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 in the upper Columbia River Basin; and (5) To replace interim management strategies (PACFISH and Inland Native Fish Strategy) 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 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 (UCRB) EIS covers approximately 45 million acres of agency-administered lands.

The planning area for the Eastside EIS includes lands 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.

Proposed Action

The Forest Service and BLM propose to develop and implement a coordinated, scientifically sound, ecosystem-based management strategy for lands they administer in the upper Columbia River Basin.

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 subregional 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 subregional and regional ecosystem basis; (7) Provide opportunities for cultural, recreational, and aesthetic experiences; (8) Provide long-term management direction to replace interim strategies (PACFISH 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 subregional 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 UCRB EIS are expected to amend current BLM and Forest Service land-use plans, Forest Service regional guides, 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 that 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 subbasins), 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 subbasins 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. Generally, greater declines in soil quality and productivity are associated with greater intensities of vegetation management, increased road construction, and livestock grazing.

◆ 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 soils 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, resulting in impaired soil processes and function, such as decreased porosity and infiltration, and increased surface erosion.

◆ 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 size component of wood, and risk of uncharacteristic fire.

◆ Floodplain and riparian area soils have 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 Canadian border to dry areas in the Snake River Plain.

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 lives in these areas. 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 and grizzly bear, which are listed as threatened; peregrine falcon, woodland caribou, gray wolf, and five molluscs listed as endangered; and spotted frog, mountain plover, and northern Idaho ground squirrel which are candidates for listing. The Forest Service and/or 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 UCRB 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 61 percent of the UCRB 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 cover 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 type 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 38 percent of the UCRB 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 rangeland 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 needing special attention (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 meet management objectives, 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. Special attention is given to native fish species, especially wide-ranging salmon and trout species.

**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) and improper livestock grazing.

◆ Flow regimes of streams, rivers, and lakes throughout the UCRB planning area have been extensively altered by dams, diversions, and control of lake outlets. 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 UCRB planning area, some Forest Service- or BLM-administered streams are Water Quality Limited as defined by the Clean Water Act. On Forest Service-administered lands in the project area, 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.

◆ Streams and rivers are highly variable across the project area, reflecting diverse physical settings and disturbance histories. Nevertheless, 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 subbasins 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 UCRB planning area that are federally listed under the Endangered Species Act as threatened are the Lahontan cutthroat trout, and Snake River chinook salmon (both the spring/summer and fall runs). Endangered species include the Snake River sockeye salmon and Kootenai River white sturgeon. Bull trout is a candidate species.

Wild chinook salmon and steelhead are near extinction in a major part of their remaining distribution.

Habitat, hydropower development, harvest and 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 the affected 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 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 the upper Columbia River Basin. 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 new residents is
encroaching on previously undeveloped
areas adjacent to lands administered by
the Forest Service or BLM. New
development can put stress on the
political and physical infrastructure of
rural communities, diminish habitat for
wildlife, and increase agency costs to
manage fire to protect new development.

◆ A wide variety of uses of Federal lands in
the UCRB contribute to the regional
economy and to local economies. At the
regional level recreation is an important
use of Federal lands in terms of economic
value and amount of use. Most recreation
use is tied to roads and accessible water
bodies, although primitive and semi-
primitive recreation is important. At the
local level there are communities that rely
on economic contributions from forest
products, livestock grazing, mining, and
recreation. Forest products and livestock
grazing, while no longer solely dictating
the economic prosperity of the region,
remain economically and culturally
important in rural areas distant from
population centers and not sharing in
regional growth.

◆ The public has invested in building road
systems on agency lands in the UCRB
planning area, primarily to serve
commodity uses. On National Forest
System lands, commercial timber harvest
has financed 90 percent of the
construction cost and 70 percent of the
maintenance cost. Recreation now
accounts for 60 percent of the use.
Trends in timber harvesting and new
road management objectives make the
cost of managing these road systems an
issue of concern.

◆ Costs of fire suppression on Federal lands
in the UCRB have increased markedly in
recent years and are expected to continue
to increase, unless actions are taken to
address fuel loading and vegetation
structure, composition, and density.

◆ For those counties that have benefitted
from Federal sharing of gross receipts
from commodities 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, bidding
methods, export restrictions, and small
business set-asides of timber sales have
been the major policy tools on Forest
Service-administered commercial forest
lands. Regulation of grazing practices has
been most important policy tool on BLM-
administered rangelands.

◆ The factors that appear important in
making 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 how land-use choices
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.

◆ Residents in the interior Columbia River
Basin indicate strong support for a variety
of land-use activities, but public opinion is
divided on some issues where a choice
and trade-offs are required. Trust or
confidence in the Forest Service and BLM
as land managers is strong at the national
level, less so at the regional level. There is
increased public interest in having a greater
role in natural resource decision-making.

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 (16 with interest in the UCRB
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. Over thirty Plateau bands historically occupied the northern portion of the interior Columbia 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 constitute a major, but no the only concern. American Indian people have concern for all factors that keep the ecosystem healthy.

Integrative Summary of Forestland, Rangeland, and Aquatic Integrity

Individual 4th-field Hydrologic Unit Codes (HUCs), also known as subbasins, 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 subbasins 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: Subbasins 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 subbasins with similar conditions.

Range Clusters: Selected subbasins 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 subbasins within clusters were more like each other than subbasins 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 H), 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, Restore, Produce, Conserve-Restore, Conserve-Produce, and Restore-Produce. The three primary emphases 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. 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 (16 National Forest plans and 31 BLM plans in the UCRB planning area), which were prepared between 1975 and 1990. 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

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

<table>
<thead>
<tr>
<th>Management Emphasis</th>
<th>% of All Forest Clusters</th>
<th>Forest Cluster No.</th>
<th>% of All Range Clusters</th>
<th>Range Cluster No.</th>
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<td>2</td>
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<td>Produce</td>
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<td>3, 4, 5</td>
<td>67</td>
<td>1, 4, 5, 6</td>
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<td>2, 6</td>
<td>25</td>
<td>3</td>
</tr>
</tbody>
</table>
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 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 seven 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:


- **Inland Native Fish Strategy (INFISH), July 28, 1995:** Applies to all National Forests in Idaho except the Bridger-Teton and Targhee and applies to BLM-administered lands in Idaho and Montana for bull trout.

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.

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

<table>
<thead>
<tr>
<th>Management Emphasis</th>
<th>% of All Forest Clusters</th>
<th>Forest Cluster No.</th>
<th>Range % of All Forest Clusters</th>
<th>Range Cluster No.</th>
</tr>
</thead>
<tbody>
<tr>
<td>Conserve</td>
<td>43</td>
<td>1, 2, 6</td>
<td>33</td>
<td>2, 3</td>
</tr>
<tr>
<td>Conserve/Restore</td>
<td>26</td>
<td>5</td>
<td>NA</td>
<td>NA</td>
</tr>
<tr>
<td>Produce/Conserve</td>
<td>31</td>
<td>3, 4</td>
<td>67</td>
<td>1, 4, 5, 6</td>
</tr>
</tbody>
</table>
desired future conditions are also the same as described in Alternative 1. On areas subject to timber 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 each 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,

<table>
<thead>
<tr>
<th>Management Emphasis</th>
<th>% of All Forest Clusters</th>
<th>% of All Range Clusters</th>
<th>Range Cluster No.</th>
</tr>
</thead>
<tbody>
<tr>
<td>Conserve</td>
<td>NA</td>
<td>8</td>
<td>2</td>
</tr>
<tr>
<td>Conserve/Restore</td>
<td>28</td>
<td>1, 6</td>
<td>3</td>
</tr>
<tr>
<td>Restore</td>
<td>54</td>
<td>2, 3, 5</td>
<td>5</td>
</tr>
<tr>
<td>Restore/Produce</td>
<td>18</td>
<td>4</td>
<td>1, 4, 6</td>
</tr>
</tbody>
</table>

Table S-3. Management Emphases for Alternative 3 (Project Area).
assuming that healthy streams, wildlife populations, and economic and social benefits will follow. Actions taken to achieve desired 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 products, 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 in building 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.

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

<table>
<thead>
<tr>
<th>Management Emphasis</th>
<th>% of All Forest Clusters</th>
<th>Range Cluster No.</th>
</tr>
</thead>
<tbody>
<tr>
<td>Conserve/Restore</td>
<td>10</td>
<td>1</td>
</tr>
<tr>
<td>Restore</td>
<td>90</td>
<td>2, 3, 4, 5, 6</td>
</tr>
</tbody>
</table>

In this alternative, the EIS team identified areas best able to produce products, 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 in building 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.

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

<table>
<thead>
<tr>
<th>Management Emphasis</th>
<th>% of All Forest Cluster</th>
<th>Range Cluster No.</th>
</tr>
</thead>
<tbody>
<tr>
<td>Conserve</td>
<td>10</td>
<td>1</td>
</tr>
<tr>
<td>Conserve/Restore</td>
<td>15</td>
<td>2</td>
</tr>
<tr>
<td>Restore</td>
<td>39</td>
<td>3, 5</td>
</tr>
<tr>
<td>Restore/Produce</td>
<td>18</td>
<td>6</td>
</tr>
<tr>
<td>Produce</td>
<td>18</td>
<td>4</td>
</tr>
<tr>
<td>Produce/Conserve</td>
<td>NA</td>
<td>NA</td>
</tr>
</tbody>
</table>

In this alternative, the EIS team identified areas best able to produce products, 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 in building 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.
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 includes 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

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

<table>
<thead>
<tr>
<th>Management Emphasis</th>
<th>% of All Forest Clusters</th>
<th>Forest Cluster No.</th>
<th>% of All Range Clusters</th>
<th>Range Cluster No.</th>
</tr>
</thead>
<tbody>
<tr>
<td>Conserve/Restore</td>
<td>28</td>
<td>1, 6</td>
<td>52</td>
<td>2, 3, 5</td>
</tr>
<tr>
<td>Restore</td>
<td>72</td>
<td>2, 3, 4, 5</td>
<td>48</td>
<td>1, 4, 6</td>
</tr>
</tbody>
</table>

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

<table>
<thead>
<tr>
<th>Management Emphasis</th>
<th>% of All Forest Clusters</th>
<th>Forest Cluster No.</th>
<th>% of All Range Clusters</th>
<th>Range Cluster No.</th>
</tr>
</thead>
<tbody>
<tr>
<td>Conserve</td>
<td>43</td>
<td>1, 2, 6</td>
<td>52</td>
<td>2, 3, 5</td>
</tr>
<tr>
<td>Conserve/Restore</td>
<td>57</td>
<td>3, 4, 5</td>
<td>48</td>
<td>1, 4, 6</td>
</tr>
</tbody>
</table>
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 UCRB 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>
<thead>
<tr>
<th>Alternative</th>
<th>Harvest</th>
<th>Thin Burning</th>
<th>Prescribed Restoration</th>
<th>Watershed</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Acres (thousands per decade)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>1</td>
<td>1125-1525</td>
<td>640-860</td>
<td>525-715</td>
<td>320-435</td>
</tr>
<tr>
<td>2</td>
<td>470-635</td>
<td>510-690</td>
<td>525-715</td>
<td>715-965</td>
</tr>
<tr>
<td>3</td>
<td>785-1065</td>
<td>850-1150</td>
<td>1040-1410</td>
<td>715-965</td>
</tr>
<tr>
<td>4</td>
<td>725-975</td>
<td>1085-1465</td>
<td>1575-2130</td>
<td>1075-1455</td>
</tr>
<tr>
<td>5</td>
<td>935-1265</td>
<td>915-1235</td>
<td>915-1235</td>
<td>725-980</td>
</tr>
<tr>
<td>6</td>
<td>445-605</td>
<td>935-1265</td>
<td>1295-1755</td>
<td>910-1230</td>
</tr>
<tr>
<td>7</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Alternative</th>
<th>Livestock Management</th>
<th>Improve Rangelands</th>
<th>Prescribed Burning</th>
<th>Riparian Restoration</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Acres (thousands per decade)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>1</td>
<td>425-575</td>
<td>270-370</td>
<td>205-275</td>
<td>35-45</td>
</tr>
<tr>
<td>2</td>
<td>1250-1690</td>
<td>270-370</td>
<td>205-275</td>
<td>35-45</td>
</tr>
<tr>
<td>3</td>
<td>1250-1690</td>
<td>815-1105</td>
<td>465-625</td>
<td>100-140</td>
</tr>
<tr>
<td>4</td>
<td>2210-2990</td>
<td>990-1340</td>
<td>465-625</td>
<td>100-140</td>
</tr>
<tr>
<td>5</td>
<td>1250-1690</td>
<td>475-645</td>
<td>210-280</td>
<td>100-140</td>
</tr>
<tr>
<td>6</td>
<td>2210-2990</td>
<td>475-645</td>
<td>465-625</td>
<td>100-140</td>
</tr>
<tr>
<td>7</td>
<td>710-960</td>
<td>270-370</td>
<td>460-620</td>
<td>60-80</td>
</tr>
</tbody>
</table>
Implementing Ecosystem Management

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

Subbasin 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

<table>
<thead>
<tr>
<th>TS-O4</th>
<th>Manage noxious weeds across jurisdictional/political boundaries</th>
</tr>
</thead>
<tbody>
<tr>
<td>TS-S5</td>
<td>Implement IWM strategy/7 steps of strategy</td>
</tr>
<tr>
<td>TS-S6</td>
<td>Implement IWM strategy on forest lands</td>
</tr>
<tr>
<td>TS-O5</td>
<td>Implement IWM strategy on rangelands</td>
</tr>
<tr>
<td>TS-S7</td>
<td>Implement steps of IWM strategy, Range Clusters 2 (alts 3,4,&amp;7 outside); 2 and 4 (alt 5); and 2,3,&amp;5 (alt 6)</td>
</tr>
<tr>
<td>TS-S8</td>
<td>Implement steps IWM strategy, Range Clusters 3 (alts 3 &amp; 5); and 1,3,4, 5&amp; 6 (alt 4)</td>
</tr>
<tr>
<td>TS-S9</td>
<td>Implement steps IWM strategy, Range Cluster 5 (alt 3 &amp; 5)</td>
</tr>
<tr>
<td>TS-S10</td>
<td>Implement steps IWM strategy, Range Clusters 1,4,&amp;6 (alt 3&amp;7 outside); 1&amp;6 (alt 5); 1,3,4,5,&amp;6 (alt 6)</td>
</tr>
</tbody>
</table>

#### Forest Lands

##### Dry Forest

<table>
<thead>
<tr>
<th>TS-O6</th>
<th>Restore ecosystem processes /Dry Forest</th>
</tr>
</thead>
<tbody>
<tr>
<td>TS-S11</td>
<td>Increase pine and warch in mature/old single &amp; multi-story forests</td>
</tr>
<tr>
<td>TS-S12</td>
<td>No harvest of dominant or co-dominant pine outside reserves</td>
</tr>
<tr>
<td>TS-S13</td>
<td>No silvicultural treatments in mature/old forests outside reserves</td>
</tr>
<tr>
<td>TS-S14</td>
<td>No commercial harvest in dry forest terrestrial reserves</td>
</tr>
<tr>
<td>TS-O7</td>
<td>Manage suitable lands to produce commodities/maintain ecosystem</td>
</tr>
</tbody>
</table>

##### Moist Forest

<table>
<thead>
<tr>
<th>TS-O8</th>
<th>Restore ecosystem processes /Moist Forest</th>
</tr>
</thead>
<tbody>
<tr>
<td>TS-S15</td>
<td>Maintain viability of and increase western white pine</td>
</tr>
<tr>
<td>TS-S16</td>
<td>Plant blister-rust-resistant stock/increase western white pine</td>
</tr>
<tr>
<td>TS-S17</td>
<td>Increase dominance of early successional, shade-intolerant species</td>
</tr>
<tr>
<td>TS-S18</td>
<td>No harvest of dominant or co-dominant pine outside reserves</td>
</tr>
<tr>
<td>TS-S19</td>
<td>No silvicultural treatments in mature/old forests outside reserves</td>
</tr>
<tr>
<td>TS-S20</td>
<td>No commercial harvest in moist forest terrestrial reserves</td>
</tr>
<tr>
<td>TS-O9</td>
<td>Manage suitable lands to produce commodities/maintain ecosystem</td>
</tr>
</tbody>
</table>

##### Cold Forest

<table>
<thead>
<tr>
<th>TS-O10</th>
<th>Restore ecosystem processes /Cold Forest</th>
</tr>
</thead>
<tbody>
<tr>
<td>TS-S21</td>
<td>Maintain viability of/increase whitebark pine and subalpine larch</td>
</tr>
<tr>
<td>TS-O11</td>
<td>Manage suitable lands to produce commodities/maintain ecosystem</td>
</tr>
</tbody>
</table>

#### Rangelands

<table>
<thead>
<tr>
<th>TS-O12</th>
<th>Restore or maintain rangeland health</th>
</tr>
</thead>
<tbody>
<tr>
<td>TS-S22</td>
<td>Implement strategies to maintain/restore watershed function</td>
</tr>
<tr>
<td>TS-S23</td>
<td>On dry shrublands, manage grazing during/after drought years</td>
</tr>
<tr>
<td>TS-O13</td>
<td>Produce livestock forage while restoring ground cover and productivity</td>
</tr>
<tr>
<td>TS-O14</td>
<td>Reduce encroachment of junipr, conifers, and sagebrush</td>
</tr>
<tr>
<td>TS-O15</td>
<td>Restore dry grass/dry shrub/cool shrub</td>
</tr>
<tr>
<td>TS-S24</td>
<td>No livestock grazing in reserves</td>
</tr>
<tr>
<td>TS-S25</td>
<td>No range improvement projects in reserves</td>
</tr>
<tr>
<td>TS-O16</td>
<td>Produce livestock forage and conserve cool shrub/dry shrub/dry grass</td>
</tr>
</tbody>
</table>

#### Aquatic/Riparian Strategies

<table>
<thead>
<tr>
<th>AQ-O1</th>
<th>Emphasize riparian and aquatic processes and functions</th>
</tr>
</thead>
<tbody>
<tr>
<td>AQ-O2</td>
<td>Maintain high quality aquatic and riparian habitat</td>
</tr>
<tr>
<td>AQ-O3</td>
<td>Protect high quality waters and identify and maintain habitats</td>
</tr>
<tr>
<td>AQ-O4</td>
<td>Category 1 sub-basins. Maintain watersheds</td>
</tr>
<tr>
<td>AQ-O5</td>
<td>Restore watersheds where they have been degraded</td>
</tr>
<tr>
<td>AQ-O6</td>
<td>Implement watershed restoration activities based on priorities</td>
</tr>
</tbody>
</table>
### Index to Objectives and Standards in Table 3-5 (continued)

| AQ-07 | Category 2 sub-basins: Maintain strongholds and restore watersheds |
| AQ-08 | Timber and livestock priority areas: Conserve species strongholds |
| AQ-09 | Category 3 sub-basins: Maintain strongholds |
| AQ-10 | 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
## Index to Objectives and Standards in Table 3-5 (continued)

| AQ-S39 | Revoke conveyance permits for those without state water rights |
| 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 |

### 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

#### Viable populations

| HA-O1 | Restore and/or maintain and habitat conditions |

| 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 |

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

**Wildlife and Livestock Conflicts**

- **HA-O7** Management practices to reduce conflicts: livestock / carnivores & bighorn / domestic sheep
  - **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
  - **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-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-O16** Ensure access essential for corridor infrastructure maintenance
  - **HU-O17** Encourage integrated ROW vegetation management to minimize impacts

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

**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, terrestrial 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

**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 management goals
- **AM-S3** Develop integrated intergovernmental monitoring and evaluation protocol
- **AM-S4** Implement annual monitoring programs at various scales
### Index to Objectives and Standards in Table 3-5 (continued)

| 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

A summary of key effects on and conclusions for various elements of the ecosystem follows. These consequences are predicted to occur if the alternatives were implemented.

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.

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.

**Terrestrial Aspects of the Ecosystem**

**Effects on Trends in Forested Terrestrial Communities**

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.

**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 Alternative 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 3 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.
Effects on Trends on Forestlands

◆ All alternatives would reduce the amount of mid-seral in the moist forests and move it within historical range of variability in the long term. Alternatives 3, 4, and 6 would have the greatest reductions.

◆ All alternatives would reduce the amount of late-seral multi-layered moist forest and move within historical range of variability in 100 years. Alternatives 1 and 5 would show greatest reductions but differences among alternatives would be small.

◆ All alternatives would increase the late-seral multi-layered cold forest to within historical range of variability in the short and long terms. Alternatives 1, 2, 6, and 7 would show the greatest increases but differences among alternatives would be small.

◆ All alternatives would increase the late-seral single-layer dry forest in the long term. Alternatives 3 and 4 would have the greatest increases due to restoration of late-seral multi-layered forest, followed by Alternatives 5 and 6.

◆ 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 interior ponderosa pine, western larch, western white pine, and large tree components in the short and long term.

Effects on Trends Toward the Desired Range of Future Condition in Forested Potential Vegetation Groups

◆ In the long term, forested potential vegetation groups would move toward their 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 forested 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 general, 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, overall. 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 are due to differing management activity levels and the differing emphases of control efforts, related to the number of acres treated and the areas or range clusters and noxious weed species treated. Alternative 4 proposes the most acres of noxious weed control and the most emphasis of implementation of the IWM strategy; therefore, it is projected to be the most effective alternative with regard to noxious weeds and cheatgrass.

Alternatives 4, 3, 6, and 5 are predicted to be the most effective in reducing the encroachment or density of woody species on rangelands, in general, in the project area. Alternative 7 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 with regard to reducing woody species encroachment or density problems, generally. Differences among alternatives are due to differing management activity levels and differing emphases of control efforts, related to the number of acres treated and the areas or range cluster where acres were treated. Alternative 4 proposes the highest amounts of prescribed burning and harvesting of woody species; therefore it is predicted to be the most effective with regard to woody species encroachment or density.

Alternatives 4, 3, and 6 are predicted to be the most effective in restoring acres of rangeland vegetation types, in general, in the project area. Alternative 7 would be the next most effective, followed by Alternative 5, with Alternatives 2 and 1 being the least effective. These alternatives would not have an effect of restoring rangeland vegetation types on non-Federal lands. The ranking of alternatives was based on the predicted ability of an alternative to restore rangeland vegetation types that have been taken over by noxious weeds or by woody species such as juniper.

Alternatives 4, 6, and 7 are predicted to be the most effective in restoring slow-to-recover rangelands (that are not infested with exotics), in general, in the project area. Alternative 3 would be the next most effective, followed by Alternative 5, with Alternatives 2 and 1 being the least effective. Restoration activities would be done through range vegetative improvements as well as livestock management improvements, which are the highest in Alternatives 3 and 4 for range improvements and highest in Alternatives 4 and 6 for livestock management improvements.

Alternatives 7, 4, and 6 would be predicted to be the most effective in reducing wildlife displacement and vulnerability to mortality on rangelands, in general, in the project area. Alternative 3 would be the next most effective, followed by Alternative 5, with Alternatives 2 and 1 being the least effective. There would be predicted effects on road closure, road use, and human activity as a result of implementation of some alternatives, especially Alternative 7, which would be predicted to reduce wildlife displacement and vulnerability to mortality through reserves.

The amount of wildfire is much less than historical levels because of fire suppression actions, with the exception of the dry shrub PVG in Alternatives 1, 2, and 7. For all
PVGs, Alternatives 3, 4, 5, and 6 have lower levels of wildfire than the other alternatives.

**Terrestrial Species**

- Currently there are 51 species in the UCRB planning area with unfavorable habitat outcomes (Outcome Class 4 or 5). Implementation of Alternatives 4, 6, and 7 would result in 32, 32, and 33 species with unfavorable habitat outcomes; and Alternatives 5, 3, 2, and 1 would result in 37, 38, 39, and 46 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 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 forest, rangeland, and riparian habitats of the other alternatives.

- Alternatives 4 and 6 would result in more species with improved likelihood of persistence and viability than with increased risks of extirpation, due to improved habitat condition through restoration of uplands and riparian emphasis.

- Alternatives 3 and 7 would result in an 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, based on a comparison of current and historical conditions. Both species were widely distributed historically, but currently their habitats and populations are reduced, isolated, and disjunct. Alternative 7 is the only alternative predicted to improve conditions for grizzly bear, due to the habitat conditions that large reserves would provide. 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 some species (“increasers”) (table 4-42).

- Implementation of any alternative would result in some risk of extirpation for some species because of cumulative effects on all lands (“decreasers”) (table 4-43).

- 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 118 vertebrate and 14 plant species analyzed. Loss of habitat both on and off Federal land contributes to this condition.

- Threatened and endangered plants have a risk of extirpation or viability loss.
primarily due to reduced habitat conditions and availability and to limited population sizes compared to historical conditions. The alternatives would not change this condition because many of the species are local endemics 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 and 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 emphasis.

◆ 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).

Aquatic Aspects of the Ecosystem

Effects on Aquatic Systems

◆ 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 subbasin 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 hierarchical 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 subbasin to subbasin. 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 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.

- All the alternatives would show an increase in timber volume harvested relative to the past few years. Alternatives 3 and 5 would show harvest volume greater than the combined 10-year average harvest level. Alternative 5 would show timber harvest volume greater 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 roadded 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 could 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 (see table 4-60). This is expected given that Alternatives 1 and 2 would not address the inconsistencies in tribal consultation between agency 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 upfront structure to management decisions through identified priority or reserve 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 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.

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 emphasized 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.