25 miles of any active nest located within or outside the planning area. In addition, the nest site would be protected with a no-harvest area of 30 acres.

Indirect effects from the proposed action would increase the amount of forage available to small mammals, which are a key prey component to goshawks within the area, therefore increasing the effectiveness of the habitat for goshawk foraging. This management would increase the size of the trees remaining in the area, providing more suitable nesting trees for goshawks in the future. In turn, as trees become larger and begin to die and create large snags, more wildlife species that use these habitat components that are considered prey items to goshawks would occur in the area (woodpeckers, cavity nesters), thus providing additional prey for goshawks.

With the U.S. Forest Service operating in areas similar to this in adjacent watersheds, cumulative effects to goshawks from the proposed action and these other actions would reduce the amount of nesting habitat in the area for approximately 30 years. Both the BLM and FS are required to protect goshawk nest sites located on public lands and any planned actions within the PFFA is to be done to maintain or promote the growth of habitat components for nesting, foraging, and protection of young.

There would be no impacts to northern goshawks from the treatments of aspen, juniper, and curlleaf mountain mahogany stands, as these habitat types are not of significant importance to goshawks.

Impacts to Woodpecker Species

Direct effects to woodpecker species in the planning area are minimal, as the proposed action calls for the protection of all snags in the planning area. Disturbance to nesting woodpeckers would be minimal, as operations would not occur near the nest tree during nesting season. As trees are removed near a woodpecker nest site, protection of the nest location from predators would decrease.

Indirect effects to woodpeckers associated with the proposed action would be an initial decline in numbers of woodpeckers in the area as exposed nest trees are preyed upon and snags that were once protected fall as a result of wind. With the opening of the tree canopy to allow for the

largest trees in the stands to grow even larger, large snags would become available for woodpecker habitat as trees mature and die. This would cause an increase in woodpecker populations in the area as long as there are populations in adjacent areas for immigration to occur. However, without an increase total numbers of snags used as woodpecker habitat in the area, woodpecker population levels would not increase to desired numbers.

Cumulative effects on woodpeckers in the area would be a result of ongoing forest health operations on U.S. Forest Service lands adjacent to the planning area. With the decrease in protective forest conditions near and around nest locations, an initial decrease in woodpecker populations would occur. However, as the forest begins to mature and provide greater numbers of larger snags on the landscape, woodpecker numbers would increase, but not to desired levels without an increase in total snag numbers.

Impacts to Snags and Down Logs

Direct effects from operations in the area would decrease the number of snags that exist due to the physical knocking down of the snags in the areas and the exposure of snags to wind. Many of the smaller snags will fall immediately with larger snags falling later. Larger snags (>15" dbh) would remain standing as these have developed a wind firmness and a larger root system prior to becoming snags.

Many of the small diameter logs and some of the larger diameter logs would be destroyed during the logging operation. In areas that would not have operations, the log component would remain in the current condition.

Indirect effects to snags and logs in the project area would be a slow increase in the sizes of snags and logs in the area. With the increase in space available to those trees left after the harvest operations, an increase in the average tree size of the stand would occur. As these trees die and become snags and eventually fall and become logs, the size of logs and snags in the area would increase as well. However the numbers of logs and snags in the area would decrease from the current conditions because of the decrease in the density of trees in the area.

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CHAPTER 5
CONTACTS, CONSULTATIONS and PREPARERS

This chapter contains a summary of Agencies, Organizations and Persons consulted, anticipated future public notification and a list of preparers.

A. Agencies, Organizations and Persons Consulted

1. An initial planning letter was mailed by the BLM to a list of 30 individuals and organizations representing environmental groups, user groups, other Federal, State and Local agencies. Letters were also sent to the Confederated Tribes of the Warm Springs Reservation, Confederated Tribes of the Umatilla Indian Reservation, and the Burns Paiute Tribe. A copy of the letters and mailing list is contained in the Rattlesnake Forest Health Project EA case file stored at the Baker Resource Area offices in Baker City, Oregon. These documents are available for public review.

2. Don Scott and Craig Schmitt, of the Pacific Northwest Research Station were consulted. Their findings are documented in a letter to Mr Ed Singleton, District Manager, Vale District dated February 18, 1998. A copy of the letter is in the analysis file.

3. The Rattlesnake Forest Health Project was included in the Spring 1998 BLM Vale District Project and Planning Focus bulletin.

4. The March 20, 1998 Baker City Herald had an article explaining the project and asking for public comment.

5. George Keister of the Oregon Department of Fish and Wildlife was consulted.

6. Oregon State Historic Preservation Office was consulted.

B. Future Public Notification

1. A 30 day public comment period will be established for review of this EA and the associated finding of no significant impact (FONSI). A notice of availability of these documents will be published in the Baker City Herald.

2. All parties who responded to the initial planning letter will receive copies of environmental documents if so requested. To this date, the following organizations have requested these documents: Oregon Natural Resources Council, Mike Higgins, David and Elizabeth Christensen. The EA will be sent to the Confederated Tribes of the Warm Springs, Confederated Tribes of the Umatilla, and the Burns Paiute Tribe for their review.

3. Current grazing lessees will be notified of the availability of EA and FONSI.

4. A notice of decision will be published in the Baker City Herald if the decision is made to implement the project.

C. List of Preparers

Dick Watson, Baker Resource Area, Team Lead/Forestry
Dan Klug, Baker Resource Area, Cultural Resources
Mary Oman, Baker Resource Area, Cultural Resources
Jack Wenderoth, Vale District office, Soils/Hydrology
John Denney, Baker Resource Area, Soils/Hydrology
Steve Coley, Vale District Office, Fuels/Fire Ecology
Walt Wood, Baker Resource Area, Forestry
Jackie Dougan, Baker Resource Area, Fisheries
Jack Melland, Baker Resource Area, Wildlife
Greg Miller, Baker Resource Area, Wildlife
Vicki Kellerman, Baker Resource Area, Recreation
Gene McLaughlin, Baker Resource Area, Range
Danielle Bernard, Unity Ranger District