Eastside Summary

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Introduction

The Interior Columbia Basin Ecosystem Management Project (ICBEMP), was initiated for the following reasons: (1) To identify existing or emerging resource problems that transcend jurisdictional boundaries, such as forest health problems and declining salmon populations, and to propose potential solutions that can best be addressed on a large scale; (2) To develop management strategies using a comprehensive, "big picture" approach, and disclose interrelated actions and cumulative effects using scientific methods in an open public process; (3) To address certain large-scale issues, such as species viability and biodiversity, from a larger context using an interagency team. This method is more cost-effective than each Bureau of Land Management (BLM) District and National Forest conducting independent efforts; (4) To respond to President Clinton's July 1993 direction to develop a scientifically sound, ecosystem-based management strategy for lands administered by the BLM or Forest Service east of the Cascade Crest; and (5) To replace interim management strategies (PACFISH, Inland Native Fish Strategy, and Eastside Screens) with a consistent long-term management strategy.

In response to these developments, management direction for Forest Service- and BLM-administered lands across parts of seven states in the Pacific Northwest was re-examined and two draft environmental impact statements (EISs) were prepared for different portions of the area covered by the Interior Columbia River Basin Ecosystem Management Project, which is referred to as the *project area*.

The planning area for the ***Eastside EIS*** includes land administered by the BLM or Forest Service in the interior Columbia River Basin, upper Klamath Basin, and northern Great Basin that lie east of the crest of the Cascade Range in Oregon and Washington. The Eastside EIS covers approximately 30 million acres of agency-administered lands.

The planning area for the ***Upper Columbia River Basin EIS*** includes lands administered by the BLM or Forest Service in parts of Idaho, western Montana and Wyoming, and northern Nevada and Utah that are drained by the Columbia River system. The Upper Columbia River Basin EIS covers approximately 45 million acres of agency-administered lands.

Proposed Action

The Forest Service and BLM propose to develop and implement a coordinated, scientifically sound, ecosystem-based management strategy for lands they administer east of the crest of the Cascade Range in Oregon and Washington.

Purpose of and Need For Action

The **purpose** of the Proposed Action is to take a coordinated approach and to select a management strategy that best achieves a combination of the following: (1) Restore and maintain long-term ecosystem health and ecological integrity; (2) Support economic and/or social needs of people, cultures, and communities, and provide sustainable and predictable levels of products and services from lands administered by the Forest Service or BLM; (3) Update or amend if necessary current Forest Service and BLM management plans with long-term direction, primarily at regional and sub-regional levels; (4) Provide consistent direction to assist federal managers in making decisions at a landscape level within the context of broader ecological considerations; (5) Emphasize adaptive management over the long term; (6) Help restore and maintain habitats of plant and animal species, especially those of threatened, endangered, and candidate species. This would be done primarily by moving toward desired ranges of landscape conditions at a sub-regional and regional ecosystem basis; (7) Provide opportunities for cultural, recreational, and aesthetic experiences; (8) Provide long-term management direction to replace interim strategies (PACFISH, Eastside Screens, and Inland Native Fish Strategy); and, (9) Identify where current policy, regulation, or organizational structure may act as challenges to implementing the strategy or achieving desired future conditions.

The alternative management strategies examined in detail in this EIS are based upon underlying **needs** for:

- Restoration and maintenance of long-term ecosystem health and ecological integrity.

- Supporting the economic and/or social needs of people, cultures, and communities, and providing sustainable and predictable levels of products and services from Forest Service- and BLM-administered lands.

Issues

Project scoping identified the issues and concerns people have about public lands managed by the BLM or Forest Service. They include:

Issue 1: In what condition should ecosystems be maintained?

Issue 2: To what degree, and under what circumstances should restoration be active (with human intervention) or passive (letting nature take its course)?

Issue 3: What emphasis will be assigned when trade-offs are necessary among resources, species, land areas, and uses?

Issue 4: To what degree will ecosystem-based management support economic and/or social needs of people, cultures, and communities?

Issue 5: How will ecosystem-based management incorporate the interactions of disturbance processes across landscapes?

Issue 6: What types of opportunities will be available for cultural, recreational, and aesthetic experiences?

Issue 7: How will ecosystem-based management contribute to meeting treaty and trust responsibilities to American Indian tribes?

Decisions to be Made

Once the Final EIS has been completed, the responsible officials can decide to:

- Select one of the alternatives analyzed within the Final EIS, including one of the No Action Alternatives (Alternative 1 or 2); or
- Modify an alternative (for example, combine parts of different alternatives), as long as the environmental consequences of the modified action have been analyzed within the Final EIS.

The alternative selected for implementation will be documented in the Record(s) of Decision.

Specific decisions involved in the selection of an alternative include adoption of:

- Management goals;
- A desired range of future conditions expected over the next 50 to 100 years;
- Objectives to be used in measuring progress toward attainment of the management goals; and
- Standards, which are required actions to be used in designing and implementing future management actions.

The Record(s) of Decision will do the following:

- Describe certain management activity levels expected and priorities for management;
- Provide a large-scale ecological context for Forest Service and BLM land-use plans;
- Help clarify the relationship of agency activities to ecosystem capabilities;
- Help develop realistic expectations for the production of economic and social benefits;
- Focus on regional and sub-regional issues;
- Describe a consistent aquatic conservation strategy;
- Establish general direction for management of habitat for threatened or endangered species or for communities of species that require management across broad landscapes to assure viability.

The Record(s) of Decision for the Eastside EIS are expected to amend current BLM and Forest Service land-use plans, the Forest Service regional guide, and BLM State Director guidance, where they conflict.

Affected Environment

This summary focuses on portions of the environment that are directly related to conditions addressed in the alternatives and that portray, at a regional scale, the significant conditions and trends of most concern to the public, the Forest Service, and the BLM with regard to lands administered by these two agencies within the project area.

Throughout this section, reference is made to "historical conditions" or the "historical range of variability". "Historical" in this EIS is intended to represent conditions and processes that are likely to have occurred prior to settlement of the project area by people of European descent. This time period is used only as a reference point to understand ecological processes and functions. In many cases it is neither desired, nor possible, to return to actual historical conditions.

Ecological Reporting Units, Hydrologic Unit Codes, and Clusters

The project area was divided into 13 geographic areas called Ecological Reporting Units (ERUs), which were identified by a process that integrated human uses and terrestrial and aquatic ecosystem data. They are the basis for reporting information on (1) the description of biophysical environments, (2) the characterization of ecological processes, (3) the discussion of past management activities and effects from these, and (4) the identification of landscape management opportunities.

For the purposes of analyzing and summarizing much of the physiographic, aquatic, and vegetative information, a hierarchy of watersheds and watershed boundaries was identified by the Science Integration Team. For larger watersheds (regions, subregions, basins, and sub-basins), watershed boundaries and their numeric Hydrologic Unit Codes (1st-field, 2nd-field, 3rd-field, and 4th-field, respectively) were adopted without change from those identified by the USGS. Smaller watersheds, referred to as watersheds (5th-field) and subwatersheds (6th-field), were identified as part of the Interior Columbia Basin Ecosystem Management Project process. Subwatersheds are the basic characterization unit for the *Integrated Assessment,* and were the basic mapping unit for identifying ERUs.

As a final step in the analysis the Science Integration Team integrated and regrouped initial information to evaluate the relative integrity of ecosystems in the project area. Forest, range, hydrologic, and aquatic systems were considered in deriving measures of integrity that attempted to answer three questions:

(1) Where are the areas of relatively high or low ecological integrity across the project area?

(2) Where are the opportunities to improve integrity? and

(3) What risks to integrity exist from management actions?

New groupings or "clusters" of sub-basins were mapped, identifying forestland and rangeland ecosystems with similar existing vegetation, ecological functions and processes, and opportunities and risks. The clusters are further explained in the Integrated Summary of Forestland, Rangeland, and Aquatic Integrity section, later in this Executive Summary.

Summary of Conditions and Trends

The following sections summarize the existing conditions, and trends from historical conditions, for various elements of the ecosystem.

Physical Environment

Soils and Soil Productivity

- Soil productivity across the project area is generally stable to declining Determination of the exact status of soil condition for any given area is difficult because of a lack of inventory and monitoring data. Generally, greater declines in soil quality and productivity are associated with greater intensities of vegetation management, roading, and livestock grazing.

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- Soil organic matter and coarse wood (woody material larger than three inches) have been lost or have decreased as a result of displacement and removal of soils, and removal of whole trees and branches.
- There has been a loss of soil material from direct displacement of soils, as well as from surface and mass erosion. Erosion can result from changed water runoff patterns from increased bare soil exposure, compaction, and concentration of water from roads.
- Changes in the physical properties of soils have occurred in conjunction with activities that increase bulk density through compaction. These changes have largely resulted in impaired soil processes and function, such as decreased porosity and infiltration, and increased surface erosion.
- In rangelands soils, the function and development of microbiotic crusts have been reduced in areas where surface-disturbing activities have been high. Microbiotic crusts provide soil stability and retention, and are essential for nutrient availability and cycling.
- Sustainability of soil ecosystem function and process is at risk in areas where redistribution of nutrients in terrestrial ecosystems has resulted from changes in vegetation composition and pattern, removal of the larger sized wood component, and risk of uncharacteristic fire.
- Floodplain and riparian area soils have a reduced ability to store and regulate chemicals and water in areas where riparian vegetation has been reduced or removed, or where soil loss associated with roading in riparian areas has occurred. In these areas, water quantity may be reduced during low flows, and water quality may have less buffer from pollution.

Air Quality

- The current condition of air quality in the planning area is considered good, relative to other areas of the country.
- Wildfires significantly affect the air resource. Current wildfires produce higher levels of smoke emissions than historically, because fuel available to be consumed by wildfire has increased.
- Within the project area, the current trend in prescribed fire use is expected to result in an increase of smoke emissions.

Terrestrial Ecosystems

Terrestrial ecosystems descriptions are separated into forestlands, rangelands, and riparian areas. Changes in vegetation and habitat, with explanations of how these changes affect management decisions today, are discussed to set the stage for the management alternatives. Forestlands and rangelands in the planning area are highly diverse, ranging from moist areas near the crest of the Cascades to dry areas in the northern Great Basin.

Due to the wide variety of plant species and landscape forms distributed throughout the planning area, there is a diversity of animal species found within forestlands, rangelands, and riparian areas. An assortment of animal species live in these areas, from the grizzly bear in the northern Cascades to the Townsend's big-eared bat in southern Oregon. There are 13,000 terrestrial animal and plant species addressed in the *Terrestrial Ecology* chapter of the *Assessment of Ecosystem Components,* of which 547 are vertebrates. Wildlife species in the planning area that are listed by the federal government under the Endangered Species Act (1976) include: bald eagle, grizzly bear, northern spotted owl, and marbled murrelet, which are listed as threatened; peregrine falcon, woodland caribou, and gray wolf, listed as endangered; and spotted frog, which is a candidate for listing. The Forest Service and/or the BLM classify 135 terrestrial vertebrates as sensitive species. Approximately 12,790 plant species are known in the project area; of these three are threatened, two are endangered, one is proposed for listing, and 526 are Forest Service or BLM sensitive species.

The existing vegetative cover within an area can vary based on past disturbances. The term potential vegetation type is used to represent all of the species that could grow on a specific site in the absence of disturbance, which is an integral part of that ecosystem and its evolution. For the Eastside EIS, potential vegetation types were grouped into seven potential vegetation groups: dry forest, moist forest, cold forest, dry shrub,

cool shrub, dry grass, and riparian shrubland herb. Vegetation and habitats in terrestrial ecosystems are discussed by potential vegetation group.

Forestlands

Forest Service- or BLM-administered forestlands make up approximately 50 percent of the Eastside planning area (this includes alpine vegetation). Forestlands in the project area are divided into three groups — dry, moist, and cold forest potential vegetation groups — and are described by distribution, composition, structure, historical and current conditions, disturbance patterns, and disturbance processes.

- Interior ponderosa pine has decreased across its range with a significant decrease in old single-story structure. The primary transitions were to interior Douglas-fir and grand fir/white fir.
- There has been a loss of the large tree component (live and dead) within roaded and harvested areas. This decrease affects terrestrial wildlife species closely associated with these old forest structures.
- Western larch has decreased across its range. The primary transitions were to interior Douglas-fir, lodgepole pine, or grand fir/white fir.
- Western white pine has decreased by 95 percent across its range. The primary transitions were to grand fir/white fir, western larch, and shrub/herb/tree regeneration.
- The whitebark pine/alpine larch potential vegetation type has decreased by 95 percent across its range, primarily through a transition into the whitebark pine cover type. Overall, however, the whitebark pine cover stand has also decreased, with compensating increases in Engelmann spruce/subalpine fir.
- Generally, mid-seral forest structures have increased in dry and moist forest potential vegetation groups, with a loss of large, scattered, and residual shade-intolerant tree components, and an increase in the density of smaller shade-tolerant diameter trees.
- There has been an increase in fragmentation and a loss of connectivity within and between blocks of late-seral, old forests, especially in lower elevation forests and riparian areas. This has isolated some animal habitats and populations and reduced the ability of populations to move across the landscape, resulting in a long-term loss of genetic interchange.
- There has been an increase in access for humans which has decreased the availability of areas with low human activities that are important to large forest carnivores and omnivores.

Rangelands

BLM- and Forest Service-administered rangelands make up approximately 48 percent of the Eastside planning area (including upland woodland vegetation). Rangelands include dry grass, dry shrub, and cool shrub potential vegetation groups. Only a few tree species, including juniper and lodgepole and ponderosa pine, are native to rangelands. These species typically are located in wetter areas, especially in riparian areas and areas close to forests.

- Noxious weeds are spreading rapidly, and in some cases exponentially, on rangelands in every range cluster.
- Woody species encroachment and/or increasing density of woody species (sagebrush, juniper, ponderosa pine, lodgepole pine, and Douglas-fir), especially on dry grasslands and cool shrublands, has reduced herbaceous understory and biodiversity.
- Cheatgrass has taken over many dry shrublands, increasing soil erosion and fire frequency and reducing biodiversity and wildlife habitat. Cheatgrass and other exotic plant infestations have simplified species composition, reduced biodiversity, changed species interactions and forage availability, and reduced the systems' ability to buffer against changes.
- Degradation of riparian areas and subsequent loss of riparian vegetation cover, has reduced riparian ecosystem function, water quality, and habitat for many aquatic and terrestrial species.
- Expansion of agricultural and urban areas on non-federal lands has reduced the extent of some rangeland potential vegetation groups, most notably dry grasslands, dry

shrublands, and riparian areas. Changes in some of the remaining habitat patches due to fragmentation, exotic species, disruption of natural fire cycles, overuse by livestock and wildlife, and loss of native species diversity have contributed to a number of wildlife species declines, some to the point of special concern (such as sage grouse, Columbian sharp-tailed grouse, California bighorn sheep, pygmy rabbit, kit fox, and Washington and Idaho ground squirrels).

- Increased fragmentation and loss of connectivity within and between blocks of habitat, especially in the shrub steppe and riparian areas, have isolated some habitats and populations and reduced the ability of populations to move across the landscape, resulting in long-term loss of genetic interchange.
- Slow-to-recover rangelands (in general, rangelands that receive less than 12 inches of precipitation per year) are not recovering naturally at a pace that is acceptable to the general public, and are either highly susceptible to degradation or already dominated by cheatgrass and noxious weeds.
- Open road densities and human activity have increased. Higher densities cause many species to leave the area to avoid human activity. Recreation, plant gathering, and other uses of all types of habitat have steadily increased recently because of increasing human populations in the project area. These uses can increase wildlife displacement and vulnerability to mortality, can fragment habitat, and allow for access of exotic plants into new locations.

Aquatic Ecosystems

The condition of aquatic ecosystems in the project area is characterized by the hydrologic environments of watersheds, water bodies, riparian areas, and wetlands, then describing the status of fish species that use and are affected by these environments. Specialattention is givento native fish species, especially wide-ranging salmon and trout species, as well as local and rare species that inhabit the northern Great Basin and upper Klamath Basin.

Watershed Processes

- Management activities throughout watersheds in the project area have affected the quantity and quality of water, processes of sedimentation and erosion, and the production and distribution of organic material, thus affecting hydrologic conditions. On federally managed lands, the most pronounced changes to watersheds are due to water diversions and impoundment, road construction, and vegetation alteration (including silvicultural practices, fire suppression, and forage production).
- Banks and beds of streams, rivers, and lakes have been altered by bank and shore structures, transportation improvements, instream mining activities, flood-control works, and alteration of riparian areas. In general, the changes have been greatest for the larger streams, rivers, and lakes.
- Water quantity and flow rates have been locally affected by dams, diversions, and groundwater withdrawal. More subtle, but widespread changes in water quantity and flow patterns on federally-managed lands have probably been caused by road construction, and changes in vegetation due to silvicultural practices and livestock grazing.
- Within the eastern Oregon and Washington planning area, 11 percent of Forest Service-administered streams and 13 percent of BLM-administered streams are "water quality limited" as defined by the Clean Water Act. On Forest Service-administered lands, the primary water quality problems are sedimentation, turbidity, flow alteration, and high temperatures. On BLM-administered lands, high sediment, turbidity levels, and temperatures are the primary reasons for listing as water quality limited.
- Important aspects of fish habitat, such as pool frequency and large woody debris abundance, have decreased throughout much of the project area. Pool frequency and wood frequency are generally less in areas with higher road densities, and in areas where timber harvest has been a management emphasis.
- The overall extent and continuity of riparian areas and wetlands has decreased, primarily due to conversion to agriculture,

but also due to urbanization, transportation improvements, and stream channel modifications.

- Riparian ecosystem function, determined by the amount and type of vegetation cover, has decreased in most sub-basins within the project area.
- A majority of riparian areas on Forest Service and BLM-administered lands are either "not meeting objectives," "non-functioning," or "functioning at risk." However, the rate has slowed and a few areas show increases in riparian cover and large trees.
- Within riparian woodlands, the abundance of mid-seral vegetation has increased whereas the abundance of late-and early-seral structural stages has decreased, primarily due to fire exclusion and the harvest of large trees.
- Within riparian shrublands, there has been extensive spread of western juniper and introduction of exotic grasses and forbs, primarily due to processes and activities associated with improper livestock grazing.
- The frequency and extent of seasonal floodplain and wetland inundation has been altered by changes in flow regime due to dams, diversions, and groundwater withdrawal, and by changes in channel morphology due to sedimentation and erosion, channelization, and installment of transportation improvements such as roads and railroads.
- There is an overall decrease in large trees and late-seral vegetation in riparian areas.

Aquatic Species

Aquatic species in the Eastside planning area that are federally listed under the Endangered Species Act as threatened are the Warner sucker, Hutton Spring tui chub, Lahontan cuttroat trout, Foskett speckled dace, and Snake River chinook salmon (both the spring/summer and fall runs). Endangered species include the shortnose sucker, Lost River sucker, Borax Lake chub, and Snake River sockeye salmon. Bull trout is a candidate species.

- The composition, distribution, and status of fishes within the planning area are substantially different than they were historically. Some native fishes have been eliminated from large portions of their historical ranges.
- Many native nongame fish are vulnerable because of their restricted distribution or fragile or unique habitats.
- Although several of the key salmonids are still broadly distributed (notably the cutthroat trouts and redband trout), declines in abundance, loss of life history patterns, local extinctions, and fragmentation and isolation in smaller blocks of high quality habitat are apparent.
- Wild chinook salmon and steelhead are near extinction in a major part of their remaining distribution.
- Habitat, hydropower development, harvest, hatchery management, and irrigation withdrawals all affect the survival of remaining anadromous fish populations within the interior Columbia River Basin to different extents. Land management activities have affected the habitat for wild chinook and steelhead and have limited their spawning and rearing success. The contribution of freshwater habitat to declines in anadromous fish populations would be least in central Idaho (for example wilderness areas and other protected areas), which is affected the most by dams between spawning and rearing areas and the ocean, and the northern Cascades, but greater in the lower Snake and mid-Columbia drainages. The influence of hydropower on anadromous fish populations increases upriver where there are more dams between freshwater spawning and rearing areas and the ocean. Harvest of fish, which has been curtailed in recent years, has less effect today than it did historically. Hatcheries are an important element throughout the basin, but their effect on native stocks is variable.
- Core areas for rebuilding and maintaining biological diversity associated with native fishes still exist within the planning area.

Human Uses and Values

Human uses are characterized by the social and economic components of ecosystems in eastern Oregon and Washington. Emphasis is on the relationship of social and economic systems to Forest Service- and BLM-administered lands in the planning area. The economic and social setting provided here establishes the context for making land use choices compatible with human needs and expectations for these lands.

- The planning area is sparsely populated and rural, especially in areas with a large amount of agency lands. Some rural areas are experiencing rapid population growth, especially those areas offering high quality recreation and scenery. Population growth can stimulate economic growth, provide new economic opportunities, and promote economic diversity in rural areas.
- Development for a growing human population is encroaching on previously undeveloped areas adjacent to lands administered by the Forest Service and BLM, diminishing habitat for some wildlife and increasing agency costs to manage fire to protect people and structures.
- Recreation is an important use of agency lands in the planning area in terms of economic value and amount of use. Most recreation use is tied to roads and accessible water bodies, though primitive and semi-primitive recreation is also important and becoming scarce relative to growing demand.
- Industries customarily served by agency land uses, such as logging, wood products manufacturing and livestock grazing, no longer dictate the economic prosperity of the region, but remain economically and culturally important in rural areas. The economic dependence of communities on these industries is highest in areas that are geographically isolated and short on alternative employment opportunities.
- The public has invested substantial land and capital to develop road systems on agency lands in the planning area, primarily to serve commodity uses. On forestlands, commercial timber harvest has financed 90 percent of the construction cost and 70 percent of maintenance cost. Recreation now accounts for 60 percent of the use.
- For those counties that have benefited from federal sharing of gross receipts from commodity sales on agency lands, changing levels of commodity outputs can affect county budgets.
- Agency social and economic policy has emphasized the goal of supporting rural communities, specifically promoting stability in those communities deemed dependent on agency timber harvest and processing. Even-flow of timber sales, timber sale bidding methods, timber export restrictions, and small business set-asides of timber sales have been the major policy tools on Forest Service-administered commercial forestlands. Regulation of grazing practices has been important on BLM-administered rangelands.
- The factors that appear to help make communities resilient to economic and social change include population size and growth rate, economic diversity, social and cultural attributes, amenity setting, and quality of life. The ability of agencies to improve community resiliency depends on the effectiveness of agency land uses and management strategies to positively influence these factors.
- Predictability in timber sale volume from agency lands has been increasingly difficult to achieve. Advancing knowledge of ecosystem processes, changing societal goals, and changing forest conditions has undermined conventional assumptions underlying the quantity and regularity of timber supply from agency lands.

American Indians

American Indian populations are characterized by their cultural history, legal context, and existing federal agency relations with the project area's 22 federally recognized American Indian tribes (17 with interest in the Eastside planning area). The ways in which American Indians use Forest Service- and BLM-administered lands is discussed in the context of their cultural, social, economic, religious, and governmental interests. The United States government has a unique responsibility to Indian tribes.

A culture includes religious, economic, political, communication, and kinship systems, as it is the whole set of learned behavior patterns common to a group of people, their interactive behavior systems, and their material goods.

Most of the prehistoric cultures of the project area belonged to either the Plateau or Northern Great Basin Culture Areas. The Pit River and Shasta tribes, who are associated with the Klamath Tribe, are grouped within the Californian Culture Area. Over thirty Plateau bands historically occupied the northern portion of the interior Columbia Basin and part of the Klamath Basin. Many bands, including the three Northern Great Basin bands ~ the Bannock, Northern

Paiute, and Shoshoni ~ occupied most of the project area's southern half. Differences existed among cultures, especially between tribal culture areas.

- There is low confidence and trust that American Indian rights and interests are considered when decisions are proposed and made for actions to be taken on BLM- or Forest Service-administered lands.
- American Indian values on federal lands may be affected by proposed actions on forestlands and rangelands because of changes in vegetation structure, composition, and density; existing roads; and watershed conditions.
- Indian tribes do not feel that they are involved in the decision-making process commensurate with their legal status. They do not feel that government-to-government consultation is taking place.
- Culturally significant species such as anadromous fish and the habitat necessary to support healthy, sustainable, and harvestable populations conistitute a major, but not the only, concern for all factors that keep the ecosystem healthy. American Indian people have concern for all factors that keep the ecosystem healthy.

Integrated Summary of Forestland, Rangeland, and Aquatic Integrity

Individual 4th-field Hydrologic Unit Codes (HUCs), also known as sub-basins, were rated for integrity from separate aquatic, terrestrial, and hydrological viewpoints. These viewpoints, or integrity layers, were then analyzed together, or integrated, to provide a more unified view. This effort revealed groups or clusters of sub-basins that exhibit a similar set of conditions or characteristics, reflecting a common management history; terrestrial and aquatic conditions, and management needs, opportunities, risks, and conflicts.

The integrated cluster summaries provided a project-wide context for the EIS team to tailor alternatives and evaluate their effects on a more site-specific scale (a few million acres) within the 144-million-acre project area. The cluster analysis also provides a context for evaluating cumulative effects.

The Clusters

Six forest clusters and six range clusters were delineated in the project area.

Forest Clusters: Sub-basins with at least 20 percent of their area composed of dry forest, moist forest, or cold forest potential vegetation groups were classified as forest clusters. Relationships among variables reflecting vegetative conditions, hydrologic sensitivity, and human-caused disturbance of native forests were studied to identify dominant patterns and differences. What emerged were six forest "clusters" of sub-basins with similar conditions.

Range Clusters: Selected sub-basins with at least 20 percent of their area composed of dry grass, dry or cool shrub, woodland, and dry forest potential vegetation groups were classified as range clusters. Relationships among variables reflecting vegetative conditions, hydrologic sensitivity, and human-caused disturbance were also used in a similar, but not identical, way as forest clusters. Range cluster analysis identified dominant patterns and differences between subsets of these variables. What emerged were six range clusters, where sub-basins within clusters were more like each other than sub-basins in other clusters.

Measuring Integrity

Current **ecological integrity** was based on the analysis of the 164 sub-basins within the project area. Relative integrity ratings (high, moderate, low) were assigned by sub-basin for forestlands, rangelands, forest and rangeland hydrology, and aquatic systems. At present, 26 percent of the land in the project area that is administered by the BLM or Forest Service is in high, 28 percent in moderate, and 46 percent in low ecological integrity areas.

Description of Alternatives

Each alternative is characterized by themes, goals, objectives, and standards. Achieving such management objectives may require alteration of the physical and biological environment. The alternatives also include guidelines (see Appendix 3-2), which are suggested actions that are designed to minimize the adverse effects associated with modifying the landscape.

Management Emphasis

For each alternative, one of six management emphases was given to each forest and range cluster, depending on the theme of the alternative. The management emphases are Conserve-Restoure, Produce, Conserve-Restore, Conserve-Produce, and Restore-Produce. The three primary empahses are briefly defined as follows.

Conserve is a management emphasis on protection and maintenance of forest, rangeland, and aquatic conditions, health, and integrity. Management recognizes that natural processes dominate the landscape and gradual change will occur. **Restore** is a management emphasis designed to move ecosystems to desired conditions and processes, and/or to healthy forestlands, rangelands, and aquatic systems. A variety of management-induced activities dominate the landscape. **Produce** is a management emphasis directed at providing, growing, or making goods and services available for human needs and/or desires, while sustaining productivity and maintaining associated values. Under Produce strategies, consumption-based activities dominate the landscape. This management strategy is applied to areas available and suitable for resource production in order to provide goods and services.

Alternatives

Alternative 1 (No Action) continues management specified under existing Forest Service and BLM land-use plans, as amended by the Northwest Forest Plan. Implementation of this alternative would occur assuming recent budgets. Analysis of a No Action alternative is a requirement of the National Environmental Policy Act (NEPA) and BLM and Forest Service planning procedures. This alternative displays the likely outcome of federal agencies' use of existing plans to manage lands and resources into the future.

The No Action Alternative includes direction from 31 National Forest plans and 44 BLM plans in the project area (15 National Forest plans and 13 BLM plans in the Eastside planning area), which were prepared between 1975 and 1995. Although substantial variation exists among agency plans, the general management approach is to emphasize or accommodate sustained timber, wood fiber, and livestock forage production in an environmentally prudent manner while managing and protecting other resources and values. Timber and livestock management are integrated and coordinated with the maintenance or enhancement of wildlife and fish habitat, scenic quality, recreation opportunities, and other resource values to achieve overall multiple use goals and objectives. On many areas, management of other resources or values such as recreation, wilderness, big game and fish habitat, or cultural resources is emphasized.

Many current land-use plans were based on the assumption of healthy ecosystem conditions. With a general focus on production from forestlands, many current plans rely on even-aged management practices leading to forests characterized by a regulated forest of early- to mid-seral structures, and controlled densities and patterns. A minimum level of late/old structures and habitats was planned. On

Table S-1. Management Emphases for Alternative 1 (Project Area)

	% of All Forest Clusters	Forest Cluster No.	% of All Range Clusters	Range Cluster No.
Management Emphasis				
Conserve	10	1	8	2
Produce	57	3, 4, 5	67	1, 4, 5, 6
Produce/Conserve	33	2, 6	25	3

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rangelands, vegetation management is focused on providing forage for livestock and wildlife while protecting forage productivity and coordinating with other resource uses.

Alternatives 1 and 2 are based on existing land and resource management plans currently being implemented by the BLM or the Forest Service. Each plan has desired future conditions or other expectations, and since the plans range from six to twenty years old, there is a high degree of variation in the desired future conditions among the plans.

Lands managed by the BLM or Forest Service will continue to provide a mix of natural resource-based goods and services. Management focuses on providing resource outputs including timber, livestock forage, wildlife, and minerals while also providing for other multiple uses and values including aesthetics, recreation opportunities, viewable wildlife, and clean air and water. Current management has improved some conditions on public lands. Resource management emphasis continues to vary among National Forests and BLM districts based on the character of the land and resources, and public interests. Timber harvest and livestock outputs are planned to be near levels produced when the plans were approved. Timber production is planned only in areas classified as suitable for such production. Because BLM-administered lands and some National Forests tend to be grasslands and shrublands, the general management perspective is to produce forage for livestock grazing, wildlife, and wild horses at or near levels when plans were approved. In general, most lands are open and accessible for mineral and energy resource exploration and development.

Alternative 2 applies recent interim direction as the long-term strategy for lands managed by the Forest Service or BLM. The interim direction was developed to retain options for management of affected federal lands while this environmental impact statement was being developed. Specific direction is described in the following decision notices:

- Implementation of Interim Strategies for Managing Anadromous Fish-producing Watersheds in Eastern Oregon and Washington, Idaho, and Portions of California (PACFISH), February 24, 1995; Applies to all or parts of Malheur, Ochoco, Okanogan, Umatilla, and Wallowa-Whitman National Forests, and Prineville, Spokane and Vale BLM Districts.
- Interim Management Direction Establishing Riparian, Ecosystem and Wildlife Standards for Timber Sales (Eastside Screens), May 20, 1994; amended June 5, 1995; riparian standards were replaced July 31, 1995; Applies to all or parts of Colville, Deschutes, Fremont, Malheur, Ochoco, Okanogan, Umatilla, Wallowa-Whitman and Winema National Forests. PACFISH is used as the riparian screen requirement.
- Inland Native Fish Strategy (INFISH), July 28, 1995. Applies to all or parts of Colville, Deschutes, Fremont, Malheur, Ochoco, Okanogan, Wallowa-Whitman, and Winema National Forests.

The interim direction emphasizes protection and maintenance of aquatic, riparian, and wildlife resources while using conservative approaches to management. Direction for PACFISH and INFISH does not overlap. All other direction from current plans (Alternative 1) would also continue into the future; the direction described in Alternative 1 applies to those areas not covered by interim direction.

Under Alternative 2, forestlands and rangelands managed by the Forest Service and BLM continue to provide a mix of natural resource-based goods and services. On forestlands not subject to timber management activities, desired future conditions are also the same as described in Alternative 1. On areas subject to timber

Table S-2. Management Emphases for Alternative 2 (Project Area).

	% of All Forest Clusters	Forest Cluster No.	% of All Range Clusters	Range Cluster No.
Management Emphasis				
Conserve	43	1, 2, 6	33	2, 3
Conserve/Restore	26	5	NA	NA
Produce/Conserve	31	3, 4	67	1, 4, 5, 6

management and/or areas within designated riparian areas in key/priority watersheds, some differences in desired range of future conditions from Alternative 1 apply.

Features Common to Alternatives 3 through 7

Goals were the foundation for developing alternatives. They are broad general statements of intent that are neither quantified nor time-specific. A set of goals common to Alternatives 3 through 7 was developed from the Purpose and Need because it is recognized that any ecosystem management strategy must simultaneously achieve a number of common conditions and outcomes. Alternatives 3 through 7 would address each goal to varying degrees.

Goal 1. Sustain and where necessary restore the health of forest, rangeland, aquatic, and riparian ecosystems.

Goal 2. Provide a predictable, sustained flow of economic benefits within the capability of the ecosystem.

Goal 3. Provide diverse recreational and educational opportunities within the capability of the ecosystem.

Goal 4. Contribute to recovery and de-listing of threatened and endangered species.

Goal 5. Manage natural resources consistent with treaty and trust responsibilities to American Indian tribes.

Alternative 3 updates existing Forest Service and BLM land use plans in response to changing conditions (such as declining forestland and rangeland health, local economies at risk, and declining salmon runs), while minimizing changes to local plans and relying on local public needs and desires. Each National Forest or BLM District would emphasize local public input to determine a desired mix of uses, services, restoration and management actions consistent with ecosystem principles to incorporate into the land use plans. Direct involvement with state, county, and tribal governments will be used in planning, decision-making, and implementation of programs.

The emphasis in this alternative is to make minimal modification to existing plans to allow them to be more effective, integrated, and consistent in the face of changed ecological conditions and increasing numbers of appeals and lawsuits. Only those priority conditions that most hinder the effectiveness of existing plans are addressed in this alternative and distinguish it from the No Action Alternative (Alternative 1). This alternative provides a broader dimension and more integrated management direction regarding priority large-scale issues that cross administrative boundaries than do Alternatives 1 or 2.

Alternative 4 is designed to aggressively restore ecosystem health, the results of which would resemble endemic disturbance processes including insects, disease, and fire. The alternative focuses on short-term vegetation management to improve the likelihood of moving towards or maintaining ecosystem processes that function properly in the long-term. Vegetation management is designed to reduce risks to property, products, and economic and social opportunities that can result from large disturbance events. Direct involvement with state, county, and tribal governments will be used in planning, decision-making, and implementation of programs.

The priority in this alternative is placed on forestland, rangeland, and watershed health, assuming that healthy streams, wildlife populations, and economic and social benefits will follow. Actions taken to achieve desired

Table S-3. Management Emphases for Alternative 3 (Project Area).

	% of All Forest Clusters	Forest Cluster No.	% of All Range Clusters	Range Cluster No.
Management Emphasis				
Conserve	NA	NA	8	2
Conserve/Restore	28	1, 6	25	3
Restore	54	2, 3, 5	19	5
Restore/Produce	18	4	48	1, 4, 6

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Table S-4. Management Emphases for Alternative 4 (Project Area).

	% of All Forest Clusters	Forest Cluster No.	% of All Range Clusters	Range Cluster No.
Management Emphasis				
Conserve/Restore	10	1	8	2
Restore	90	2, 3, 4, 5, 6	92	1, 3, 4, 5, 6

conditions are designed to produce economic benefits whenever practical. A wide variety of management tools are available under this alternative.

Alternative 5 emphasizes production of goods and services at the sub-regional level consistent with the principles of ecosystem management. Biological capability and economic efficiency are used to determine relative priority uses for an area, rather than local demands and traditional uses. Areas that are best able to produce products, goods or services, or desired conditions are targeted to do so within the ecological capability of the area. Other uses also are expected to exist when they do not conflict with or diminish the priority uses. While a full range of conditions, products, and services may not be provided in all localities, the desired range of conditions, products, and services will be met on a regional (project area) basis. Direct involvement with state, county, and tribal governments will be used in planning, decision-making, and implementation of programs.

In this alternative, the EIS team identified areas best able to produce goods, services, or desired conditions, within the ecological capability of the land. Five resource priorities were considered: timber, livestock, aquatic resources, wildlife, and recreation. The assumption used inbuilding this alternative was that each forest and range cluster has a primary management priority and some have a secondary priority. Other uses are likely to occur, but any conflicts would be resolved in favor of the priority uses.

Alternative 6 emphasizes an adaptive management approach to restore and maintain ecosystems and provide for the social and economic needs of people. While much knowledge of natural resource management has been acquired through experience and research, ecosystems are complex, and knowledge of the functions and processes that make up ecosystems is limited. Management strategies will be adjusted based on information gained from continued research and monitoring of ecological, social, and economic conditions and from direct input from state, county, and tribal officials.

Table S-5. Management Emphases and Priorities for Alternative 5 (Project Area).

	% of All Forest Cluster	Forest Cluster No.	% of All Range Cluster	Range Cluster No.	Forest Cluster Priority	Range Cluster Priority
Management Emphasis						
Conserve	10	1	7	2	Recreation/Aquatics	Recreation/Aquatics
Conserve/Restore	15	2	25	3	Aquatics/Recreation	Recreation/Wildlife
Restore	39	3, 5	NA	NA	Aquatics/Timber/ Livestock	NA
Restore/Produce	18	6	35	1, 6	Wildlife/Recreation	Livestock/Timber/ Wildlife
Produce	18	4	NA	NA	Timber/Wildlife	NA
Produce/Conserve	NA	NA	33	4, 5	NA	Wildlife/Livestock/ Recreation

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This alternative is similar to Alternative 4 but takes a slower, more cautious approach; implies the use of experimental processes, local research, and extensive monitoring; is expected to take longer to reach desired conditions; and has built-in uncertainty over which management actions will prove to be the most effective.

Under this alternative, actions are implemented on a broad-scale basis only when previous monitoring results or scientific research demonstrate that the actions are effective in achieving desired outcomes. Restoration activities that are well studied and well understood are pursued as actively under Alternative 6 as under Alternative 4. Priorities for restoration are generally in high hazard or high risk areas with high or moderate potential for success.

Alternative 7 emphasizes reducing risk to ecological integrity and species viability by establishing a system of reserves on lands administered by the Forest Service or BLM. Reserves are located to include all representative vegetation types and are large enough so natural process can occur without the influence of humans and still maintain the communities they were selected to represent. The level of human use and management is very low within the reserves. When disturbance events occur, actions are taken to reduce the likelihood of the event extending beyond the boundary of the reserve. Management of reserves is focused on long-term maintenance of natural processes and conditions with which plant and animal species have evolved. Most restoration activities occur on lands managed by the Forest Service or the BLM outside reserves, although restoration actions are taken within reserves where there is a high risk for events occurring in the short term that would preclude achieving desired outcomes in the long term. Management outside the reserve boundaries include an emphasis on conserving remaining old forest stands and roadless areas larger than 1,000 acres. Direct involvement with state, county, and tribal governments will be used in planning, decision-making, and implementation of programs.

Reserves were selected for their representation of vegetation and rare animal species. No commercial timber harvest is permitted inside reserves, but limited silvicultural activities are allowed to enhance species viability. Livestock grazing is strictly limited to improve the long-term conditions for which the reserve was established. Dispersed, low-impact recreation use is allowed, including hunting and fishing, as long as these activities do not affect populations or habitats of rare species.

An emphasis of Alternative 7 is to restore fire as a natural disturbance process. However, limited management efforts may occur for some conditions where human action is considered necessary to achieve objectives of the reserves. The areas outside the reserves, sometimes referred to as the matrix, will be generally managed more actively.

Objectives and Standards

An index to the objectives and standards for the alternatives is included here. The full description of this management direction can be found in Table 3-5 in Chapter 3.

Management Activities Summary

Tables S-8 and S-9 summarize the levels of management activity that the EIS team assumed would occur in the first 10 years across the Eastside planning area. These numbers were derived by applying rule sets developed by the EIS team to the results of a vegetation succession model (CRBSUM) used for the Interior Columbia Basin Ecosystem Management Project.

Table S-6. Management Emphases for Alternative 6 (Project Area).

	% of All Forest Clusters	Forest Cluster No.	% of All Range Clusters	Range Cluster No.
Management Emphasis				
Conserve/Restore	28	1, 6	52	2, 3, 5
Restore	72	2, 3, 4, 5	48	1, 4, 6

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Table S-7. Management Emphases for Alternative 7 (Project Area).

	% of All Forest Clusters	Forest Cluster No.	% of All Range Clusters	Range Cluster No.
Management Emphasis				
Conserve	43	1, 2, 6	52	2, 3, 5
Conserve/Restore	57	3, 4, 5	48	1, 4, 6

Table S-8. Management Activities in Forest Clusters (Eastside Planning Area).

Alternative	Harvest	Thin	Prescribed Burning	Watershed Restoration
		Acres (thousands per decade)		
1	1235-1665	405-545	325-435	190-255
2	640-860	425-575	325-435	305-415
3	870-1180	640-860	955-1295	305-415
4	935-1265	765-1035	1380-1870	600-820
5	1065-1440	615-835	895-1210	485-660
6	765-1035	725-975	1255-1695	530-720
7	240-320	260-350	1005-1355	190-255

Table S-9. Management Activities in Range Clusters (Eastside Planning Area).

Alternative	Livestock Management	Improve Rangelands	Prescribed Burning	Riparian Restoration
		Acres (thousands per decade)		
1	355-485	240-320	180-240	30-50
2	1045-1415	240-320	180-240	30-50
3	1045-1415	705-955	315-425	80-110
4	1750-2370	965-1305	355-475	90-125
5	970-1310	535-725	230-310	80-110
6	1750-2370	595-805	355-485	90-125
7	645-875	240-320	305-415	70-90

Index to Objectives and Standards in Table 3-5

Implementing Ecosystem Management

EM-O1 **Implement ICBEMP using multi-scaled hierarchical analysis**
EM-O2 **Implement ICBEMP using collaborative intergovernmental approach**

Sub-basin Review

EM-O3 **Conduct brief sub-basin reviews**
- EM-S1 Complete sub-basin reviews within 1-3 years
- EM-S2 Things to consider during sub-basin review
- EM-S3 Collaborative, interagency sub-basin review shall prioritize EAWS
- EM-S4 Use sub-basin review for EAWS and land use plan revisions

Ecosystem Analysis at the Watershed Scale

EM-O4 **Conduct ecosystem analysis at the watershed scale (EAWS)**
- EM-S5 Federal Guide for EAWS shall be used
- EM-S6 Line officers shall set the scope of EAWS
- EM-S7 Category 1 sub-basins EAWS "trigger"
- EM-S8 Listed, Proposed, Candidate species EAWS "trigger"
- EM-S9 Low road density EAWS "trigger"
- EM-S10 Large blocks of native rangeland EAWS "trigger"
- EM-S11 Screening process to exempt activities from EAWS
- EM-S12 Four-year transition period in Category 2 and 3 sub-basins
- EM-S13 Restrictions on modifying standards, including RMOs and RCAs
- EM-S14 Use EAWS to provide context for land management activities

Physical Environment

Soil Productivity

PE-O1 **Maintain soil productivity**
PE-O2 **Maintain riparian soils to ensure high quality water**
PE-O3 **Develop soil productivity protection and restoration programs**
PE-O4 **Restore and maintain nutrient cycling**
- PE-S1 Recommendations for managing coarse woody debris
- PE-S2 Recommendations for amounts of coarse woody debris after wildfire
- PE-S3 Recommendations for large diameter standing live and/or dead wood

Air Quality

PE-O5 **Protect air quality/comply with Clean Air Act requirements**
- PE-S4 Assess management activities that may affect air quality

Terrestrial Strategies

TS-O1 **Maintain and promote native plant communities**
- TS-S1 Maintain or improve native plant communities

Fire Disturbance Processes

TS-O2 **Restore fire as natural disturbance process**
TS-O3 **Rehabilitate disturbed areas**
- TS-S2 Rehabilitate/revegetate disturbed areas with ecologically appropriate species
- TS-S3 Use native species in rehabilitation seedings
- TS-S4 Rest burned areas from grazing to maintain soil productivity

Index to Objectives and Standards in Table 3-5 (continued)

Noxious Weeds

TS-O4 **Manage noxious weeds across jurisdictional/political boundaries**
- TS-S5 Implement IWM strategy/ 7 steps of strategy
- TS-S6 Implement IWM strategy on forest lands

TS-O5 **Implement IWM strategy on rangelands**
- TS-S7 Implement steps of IWM strategy, Range Clusters 2 (alts 3,4,&7 outside); 2 and 4 (alt 5); and 2,3,&5 (alt 6)
- TS-S8 Implement steps IWM strategy, Range Clusters 3 (alts 3 & 5); and 1,3,4, 5& 6 (alt 4)
- TS-S9 Implement steps IWM strategy, Range Cluster 5 (alt 3 & 5)
- TS-S10 Implement steps IWM strategy, Range Clusters 1,4,&6 (alt 3&7 outside); 1&6 (alt 5); 1,3,4,5,&6 (alt 6)

Forest Lands

Dry Forest

TS-O6 **Restore ecosystem processes /Dry Forest**
- TS-S11 Increase ppine and wlarch in mature/old single & multi-story forests
- TS-S12 No harvest of dominant or co-dominant ppine outside reserves
- TS-S13 No silvicultural treatments in mature/old forests outside reserves
- TS-S14 No commercial harvest in dry forest terrestrial reserves

TS-O7 **Manage suitable lands to produce commodities/maintain ecosystem**

Moist Forest

TS-O8 **Restore ecosystem processes /Moist Forest**
- TS-S15 Maintain viability of and increase western white pine
- TS-S16 Plant blister-rust-resistant stock/increase western white pine
- TS-S17 Increase dominance of early successional, shade-intolerant species
- TS-S18 No harvest of dominant or co-dominant ppine outside reserves
- TS-S19 No silvicultural treatments in mature/old forests outside reserves
- TS-S20 No commercial harvest in moist forest terrestrial reserves

TS-O9 **Manage suitable lands to produce commodities/maintain ecosystem**

Cold Forest

TS-O10 **Restore ecosystem processes /Cold Forest**
- TS-S21 Maintain viability of/increase whitebark pine and subalpine larch

TS-O11 **Manage suitable lands to produce commodities/maintain ecosystem**

Rangelands

TS-O12 **Restore or maintain rangeland health**
- TS-S22 Implement strategies to maintain/restore watershed function
- TS-S23 On dry shrublands, manage grazing during/after drought years

TS-O13 **Produce livestock forage while restoring ground cover and productivity**

TS-O14 **Reduce encroachment of junipr, conifers, and sagebrush**

TS-O15 **Restore dry grass/dry shrub/cool shrub**
- TS-S24 No livestock grazing in reserves
- TS-S25 No range improvement projects in reserves

TS-O16 **Produce livestock forage and conserve cool shrub/dry shrub/dry grass/RC5**

Aquatic / Riparian Strategies

AQ-O1 **Emphasize riparian and aquatic processes and functions**

AQ-O2 **Maintain high quality aquatic and riparian habitat**

AQ-O3 **Protect high quality waters and identify and maintain habitats**

AQ-O4 **Category 1 sub-basins: Maintain watersheds**

AQ-O5 **Restore watersheds where they have been degraded**

AQ-O6 **Implement watershed restoration activities based on priorities**

Index to Objectives and Standards in Table 3-5 (continued)

AQ-O7 Category 2 sub-basins: Maintain strongholds and restore watersheds
AQ-O8 Timber and livestock priority areas: Conserve species strongholds
AQ-O9 Category 3 sub-basins: Maintain strongholds
AQ-O10 Manage riparian vegetation consistent with site potential

Watershed and Riparian Restoration

AQ-S1 Watershed restoration projects to promote long-term ecological integrity
AQ-S2 Attain PFC as a first step
AQ-S3 Develop watershed plans for instream structures and road obliteration/reconstruction
AQ-S4 Offset new sediment-producing activities with sediment abatement
AQ-S5 Design fish/wildlife habitat restoration/enhancement to attain RMOs

Timber Management

AQ-S6 Forest vegetation management in RCAs
AQ-S7 Zone 1 - management to achieve or maintain characteristic stream/valley conditions
AQ-S8 Zone 2a - manage as buffer to Zone 1
AQ-S9 Zone 1 and 2a - not included in suitable timber base
AQ-S10 Zone 2b - manage as additional buffer to Zones 1 and 2a

Grazing Management

AQ-S11 Priorities for revising AMPs based on sub-basin reviews
AQ-S12 Attaining PFC and RMOs
AQ-S13 Limit handling efforts to not prevent attainment of RMOs
AQ-S14 New livestock handling facilities to be located outside RCAs
AQ-S15 No livestock grazing in RCAs in or adjacent to designated critical habitat
AQ-S16 Suspend grazing where riparian protection can't be implemented
AQ-S17 Adjust wild horse management to avoid impacts to RMOs/aquatic resources

Minerals Management

AQ-S18 Locatable minerals - Avoid or minimize adverse impacts to aquatic resources
AQ-S19 Locate structures outside of RCAs where practicable
AQ-S20 Mine wastes and toxic chemicals
AQ-S21 Leasable minerals - No surface occupancy in RCAs
AQ-S22 Restrictions on sand and gravel extraction within RCAs
AQ-S23 Develop inspection, monitoring, and reporting requirements

Recreation Management

AQ-S24 Prevent or minimize adverse effects to from recreation facilities in RCAs
AQ-S25 Design recreation facilities to not retard/prevent attainment of RMOs
AQ-S26 Existing recreation facilities in RCAs to not prevent attainment of RMOs
AQ-S27 Fish/wildlife user facilities to not prevent attainment of RMOs
AQ-S28 Adjust recreation practices that retard or prevent attainment of RMOs

Fire Suppression/Fuels Management

AQ-S29 Fuel treatment/fire suppression to not prevent attainment of RMOs
AQ-S30 Fire suppression activities restrictions in RCAs
AQ-S31 Locate centers for fire incident activities outside of RCAs
AQ-S32 Prohibit delivery of chemicals to surface waters
AQ-S33 Prescribed burns/prescriptions consistent with attainment of RMOs
AQ-S34 Prohibit backfire operations that increase fire intensities in RCAs
AQ-S35 Establish team to develop rehab plan to attain RMOs

Lands/Permits/Facilities

AQ-S36 For hydro projects, require instream flows to maintain resources
AQ-S37 Complete EAWS prior to issuing water conveyance permits
AQ-S38 Determine/establish instream flow requirements for species needs
AQ-S39 Revoke conveyance permits for those without state water rights

Index to Objectives and Standards in Table 3-5 (continued)

AQ-S40 All water conveyance intakes shall meet established standards
AQ-S41 Conveyance permits require best methodology to conserve water
AQ-S42 Hydroelectric ancillary facilities to not prevent attainment of RMOs
AQ-S43 New developments that may adversely affect RCAs not permitted
AQ-S44 Leases, permits, etc., to avoid effects inconsistent with attainment of RMOs

Additional Riparian Management
AQ-S45 Eliminate or reduce risks from transport of toxic chemicals
AQ-S46 Develop contingency plans for chemical spills or contamination
AQ-S47 Herbicides etc. to not retard or prevent attainment of RMOs
AQ-S48 Prohibit storage of fuels and toxicants within RCAs
AQ-S49 Locate water drafting sites to avoid adverse effects on aquatics
AQ-O11 Manage grazing in wetlands to prevent impairment of functions
AQ-O12 Minimize disturbance to redds for candidate & sensitive species
AQ-S50 Manage livestock to prevent disturbance to redds for T,E,P species
AQ-S51 Manage livestock to minimize impacts on redds for C & S species

Water Quality
AQ-O13 Maintain and improve water quality
AQ-S52 Maintain water quality in Outstanding Resource Waters
AQ-S53 Comply with state or tribal anti-degradation requirements
AQ-S54 Comply with TMDLs in Water Quality Limited segments
AQ-S55 Incorporate state WQLS priority lists into intergovernmental prioritization process
AQ-S56 Adjust activities to meet water quality standards
AQ-O14 Develop management actions supported by EAWS to restore WQLS

Terrestrial and Aquatic Species and Habitats

HA-O1 Restore and/or maintain and habitat conditions

Viable populations
HA-O2 Provide habitat for viable populations, recovery of listed spp, social needs
HA-S1 Manage habitats for long-term viability, especially edge of range
HA-S2 Management to restore vegetation composition, linkage, patch size
HA-S3 Restore/maintain habitats for free movement between habitat blocks
HA-S4 Improve/restore linkages at known habitat bottlenecks
HA-S5 Develop mature/old forest structural definitions
HA-S6 Analysis and strategies for mature/old structure stands
HA-S7 Use local analysis to develop snag levels
HA-S8 Use local analysis to develop downed wood levels
HA-S9 Manage firewood programs consistent with snag and downed wood standards
HA-S10 Restore mountain mahogany, bitterbrush, quaking aspen
HA-S11 Restore native plants on important wild ungulate winter range
HA-S12 Protect bat roost sites and hibernacula

Protection/Restoration of Listed Species Habitats
HA-O3 Restore or protect habitat for listed species; manage habitat to prevent listing
HA-S13 Manage habitats to recover special status species, prevent listings
HA-O4 Manage rangelands for special status species habitat requirements
HA-O5 Provide for continued existence and long-term conservation of species

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Index to Objectives and Standards in Table 3-5 (continued)

Recovery of Federally Listed Aquatic and Terrestrial Species

HA-O6 Contribute to range-wide recovery of federally listed or proposed species
- HA-S14 Implement recovery plans, document departures
- HA-S15 Apply standards & guides from recovery documents for raptors
- HA-S16 Adopt IGBC grizzly bear resource management guidelines/situations
- HA-S17 Management activities consistent with IGBC access management recommendations
- HA-S18 Habitat mapping/cum effects in high road density recovery areas
- HA-S19 Evaluate IGBC strategy for reducing grizzly bear mortalities, Selkirk and Cabinet/Yaak

Wildlife and Livestock Conflicts

HA-O7 Management practices to reduce conflicts: livestock / carnivores & bighorn / domestic sheep
- HA-S20 Minimize conflicts between carnivores and livestock mgt. practices
- HA-S21 Reduce potential disease transmission between bighorn / domestic sheep

Human Uses and Values

Collaboration

HU-O1 Foster support of decisions by promoting collaboration - broad range
HU-O2 Foster support of decisions by promoting collaboration - intergovernmental
- HU-S1 Initiate MOU to offer advice to federal land managers

Economic Activity

HU-O3 Derive soc/econ benefits, promote commercial activities
HU-O4 Efficiently deliver goods and service from FS/BLM-administered lands
HU-O5 Minimize large annual shifts in commercial activity
HU-O6 Emphasize customary economic uses in rural communities
HU-O7 Contribute to economic diversity/local economic development goals
HU-O8 Collaborate with local entities for compatibility of land uses
HU-O9 Reduce risk of life/property loss due to wildfire; decrease costs
- HU-S2 Involve locals in development of coordinated fuel management plans

Recreation Opportunities

HU-O10 Supply recreation opportunities consistent with public policies/abilities
- HU-S3 Use ROS to meet recreation management goals

HU-O11 Identify opportunities to provide public access for recreation
HU-O12 Foster and strengthen partnerships to manage facilities & services
HU-O13 Meet visual quality objectives
HU-O14 Maintain or enhance scenic integrity

Cultural Resources

- HU-S4 Survey and evaluate significance of federal lands for cultural resources
- HU-S5 Evaluate and nominate sites to NRHP
- HU-S6 Assess site-specific projects for effects on cultural resources

Transportation and Utility Corridors

HU-O15 Ensure reliable and buildable utility corridors
- HU-S7 Use 1993 Western Regional Utility Corridor Study as reference

HU-O16 Ensure access essential for corridor infrastructure maintenance
- HU-S8 Provide access to and maintenance of existing utility ROW

HU-O17 Encourage integrated ROW vegetation management to minimize impacts

Index to Objectives and Standards in Table 3-5 (continued)

Federal Trust Responsibility and Tribal Rights and Interests

Government-to-Government Cooperation and Relations

TI-O1 **Maintain government-to-government relationship with affected tribes**
- TI-S1 Use consistent approach to government-to-government consultation
- TI-S2 Agreements with tribal governments regarding repatriation procedures
- TI-S3 Recognize tribal management efforts and work cooperatively
- TI-S4 Cooperate with tribes to restore/research treaty/trust resources

TI-O2 **Assess sense of place and incorporate into management**
- TI-S5 Complete place assessments as part of ecosystem analysis

Habitat Conditions

TI-O3 **Recognize native plant communities as traditional resources**
- TI-S6 Establish programs for restoration/maintenance of native plant communities
- TI-S7 Provide habitat conditions to support harvestable resources
- TI-S8 Consider protection/restoration of treaty resources on ceded lands
- TI-S9 Assess habitat where it has social/ traditional importance
- TI-S10 Adopt aquatic conservation strategy
- TI-S11 Least restrictions on tribes to implement ESA conservation measures

Road Management

RM-O1 **Cooperate with partners on road design, operations, maintenance**

Road-related Adverse Effects

RM-O2 **Reduce road-related adverse effects**
- RM-S1 Reduce road-related adverse effects
- RM-S2 Timber and livestock priority areas: management actions to not increase erosion, sediment
- RM-S3 Conduct Road Condition/Risk Assessment
- RM-S4 Develop or revise Access and Travel management plans
- RM-S5 Reduce effects on aquatic, riparian, terrestral species and habitats
- RM-S6 Determine habitat effectiveness ratings to reduce risk caused by human access
- RM-S7 Design and improve culverts to accommodate 100-year floods

Road Density

RM-O3 **Reduce road density where roads have adverse effects**
- RM-S8 Decrease road miles in High and Extreme road density classes
- RM-S9 Use existing transportation networks in High & Extreme classes

Road Construction

RM-O4 **New road construction to prevent or minimize adverse effects**
- RM-S10 Roads and landings should be outside RCAs
- RM-S11 Timber and livestock priority areas: no roads within 150' of active channel margins
- RM-S12 Maintain/restore fish passage, spawning, etc.
- RM-S13 Avoid high hazard areas, prevent sediment delivery to streams and RCAs
- RM-S14 Prohibit side casting in RCAs
- RM-S15 Don't increase road density by more than one density class in areas with none/low/ very low road densities
- RM-S16 No road construction in reserves or unroaded areas > 1,000 acres

Index to Objectives and Standards in Table 3-5 (continued)

Adaptive Management / Monitoring

Adaptive Management

AM-O1 **Make appropriate adjustments in management strategies**

- AM-S1 Use adaptive management principles
- AM-S2 Adjustments to 'reserve' boundaries

Monitoring

AM-O2 **Monitor changes in conditions and take action to meet ecosystem managment goals**

- AM-S3 Develop integrated intergovernmental monitoring and evaluation protocol
- AM-S4 Implement annual monitoring programs at various scales
- AM-S5 Critical monitoring shall be implemented immediately
- AM-S6 Update riparian monitoring within grazing allotments
- AM-S7 Use monitoring to modify management actions to achieve objectives

Accountability

A-O1 **Line officers are accountable for implementation**

- A-S1 State Directors/Regional Foresters ensure accountability
- A-S2 Develop interagency implementation MOU
- A-S3 Provide opportunities for participation in implementation oversight
- A-S4 Implement accountable, measurable standards

Environmental Consequences

The Science Integration Team (SIT) was directed by the Project Charter to assess, based on the best information available, the tradeoffs, consequences, outcomes, and interactions associated with each alternative. To the extent possible, the evaluations linked the biological, cultural, social, and economic concerns at various scales. The EIS team developed the array of alternatives and a set of evaluation criteria based on the Purpose and Need statement, the issues, and the goals. Outcomes of each alternative were evaluated relative to (a) maintaining and/or restoring forest, rangeland, riparian, and aquatic health and productivity; (b) maintaining economic, social, and cultural systems; and (c) contributing to meeting federal trust responsibilities to American Indian tribes.

Summary of Key Effects and Conclusions

Physical Aspects of the Ecosystem

Soils and Soil Productivity

- In forestlands, Alternative 6 has the highest likelihood of reducing soil disturbances from current, followed closely by Alternatives 4 then 3, then by Alternatives 5, 2, 7 and 1. Because of the uncertainty associated with Alternative 7, reduction of soil disturbance could range from low to high, and could trend towards high in the long term. In rangelands, Alternative 3 has the highest likelihood of reducing soil disturbance from current, followed closely by Alternatives 5 and 6, then 4. Alternative 7 has a moderate likelihood of reducing soil disturbance from current, followed by Alternative 2. Alternative 1 is likely to increase soil disturbance from current levels, due largely to the increase in exotic plant invasion. Alternative 7 would have the highest likelihood of restoring floodplain and riparian soil functions in rangelands because the level of grazing disturbance would be about half that of the other alternatives. Actual effects on soil productivity from soil disturbance will depend on the type, extent, and method of disturbance, and existing condition of the soil and vegetation — all factors that cannot be adequately characterized at this scale.
- Alternatives 4 and 6 would have a higher likelihood of restoring and conserving organic matter and woody material to the soil ecosystem than the other alternatives because of the required minimum levels of coarse woody debris, and standing and downed large trees. Alternative 7 (inside reserves) would have highly variable levels of organic matter and wood because of unpredictable fire effects, but levels are expected to approach minimum requirements, particularly in the long term. Alternatives 3 and 5 are less likely to restore and conserve organic matter and woody material needed for sustainable soil productivity because of lower required minimums and the lack of large standing and downed trees. Amounts of organic matter and wood in Alternatives 1 and 2 are generally unspecified, and areas where soil productivity has declined due to loss of organic matter and coarse wood may continue to decline because of overall lack of consideration of soil requirements.
- Vegetation conditions similar to natural or historical range of variability, are more likely to maintain a stable and available nutrient supply, and thus sustain soil productivity and reduce risk of nutrient loss from uncharacteristic fire. Alternatives 3, 4, 5, and 6 are likely to result, more quickly, in achieving vegetation conditions similar to the historical range of variability, both in the short term and long term. An exception is Alternative 3, which may show greater departure of some forested landscapes from the historical range of variability. Alternatives 1, 2, and 7 have less emphasis than the other alternatives in achieving vegetation conditions similar to the historical range of variability, and consequently are less likely to result in sustainable soil and nutrient conditions; while Alternative 7 is fairly similar to Alternatives 3 through 6 in rangelands, it would not be as effective in reducing exotic weeds. Alternatives 1 and 2 would likely result in continuing and increasing departures of forested landscapes from the historical range of variability in forestlands and would not be effective in arresting the spread of exotics in rangelands.

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- Alternative 4 provides the highest levels of watershed restoration and road closures that would restore hydrologic and soil function. Alternative 3, followed by Alternative 6, then Alternative 5 have fairly high levels of restoration focused at restoring hydrologic and soil function. Alternative 7 has high levels of road closures, but because it takes a more passive approach to restoration, it is anticipated that the majority of closures would only block access and, therefore, may present a higher risk to soil and hydrologic function in the short term than if they remained open. Alternative 5 would result in less watershed restoration and road closures that restore hydrologic and soil function than Alternatives 3, 4, 6, and 7; Alternatives 1 and 2 would have much lower levels than the other alternatives. Consequently, Alternatives 1 and 2 are not expected to improve soil and hydrologic function where it has declined. Where watershed and road restoration is focused in riparian areas, and where riparian vegetative cover is increased, floodplain and riparian area soils are most likely to improve.

Air Quality

- The dispersion modeling assessment indicates that there may be significantly greater impacts from wildfires than from prescribed burning. However, due to limitations of this analysis, comparison of the model estimates with the National Ambient Air Quality Standards is not possible. Compliance of prescribed burning impacts with the National Ambient Air Quality Standards should be evaluated at a subsequent planning level.
- Increased haziness (a reduction in viewing distance and ability to detect finer features on the landscape) would likely result from the increases in prescribed burning proposed in Alternatives 3 through 7. Large wildfires result in more of the project area affected by haze. It can be inferred that the higher concentrations of emissions associated with these wildfires would reduce visibility in affected areas more so than the highest levels of prescribed fire. However, a higher frequency of visibility impacts would result from prescribed fire than wildfire.
- Other criteria pollutants are not likely to have an impact on public health because of the small levels produced and the rapid dilution or modification of these substances within relatively short time frames. However, the potential effects of air pollutants impacting plants and animals on public lands could be mitigated by managing to minimize stress and through monitoring. The effects of alternatives on landscape health provide an indicator for reducing stress on plant and animal habitats with Alternatives 3, 4, 6, and 7 having the greatest ability, and Alternatives 1, 2, and 5 providing almost no improvement in landscape health that would reduce stress. Monitoring and prediction of potential effects with feedback to the EPA would be best addressed under Alternatives 6, 4, and 3 respectively, with 7 and 5 at moderate levels, and 2 and 1 at the lowest levels.

Terrestrial Aspects of the Ecosystem

Effects on Trends on Forestlands

- Overall, Alternatives 4 and 6 would be most effective in changing forest conditions to a more desirable pattern of forest structural stages and composition. They would reverse these current undesirable trends: high amounts of mid-seral in the dry and moist forests, high amounts of late-seral multi-layer in the dry and moist forests, less late-seral single-layer in the dry forests, fewer large trees and shade-intolerant species. Alternatives 3 and 5 would have slower transitions than Alternatives 4 and 6. They would be less effective in restoring desirable structure and composition on the landscape. Alternatives 1, 2, and 7 would be the least effective overall in reversing current declining trends in forest health.
- All alternatives would reduce the amount of late-seral multi-layer in the dry and moist forests within 100 years. Alternative 1 would result in the greatest reduction in the amount of late-seral multi-layer in the dry and moist forests. In the short and long term under Alternatives 2 and 7, the amount of late-seral multi-layer in the dry and moist forests would be greater than that historically.
- Alternatives 1 and 2 would lead to reductions in interior ponderosa pine, western larch, and western white pine.

- Alternatives 3 through 7 (outside reserves) would lead to increases in late-seral single-layer in the dry forests and increases in interior ponderosa pine, western larch, western white pine, and large tree components in the short and long term.
- Alternatives 3 through 7 would reduce the amount of mid-seral in the moist forests. Alternatives 1 and 2 would have relatively greater increases in this community in the long term.

Effects on Trends Toward Desired Conditions in Forested Potential Vegetation Groups

- In the long term, forested potential vegetation groups would move toward the desired range of future condition more effectively under Alternatives 3, 4, 5, and 6 than under Alternatives 1, 2, and 7.

Effects on Successional and Disturbance Processes Across the Project Area

- In Alternatives 1, 2, and 5 (in timber priority areas), young forest structures would tend to be relatively more uniform in spacing and size, with smaller patch sizes and lower representation of large tree components than for Alternatives 3, 4, 6, and 7.
- Alternatives 4 and 6 would result in young, mid-seral, and late-seral forest structures, composition, and disturbance patterns that are more similar to historical conditions than the other alternatives. These alternative would be the most successful in restoring western larch, western white pine, interior ponderosa pine, whitebark pine, alpine larch, and large tree components.
- Alternatives 3 and 7 (outside reserves) would result in a mixture of uniform and non-uniform tree size and spacing in the young forest stage. Alternative 7 (inside reserves) would result in uncharacteristically large patch sizes of young forest in the short term.
- Alternatives 1 and 2 would have more forests move from late-seral to mid-seral, and from mid-seral and late-seral single-layer to late-seral multi-layer forest structure than the other alternatives. These alternatives would result in forest structures and compositions that are most dissimilar to historical conditions.
- Alternatives 3 through 7 (outside reserves) would have higher transitions of mid- seral and late-seral multi-layer to late-seral single-layer in the dry forests than the other alternatives.

Effects on Insects and Disease

- Alternatives 1, 2, and 7 would produce forest structure and composition with the highest susceptibility to insects and disease.

Effects on Fire Regimes

- Under Alternatives 1, 2, and 7 the amount of wildfire in dry and moist forests would be less than historical levels but the amount of crown fire in dry forests would approximate historical levels. Alternatives 3, 4, 5, and 6 would have lower levels of wildfire than the other alternatives in all forest potential vegetation groups.

Rangelands

- Alternatives 4 and 3 are predicted to be the most effective in reducing the spread of noxious weeds and cheatgrass on rangelands in the project area. Alternatives 6 and 7 would be the next most effective, followed by Alternative 5, with Alternatives 2 and 1 being the least effective. No alternative was predicted to reduce the acres of infestations on dry grassland. Alternatives 3 and 4 were predicted to decrease the acres of noxious weed infestations, in general, on the dry and cool shrublands. Differences among alternatives would be due to differing management activity levels and the differing emphases of control efforts, related to the number of acres treated, location of treatment, and type of noxious weed species treated. Alternative 4 proposes the most acres of noxious weed control and the greatest emphasis of implementation of the integrated weed management strategy; therefore, it is projected to be the most effective alternative with regard to reducing the spread of noxious weeds and cheatgrass.
- Alternatives 4, 3, 6, and 7 are predicted to be the most effective in reducing the encroachment or density of woody species on rangelands in the project area. Alternative 5 would be the next most effective, and Alternatives 2 and 1 would be the least effective. It is predicted that Alternative 4

and possibly Alternative 3 would meet the desired range of future condition (DRFC) with regard to reducing woody species encroachment or density problems. Differences among alternatives would be due to differing management activity levels and differing emphases of control efforts, related to the number of acres treated and the location of treatment. Alternative 4 proposes the highest levels of prescribed burning and harvesting of woody species; therefore it is predicted to be the most effective with regard to reducing woody species encroachment or density.

- Alternatives 4, 3, and 6, respectively, are predicted to be the most effective in restoring rangeland vegetation in the project area. Alternative 7 would be the next most effective, followed by Alternative 5. Alternatives 2 and 1 would be the least effective. These alternatives would not have an effect on restoration of rangeland vegetation types on non-federal lands. The ranking of alternatives was based on their relative predicted ability to restore rangeland vegetation types that have been taken over by noxious weeds or by woody species, such as juniper, on BLM- or Forest Service-administered lands. Differences among alternatives are due to similar factors as those for noxious weeds and woody species control.
- Alternatives 4 and 6 would be the most effective in reducing fragmentation and loss of connectivity on rangelands in the project area. Alternative 7 would be the next most effective, followed by Alternative 3. Alternatives 5, 2, and 1 would be the least effective. Most restoration activities would be undertaken under Alternatives 3 through 7 after consideration of fragmentation and connectivity issues. Standards and guidelines in Alternatives 4 and 6 would be the most effective in reducing fragmentation and loss of connectivity due to the implementation of management actions that reduce existing problems and do not cause further problems.
- Alternatives 4, 6, and 7 are predicted to be the most effective in restoring slow-to-recover rangelands (not infested with exotics) in the project area. Alternative 3 would be the next most effective, followed by Alternative 5. Alternatives 2 and 1 would be the least effective. Restoration activities such as range vegetative improvements and livestock management improvements, would be the highest in Alternatives 3 and 4 (range improvements) and Alternatives 4 and 6 (livestock management improvements).
- Alternatives 7, 4, and 6 would be the most effective in reducing wildlife displacement and vulnerability to mortality on rangelands in the project area. Alternative 3 would be the next most effective, followed by Alternative 5. Alternatives 2 and 1 would be the least effective. Differences among alternatives are due to relative effects of road closure, road use, and human activity. Alternative 7 would reduce wildlife displacement and vulnerability to mortality through existence of the reserves.
- The amount of wildfire would be much less than historical levels on rangelands because of fire exclusion, with the exception of the dry shrub potential vegetation group in Alternatives 1, 2, and 7. For all range potential vegetation groups Alternatives 3, 4, 5, and 6 would have lower levels of wildfire than the other alternatives.

Terrestrial Species

- Currently there are 62 species in the Eastside planning area with unfavorable habitat outcomes (Outcome Class 4 or 5). Implementation of Alternatives 4, 6, and 7 would result in 41, 41, and 45 species with unfavorable habitat outcomes; and Alternatives 3, 5, 2, and 1 would result in 55, 56, 57, and 59 species with unfavorable outcomes.
- On average, Alternatives 4, 6, and 7 would provide the highest likelihood of species persistence and viability over the next 100 years. These alternatives emphasize restoration of habitats, which would likely reverse negative trends for most species because of improved management, riparian emphasis, and proposed activities that would have varying degrees of positive effects on some habitats and species.
- Alternative 1 would result in the highest number of species with increased risk of extirpation or loss of viability because it lacks the increased emphasis on restoration of forestland, rangeland, and riparian habitats of the other alternatives.
- Alternatives 4, 6, and 7 would result in more species with improved likelihood of

persistence than with increased risks of extirpation, due to improved habitat conditions through restoration of uplands and riparian communities.

- Alternatives 1 and 5 would result in more species with increased risk of extirpation or viability loss than with improved likelihood of persistence and viability. Activity levels expected under these alternatives would result in higher levels of traditional management, which is assumed to result in some risk to species.
- Alternatives 3 and 7 would result in an approximately equal number of species with increased risks of extirpation and improved likelihood of persistence and viability, due in part to the intermediate levels of restoration in upland and riparian communities.
- Alternatives 1, 2, and 5 would result in more species with increased risk of extirpation than with improved likelihood of persistence and viability. Activity levels expected under these alternatives would result in higher levels of habitat modification, which is assumed to result in some risk to species.
- Human access and its direct and indirect effects on wildlife species are most appropriately addressed at finer scales. However, in relative terms, Alternatives 6 and 7 would result in lower levels of human activity and therefore lower impact levels. Alternatives 1 and 5 are predicted to have the highest levels of human activity and therefore the highest level of impacts to wildlife from access and related activities. Alternatives 2, 3, and 4 would result in intermediate levels of impacts associated with access.
- Grizzly bear and Columbian sharp-tailed grouse have undergone the greatest change in habitat conditions, from historical to current times. Historically both species were widely distributed; however, current habitat for both species is greatly reduced, and populations are isolated. Non-federal lands will continue to limit populations of these species.
- Implementation of any alternative except Alternative 1 would result in improved chances of persistence and viability for a few species ("increasers").
- Implementation of any alternative would result in some risk of extirpation or reduced habitat outcomes for some species ("decreasers"), because of cumulative effects on all lands.
- Under Alternatives 1 and 5, if a species were trending toward extirpation based on the changes from historical to current conditions, that trend would be continued. In comparison, under Alternatives 4 and 6, predicted negative trends in habitat would tend to be stopped or slowed down.
- There would be little change in overall outcomes for the majority of species analyzed under any alternative. This result is based on current and projected future populations and habitat conditions, and on the fact that most species respond to habitat changes at finer scales than this evaluation portrays.
- None of the alternatives approach historical conditions (habitats or population) for the 119 vertebrate and 22 plant species analyzed. Loss of habitat both on and off federal land contributes to this condition.
- Threatened or endangered plants would have outcomes indicating a risk of extirpation or viability loss, primarily due to reduced habitat conditions and availability and to limited population sizes, compared to historical conditions. No alternative would change this condition because many of these plants are locally endemic with little chance to expand habitat or populations and are difficult to analyze at this scale. However, protection will be provided for these species under provisions in the Endangered Species Act and recovery and conservation plans.
- Habitats of threatened or endangered wildlife species do not demonstrate a substantial change in any alternative at the broad scale of analysis. The one exception is the bald eagle, which shows an improved likelihood of persistence and viability under Alternatives 4 and 6 due to riparian emphases.
- Major exceptions to this list of summary findings are those for woodland birds. Alternatives 4 and 6 would result in the least favorable outcomes for woodland birds, because of proposed reductions in extent of juniper woodlands, in which the reduced extent would more closely approximate the historical range of variability.

Effects on Aquatic Systems

Aquatic Aspects of the Ecosystem

- Specific outcomes (such as water quantity, water quality, instream and riparian area habitat conditions) from the alternatives pertaining to lakes, streams, rivers, and riparian areas and wetlands were not predictable without site-specific NEPA analysis.
- In Alternatives 1 and 2, ecosystem management would not be emphasized, and there would not likely be watershed-scale consideration and protection of hydrologic and riparian area/wetland processes and functions. This would likely result in continued degradation of lakes, streams, and rivers.
- In Alternatives 3 through 7, ecosystem management would be emphasized, thus facilitating management for multiple ecological goals and long-term ecological sustainability on a landscape basis. Ecosystem management would provide a mechanism to effectively prioritize activities and weigh multiple risks to various resources. Furthermore, ecosystem management direction in Alternatives 3 through 7 would more readily foster implementation of adaptive management and analysis of cumulative effects than the approaches of Alternatives 1 and 2. It is expected that these features of Alternatives 3 through 7 would aid in overall improvement in lakes, streams, rivers, and riparian areas and wetlands.
- Alternative 4, with its higher activity levels, could pose greater short-term risks to aquatic ecosystems than would the slower activity rates and amounts of Alternative 6 and the restrictive and passive approach of Alternative 7, although lack of watershed and road restoration in Alternative 7 could pose greater risks to aquatic ecosystems in the long term.
- Watershed restoration levels would be greatest for Alternatives 4 and 6 and are expected to result in greater long- and short-term benefits to lakes, streams, rivers, riparian areas, and wetlands compared to other alternatives. However, greater uncertainty would be associated with Alternative 4, because requirements for Ecosystem Analysis at the Watershed Scale are less and therefore the context to reduce risk and maximize potential benefits from restoration actions may not be provided.
- In Alternatives 3 through 7, adjustment of standards supported by Ecosystem Analysis at the Watershed Scale in concert with broad-scale planning and sub-basin review would likely meet the intent of ecosystem management and integration of landscape, terrestrial, aquatic, and social objectives. Alternatives 4, 5, and 6 would offer more flexibility than Alternative 7 with respect to activities permitted in riparian areas and wetlands. Alternative 6 would provide the most management options because site-specific NEPA analysis could be used in some areas for up to four years to adjust ICBEMP standards. This adjustment process would maximize opportunities for adaptive management. Since less hierarchial analysis would be required in Alternative 4, implementation of restoration actions would occur faster than in other alternatives. However, uncertainty of meeting the intent of ecosystem management and integration of objectives would be greater than Alternative 6 because of the lack of incentive to modify and integrate objectives and standards that fit watershed-scale processes and functions. There would also be risks associated with the lack of active landscape and watershed restoration in Alternative 7, especially in the long term.
- Alternatives 2 through 7 would adequately protect ecological functions within riparian areas and wetlands except for the timber priority areas of Alternative 5. Within timber priority areas of Alternative 5, the size of the riparian conservation areas would not likely be adequate to fully protect aquatic resources, primarily because of their limited widths and lack of protection for intermittent streams. Within livestock priority areas of Alternative 5 (including large parts of the Northern Great Basin, Columbia Plateau, and Owyhee Uplands ERUs), priority areas for protection of riparian areas would not be established. Even so, to meet proper functioning condition objectives within timber and livestock priority areas, degradation of riparian areas would cease and some restoration would begin.
- Alternative 1 would have no consistent planning-area-wide direction for riparian area protection and is predicted to not adequately protect riparian functions.

Effects on Aquatic Species

- The current composition, distribution, and status of most native fish species within the planning area would remain stable under Alternative 2 and remain stable or improve under Alternatives 3, 6, and 7. The greatest potential for improvement occurs with Alternatives 6 and 7. Alternative 4 has similar potential to benefit native species as Alternatives 6 and 7, but uncertainty in the ability to prioritize management actions and evaluate risks, coupled with high levels of activities, decreases confidence in successful ecological outcomes. Improvements in distribution and status are linked to levels of watershed and riparian restoration and other management activities within the species' current range. Most native fishes' distribution and status would continue to decline under Alternatives 1 and 5 inside timber and livestock priority areas due to inconsistent and inadequate riparian and aquatic protection measures in all or part of species' current ranges.
- Benefits of any alternative are linked to improved instream and riparian conditions resulting from better riparian management, higher levels of watershed and riparian restoration, and Ecosystem Analysis at the Watershed Scale. Successful ecological outcomes from Alternatives 4 and 6 depend on efficient prioritization of restoration actions and maximizing adaptive management to minimize risk. Alternative 7 could pose risks to isolated and fragmented populations because of the lack of active forest, rangeland, and watershed restoration, raising uncertainty about long-term improvements in the more depressed and fragmented portions of species' ranges.
- Alternatives 1, 2, and 5 would result in the continued decline in the overall status and distribution of steelhead and stream-type chinook salmon stocks due to a minimal emphasis on restoration and continued land disturbance in portions of the current range over the long term. None of the alternatives address the need for a comprehensive approach to alleviate mortality outside BLM- or Forest Service-administered lands to ensure persistence and viability of steelhead or stream-type chinook salmon stocks.
- Downstream stresses associated with the hydropower system are one of the major causes of declining Snake River anadromous fish populations (NPPC 1986; NMFS 1992). Federal efforts are underway to address these problems through increased spill, barging, and monitoring. Mid-Columbia anadromous stocks (for example, John Day and Deschutes Rivers) are influenced less by hydropower due to a lower number of dams below spawning and rearing areas. Maintenance of high-quality habitats is vital to the persistence of populations, but the magnitude of effects varies from sub-basin to sub-basin. In general, it remains important to restore degraded watersheds where habitat is most limiting to fish, to improve egg-to-smolt survival over current conditions. High-quality habitat alone, however, is no guarantee of increased persistence without a comprehensive approach that addresses all mortality factors. Additional high quality habitat alone could increase abundance of individual fish, but it would not likely reverse current negative population trends in the short-term. Salmon population numbers in much of the interior Columbia Basin are far below what current habitat conditions could likely support under a scenario of increased downriver survival.
- None of the alternatives would be expected to measurably affect the habitat needs of ocean-type chinook salmon because they inhabit lower-elevation mainstem river habitats that are less responsive to federal land management. Alternatives 6 and 7 have the most conservative approach and might result in some benefit to ocean-type chinook salmon if management actions improve water quality and quantity. None of the alternatives address the need for a comprehensive approach to alleviate mortality outside BLM- or Forest Service-administered lands to ensure persistence and viability of ocean-type chinook salmon stocks.

Human Uses and Values

- Alternatives involving substantial change from current direction, especially if different from conventional management strategies, would likely be less predictable in their outcomes in the short term. In the long term, predictability would improve as experience is gained and new strategies are proven effective. Alternatives 4, 6, and 7, which emphasize restoring ecosystems by managing for more desirable and predictable disturbance regimes, would likely experience

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less short-term predictability in the delivery of services so that long-term predictability is improved. Alternatives 1 and 2 may be more predictable in the short term but would result in future disturbance regimes that are less predictable. Alternatives 3 and 5 may lie somewhere in between.

- Active restoration actions at the wildland-urban interface to reduce fire-related risks may increase risk of unintended disturbances in the short term. This would apply especially to Alternatives 4, 3, and 6. With successful restoration results, long-term risk in these areas should drop below current levels. However, a policy of lowering risk at the wildland-urban interface through public investments by the Forest Service and BLM may encourage more private investments and incursions in this zone, which could further increase risks to people and property.
- The current trend in livestock grazing shows a decline of 7 percent per decade. Only Alternative 5 would be expected to lessen this decline. Alternatives 2, 3, 4, and 6 would show a slight additional decline, with little difference among them. Alternative 7 would show the greatest decline because of restricted livestock grazing in reserves.
- Alternatives 1, 3, 4, 5, and 6 would show a first decade increase in timber volume harvested relative to the past few years. All alternatives would produce less than the 10-year average harvest level. All alternatives would show harvest volume outputs less than the combined National Forest allowable sale quantity value.
- Alternatives 3, 4, 6 and 7 would establish an extensive network of Riparian Conservation Areas (RCAs) that would likely result in a reduction in the suitable timber base and long-term sustained yield on National Forests. The extent and configuration of RCAs could also constrain operations in areas available for timber production and forest areas targeted for restoration treatments.
- Planned restoration activities would generate jobs — fewer than wood products manufacturing but more than ranching. Alternatives 4, 3, and 6 would concentrate a larger proportion of total restoration investments (and jobs) at the wildland-urban interface (generally areas with high socio-economic resiliency) than other alternatives. It is inferred that economically vulnerable areas (low socio-economic resiliency) would benefit proportionally less (in terms of jobs) under these alternatives.
- Recreation opportunities on Forest Service- and BLM-administered lands in the project area would not vary measurably by alternative, but some trends are evident. A slight shift would be expected from primitive-type use to roaded natural-type use where areas with very low road densities experience more road development. This outcome is most likely in Alternatives 1 and 5. There could be a small reduction in dispersed roaded recreation caused by road density reductions in Alternatives 3, 4, 5, and 6, with a substantial reduction in Alternative 7. There could be reduced opportunity for water-based recreation because of potential access restrictions associated with new standards for RCAs, especially in Alternatives 3 through 7.
- Changes in the economic resiliency of counties or communities resulting from implementing alternatives cannot be reliably predicted at this broad scale. The current economic vulnerability of counties can be determined and used to infer potential future effects. Areas identified as economically vulnerable (using a measure like socioeconomic resiliency) would benefit most economically from more management activities and from concentrating activities in these areas. Alternatives 1, 3, and 5 may be most responsive to this need. Economically vulnerable areas are expected to bear the most social and economic costs of changing land management strategies because they tend to be more economically reliant on employment in natural resource industries.

American Indians and Tribes

- Generally, Alternatives 3, 4, 6, and 7 would provide the best response to agency need for appropriate levels of government-to-government consultation. This is expected given that Alternatives 1 and 2 would not address the inconsistencies in tribal consultation between agency administrative units or emphasize a more effective consultation process as found in Alternatives 3 through 7. Also, Alternatives 5 and 7 would limit opportunities for consultation and access to agency policy-making by providing up-front structure to management decisions through identified priority (Alternative 5) or reserve (Alternative 7) areas. Alternatives 4, 6, and 7

appear to be most responsive to federal trust responsibilities and tribal rights and interests, as these alternatives would provide highest levels of habitat consideration for trust resources.

- Alternative 5 would provide fewer opportunities for collaboration or consultation with tribes because it makes decisions for management emphasis for different areas across the project area.

- Alternatives 3, 4, 6, and 7 would be most responsive to those issues of interest to tribes. This includes provisions for ethno-habitats and forculturally significant places and resources in management decisions. The collective reasons for this are based on how these alternatives would provide for: (a) a meaningful agency-tribal consultation process; (b) projections of ecological integrity trends; and (c) overall aquatic and terrestrial projections of identified tribal interest species' habitats rated for viability concerns.

- Tribes share an over-riding concern and interest for healthy functioning ecosystems in the project areas, and for land management that would provide biophysical trends toward their socially desired range of future condition. Those alternatives that appear most responsive to such federal trust responsibilities and tribal rights and interests are Alternatives 3, 4, 6, and 7 as they would provide the highest levels of consideration for major ecosystem components, such as aquatic integrity; rangeland and forestland regulation processes, patterns, functions and structures; and hydrologic systems.

- The alternatives differ in the rate and degree at which trends in ecological integrity would occur due to a combination of factors including: (a) differing rates in application of aquatic and riparian habitat protections as found in Alternatives 2 through 7 and especially Alternatives 3, 4, 6, and 7; (b) method of land management activities; and (c) the primary factors contributing to composite ecological integrity and landscape ecology trends (see the Composite Ecological Integrity section). These would benefit most under Alternatives 3, 4, 6, and 7.

Effects on Ecological Integrity and Social/ Economic Resiliency

- Summing across all the Forest Service- and BLM-administered lands within the planning area shows that the alternatives would provide very different outcomes in overall ecological integrity trends.

- Alternatives 3, 4, 6, and 7 would show mostly upward trends over time. These alternatives have consistent aquatic/riparian conservation strategies coupled with either passive or active restoration/conservation management emphasis. Restoration actions would focus on restoring biophysical processes, functions, structures, and patterns across the landscape. Alternatives 4 and 6 would show the highest upward trends. Alternative 7 would have many upward trends but is also projected to show some downward trends in the reserves and in some unroaded areas. Over time, natural disturbance events such as fire, insects, and disease would tend to be of higher intensity and more unpredictable, especially within reserves.

- Alternatives 1, 2, and 5 are less focused on restoration of ecological processes, functions, structures, and patterns and would have less consistency in managing aquatic/riparian resources. They would also have less emphasis on reducing impacts from roads. Alternatives 1 and 5 would have more management emphasis on production, which can increase risks to aquatic, riparian, and terrestrial resources. Under these alternatives, many subbasins would become ecologically stable over time, but many would also show downward trends.

Managing Multiple Risks and Future Trends

Alternatives 3 through 7 have more emphasis on recognizing these risks than Alternatives 1 and 2. Alternatives 4 and 6 would more actively respond to these multiple risks, especially in placing emphasis on hazard reductions from fire in concert with aesthetics and habitat needs. Alternative 7 would pose greater risks from wildfire, insect, and disease outbreaks in some

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areas, as natural disturbances may not always be contained within reserves. Alternative 5 places emphasis on these risks, but it would be a more variable response due to different levels of management priority throughout the planning area.

Cost Analysis of the Alternatives

- Based on total annual implementation costs of the alternatives, it appears that Alternatives 3, 4, and 5 present the greatest relative increase in costs compared to Alternatives 1 and 2. Not all activities and costs which may or may not be directly or indirectly affected by the EIS were included in the cost calculation tables. For example, the annual cost estimate for Alternative 2 is substantially less than the total estimated annual budgets for the Forest Service and BLM.
- Some requirements can be considered costs additional to current agency land management. For example, the costs of an Integrated Weed Management strategy for rangelands. Some costs represent no additional cost, rather a re-prioritizing of existing resources to meet the broad scale ecosystem objectives of an alternative.
- The sensitivity analysis estimated the costs and likelihood of funding of activities empahsized in each alternative. For example, an expensive new program would be highly sensitive, while a traditionally funded activity such as timber harvest would be low sensitivity.
- A comparison of alternatives shows that Alternative 1 would have the highest proportion of projected activities which may be least sensitive to funding, with 60 percent of the costs in the "low sensitivity" category for each alternative. At the other end of the spectrum, Alternative 7 would be the most sensitive to funding the "high" or "moderate to high" sensitivity categories. Alternatives 3, 4, and 6 would fall in the middle.

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