Chapter 1 - Introduction

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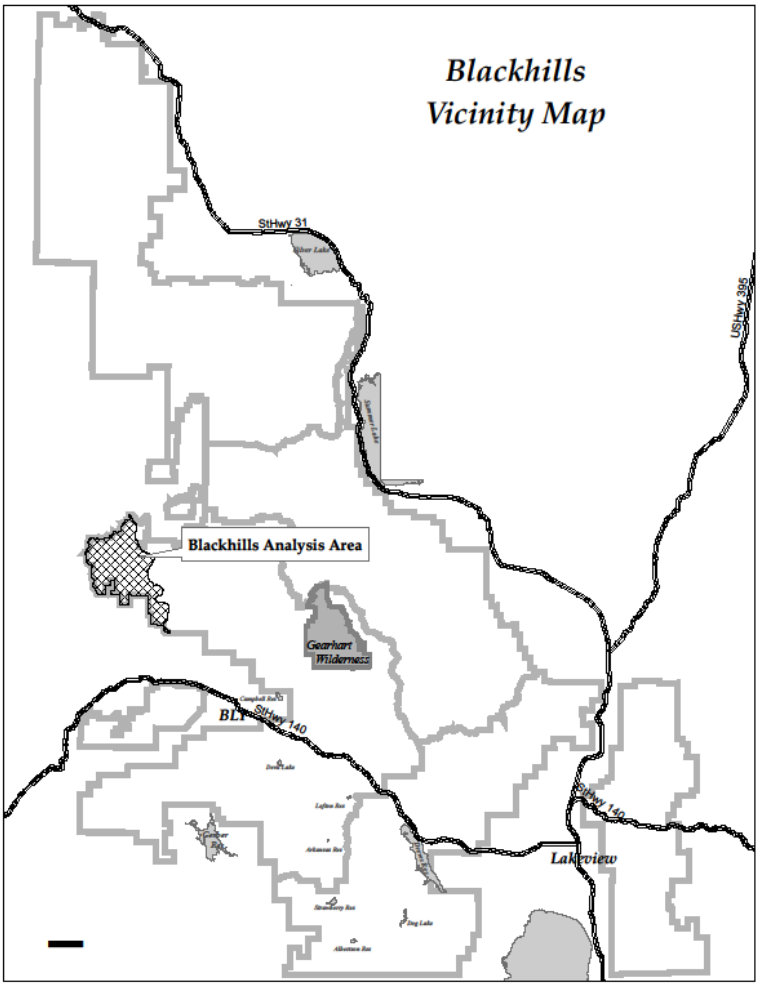
CHAPTER 1 - INTRODUCTION

The Black Hills Project is being developed to promote ecological restoration of vegetative systems across the landscape of the project planning area. Ecological restoration is the process of assisting the recovery of resilience and adaptive capacity of ecosystems that have been degraded, damaged, or destroyed. The planning area just north of Beatty, Oregon in the area of Spodue Mountain on the Bly Ranger District encompasses approximately 29,657 acres. About 28,537 acres are National Forest System (NFS) lands managed by the USDA Forest Service, with the remaining 1,120 acres being privately owned. The planning area consists of lands within the Sycan River, Snake River and a portion of the Marsh Reservoir subwatersheds in the Lower Sycan Watershed located west of Bly, Oregon. The project is located within and around T. 34 S., R. 12 E., Willamette Meridian, Klamath County, Oregon (refer to Map at right).



General characterization of the planning area is described in the *Lower Sycan Watershed Analysis* (USDA Forest Service 2005).

The planning area is in the shadow of the Cascade Mountains to the west. The Lower Sycan Watershed receives rain and snow, totaling between 15-20 inches of precipitation each year, depending on elevation. Winter temperatures drop below 0°F. Even during the summer, frost and snow may occur at higher elevations.

Average elevations in the planning area range from 4,500 to 5,000 feet. The highest point in the planning area is Spodue Mountain at 6,442 feet, where the Forest Service maintains a fire lookout during the summer. Several communication devices and towers also reside on Spodue. The Sycan River that forms the northeast boundary of the planning area is designated 'Wild and Scenic'. Outstandingly Remarkable River Values (ORVs) are those values that cause a river to be designated by Congress under the Wild and Scenic Rivers Act. ORVs identified for the Sycan River are: geology, scenery, fisheries, and wildlife.

Vegetation types in the planning area consist of meadow, grassland/shrubs, and ponderosa pine, lodgepole pine, mixed-conifer, and juniper woodlands. Past management activities and alteration of natural disturbance processes, including fire exclusion, have changed the function, pattern, composition, structure, and density of vegetation within the planning area.

More detailed information regarding resources in the Black Hills Project area can be found in Chapter 3 of this EA.

Background

The Black Hills Project planning area is of specific interest to the Klamath Tribes because it is within former Tribal Reservation lands and is considered an area with high resource values. The Tribes' vision and goals for the forest lands within the Black Hills Project are contained in *A Plan for the Klamath Tribes' Management of the Klamath Reservation Forest* (Klamath Tribes' Plan) prepared by K. Norman Johnson, Jerry F. Franklin and Debora L. Johnson (May 2008). The basic goals of the Tribes can be summarized as:

- Restoration of diverse, structurally complex forest ecosystems; and
- Enhancement and protection of the forest, wildlife, water, and soil resources of the former reservation lands.

The Forest Service has been working in collaboration with representatives of the Klamath Tribes in developing the proposed Black Hills Project. The Tribal Forester and Wildlife Biologist have been instrumental in helping to design the project. The Forest Service has been consulting with the Director of the Tribes Cultural and Heritage Department.

The Forest Service has also benefited from the collaborative efforts of local landowners Marc Valens and Crystal McMahon and members of local environmental groups. Our partners have helped identify common restoration goals for the area and have provided a unique perspective on the important values of the area.

Need for the Proposal

The underlying needs for the proposed Black Hills Project derive from the differences between current resource conditions as summarized here and further detailed in Chapter 3 of this EA and the desired, sustainable resource conditions as discussed in the Fremont Forest Plan, the *Lower Sycan Watershed Analysis*, and the *Klamath Tribes' Plan*.

The *Lower Sycan Watershed Analysis* identified the need to reduce forest stocking levels, juniper expansion and encroachment, remove or reduce conifers from areas of encroachment, including aspen stands, dry meadows and riparian areas and reduce fuel loadings and reintroduce fire on the landscape.

Fire was historically the major disturbance in the Lower Sycan watershed. Frequent low intensity fires kept ponderosa pine forests generally open, usually doing little damage to the thick-barked old pine trees. Wildfire swept through mixed conifer forests somewhat less

frequently than pine forests, and with more effect (*Klamath Tribes' Plan*). A fire management strategy in effect during most of the 20th century that included prevention, detection, and suppression altered the fire ecology conditions that had historically promoted the characteristic open stands. Stands have quickly shifted from single to multistory structures. The changes in stand structure and density consequentially changed the dynamics of the ecosystems and the environment's ability to withstand and recover from natural disturbance events. Due to the absence of "maintenance fires", wildfires today are more likely to be stand replacing events (*Lower Sycan Watershed Analysis*).

Fire suppression, timber harvest and early grazing practices have resulted in changes to landscape patterns, species composition, stand structure and resistance to insects and diseases. Overall, in the 20th century, the forested landscape in the Black Hills Planning Area has been converted to a much more homogenized, denser, less healthy forest landscape with more shade-tolerant species, particularly white fir; many fewer large, old ponderosa pines; and dense stands of lodgepole pine (*Klamath Tribes' Plan*). What were extensive, open and park-like stands of ponderosa pine have turned into dense, multistory structures with weakened overstories and high fuel levels. Existing late and old ponderosa stands do not retain the single mature canopy structure that was expressed historically.

In pine-associated forest types ponderosa pine is outcompeted when shade tolerant white fir or fast growing lodgepole are present. Pine-associated stands have closed into more homogenous structures with a species composition shift to white fir. Some forest stands that are classified as pine-associated today may historically have been ponderosa pine forests (*Lower Sycan Watershed Analysis*).

Lodgepole pine stands have become less structurally diverse. Fine scale fragmentation has shifted to a coarse and blocky fragmentation due to even-aged forest management practices. Seral stage distribution has shifted from one of being within stand to aggregations among stands. The lodgepole pine vegetation type is above the historic range of variability for late and old structural conditions. Current tree densities and age make lodgepole stands highly susceptible to attack by bark beetles (*Lower Sycan Watershed Analysis*).

All forested stands have more small trees, and fewer large trees than existed in the past, increasing the amount of ladder fuels. Current tree growth rates are slow, and stand vigor is declining as competition for water, nutrients, and growing space has increased as a result of higher tree density. The decreased growth rates and low level of tree and stand vigor makes trees more susceptible to insect attack and disease mortality, and makes trees less likely to survive a wildfire (*Lower Sycan Watershed Analysis*).

In each of the vegetation types described, fuels have accumulated from plant senescence and plant mortality. Dry climatic conditions and slow decomposition rates have resulted in large accumulations of burnable materials (*Lower Sycan Watershed Analysis*).

Fire suppression since 1910 has acted as a habitat change agent and created conditions that benefited browse species such as antelope bitterbrush and curl-leaf mountain mahogany in the short-term. However, in the long term, this same protection from wildfire has created even-aged

decadent stands of bitterbrush and mahogany with reduced reproduction and vigor. Overall condition of understory browse used by deer and elk has deteriorated (*Klamath Tribes' Plan*). The increasing decadence of shrubs is of concern because bitterbrush is the primary mule deer forage in the area. Fire suppression has also allowed western juniper to establish in areas where juniper was historically a minor component of the landscape. In the absence of natural wildfires, juniper has expanded at the expense of the understory shrubs and native herbaceous species. Ponderosa pine, lodgepole pine and western juniper trees have increased in range, currently occupying areas formerly dominated by sage, bitterbrush, and mountain mahogany (*Lower Sycan Watershed Analysis*).

Meadows have been degraded through fire suppression, grazing, and channelization (*Klamath Tribes' Plan*). Fire suppression has allowed conifers to encroach on grassy meadows, resulting in decreased productivity and inhibited nutrient cycling. Suppressed aspen stands are commonly encountered in the watershed due to the absence of fire in the ecosystem. In the absence of fire, encroaching conifers are contributing to the degradation of aspen stands (*Lower Sycan Watershed Analysis*).

Fire exclusion has allowed encroachment of shade tolerant conifers into riparian areas. This reduces the ability of these deciduous communities to compete for site resources and to regenerate in the low light conditions caused by conifer encroachment (*Lower Sycan Watershed Analysis*).

An extensive road system exists in the Lower Sycan Watershed, with the majority being non-maintained natural surface roads (*Lower Sycan Watershed Analysis*). Areas of relatively gentle terrain are crisscrossed by many, many roads; where it is easy to build roads and difficult to close them (*Klamath Tribes' Plan*).

Project Purposes

The general purposes of the Black Hills Project, consistent with the direction of the Forest Plan, would be to promote ecological restoration, including sustainability of vegetative and hydrologic functions within the project planning area. Specifically, the objectives for this project are to:

- Enhance and restore ponderosa pine stands closer to historic conditions
- Protect and enhance existing old growth trees/LOS stands, including Forest Plan allocated old growth
- Reduce fuel levels and reintroduce fire on the landscape
- Improve and enhance mule deer habitat
- Revitalize non-forested vegetation habitat
- Maintain and restore aspen stands
- Enhance riparian habitats
- Reduce road densities
- Provide forest products as a by-product of meeting the above objectives, including the removal of incidental quantities of dead, dying and infested trees.

Proposed Action

To meet the purposes and needs for the proposal, the Forest Service proposes conifer thinning that would be accomplished by use of ground-based and helicopter logging systems, followed by prescribed fire treatments across the landscape.

The proposal includes a Forest Plan amendment to allow harvest of white fir trees greater than 21 inches in diameter at breast height (dbh), where such thinning would help meet restoration objectives. Additionally, a Forest Plan amendment is proposed to commercially treat designated old growth (Management Areas 3 and 14) stands in the project area to reduce tree densities to improve stand health and resiliency.

Other proposed activities include: meadow, mountain mahogany and aspen stand enhancement, road maintenance/reconstruction, road closures and decommissioning as necessary or where opportunities exist based upon roads analysis, and construction of temporary spur roads.

The proposed action has been further refined by the addition of details of the prescribed treatments and specific project design features. The details of the proposed action can be found in Chapter 2 of this document, identified as 'Alternative 2'.

Management Areas and Management Direction

Development of this Environmental Assessment follows implementing regulations of the *National Forest Management Act* (NFMA) (36 CFR part 219), *National Environmental Policy Act* (NEPA), the *Council on Environmental Quality* (CEQ) regulations (40 CFR parts 1500-1508), *United States Department of Agriculture* (USDA) *NEPA Policies and Procedures* (7 CFR part 1b), *Forest Service NEPA Procedures* (36 CFR part 220), the *Clean Water Act*, and the *Endangered Species Act*.

This Environmental Assessment is tiered to the *Final Environmental Impact Statement* (FEIS) and *Record of Decision* for the *Fremont National Forest Land and Resource Management Plan* ("Forest Plan," USDA 1989, as amended). The analysis of the standards and guidelines and desired conditions in the Forest Plan is documented in the FEIS for the Fremont Forest Plan. The FEIS for the Forest Plan describes eight alternatives for managing the land and resources of the Fremont National Forest, including an alternative that is described as the Preferred Alternative. It presents and compares these management alternatives, and discloses the economic and environmental consequences of their implementation. This analysis is tiered to the analysis that is documented in the FEIS for the Forest Plan. The Black Hills Project is a site-specific application of the direction provided in the Forest Plan.

The relevant general management direction for this project is found in the Fremont Forest Plan and associated amendments. The Forest Plan specifies Forest-wide and Management Area goals, objectives, and standards that define desired conditions and provide for land uses and resource outputs.

The primary amendments to the Forest Plan are: *Regional Forester's Eastside Forests Plan Amendment 2* (USDA Forest Service 1995), which provides direction for retention and promotion of Late/Old structural (LOS) forest characteristics and the *Inland Native Fish Strategy*

(INFISH; USDA 1995), which provides interim direction to protect habitat and populations of resident native fish. These Regional Forester decisions and supporting documents are incorporated by reference, as part of the Forest Plan.

In addition, Standards and Guidelines for specific areas (termed "Management Areas") are stipulated in the Forest Plan. Management Areas are lands that are grouped into categories based on particular management emphases. Management Areas (MAs) and associated Standards and Guidelines are described in Chapter IV of the Forest Land and Resource Management Plan.

The lands within the Black Hills Project are categorized by Management Area, with approximate acreages, as described below and as shown in Figure 1-2 Management Areas in the Black Hills Project. A brief summary of the direction for each management area is as follows:

Management Area 1 (MA 1) - Mule Deer Forage and Cover on Winter Range (2,713 acres)
Management of MA 1 is intended to provide the forage and cover requirements for wintering mule deer to meet the Oregon Department of Fish and Wildlife and Klamath Tribe population Management Objective (Forest Plan pages 132-134).

Management Areas 3 (MA 3) and 14 (MA 14) - Old-Growth Dependent Species Habitat (2,633 acres) The goal is to manage stands of old growth on the Forest to maintain or increase populations of dependent, native vertebrate species (Forest Plan pages 137-139 and 196-198). Standards include:

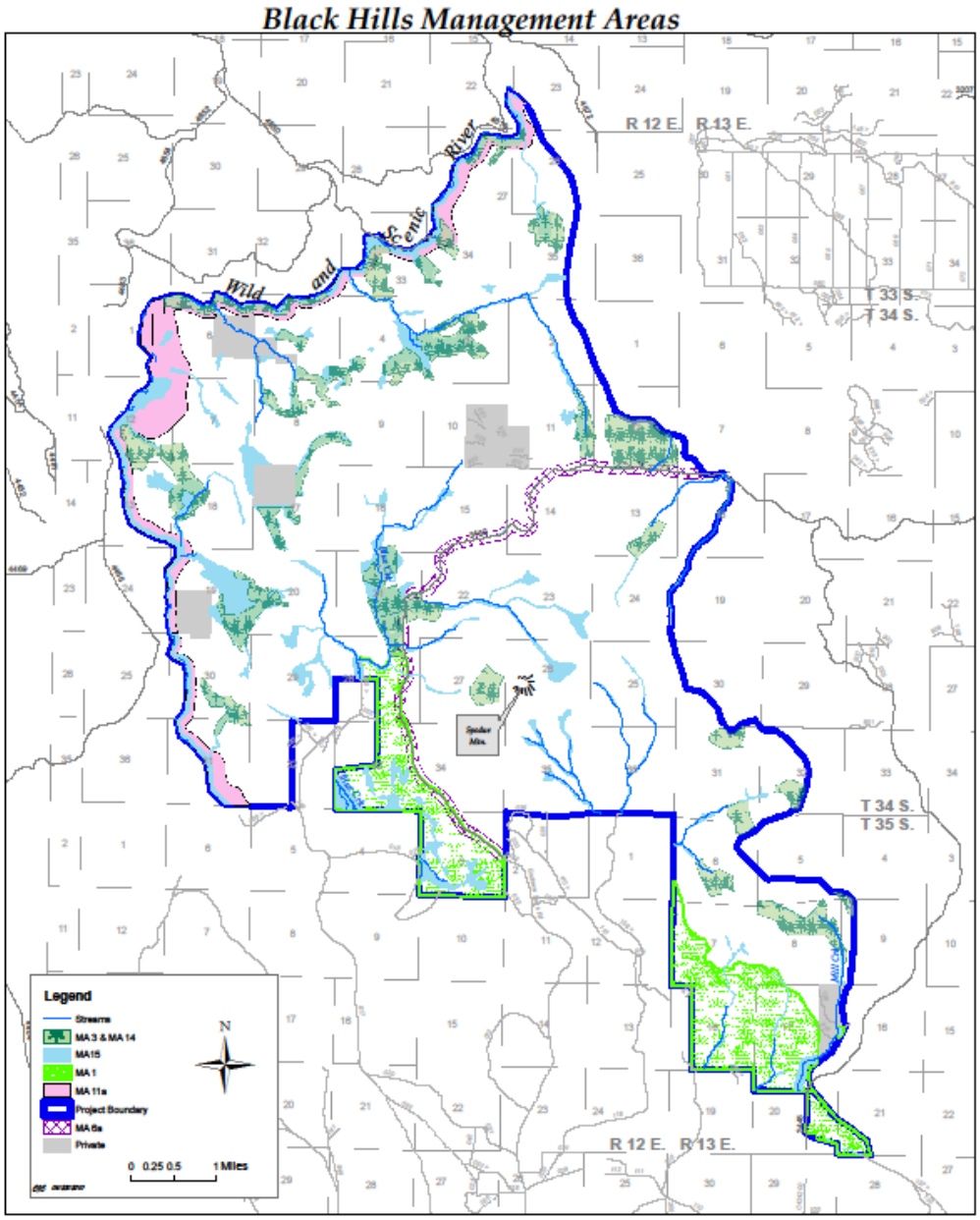
- Old-growth pine and pine-associated stands are dedicated, i.e. receive no timber management; however, these stands may have wildlife habitat enhancement projects to maintain or enhance old-growth habitat.
- Natural fuels management will take place in old-growth areas only to meet old-growth habitat objectives.
- Lodgepole pine old growth will be managed on a 120 year rotation by designating a system of replacement old growth for that which becomes unsuitable habitat due to wildfire, insect infestations, windthrow, etc. (LRMP, page 139).

Management Area 5 (MA 5) – Timber and Range Production (18,294 acres)
Management of MA 5 emphasizes timber production and livestock grazing while meeting standards and guidelines for other resources (Forest Plan pages 145-152). The *Regional Forester's Eastside Forests Plan Amendment 2* (also referred to as the "Eastside Screens") modified this emphasis by directing that a balance between Forest Plan objectives for timber production and maintenance of LOS be achieved.

The *Regional Forester's Eastside Forests Plan Amendment 2* consists of Forest-wide Standards and Guidelines intended to maintain or enhance LOS and to guide vegetation management outside of LOS stands in such a manner as to move it towards LOS conditions as quickly as possible. The Black Hills planning area is within historic range of variability (HRV) in terms of total LOS, but is well above HRV with respect to multi-storied large trees, and well below HRV with respect to single-storied large trees. When one or both of the LOS stages fall below HRV, the following direction from Scenario A of the Eastside Screens specifically applies:

- No net loss of LOS (late and old structural) components
- Outside of LOS, the intent is to maintain and/or enhance LOS components by adhering to the following standards:
  - Maintain all live trees equal to or greater than 21 inches dbh (diameter at breast high);
  - Manipulate vegetative structure that does not meet late and old structural conditions in a manner that moves it toward LOS as appropriate to meet HRV (Historical Range of Variability);
  - Maintain open, park-like stand conditions where this condition occurred historically;
  - Manipulate vegetation in a manner to encourage the development and maintenance of large diameter, open canopy structure;
  - Maintain connectivity and reduce fragmentation of LOS stands by maintaining or enhancing the current level of connectivity between LOS stands and old growth habitats.

Figure 1-2 Management Areas in the Black Hills Project



Management Area 6B (MA 6B): Scenic Viewsheds (656 acres [58 acres of old growth overlap])

MA 6B emphasizes scenic quality along selected travel corridors. MA 6B falls under maximum modification and will be intensively managed for timber; however, visual quality will be taken into consideration during management activities. For example, uneven-aged management and slash disposal techniques will be considered (Forest Plan, page 114).

Management Area 11A (MA 11A) – Wild and Scenic River Corridor (1,510 acres) MA 11A includes river corridors that have been designated under the Wild and Scenic Rivers Act of 1968. The Sycan River that forms the northeast boundary of the Black Hills Project is designated as Wild and Scenic. Fremont Forest Plan Amendment Number 5, *Sycan Wild and Scenic River Management Plan (1992)*, provides management direction for the river corridor. The river corridor is to be managed to provide for the protection and enhancement of the outstandingly remarkable values (geology, scenery, fisheries, and wildlife). Timber harvest is allowed if the purpose is to preserve/enhance river related characteristics (*Sycan Wild and Scenic River Environmental Assessment and River Management Plan*, *Table of Alternatives*). Prescribed fire, using low to moderate fire intensities, may be used to reduce hazardous fuel accumulations or to meet other resource objectives (*Sycan Wild and Scenic River Environmental Assessment and River Management Plan*, *Table of Alternatives.*

Management Area 15 (MA 15) – Riparian Fish and Wildlife Habitat (2,789 acres)
The aquatic and riparian zones of all drainages and water bodies, and their immediately adjacent uplands, will be managed to meet the objectives of MA 15. This management area will be managed to maintain or improve water quality, fish habitat, recreation opportunities, and riparian habitat for dependent wildlife species. This includes all perennial, intermittent, ephemeral drainages, and seeps and springs. Other than water bodies, MA 15 also occur in other management areas so there is some overlap of acres.

The *Regional Forester's Plan Amendment for INFISH* (USDA 1995) has amended the Fremont Forest Plan Standards and Guidelines for this management area by creating Riparian Habitat Conservation Areas (RHCAs). All project actions must be in compliance with INFISH. Riparian dependent resources receive primary emphasis in all RHCAs. Standard RHCA widths are as follows:

Perennial Fishbearing Streams: The area on either side of the stream extending from edges of active stream channel to the top of the inner gorge, or the outer edges of the 100-year floodplain, or the outer edges of riparian vegetation, or to a distance equal to the height of two site-potential trees, or 300 feet slope distance (600 feet, including both sides of the stream channel), whichever is greatest.

Perennial Non-Fishbearing Streams: The area on either side of the stream extending from edges of active stream channel to the top of the inner gorge, or the outer edges of the 100-year floodplain, or the outer edges of riparian vegetation, or to a distance equal to the height of one site-potential tree, or 150 feet slope distance (300 feet, including both sides of the stream channel), whichever is greatest.

Non-Fishbearing Intermittent streams and wetlands less than 1 acre: (1) The intermittent stream channel and the area to the top of the inner gorge, (2) the intermittent stream channel or wetland and the area to the outer edges of the riparian vegetation, and (3) the area to the edge of the channel or wetland to a distance equal to the height of one-half site potential tree, or 50 feet slope distance, whichever is greatest.

For this project the applicable INFISH direction reads: "Prohibit timber harvest in RHCAs, except as described below….b. Apply silvicultural practices for RHCAs to acquire desired vegetation characteristics where needed to attain Riparian Management Objectives. Apply silvicultural practices in a manner that does not retard attainment of Riparian Management Objectives (RMOs) and that avoids adverse effects on inland native fish."

Roads and Timber Best Management Practices
Best Management Practices (BMPs) are the primary mechanisms used to achieve water quality standards (Environmental Protection Agency 1987). BMPs have been selected and tailored for site-specific conditions to meet project-level water protection objectives (Appendix B). The project-level BMPs are supplemental to the General Water Quality Best Management Practices, Pacific Northwest Region 1988.

Decision Framework

Given the purpose and need, public comments and the issues raised during analysis, the responsible official, Fremont-Winema National Forest Supervisor, will review this Environmental Assessment to make the following decisions:

Should the proposed action, an alternative action or a modified version of an action alternative be implemented, or should no action be taken at this time in the Black Hills Project area?

Is it likely that helicopter logging would be feasible for portions of the project in light of the current timber market and the costs of helicopter systems?

Would the selected action have a significant impact upon the quality of the human environment and thus require development of an environmental impact statement (EIS)?

Is the selected action consistent with the management direction of the Forest Plan or is a site-specific Forest Plan amendment necessary?

Is additional road information needed at the watershed or project scale to support the selection of an action alternative?

Consultation with the Klamath Tribes

The Forest Service regularly consults with the Klamath Tribes on management activities and project proposals. The Klamath Tribes were initially made aware of the Black Hills Project planning effort at the fall 2003 quarterly pre-Schedule of Proposed Actions meeting between the Klamath Tribal Directors and Fremont-Winema National Forest' staff. The Forest Service has specifically been collaborating with representatives of the Klamath Tribes in the development of the Black Hills Project.

Field tours of the Black Hills project area in July 2009 included staff members of the Klamath Tribes Natural Resources Department and Ranger District staff members.

Additional input was gained during 2009-2011 from on-going discussions by Ranger District staff members with staff members of both the Klamath Tribes Natural Resources Department and the Klamath Tribes Culture and Heritage departments. The Nature Conservancy and Lomakatsi were also brought into the collaborative group for this project.

Further information on the history of consultation, information provided and technical consultation process with the Klamath Tribes for this project can be found in Chapter 3 Tribal Consultation and Treaty Rights.

Public Involvement and Collaborative Efforts

In ongoing efforts to keep the public apprised of Forest Service activities, the Black Hills Project proposal was first described in the Fremont-Winema National Forest' quarterly *Schedule of Proposed Actions* (SOPA) beginning with the winter 2003 edition. Priority changes resulted in the project being put on hold in 2005. The project was again listed in the January-March 2006 SOPA, and has since appeared in all subsequent editions. The initial proposed action was contained in a scoping packet of June 10, 2009 that was mailed to adjacent landowners, and government agencies at all levels, conservation and environmental organizations, livestock and timber industry representatives, and other private interested individual that are on the Bly and Lakeview Ranger Districts NEPA mailing list. Project information was also posted on the Fremont-Winema Forests' public website.

The initial scoping process produced responses from:

George Sexton (Klamath-Siskiyou Wildlands Center)
Doug Heiken (Oregon Wild)
Crystal McMahon
Marc Valens and Anne Golden

Public comments and concerns generated through scoping have been used to develop resource protection measures, project specific design criteria and another potential action alternative to achieve the desired outcome.

To ensure consideration of the public comments, during the analysis process all comments received during initial scoping were reviewed by the ID Team and other staff. All mailing lists, scoping documents, and responses are on file in the Black Hills Project record at the Bly Ranger District office.

Field tours of the Black Hills project area in July 2009 included local private landowners and Ranger District staff members.

On March 18, 2010 a presentation on the Black Hills Project was made to the Klamath Watershed Partnership Sprague River Working Group at the Sprague River Community Center. This provided local ranchers and property owners in the Sprague River Valley an overview of the project and allowed for questions on the project to be addressed.

In the summer of 2011, the Fremont-Winema National Forest hosted Dr. Norman K. Johnson, Professor of Forest Resources at Oregon State University, and Dr. Jerry F. Franklin, Professor of Ecosystem Science at the University of Washington, to expose a broad range of natural resource specialists to their concepts for dry forest restoration from their joint paper titled *Restoration of Federal Forests in the Pacific Northwest, Strategies and Management Implications* (2009). While on the Forest they heard a brief description of the Black Hills Project. In September 2011, Norman and Jerry along with 16 students from the University of Washington, and Doug Heiken and Chandra LeGue of Oregon Wild toured the project while the Forest Service described the various elements of the proposed action. Norm and Jerry presented concepts used in the development of the 2008 Tribes Plan and their 2009 paper and explained how they could be applied to specific examples in the field. The final silvicultural prescriptions developed for the project will incorporate the principles of the strategies for dry forest restoration that Norm and Jerry described.

Issues and Concerns

Issues serve to highlight effects or unintended consequences that may occur from the proposed action and alternatives, giving opportunities during the analysis to reduce adverse effects and compare trade-offs for the decision maker and public to understand.

During the scoping period for the Black Hills Project, we received comments from 4 sources. The comments were sorted into key issues that would drive alternative development and other issues or comments that would be addressed by narrative discussion in the analysis and those which would be addressed by incorporation of resource protection measures and/or specific project design features that would minimize the potential for adverse impacts.

Crystal McMahon, a local property owner, concerns included climate change effects on birds and other wildlife, and potential effects to sensitive plants. These issues are addressed in the analysis in Chapter 3. Other comments suggested old juniper trees should be retained for wildlife values and that plastic sheets should not be used on burn piles to minimize effects to air quality. These issues are addressed by project design and resource protection measures.

Marc Valens, a local property owner in the project area, concerns included cleanup of project generated slash and potential impacts to road access immediately around his private residence. Potential slash generated by the project and road access concerns have been addressed in the specific design of the alternatives described in Chapter 2.

George Sexton of Klamath-Siskiyou Wildlands Center submitted comments on the Black Hills Project. The main issues raised were potential impacts to soils, riparian habitat conservation areas and water quality, use of prescribed fire for stand maintenance and removal of large diameter trees for safety or operational needs. All of these issues are addressed by project design elements and resource protection measures of the alternatives. Mr. Sexton's concern regarding the proposed Forest Plan Amendment to treat allocated old growth stands was identified as a key issue and led to the development of Alternative 3 as described in Chapter 2.

Doug Heiken of Oregon Wild responded with concerns for protection of all trees with old-growth characteristics and future snag recruitment. These issues are addressed by project specific design elements of the alternatives and in analysis consideration in Chapter 3. Mr. Heiken also requested consideration of recommendations for restoring ecological processes as discussed in the final Spotted Owl Recovery Plan and consideration of prescriptions developed by Tim Lillebo (Oregon Wild) for the Glaze Meadow project on Sisters Ranger District. These documents are addressed in the analysis contained in Chapter 3.

Comments from the public and input from resource specialists and the District Ranger led to identification of the following key issues that served as the basis for alternative development:

Key Issue #1
Proposed thinning treatments within Forest Plan allocated old growth (MA 3 and MA 14) may adversely impact old growth dependent species or their habitat.

This issue is measured by:

- Acres of allocated old growth thinning proposed by alternative.
- The effects of treatment on old growth dependent wildlife species.

Key Issue #2
It may not be economically feasible to thin stands in the steep areas on and around Spodue Mountain by use of helicopter logging.

This issue is measured by:

- The potential cost of helicopter logging.
- Acres treated by use of helicopter logging.

SURVEY MONUMENT ON SPODUE MOUNTAIN