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CHAPTER 4 – ENVIRONMENTAL CONSEQUENCES

4.1 INTRODUCTION

Chapter 4 presents the likely direct, indirect, and cumulative impacts on the human and natural environment in terms of environmental, social, and economic consequences that are projected to occur from implementing the alternatives presented in Chapter 2. Because the alternatives generally describe overall management emphasis, the environmental consequences are most often expressed in comparative general terms. Separate sections describing irretrievable or irreversible commitment of resources and unavoidable adverse impacts are presented at the end of the chapter.

Impact analyses and conclusions are based on interdisciplinary team knowledge of the resources and planning area, information provided by experts in the BLM or in other agencies, and information contained in pertinent existing literature. The baseline used for the impact analysis is the current condition or situation as described in Chapter 3 (Affected Environment). Analysis assumptions have also been developed to help guide the determination of effects (see Section 4.1.1, Analytical Assumptions). Because the ~~Draft~~ Proposed RMP/EIS provides a broad management framework, the analysis in this chapter represents best estimates of impacts because exact locations of development or management are often unknown. Impacts are quantified to the extent practical with available data. In the absence of quantitative data, best professional judgment provides the basis for the impact analysis.

4.1.1 Analytical Assumptions

Several assumptions were made to facilitate the estimation of the effects of the alternatives. These assumptions are made only for the purpose of analysis and do not represent potential RMP decisions. The assumptions do provide reasonably foreseeable projected levels of development that could occur within the planning area. These assumptions should not be interpreted as constraining or redefining the management objectives and actions proposed for each alternative as described in Chapter 2. Following are the general assumptions applicable to all resource categories. Any specific resource assumptions are provided in the Methods of Analysis subheading for that resource.

- Sufficient funding and personnel would be available for implementing the final decision;
- Implementing actions from any of the RMP alternatives would be in compliance with all valid existing rights, federal regulations, BLM policies, and other requirements;
- Local climate patterns of historic record and related conditions for plant growth would continue;
- Appropriate maintenance would be carried out to maintain the functional capability of all developments;
- The discussion of impacts is based on the best available data. Knowledge of the planning area and professional judgment, based on observation and analysis of conditions and responses in similar areas, are used to infer environmental impacts where data are limited;
- Acreage figures and other numbers used in the analyses are approximate projections for comparative and analytic purposes only. Readers should not infer that they reflect exact measurements or precise calculations; and

- Acreages were calculated using GIS technology, and there may be slight variations in total acres between resources. These variations are negligible and will not affect analysis.

4.1.2 Types of Effects (Direct, Indirect, and Cumulative)

Direct, indirect, and cumulative impacts are considered in this effects analysis, consistent with direction provided in 40 CFR 1502.16. Direct impacts are caused by an action or implementation of an alternative and occur at the same time and place. Indirect impacts result from implementing an action or alternative but are usually later in time or removed in distance and are reasonably certain to occur. Cumulative effects are defined below in Section 4.1.3, Cumulative Impacts.

Effects are quantified where possible, primarily by using GIS applications. In the absence of quantitative data, best professional judgment prevailed; impacts are sometimes described using ranges of potential impacts or in qualitative terms. Only management programs with impacts are discussed. The standard definitions for terms referring to impact duration that are used in the effects analysis are as follows, unless otherwise stated:

Short-Term Effect: The effect occurs only during implementation or immediately after implementation of the alternative. For the purposes of this RMP, short-term effects would occur during the first five years.

Long-Term Effect: The effect could occur for an extended period after implementing the alternative. The effect could last several years or more and could be beneficial or adverse. For the purposes of this RMP, long-term effects would occur beyond the first five years and perhaps over the life of the RMP.

4.1.3 Cumulative Impacts

Cumulative effects are defined as the direct and indirect effects of a proposed project alternative's incremental impacts when they are added to other past, present, and reasonably foreseeable actions, regardless of who carries out the action (40 CFR Part 1508.7). Guidance for implementing NEPA (Public Law 91-190, 1970) requires that federal agencies identify the timeframe and geographic boundaries within which they will evaluate potential cumulative effects of an action and the specific past, present, and reasonably foreseeable projects that will be analyzed. Effects of past actions and activities on resources are manifested in the current condition of the resource, which is described in Chapter 3 (Affected Environment) for resources on BLM-administered lands.

Cumulative Impact Assessment Methodology

This cumulative assessment is a programmatic, broad-scale, qualitative assessment. The BLM makes both land use planning and implementation decisions. Examples of planning decisions include land use allocations, special designations, and determining which lands would be open or available for certain uses, such as OHV use. Examples of implementation decisions include designating routes for motorized or nonmotorized vehicle travel, specific recreation facilities, and actions that may be taken without preparation of additional environmental documentation. Implementation decisions generally constitute the BLM's final approval allowing on-the-ground actions to proceed.

The land use planning-level decisions that BLM will make regarding this RMP are programmatic decisions based on analysis that can only be conducted on a broad scale. Because of the broad scope, impact analysis of planning-level decisions is speculative with respect to projecting specific activities.

Subsequent documents tiered to this RMP would generally contain a greater level of detail and would be subject to NEPA ~~assessment~~ analysis and compliance. Subsequent tiered activity- and project-level plans are more definitive than plans found in an RMP. An activity-level plan typically describes projects in detail that will lead to on-the-ground action and traditionally focused on single resource programs. A project-specific plan is typically prepared for an individual project or several related projects. Activity plans (such as travel management plans) are generally more site specific and less speculative than the RMP analyses. Project-level plans (such as stream restoration) contain specific proposed actions, and site- or area-specific analysis is conducted. Activity plans may contain information that is as detailed or specific at a project level.

A cumulative impact analysis is based on numerous assumptions. The CEQ guidance limits cumulative impact analysis to important issues of national, regional, or local significance. Therefore, this cumulative impact assessment focuses only on actions and impacts that would potentially be significant.

Projects That Make Up the Cumulative Impact Scenario

For this EIS, the cumulative impact assessment timeframe is from approximately 1980 to 2025, with some exceptions where additional past data are available. This encompasses a range within which data are generally available and forecasts can be reasonably made. This analysis is provided for each resource and is general because decisions about other actions in the planning area would be made by many public and private entities, and the location, timing, and magnitude of these actions are not well known.

The geographic area of primary concern is composed of the six Idaho counties in which the Field Office is located: Latah, Clearwater, Nez Perce, Lewis, Idaho, and Adams Counties, which include various land owners (**Table 4-1**). Projects outside this six-county area, however, are also considered if they have the potential to affect resources with broad regional importance.

Table 4-1
Land Ownership in the Planning Area

Land Ownership	Size (Acres)	Percent of Total
BLM	143,830	<2%
Forest Service	5,528,167	63%
Nez Perce tribal lands	94,705	1%
State	444,791	5%
Private	2,581,685	29%
Other	48,019	<1%
Total	**8,841,197**	

Source: BLM 2004a

Public documents and data prepared by federal, state, and local government agencies are the primary information sources for past, present, and reasonably foreseeable future actions. Actions undertaken by private persons and entities are assumed to be captured in the information made available by such agencies. Specific projects with the potential to cumulatively affect the resources evaluated (e.g., water resources, vegetation) are identified below. Projects included in the cumulative impact analysis do not affect all resources equally: Some resources would be affected by several or all of the

described activities, while others would be affected very little or not at all. Cumulative impact analyses are presented in this chapter by resource topic. The projects that make up the cumulative impact scenario were analyzed in conjunction with the impacts of each alternative to determine if they would have any additive or interactive effects on a particular resource.

Land tenure actions since 1981 have resulted in increasing the total area of public lands managed by the CFO from approximately 134,417 acres to 143,826 acres, a 7-percent increase. Land tenure actions of various sizes are occurring and will continue to occur to consolidate BLM-administered lands and facilitate management.

Idaho Statewide Implementation Strategy for the National Fire Plan. The Idaho Department of Lands, in conjunction with the BLM and other federal agencies, signed the Idaho Statewide Implementation Strategy for the National Fire Plan. The implementation plan focuses on fire prevention and suppression, hazardous fuels reduction, restoration of fire-adapted ecosystems, and the promotion of community assistance in fire management (Idaho Department of Lands 2002). The CFO FMP was completed in 2004. This plan, along with the Coeur d'Alene Field Office FMP, was updated as one plan, the North Zone FMP, in 2005 (BLM 2005c).

During 2002, Idaho Department of Lands, in cooperation with federal agencies, disbursed $1.9 million to WUI projects and development of defensible space in Idaho. Additional money was used for hazardous fuels-reduction programs for several communities. Between 2002 and 2005, all planning area counties completed community wildfire protection plans that identify WUI areas. The development of community wildfire protection plans allows counties and communities to determine their current fire hazard risk and to develop effective mitigation to minimize wildland fire risks to persons and property. In addition, implementing community-based fuels-reduction programs gives private landowners opportunities to work with public land management agencies to manage the WUI.

Wildland fires:

- have been suppressed over the past 100 years;
- have burned low amounts of acreage in the Upper Columbia River Basin through the mid-1900s, with an increasing and noticeable trend in increased fire size between 1985 and 1995 (BLM and Forest Service 1997);
- burned three million acres of timberland in western Montana and northern Idaho including the CFO planning area, during the fire of 1910, the largest forest fire in US history (Idaho Forest Products Commission 2005);
- have occurred and will continue to occur over time, and although the number of fire starts on BLM land is relatively small, land ownership in north-central Idaho is fragmented, which increases the potential for fires to cross administrative boundaries and affect BLM-managed lands; and
- outside ~~FMU~~Fire Management Areas (FMAs) designated for wildland fire use are suppressed and will continue to be suppressed to reduce the risk to resource values, private property, and human safety.

Fuels treatments, including prescribed fire, chemical and mechanical treatment, and seeding, have affected vegetation. Fuels treatments, including these methods and wildland fire use, are expected to

increase, potentially affecting vegetation, soil, air, and water resources and reducing the potential for stand-replacing wildfires.

Cyclic insect and disease activity have persisted and will continue to persist in forested stands and rangelands, including bark beetle infestations and root rot in forested stands and grasshoppers in rangelands.

Fish and Wildlife. Populations of some fish and wildlife species are declining in the Pacific Northwest. Declining wildlife and fish species will likely receive increased federal and state agency restoration and conservation efforts.

Listings under the Endangered Species Act. Some flora and fauna species have declined to the level where listing under the ESA became necessary. The Northern Rockies Lynx Amendment Final Management Plan, which establishes guidelines for management of Canada Lynx on certain lands under the authority of the Forest Service and BLM, was completed in 2005. Potential listings under the ESA may occur in the foreseeable future if populations of sensitive species continue to decline; species that may have more potential for listing than other species may include federally listed candidate species and BLM sensitive species. The bald eagle and gray wolf will likely be delisted.

Livestock Grazing. Domestic livestock (cattle, sheep, and horses) have grazed and will continue to graze most of the area, including BLM-administered lands, Nez Perce Reservation lands, private lands, State of Idaho lands, and Clearwater, Payette, Nez Perce, and Wallowa-Whitman National Forest lands.

- In the CFO planning area, approximately 24 percent of forage comes from federal lands in Adams County, 4 percent in Clearwater County, 6 percent in Idaho County, 8 percent in Latah County, and less than 1 percent in Lewis and Nez Perce Counties (BLM and Forest Service 1997).
- The North Idaho Range Management Program Plan was completed in 1982. In general, the number of livestock grazing permits/leases issued by the BLM in Idaho has gradually declined over the last several decades, while the number of authorized AUMs has increased slightly (Tetra Tech Inc. 2005).
- In the CFO, 67 percent of grazing allotments are small isolated tracts that are surrounded by large blocks of private lands, typically ranches. The BLM cannot control the season of use or the number of AUMs removed from public lands on isolated tracts without cost-prohibitive measures;
- The BLM will continue to assess all livestock use allotments in Idaho with use of the Idaho Standards for Rangeland Health and Guidelines for Livestock Grazing Management (BLM 1997a) (**Appendix A** [see Volume II~~I~~]). These standards are designed to provide resource measures and guidance needed to ensure healthy, functional rangelands. Livestock use allotments are evaluated to determine if Idaho Standards for Rangeland Health and Guidelines for Livestock Grazing Management (BLM 1997a) (**Appendix A** [see Volume II~~I~~]) are being met or if significant progress toward meeting them is being achieved. If standards are not being met, the BLM is required to make changes that would help achieve these standards in the future.

Timber has been and is harvested on private, state, federal, and tribal lands in North Idaho, including Latah, Clearwater, Nez Perce, Lewis, and Idaho Counties (in the CFO planning area; Adams County is not included), and Benewah, Bonner, Boundary, Kootenai, and Shoshone Counties (north of and outside the CFO planning area). A total of 10,620 million board feet (MMBF) has been harvested between 1994 and 2003 on:

- private lands: 7,324 MMBF (1994-2003), which is 69 percent of all timber harvested in North Idaho during this period;
- State of Idaho lands: 1,869 MMBF (1994-2003), which is 18 percent of all timber harvested in North Idaho during this period. Additionally, within CFO planning area, 45 MMBF are planned in 2005 and 51 MMBF are planned in 2006 (Idaho State Board of Land Commissioners 2005);
- All National Forests in North Idaho (Clearwater, Payette, and Nez Perce National Forests in the CFO planning area, and the Idaho Panhandle National Forest outside the CFO planning area): 1,201 MMBF of timber and 76 MMBF of fuelwood collected by the public (1994-2003), which totals 12 percent of all timber harvested in North Idaho during this period. Since 1980, the three major National Forests in the CFO planning area have harvested timber as follows:
    - Clearwater National Forest lands: 1,479 MMBF (1980-2002) on 1.8 million acres (Whitehead 2005);
    - Payette National Forest lands: 1,301 MMBF (1980-2004) on 2.3 million acres (Christman 2005); and
    - Nez Perce National Forest lands: 1,387 MMBF (1980-2004) on 2.2 million acres (McGee 2005).
- Tribal lands: 102 MMBF (1994-2003), which is 0.9-percent of all timber harvested in North Idaho during this period; and
- BLM-administered lands: 48 MMBF (1994-2003), which is 0.4-percent of all timber harvested in North Idaho during this period. Between 1992 and 2004, the CFO has sold between 2 and 8 MMBF annually.

The North Idaho Timber Management Plan was completed in 1982. This 10-year timber management program encompassed BLM-administered lands in the CFO and Coeur d'Alene Field Offices.

Timber harvest on National Forest lands has declined substantially in the last 20 years. Similar declines are expected in the CFO planning area unless national direction places more emphasis on timber production from federal lands. Idaho County would suffer the greatest impact if the timber industry continues to decline. However, harvests from private timberlands have increased as a result of declining harvests from federal lands (Forest Service 2004).

Mineral development has occurred continuously in the region for over 140 years. Mining has occurred and continues to occur on BLM-administered lands, Nez Perce Reservation lands, private lands, State of Idaho lands, and Clearwater, Payette, Nez Perce, and Wallowa-Whitman National Forest lands.

- In the CFO, Clearwater, Idaho, and Latah Counties' contribution of federal mineral revenues constitute a small percentage of the state's total and, since 2001, have diminished in royalty value and, therefore, diminished returned payments, up through 2004 (Tetra Tech Inc. 2005).
- In the CFO planning area, development of various industrial minerals, including sand, gravel, and aggregate, dimension stone, and limestone, is expected to continue to expand or contract in response to urban growth and construction in Idaho (Parker 2002).

Minerals. In the CFO (on BLM-administered lands), the reasonably foreseeable development of mineral resources is as follows:

- Oil and Gas — Activity over the next 15 to 20 years would continue to be low, with the possible issuance of 1 or 2 geophysical surveys and perhaps the drilling of 1 or 2 exploratory holes. No field development is expected.
- Geothermal Resources — No geothermal resources have been identified, so the potential for developing geothermal resources is low. It is estimated that one or two exploratory wells would be plugged and abandoned.
- Solid Minerals — The potential for the occurrence of solid leasable minerals (both energy and non-energy) has been rated as low to zero. No future activity is anticipated.
- Salable Mineral Resources — It is anticipated the need for salable minerals (primarily sand, gravel, and crushed rock) will increase due to the continued urbanization of northern Idaho. Decorative stone sales to individuals are expected to increase.
- Locatable Mineral Resources — The major commodity of interest would continue to be gold. Both placer mining and the development of underground lode deposits are anticipated. There is a possibility that at least one chemical heap-leaching operation would be permitted on BLM land northwest of Elk City.

Road construction has occurred in association with timber harvesting and mining on BLM-administered lands, private lands, State of Idaho lands, and Clearwater, Payette, Nez Perce, and Wallowa-Whitman National Forest lands. The rate of road building has recently slowed due to less harvesting and mining activity on National Forest and BLM lands when compared with 20 to 30 years ago. This activity is expected to continue at a steady rate on BLM-administered and National Forest lands; the future rate is unknown on private and State of Idaho lands.

Population:

- Idaho's population has risen approximately 29 percent between 1990 and 2000, while the population of the CFO planning area has grown an average of 13 percent (Idaho Department of Commerce and Labor 2004).
- In the CFO planning area, population growth is projected to continue slowly: Between 2000 and 2020, the planning area population is anticipated to grow 11 percent, while Idaho's population is anticipated to grow 35 percent (US Census Bureau 2004).

Recreation has increased, and use patterns and motorized technology have changed.

- Recreation-related visits to Idaho are estimated to continue to increase at an annual rate of 1 to 4 percent (Tetra Tech Inc. 2005).

- Recreational activities, specifically motorized recreational activities, will continue to contribute to soil impacts.
- An increase in the use of developed recreation sites and campgrounds is likely as the population increases.

Noxious weeds have invaded the area, carried by wind, humans, machinery, and animals (pets, livestock, and wildlife). Cooperative weed management activities exist among the counties, private landowners, and government agencies. The ROD for Vegetation Treatment on BLM Lands in Thirteen Western State Decision was completed in 1991. The Coeur d'Alene District Programmatic Noxious Weed Control Decision was completed in 1994. Noxious weed invasion is increasing and will continue, potentially increasing treatment efforts.

Tribal Coordination. Coordination with the Nez Perce Tribe resource management assists in designing projects that help protect treaty rights and tribal interests.

Clean Air Act. US EPA is likely to set $PM_{2.5}$ standards under the Clean Air Act. Air quality in the planning area is seasonally affected by agricultural field burning, forested prescribed burning, and wildland fires.

Water Quality. Timber harvesting, livestock grazing, agriculture, OHV use, and mining have contributed to the impaired water quality of some streams in the CFO planning area.

The IDEQ has established TMDLs for some 303(d) water quality limited streams in the planning areas (in 2000, 2004, and 2005). The TMDLs for the remaining 303(d) water quality limited streams in the planning area will be established by 2007. The BLM has limited opportunity to significantly improve water quality because of several factors, including location and distribution of lands under its management and the amount of land managed within watersheds with impaired water quality.

Access to BLM lands has been restricted by some private landowners and is likely to be increasingly restricted. The demand for access to public lands has increased and will continue to increase with growth in population and recreational use.

Archaeological investigations, illegal activities (e.g., cultural resource site vandalism or collecting), and development and maintenance activities (e.g. grazing, mining, recreation use, OHV use) that adversely affect sites have occurred and will continue to occur.

ICBEMP. The Forest Service/BLM ICBEMP, an extensive study of the Interior Columbia Basin, was initiated in 1997 to develop a scientifically sound and ecosystem-based strategy for management of all BLM and National Forest lands in the Interior Columbia River basin. The ICBEMP was charged with developing a scientifically based broad-scale ecosystem management strategy that may potentially alter the management direction on over 60 million acres of lands administered by the Forest Service and BLM. This study determined that some ecosystems are at risk due to several past and existing impacts. To address these risks, the BLM entered into a 2003 Memorandum of Understanding to implement the ICBEMP. The implementation strategy includes direction to federal agencies to update or develop land use plans to address the following:

- Maintain and promote a healthy, productive, and diverse ecosystem and restore, through a system of prioritization, areas that are degraded;

- Develop an integrated mix of restoration activities to provide for re-patterning succession and disturbance regimes and achievement of sustainable landscape conditions, thereby contributing to the reduction of events such as uncharacteristically large and severe wildland fires;
- Restore natural disturbance patterns in watersheds and hydrologic process to help restore and maintain riparian, aquatic, and wetland habitat;
- Develop integrated weed management strategies; and
- Develop a coordinated multiscale and interagency approach to planning and decision making.

National Forest Plan Revisions. Various National Forests have completed Forest Plan Revisions that establish management guidance for future management of publicly owned lands within the National Forest System. Although they do not make site-specific decisions, the plans supply a path for all individual projects to follow. The revised forest management direction responds to new initiatives such as the National Fire Plan and Healthy Forest Initiative and to concerns about listed species, habitat restoration, and commodity production. The revised Forest Plans differ from the original plans in that they emphasize restoring or maintaining vegetation and watershed conditions and focus on the ecological condition of the forests rather than commodity production.

The Payette National Forest (2.3 million acres) Plan revision was completed in 2003. The travel management plan is expected to be completed in 2006. The Clearwater (1.8 million acres) and Nez Perce (2.2 million acres) National Forests anticipate completing their Forest Plan revisions (under the 2005 Planning Rule) in 2007. The Wallowa-Whitman National Forest (2.3 million acres) is revising its Forest Plan in conjunction with the Malheur and Umatilla National Forests and anticipates completion in 2007. These plan revisions will address access and recreation, wildlife, watersheds and aquatic species, inventoried roadless areas and proposed wilderness areas, vegetation, timber production, fire risk, and social and economic factors.

4.1.4 Incomplete or Unavailable Information

The CEQ established implementing regulations for NEPA requiring that a federal agency identify relevant information that may be incomplete or unavailable for an evaluation of reasonably foreseeable significant adverse effects in an EIS (40 CFR 1502.22). If the information is essential to a reasoned choice among alternatives, it must be included or addressed in an EIS. Knowledge and information is and will always be incomplete, particularly with infinitely complex ecosystems considered at various scales.

The best available information pertinent to the decisions to be made was used in developing the RMP. Considerable effort has been taken to acquire and convert resource data into digital format for use in the plan—both from BLM sources and from outside sources.

Certain information was unavailable for use in developing this plan, usually because inventories have either not been conducted or are not complete. Some of the major types of data that are incomplete include cultural resources (most of the CFO has not been inventoried for cultural resources), paleontological resources, vegetation, wildlife, riparian inventories, and noxious weeds (most of the CFO has not been inventoried for noxious weeds).

This RMP is based on the concept of adaptive management. Thus, it has been built to be dynamic enough to account for changes in resource conditions (e.g., large-scale wildfire), new information and science, and changes in regulation and policies. The RMP may be amended as appropriate to respond to these factors. No incomplete or unavailable information was deemed essential to a reasoned choice among the alternatives portrayed in this EIS.

4.2 RESOURCES

4.2.1 Air Quality

Goal: Comply with laws and regulations to meet public health and safety requirements.

Summary

Air quality management objectives and actions are the same for all alternatives. All prescribed fire and wildland fire use would be used in a manner to minimize degradation of airsheds and would be coordinated with the Montana/Idaho Airshed Group. All authorized public land management activities would meet federal and IDEQ air quality standards and regulations.

Impacts on air quality from forest vegetation management activities include smoke and fugitive dust from roads and equipment, which could affect human health and air quality-related values such as visibility. Because of the generally qualitative nature of the management objectives, a quantitative comparison of alternatives for their impacts on air quality is not feasible. The types of impacts on air quality from these management activities would be similar for all alternatives.

Alternative C would have the least impact on air quality due to its treatment objective (20 percent of FRCC 2 and 3 lands) for fuels which would minimize mechanical fuel treatments, associated transportation impacts and the use of prescribed fire. Alternative C prescribes the most resource protection by allowing the least amount of ground-, water-, and/or air-disturbing management activities. In the long term, the fuel-reduction activities use of wildland fire could reduce the risk of large, stand-replacing wildland fires that frequently result in substantial and uncontrollable air quality impacts. Alternatives B, C, and D all have the potential to decrease air pollutant emissions from Alternative A, current management, with Alternative C having the greatest potential decrease, followed by Alternatives B then D. **Table 4-2** identifies the indicators that were used to analyze effects on air quality under each alternative.

Table 4-2
Comparison of Air Quality Indicators by Alternative

Indicator	Alternative A	Alternative B	Alternative C	Alternative D
Changes in National Ambient Air Quality Standards (NAAQS) pollutant concentrations resulting from agency-managed or permitted activities	Short-term effects from forest products management and wildland fire management, (mechanical treatments and prescribed fire) generally are significant air impact increases			
Potential conformance of management actions with the Clean Air Act	Conforms			

Source: BLM 2004a

Methods of Analysis

Indicators

Indicators are used to identify the level of impact. For air quality management, the indicators used for impact analysis are identified in **Table 4-2**, Comparison of Air Quality Indicators by Alternative.

Methods and Assumptions

Idaho's dominant air pollutant is particulate matter from such sources as open burning, industrial and mining emissions, agricultural activities, fugitive road dust, and residential wood burning. Management activities considered most likely to create an effect on air quality include forest vegetation management, wildland fire management, forestry products, and minerals.

Potential impacts on air quality from actions proposed in each alternative were assessed quantitatively (where possible) as a percent change from current levels on the basis of the corresponding changes in proposed management activity (e.g., acreage). Where a management change could not be quantitatively determined, a qualitative assessment of impacts on air quality was provided.

Effects Common to All Alternatives

The primary air quality goal of all alternatives is to comply with all existing laws and regulations to meet health and safety requirements. Management objectives include minimizing degradation of airsheds from wildland fire use and prescribed fire use and through the coordination of these activities with the Montana/Idaho Airshed Group. All other authorized activities on public lands would meet federal and IDEQ air quality standards and regulations. These management objectives would be accomplished through specific management actions, including the use of BMPs and considerations of air quality in Wildland Fire Situation Analysis, Wildland Fire Implementation Plans, and prescribed burn plans. Impacts on air quality from wildland fire management activities include smoke and fugitive dust from roads and equipment. These effects would usually be short term and localized. One of the management objectives for air quality is the reduction of particulate emissions from uncontrolled wildland fires, primarily through suppression. Fire suppression would remain a central strategy for all alternatives; however, wildland fire use, mechanical fuels treatments, and prescribed fire treatments could also be used to varying degrees across the alternatives. Less aggressive suppression tactics, including wildland fire use, would likely result in greater short-term smoke emissions but decreased fugitive dust emissions from roads and vehicles compared to current activities.

Ongoing activities, programs, and/or management in the planning area, besides forest vegetation management, wildland fire management, forestry products, and minerals (addressed below), that have the potential to affect air quality include soils, recreation, livestock grazing, transportation and travel management, lands and realty, and AMLs and HMM activities. These activities could directly affect air quality in the short term by generating fugitive dust, hazardous pollutants, smoke, or other emissions. Due to the widely varied specific conditions, timing, and scale of these activities, reliable quantitative estimates of particulate emissions from these activities cannot be determined; however, implementation of resource protection measures, permitting requirements, and emissions-control strategies, including established BMPs, to mitigate emissions would minimize impacts on air quality.

Effects from Vegetation—Forests Management

Impacts on air quality from forest management activities include smoke and fugitive dust from roads and equipment, which could affect human health and air quality-related values, such as visibility. Smoke resulting from prescribed fire would be mitigated through burning on burn days approved by the Montana/Idaho Airshed Group. Dust caused by vehicle traffic or mechanical equipment activities would be mitigated through fugitive dust BMPs (such as road watering and application of dust palliatives) as appropriate. Impacts typically would be short term and localized. Also see Effects from Forest Products Management, below.

Effects from Wildland Fire Management

Fire management objectives and actions emphasize appropriate management response for suppression actions striving for a maximum of 30 percent of the CFO (43,148 acres) allowed to burn in a 5-year period. Impacts on air quality from wildland fire and its management activities include smoke and fugitive dust from roads and equipment, which could affect human health and visibility. The effects on air quality from smoke and dust caused by wildland fire management activities typically would be short term and localized.

Effects from Forest Products Management

Impacts on air quality from forest products management activities include fugitive dust from use of roads and equipment (e.g., skidders and CATs), road construction, and smoke from broadcast/underburning to reduce hazardous fuels or to prepare areas for reforestation and slash pile burning. The effects on air quality from smoke and dust caused by the management activities typically would be short term and localized. Smoke resulting from prescribed fire and pile burning would be mitigated through coordinating controlled burn activities through the Montana/Idaho Airshed Group.

Effects from Minerals Management

Minerals management activities have the potential to impact air quality everywhere except the Frank Church Wilderness, because mineral activities could occur everywhere but in the Wilderness. Impacts from fluid mineral activities include fugitive dust from roads and equipment and National Ambient Air Quality Standards pollutants originating from equipment (e.g., compressors). Impacts on air quality from development of solid leasable, salable, and locatable minerals activities are primarily fugitive dust from mining activities, roads, and equipment operations. Effects typically would be long term and localized.

Alternative A

Effects from Vegetation—Forests Management

General effects are described under Effects Common to All Alternatives, above. Forest management under Alternative A includes direction on harvest volume, areas treated, and strategy for each forest land classification (intensive, extensive, and custodial management) to meet management objectives, such as maximum timber production, sustained yield timber production, or no timber production (although harvesting could occur for ecological reasons). Alternative A would designate 35,757 acres (35 percent) of forested acres as commercial forest. Alternative A does not include management of forested blocks for DFCs. Also see Effects from Forest Products Management, below.

Effects from Wildland Fire Management

General effects are described under Effects Common to All Alternatives, above. Treatment areas are prioritized by FRCC. Under Alternative A, specific percentages of the CFO FRCC 2 and 3 (moderate to high risk) WUI areas would not be identified for fire risk/ fuels-reduction treatments. Given current management, an estimated 1,950 to 5,950 acres could be treated annually with mechanical treatments and prescribed fire under Alternative A (see Section 4.2.12, Wildland Fire Management).

Because of management controls employed through the Montana/Idaho Airshed Group, smoke from CFO prescribed fire is unlikely to adversely impact Class I visibility areas within the CFO boundary (Hells Canyon Wilderness Area and Selway-Bitterroot Wilderness Area) and the seven other Class I visibility areas near the CFO. Smoke from wildland fires with a wind pattern moving toward Class I visibility areas is very likely to degrade air quality for days to weeks.

Effects from Forest Products Management

General effects are described under Effects Common to All Alternatives, above. Under current management, 35,757 acres are specified as managed for timber production (commercial forest land). The current estimated annual ASQ for timber harvesting, which is 6,600 MBF on 358 acres, would continue.

Effects from Minerals Management

General effects to air quality from minerals management activities are described under Effects Common to All Alternatives, above. Impacts under Alternative A would be limited by continuation of the Wilderness designation, continuation of lands withdrawn from locatable minerals (21,869 acres), management per Alternative A, and compliance with current laws and regulations. Under Alternative A, 131,044 acres would continue to be open to fluid (oil, gas, and geothermal) minerals and solid leasable (energy and nonenergy) minerals leasing with 12,786 acres subject to nondiscretionary closures (same nondiscretionary closure acres for all alternatives). Approximately 131,044 acres would also be open to mineral (salable) materials disposal, with 12,034 acres subject to discretionary WSA closures and 750 acres subject to nondiscretionary closures. Approximately 121,961 acres would be open to locatable minerals.

Alternative B

Effects from Vegetation—Forests Management

General effects to air quality are described under Effects Common to All Alternatives, above. Alternative B designates 40,598 acres (40 percent of forested acres) as commercial forest, 13 percent more than current management. Vegetation management activities under Alternative B would emphasize management for forest health~~vigor~~ or habitat diversity in DFC blocks of 1,000 or more forested acres, which comprise 24,789 acres, which is 24 percent of forested acres and 17 percent of the CFO.

Due to the generally qualitative nature of the resource objectives, a direct comparison of alternatives with respect to impacts on air quality is not workable. However, the nature of impacts on air quality from these management activities would be similar for all alternatives. Also see Effects from Forest Products Management, below.

Effects from Wildland Fire Management

General effects to air quality are described under Effects Common to All Alternatives, above. Under Alternative B, up to 40 percent of the CFO classified as FRCC 2 or 3 (moderate to high risk) WUI areas could be treated in any 5-year period; an estimated 33,766 acres could be treated under Alternative B (see Section 4.2.12, Wildland Fire Management). Additional areas could be treated outside the WUI. Treatments would be designed to alter vegetation composition, structure, and fuels to recreate historic or maintain desired fire regime behaviors, severities, and patterns. Alternative B would include approximately 1,182 to 3,545 acres annually of mechanical treatments and prescribed fire (see Section 4.2.5, Vegetation—Forests).

In the long term, the fuel-reduction activities and use of wildland fire could reduce the risk of large, stand-replacing wildland fires that frequently result in substantial and uncontrollable air quality impacts.

Effects from Forest Products Management

General effects to air quality are described under Effects Common to All Alternatives, above. Alternative B would include 40,598 acres of commercial forest land and would decrease the current estimated annual PSQ by 53 percent (to 3,129 MBF), with an estimated 242 acres treated per year (an estimated 32-percent decrease from current management). Impacts on air quality from these activities are similar to those for Alternative A, with a potential corresponding decrease in emissions (primarily fugitive dust and smoke) from current levels.

Effects from Minerals Management

General effects to air quality from minerals management activities are described under Effects Common to All Alternatives, above. Under Alternative B, effects on air quality from minerals management would be similar to those described under Alternative A, but would be further limited by additional areas with surface use restrictions (leasables and mineral materials), which include 43,590 acres subject to NSO stipulations and 42,403 acres subject to CSU stipulations. The increase in surface use stipulations would decrease emissions, compared to current levels.

Alternative C

Effects from Vegetation—Forests Management

Impacts under Alternative C would be similar to those described under Alternative B and the general effects described under Effects Common to All Alternatives, except that vegetative treatments would emphasize achievement of DFC on timbered tracts that are 500 acres or more in size (comprising 28,087 acres of forested vegetation, or 28 percent of forested acres and 20 percent of the CFO). Also see Effects from Forest Products Management, below. Alternative C would designate 34,611 acres (34 percent) of forested acres as commercial forest, 3 percent less than current management.

Effects from Wildland Fire Management

Effects would be similar to those described under Alternative B, except that 16,833 acres of the CFO classified as FRCC 2 or 3 (moderate to high risk) WUI areas could be treated in any 5-year period under Alternative C (see Section 4.2.12, Wildland Fire Management), 50 percent less than Alternative B. Additional areas could be treated outside the WUI.

Alternative C would include approximately 1,182 to 4,390 acres annually of mechanical treatments and prescribed fire (see Section 4.2.5, Vegetation—Forests). Under Alternative C, up to 20 percent of the CFO classified as FRCC 2 or 3 (moderate to high risk) WUI areas could be treated in any 5-year period, half the percentage than under Alternative B. Treatments in areas with FRCC 2 or 3 would be similar to those described under Alternative B, except that Alternative C could use prescribed fire on an additional five percent of the FRCC 2 and 3 lands, slightly more than Alternative B.

Effects from Forest Products Management

Alternative C specifies 34,611 acres of commercial forest land and an estimated PSQ of approximately 3,101 MBF per year. Impacts on air quality from these activities are similar to current impacts (Alternative A), with a potential corresponding decrease in emissions from current levels because of the decrease in harvest volume and acres treated.

Effects from Minerals Management

Under Alternative C, effects on air quality from minerals management would be similar to those described under Alternative B, but would be further limited by additional areas with surface use restrictions (leasables and mineral materials), which include 68,854 acres subject to NSO stipulations and 59,122 acres subject to CSU stipulations. The increase in surface use stipulations would decrease emissions compared to Alternative A. Alternative C specifies the largest acreages for lease stipulations and could, therefore, result in the least amount of impacts on air quality from mining activities.

Alternative D

Effects from Vegetation—Forests Management

Effects would be similar to those described under Alternative B, except that Alternative D would not include treatments to establish DFCs. Alternative D would designate 45,190 acres (45 percent) of forested vegetation as commercial forest, 27 percent more than current management. Impacts would be similar. Also see Effects from Forest Products Management, below.

Effects from Wildland Fire Management

In addition to the effects described above under Effects Common to All Alternatives, Alternative D would allow wildland fire use if the fire would not adversely impact commercial forest land management areas or authorized livestock grazing areas (**Figure H-3**, Areas Available for Wildland Fire Use—Alternative D [see **Appendix H** in Volume II~~I~~]). Alternative D would include 45,190 acres of commercial forest land and 135,850 acres of authorized livestock grazing areas, more than under Alternatives A, B, or C. Although the commercial forest land and authorized livestock grazing areas would be larger under Alternative D than under Alternatives A, B, and C, wildland fire could still be used within them, as long as it did not adversely impact them.

Effects would be similar to those described under Alternative B, except that 50,650 acres of the CFO classified as FRCC 2 or 3 (moderate to high risk) WUI areas could be treated in any 5-year period under Alternative D (see Section 4.2.12, Wildland Fire Management), 50 percent more than Alternative B and triple that under Alternative C. Alternative D would include approximately 2,870 to 7,597 acres annually of mechanical treatments and prescribed fire (see Section 4.2.5, Vegetation—Forests). Additional areas could be treated outside the WUI.

Treatments would be designed to alter vegetation composition, structure, and fuels to recreate historic or maintain desired fire behaviors, severities, and patterns. Treatments in areas with FRCC 2 or 3 would be similar to those described under Alternative B, except that Alternative D would include 2 to 15 percent mechanical treatments.

Effects from Forest Products Management

Similar to Alternative A, impacts on air quality from forest products management activities include fugitive dust from use of roads and equipment (e.g., skidders and CATs), road construction, and smoke from broadcast/underburning to reduce hazardous fuels and to prepare areas for reforestation and slash pile burning.

Under Alternative D, 45,190 acres are classified as commercial forest land with an estimated PSQ of approximately 4,823 MBF per year. Impacts on air quality from these activities could result in a corresponding decrease in emissions from current levels because of the decrease in harvest volume and acres treated.

Effects from Minerals Management

Under Alternative D, effects on air quality from minerals management would be similar to those described under Alternative B, but would be less limited because of fewer areas with surface use restrictions (leasables and mineral materials), which include 35,045 acres subject to NSO stipulations and 32,013 acres subject to CSU stipulations. The increase in surface use stipulations could decrease emissions compared to current levels.

Cumulative Effects

Despite the increasing population base in northern Idaho, annual average concentrations have remained fairly constant over the past few years and PM_{10} data have shown an improvement over the last 10 years (Stevenson 2004). Historically, smoke has been identified as the primary source affecting air quality and the poorest air quality conditions have been reported from October through December due to biomass burning and atmospheric conditions that trap pollutants.

In the foreseeable future, state-wide implementation of the National Fire Plan and changes in the Clean Air Act could result in increased regulatory restrictions and additional requirements for conformance, as required for all of the proposed alternatives. Increased wildland fires and fuels treatments in the region are particularly likely to adversely affect air quality. As previously noted, the BLM coordinates fire management activities with the Montana-Idaho Airshed Group. A primary mission of the airshed management group is to coordinate fire management activities between participating entities (such as BLM, Forest Service, IDEQ, and others) to ensure that simultaneously occurring actions do not cumulatively result in violations of air quality standards or significant deterioration of air quality, including visibility. Under all alternatives, the BLM's continued participation and coordination with this group would manage cumulative effects on air quality due to fire management actions (including RMP and Forest Plan revisions). Per US EPA rules, the Nez Perce Tribe controls burning on all lands within the reservation boundary.

Future increases in mineral development, timber harvesting, and particularly population in the region could also affect air quality and would present a challenge to air quality management and necessitate assessment of direct and indirect effects on air quality from planned actions to avoid adverse cumulative effects.

Activities within the planning area and in adjacent areas could, when combined with the various proposed RMP alternatives, cumulatively affect air quality and could impact air quality management decisions. The potential effects would be similar for all alternatives. Alternatives B, C, and D would all contribute more to decreased air pollutant concentrations in comparison to Alternative A, with Alternative C having the greatest potential decrease due to low fuel treatment objectives and numerous management actions, mitigation measures, and restrictions, followed by Alternatives B and D. Activities include those related to the Idaho Statewide Implementation Strategy for the National Fire Plan, wildland fire, fuels treatments, timber management, minerals development, population change, the Clean Air Act, and Forest Plan revisions, including the increasing use of wildland fire use on Forest Service lands.

4.2.2 Geology

Recreational aspects of geologic features are discussed under Section 4.3.4, Recreation. Impacts to geology are not addressed because management of resources is not expected to affect geology.

4.2.3 Soils

Goal: Maintain and restore watershed health, soil productivity, and areas of fragile soils.

Summary

The alternatives vary by total potential areas where management activities could cause soil disturbances or result in soil erosion. In general, Alternative C would be most protective of soil resources, followed by Alternatives B, D, and A. However, implementing appropriate BMPs would ensure that long-term impacts on soils would be minimized or avoided under any alternative. **Table 4-3** identifies the indicators that were used to analyze effects on soils under each alternative.

Methods of Analysis

Indicators

Indicators are used to identify the level of impact. For soils, the indicators used for impact analysis are identified in **Table 4-3**, Comparison of Soils Indicators by Alternative.

Methods and Assumptions

Impact analyses and conclusions are based on interdisciplinary team knowledge of resources in the CFO, review of existing literature, and information provided by experts in the BLM or other agencies. Impacts are based on the design of the alternatives under consideration. Effects are quantified where possible. In the absence of quantitative data, best professional judgment prevailed. All alternatives must comply with the Clean Water Act and the Idaho Forest Practices Act.

Substantial disturbance of soil, including compaction of soil or changes in vegetative cover, can decrease soil productivity and contribute to increased peak flows. This may result in channel instability and increased sediment transport, thereby degrading water quality, channel structure, and overall watershed health.

The degree of impact attributed to any one disturbance or series of disturbances is influenced by several factors, including location, time and degree of disturbance, existing vegetation, and precipitation.

Table 4-3
Comparison of Soils Indicators by Alternative

Indicator	Alternative A	Alternative B	Alternative C	Alternative D
Acres of proposed management activities, including grazing, timber production, fuels reductions, and mineral development	Available for grazing: 122,732 acres	Available for grazing: 105,619 acres	Available for grazing: 101,350 acres	Available for grazing: 135,850 acres
	Timber production: Estimated annual ASQ: 6,600 MBF on 358 acres	Timber production: Estimated annual PSQ: 3,129 MBF on 242 acres	Timber production: Estimated annual PSQ: 3,101 MBF on 191 acres	Timber production: Estimated annual PSQ: 4,823 MBF on 361 acres
	Fuels treatments: 20,000-81,500 acres estimated in 5 years	Fuels treatments: 57,000 acres estimated in 5 years	Fuels treatments: 25,974 acres estimated in 5 years	Fuels treatments: 86,251 acres estimated in 5 years
	NSO constraints: case-by-case basis	NSO constraints: 43,590 acres	NSO constraints: 68,854 acres	NSO constraints: 35,045 acres
	CSU restrictions: case-by-case basis	CSU restrictions: 42,403 acres	CSU restrictions: 59,122 acres	CSU restrictions: 32,013 acres

Source: BLM 2004a

Roads contribute to soil compaction and erosion, particularly in forested areas (Gucinski et al. 2001), so higher road densities would result in more adverse impacts on soils. Roads that receive more traffic are also at greater risk for soil erosion (Smith 2005). BMPs would be implemented under all alternatives to reduce the potential impacts of road construction and maintenance.

Some management activities may involve soil compaction from animals or heavy machinery, direct soil disturbance, or soil displacement (Froelich and McNabb 1993, Forest Service 2003a, Wert and Thomas 1981). Fires that heat soils to high temperatures can volatilize organics and produce a hydrophobic layer that contributes to higher rates of runoff and more soil erosion. Vegetative treatments, including mechanical treatments and prescribed burning, may result in impacts on soils. Implementing BMPs, including soil moisture restrictions for use of heavy machinery and soil temperature limitations for prescribed burning, would reduce potential impacts under all alternatives. BMPs related to grazing, such as rotating grazing locations to avoid long-term soil compaction, would also reduce potential impacts under all alternatives. Fire risk/fuels-reduction projects, which typically involve vegetative treatments and/or low-intensity burns, may result in short-term soil disturbance, but if successful, they would prevent or reduce long-term damage to soils from high-intensity wildland fires. Earth-moving activities related to mineral development may result in long-term commitments of soil resources.

Access roads and surface-disturbing activities would follow the standards, guidelines, and BMPs in PACFISH (BLM and Forest Service 1995) and the MFP Guidelines (BLM 1981a). In addition,

Alternative A would follow the Riparian Management Guidelines (BLM 1985e). Alternatives B, C, and D would follow the guidelines in **Appendices F** (Aquatic and Riparian Management Strategy) and **B** (Best Management Practices) (see Volume II~~I~~). However, even properly designed roads would alter hillslope hydrology and concentrate overland flow in some areas. In areas with steep topography (greater than 60-percent slope), these impacts would increase.

Fine-textured soils are more susceptible to water erosion and compaction when wet.

Effects Common to All Alternatives

Effects from Soils Management

All alternatives would require implementing appropriate BMPs to protect soil and water resources. For Alternative A these would include the PACFISH standards and guidelines (BLM and Forest Service 1995), MFP Road Guidelines (BLM 1981a) and Riparian Management Guidelines (BLM 1985e). For Alternatives B, C, and D, these would include the direction listed in **Appendices F** (Aquatic and Riparian Management Strategy) and **B** (Best Management Practices) (see Volume II~~I~~). BMPs and potential impacts on soils are described below under each alternative. Similarly, management activities under any of the alternatives must comply with the Clean Water Act, which imposes penalties for water quality degradation from eroded sediments. All alternatives would comply with the Idaho Department of Lands Forest Practices Regulations, the Idaho Department of Water Resources Stream Channel Alteration Regulations, and with EPA and US Army Corps of Engineers regulations relating to the Clean Water Act. These establish additional BMPs, including road, streamside management, timber harvesting, and stream crossing measures. Implementing these BMPs would protect soil resources.

All alternatives would include actions to protect landslide-prone areas and minimize mass wasting. These actions would stabilize soil resources.

Effects from Vegetation—Rangelands Management

The Idaho Standards for Rangeland Health and Guidelines for Livestock Grazing Management (BLM 1997a) (**Appendix A** in Volume II~~I~~) would minimize or mitigate potential impacts to soil resources from management of nonforested vegetation under all alternatives. In particular, several standards would limit soil erosion and compaction, including Standard 1 (watersheds), Standard 2 (riparian areas and wetlands), and Standard 3 (stream channel/floodplain), and several would ensure adequate soil crusts and nutrients, including Standard 4 (native plant communities), Standard 5 (seedings), Standard 6 (exotic plant communities, other than seedings), and Standard 8 (threatened and endangered plants and animals). Idaho Standards for Rangeland Health and Guidelines for Livestock Grazing Management (BLM 1997a) (**Appendix A** in Volume II~~I~~) guidelines would reduce soil compaction and would stabilize soils.

Effects from Wildlife and Special Status Wildlife Management

All of the alternatives would include HMPs to protect wildlife. Where these plans include grazing restrictions and vehicle use restrictions, their implementation would protect soil resources.

Effects from Special Status Plant Management

Management measures to protect special status plant species would have similar soil resources impacts under all alternatives. Plant species protection could involve avoiding activities that disturb soils which would help reduce potential for soil resource impacts.

Effects from Wildland Fire Management

All of the alternatives would allow no more than 30 percent of CFO acres to burn in any 5-year period. Fires that heat soils to high temperatures can volatilize organics and produce a hydrophobic layer that contributes to higher rates of runoff and more soil erosion. Prescribed burning also may impact soils by removing the protective duff layer. Fuel-reduction treatments and wildland fire use could result in short-term soil disturbance, but if successful, it would prevent or reduce long-term damage to soils from high-intensity wildland fires.

Under all alternatives, impacts from wildland fire to soils that are not expected to recover naturally could be mitigated in a cost-effective manner through rehabilitation. Emergency Stabilization and Rehabilitation protocols (described in **Appendix H**, Wildland Fire Management [see Volume II~~I~~]) would be implemented to prevent post-fire resource damage, including severe soil erosion. Rehabilitation of disturbed areas related to fire lines, camps, and other fire suppression activities would reduce potential long-term impacts to soil resources.

Effects from Cultural Resources Management

Soil resources would be protected under all alternatives by restricting ground-disturbing activities to protect cultural resources.

Effects from Forest Products Management

All alternatives would require implementing appropriate BMPs to protect soil and water resources as discussed under effects from soil management above. All alternatives would comply with the Idaho Department of Lands Forest Practices Regulations. Implementing these BMPs would protect soil resources.

Effects from Livestock Grazing Management

The Idaho Standards for Rangeland Health and Guidelines for Livestock Grazing Management (BLM 1997a) (**Appendix A** in Volume II~~I~~) would minimize or mitigate potential impacts to soil resources from management of livestock grazing under all alternatives, as described above under Effects from Vegetation—Rangelands.

Effects from Minerals Management

All alternatives would continue the withdrawals on the Lower Salmon River. In total, 21,869 acres of public land (including Wilderness, power site reserves, and Federal Energy Regulatory Commission) and 8,062 acres of federal minerals (split estates) would be withdrawn from locatable minerals. These areas would be closed to locatable mineral activities. Without surface disturbances, impacts to soil resources would not occur in these areas.

Each of the alternatives also would include 12,786 acres closed to leasable mineral activities. The remaining areas open to leasable minerals would be managed differently under each alternative, as described below by alternative.

Each of the alternatives would involve 750 acres of nondiscretionary closures to mineral material disposal. Mineral material disposal would not be allowed in these areas. In addition, discretionary closures for mineral materials would apply to 12,034 acres under each alternative. Activities could be allowed in these areas on a case-by-case basis. Like leasable minerals, mineral material activities would be managed differently under each alternative, as described below.

Effects from Transportation and Travel Management

Roads contribute to soil compaction and erosion, particularly in forested areas (Gucinski et al. 2001), so higher road densities would result in more adverse impacts on soils. Roads that receive more traffic are also at greater risk for soil erosion. BMPs would be implemented under all alternatives to reduce the potential impacts of road construction and maintenance. All of the alternatives would locate roads and trails in a manner to minimize impacts to soils.

Effects from Lands and Realty Management

All of the alternatives would consider land fragmentation in land acquisitions and disposals. (Alternative A would eliminate surface and subsurface inholdings within Management Areas. Alternatives B, C, and D would reduce the number of scattered parcels of public land.) As the CFO became less fragmented, resource management by entire watersheds would be more feasible. Soil resources may be better protected with watershed-scale management.

All alternatives would exclude mining in the withdrawals on the Lower Salmon River. In total, 21,869 acres of public land and 8,062 acres of federal minerals (split estates) would be withdrawn from locatable minerals.

Effects from ACEC/RNA Management

All of the alternatives would prohibit vegetation manipulation in the Lower and Middle Cottonwoods Islands ACEC/RNA, as stated in the HMP, which would prevent impacts to soils. Similarly, no livestock grazing would be authorized in the Captain John Creek or the Skookumchuck ACEC/RNAs, which would prevent impacts to soils.

Effects from Wild and Scenic Rivers Management

All alternatives would ~~involve efforts to renew~~ continue the withdrawal of the Salmon River from Long Tom Bar to the Snake River from mineral entry, which would protect soils from related surface disturbances.

Effects from Wilderness and Wilderness Study Areas Management

Under all alternatives, surface-disturbing activities would be excluded from the Frank Church/River of No Return Wilderness, which would protect soil resources.

Effects from Native American Tribal Uses Management

Consultation with tribes regarding treaty rights, cultural access and use of plants, animals, fish and habitats could result in identifying areas where mineral development actions may need to be modified to accommodate or maintain tribal uses or to avoid resources important to tribes. However, it is unlikely that accommodating tribal uses would impede the anticipated level of mineral development within the CFO in the long term.

Effects from Public Safety—Abandoned Mines and Hazardous Materials Management

All of the alternatives would protect soils from contamination by requiring cleanup of hazardous materials.

Alternative A

Effects from Soils Management

As described under Effects Common to All Alternatives, Alternative A would continue to implement PACFISH. The standards and guidelines in this management direction would restrict

many management activities in RHCAs, which under this alternative are larger stream buffers than the RCAs under Alternatives B or D. The MFP supplement established 39 prescription watersheds totaling 66,077 acres, which are higher priority for achieving water quality and fish objectives. Many standards and guidelines are designed to protect soil resources.

Alternative A also would implement the 1981 MFP Road Guidelines (BLM 1981a). The road-related BMPs in Alternative A are sufficiently general to allow implementation of the same detailed BMPs as in Alternatives B, C, and D (**Appendix B**, Best Management Practices [see Volume II~~I~~]). Several timber harvest restrictions, which also would protect sensitive soils, would be implemented under Alternative A as part of the PACFISH strategy.

Also as described under Effects Common to All Alternatives, Alternative A would implement the Riparian Management Guidelines (BLM 1985e). These guidelines establish general management objectives for riparian areas, including protecting the water body and adjacent environment to maintain wildlife and fish habitat, water quality, and aquatic resources at a high natural level. The specific management requirements and constraints and specific mitigation measures primarily apply to riparian areas.

Because Alternative A would not include specific direction on field assessments and protection zones for landslide-prone areas, it may not protect soils to the same extent as the other alternatives.

Effects from Water Resources Management

As described under Effects from Soils Management, Alternative A would protect soils to the same extent as other alternatives because activities would follow the PACFISH standards and guidelines, MFP Road Guidelines (BLM 1981a), and Riparian Management Guidelines (BLM 1985e). While these guidelines generally state the same goals as **Appendices F** (Aquatic and Riparian Management Strategy) and **B** (Best Management Practices) (see Volume II~~I~~), they would offer less-detailed management restrictions. Although Alternative A does not specifically include implementation and effectiveness monitoring, BLM Instruction Memorandum ID-2005-065 specifies a program for PACFISH monitoring and adaptive management.

Alternative A gives direction to identify and resolve potential water quality problems (including sediment from eroded soils). Alternative A identifies prescription watersheds to prioritize these areas for active restoration activities.

Effects from Vegetation—Forests Management

Alternative A would not include vegetative treatments to achieve forest vigor and/or habitat diversity in DFC blocks. Instead, vegetation treatments would focus on timber production and are addressed in the Effects from Forest Products Management section.

Effects from Vegetation—Riparian and Wetlands Management

Under this alternative, RHCA buffers totaling 24,290 acres would be implemented to protect riparian areas and wetlands. Activities would be planned and monitored in these areas to prevent damage to riparian areas and wetlands. These restrictions and monitoring efforts, including limiting logging methods to minimize soil disturbance, would protect soil resources under Alternative A.

Effects from Wildlife and Special Status Wildlife Management

Alternative A would involve reviewing ongoing activities, and if negative impacts to federally listed species or their habitats were occurring as a result of discretionary actions, the activity would be modified to avoid or minimize adverse impacts to the species and suitable habitats. Also, lands identified for less intensive wildlife management may include controls of vehicle use or other guidelines. Where these activities would involve reducing route density or vehicle use, soil resources would be protected. Where they would involve vegetative treatments to improve range conditions (for example, under Objective 8, Action 2), they could result in short-term soil compaction and soil erosion. However, BMPs would be applied to these treatments to mitigate or minimize potential impacts on soils, especially the adverse effects from the use of roads and heavy machinery. In the long term, improved range conditions would protect soil resources.

Where grazing restrictions are employed to protect wildlife habitat, limiting use of forage in riparian areas would reduce soil compaction in those areas, which would protect soils. Measures to address grazing in riparian areas proposed under Alternative A would be less restrictive than under the other alternatives.

Effects from Aquatic Resources, Fish, and Special Status Fish Management

As described under Effects from Soils Management, Alternative A would protect soils to the same extent as other alternatives because activities would follow the PACFISH standards and guidelines and the Riparian Management Guidelines (BLM 1985e). Alternative A would not emphasize conservation or restoration watershed management. Management plans would be implemented and activities restricted in sensitive areas, and soils would be protected in PACFISH prescription watersheds (39 watersheds totaling 66,077 acres).

Effects from Wildland Fire Management

Wildland fire use would be allowed under Alternative A (**Figure H-1**, Areas Available for Wildland Fire Use—Alternatives A and C [see **Appendix H** in Volume II~~I~~]), which could result in minor short-term impacts to soils but would result in fewer long-term impacts because these treatments would reduce the risk for more damaging wildland fires.

Under Alternative A, specific percentages of the CFO FRCC 2 and 3 (moderate to high risk) WUI areas would not be identified for fire risk/ fuels-reduction treatments. Given current management, an estimated 1,950 to 5,950 acres could be treated annually with mechanical treatments and prescribed fire (see Section 4.2.12, Wildland Fire Management). If more acres were treated under Alternative A than under the other alternatives, then the short-term impacts to soils could involve more potential localized soil compaction and soil erosion, but the long-term impacts would protect soils from larger and more widespread erosion by reducing the risk of large, high-intensity wildland fires. Implementation of BMPs (such as ceasing operations during wet soil conditions) would reduce the potential for short-term impacts.

Effects from Cultural Resources Management

Where OHV limitations were employed to protect cultural resources, soil resources would be protected under Alternative A.

Effects from Visual Resources Management

Soil resources would be protected in areas with ground-disturbance restrictions, including VRM Classes I and II. Alternatives A and B would include 12,704 acres of VRM Class I and 41,195 acres of VRM Class II.

Effects from Forest Products Management

The current estimated annual ASQ is 6,600 MBF on 358 acres under Alternative A (see Section 4.3.1, Forest Products). A total of 35,757 acres of commercially viable forest would be included in the commercial timber base. The remaining commercially viable forest would be considered custodial and would not be managed for timber, although harvesting could occur for other ecological reasons. Because the most timber would be extracted under this alternative, potential impacts to soils (including soil compaction, erosion, and loss of nutrient cycling) would be greatest under Alternative A.

Treatments focused on timber production would include harvests involving log landings, skid trails, temporary roads, and vegetation removal. These treatments could result in soil compaction and soil erosion. Because BMPs are not specifically defined for timber harvests in the MFP Road Guidelines (BLM 1981a) or the Riparian Management Guidelines (BLM 1985e), potential impacts to soils, including soil compaction and soil erosion, would be more likely under this alternative than under the other alternatives. However, continued implementation of PACFISH would protect soils, particularly in RHCAs (24,290 acres) and prescription watersheds (39 watersheds totaling 66,077 acres).

Alternative A would include an estimated annual timber harvest ASQ of 6,600 acres and 1,530 to 4,800 acres of mechanical treatments and prescribed fire (see Section 4.2.5, Vegetation—Forests). These vegetation treatments could result in soil compaction and soil erosion.

Effects from Livestock Grazing Management

In addition to the Effects Common to All Alternatives, Alternative A would consist of 122,732 acres, 168 allotments with a total 7,~~204~~ 200 AUMs available for livestock authorizations. All alternatives would follow the Idaho Standards for Rangeland Health and Guidelines for Livestock Grazing Management (BLM 1997a) (**Appendix A** in Volume II~~I~~), which would protect soil resources.

Effects from Minerals Management

In addition to Effects Common to All Alternatives, under Alternative A, restrictions could be applied on a case-by-case basis during review of a proposed activity to protect resources, including soil resources. These stipulations would protect soil resources beyond that of the standard lease/permit.

Effects from Recreation Management

Alternative A would include 26,682 acres of SRMAs. To the extent that these areas would limit road construction or use or other ground-disturbing management activities to provide nonmotorized and other types of recreation opportunities, soil resources would be protected. The other alternatives would include more acres of SRMAs, providing more soil protection.

Alternative A also would include 33,197 acres of nonmotorized ROS designations (including 14,381 acres Primitive and 26,206 acres Semiprimitive Nonmotorized). In Primitive and Semiprimitive

areas, soils would not be impacted by mechanized and motorized vehicle uses. Because Alternative A would include a slightly smaller area where these uses were restricted, more soils would be open to potential impacts.

Effects from Renewable Energy Management

There would be no impacts to soils from renewable energy management. This alternative would not specify that biomass be emphasized.

Effects from Transportation and Travel Management

Alternative A would include the largest area (85,308 acres) Open to yearlong, cross-country motorized travel. An additional 40,437 acres would be Limited to existing routes. The Closed areas would be very similar in all alternatives, with 18,054 acres under Alternative A and 18,069 acres under the other alternatives. Because unlimited, cross-country motorized use would be most damaging to soils, resulting in soil compaction and erosion, Alternative A would have the most adverse impacts on soil resources.

There are approximately 341 miles of routes on BLM lands, approximately 68 miles (20 percent) of which are located within Open areas but are closed to motorized vehicles yearlong. Within Limited areas, approximately 43 miles are open yearlong. However, 13 of the 43 miles do not have legal public access so likely receive little or no use. Additionally, about 40 miles are closed yearlong in Limited areas. Route restrictions and closures would protect soil conditions by reducing or eliminating traffic, which could contribute to localized erosion of the roadbed, particularly when such use occurs on native-surface roads during wet periods.

Effects from ACEC/RNA Management

Alternative A would not allow timber harvest or vegetation treatments but would allow livestock grazing in the Wapshilla Ridge ACEC/RNA. Soils would not be impacted from timber harvesting. The potential impacts to soils from livestock grazing are described above under Effects from Vegetation—Rangelands Management and under Effects from Livestock Grazing Management.

Alternative A would not allow timber harvest in the Captain John Creek ACEC/RNA except for disease and insect control. Alternative A would not allow ground-disturbing activities in the Long Gulch ACEC/RNA, which would prevent impacts to soils.

Alternative A would protect 3,956 acres of Craig Mountain as an ACEC. Timber would be removed only when necessary to protect resource values. Maximum protection to resources would be followed during any timber extraction. No new rights-of-way or road construction would be allowed. Alternative A would maintain the Elk City Dump/American Hill Lake ACEC. OHV use would be excluded, and ground-disturbing activities would not be allowed, which would protect soil resources.

Alternative A would include provisions to protect soil resources, including requiring yarding methods that would not disturb soils for timber harvests on slopes greater than 50 percent.

Effects from Wilderness and Wilderness Study Areas Management

If Congress were to release the WSAs from wilderness consideration, Alternative A would not specifically protect these WSAs from surface disturbances, and impacts to soil could occur.

Alternative B

Effects from Soils Management

The BMPs and standards and guidelines established in **Appendices F** (Aquatic and Riparian Management Strategy) and **B** (Best Management Practices) (under Alternative B) (see Volume II~~I~~) would be similar to the PACFISH and 1981 MFP Road Guidelines under Alternative A. Some of the BMPs and standards and guidelines for roads have been updated in **Appendices F** (Aquatic and Riparian Management Strategy) and **B** (Best Management Practices) to reflect improved understanding of the effects of roads on soil erosion and sedimentation. The separate section of BMPs related to timber harvesting activities under Alternative B would mitigate potential impacts to soil from landings, skid trails, temporary roads, and vegetation removal. The specific mention of these activities under Alternative B would result in fewer impacts to soils from timber harvest activities than under Alternative A.

Guidelines that would be established under Alternative B would apply to both riparian and upland areas. In addition, they would include standards and guidelines related to grazing management, recreation management, mineral management, fire management, and lands, none of which would be covered specifically under Alternative A. Alternative B would prioritize management of conservation and restoration watersheds totaling 64,481 acres, 2 percent less than the prescription watersheds in Alternative A. Multiscaled assessments, including watershed analyses, are described under Alternative B. In addition, adaptive monitoring would occur under Alternative B. All of these additional measures would better protect soils (particularly upland soils) under Alternative B than under Alternative A.

In addition to BMPs, Alternative B would include reclamation efforts to mitigate adverse impacts to soils and water resources on impacted sites. Specific field assessments would be required to protect landslide-prone areas. Where these areas were identified, Alternative B would include field-verified protection zones, which would be managed to identify landslide-prone areas. Because Alternative A would not include specific direction on field assessments and protection zones for landslide-prone areas, it may not protect soils to the same extent as the other alternatives. Similarly, Alternative B would include specific directions for evaluating potential risks of mass wasting before project implementation. Management activities would be limited if the project interdisciplinary team determined that they may increase potential slope failures. These measures would provide increased protection to soil resources beyond the actions in Alternative A.

Effects from Water Resources Management

Alternative B would include implementation and effectiveness monitoring, which would reduce the potential for impacts to soils. While Alternative A gives direction to identify and resolve potential water quality problems (including sediment from eroded soils), Alternative B gives updated direction to address current regulations. Alternative A identifies prescription watersheds, and Alternative B identifies restoration watersheds to prioritize these areas for active restoration activities. Under Alternative B, plans for identifying and resolving potential water quality problems (including sediment from eroded soils) would be updated to address current regulations. Alternative B identifies and prioritizes activities in restoration watersheds. These actions would protect soil resources.

Effects from Vegetation—Forests Management

Alternative B would include vegetative treatments to achieve forest health ~~vigor~~ and/or habitat diversity in 1,000-acre DFC blocks comprising 24,789 acres, which is 24 percent of forest land and 17 percent of the CFO. Management would focus on large trees and old growth areas. These timber harvests could result in localized soil compaction and erosion. However, BMPs and standards and guidelines described in **Appendices F** (Aquatic and Riparian Management Strategy) and **B** (Best Management Practices) (see Volume II~~I~~) would be applied to these activities to mitigate or minimize potential impacts, resulting in few anticipated effects to soils.

Effects from Vegetation—Weeds Management

Invasive species affect soil stability. Many invasive broadleaves have taproots, and invasive annual bromes are shallow rooted. These plant forms replace native bunchgrass vegetation that is mainly composed of plants with fibrous root systems that root to a deeper depth. Either invasive plant type increases erosion potential. Action to control invasive species promotes and maintains native plant communities with root systems more prone to holding soil in place. Weed-control actions and rehabilitation treatments would thereby improve soil stability and nutrient cycling in the long term. There may be short-term impacts associated with projects such as soil disturbance during treatment.

Effects from Vegetation—Rangelands Management

The Idaho Standards for Rangeland Health and Guidelines for Livestock Grazing Management (BLM 1997a) (**Appendix A** in Volume II~~I~~) includes standards related to weed management that would ensure adequate soil crusts and nutrients. These include Standard 4 (native plant communities), Standard 5 (seedings), and Standard 6 (exotic plant communities, other than seedings).

Effects from Vegetation—Riparian and Wetlands Management

Under this alternative, RCA stream buffers totaling 22,847 acres would be implemented to protect riparian areas and wetlands. Activities would be planned and monitored in these areas to prevent damage to riparian areas and wetlands. These restrictions and monitoring efforts, including ensuring that vegetation treatments maintain riparian management objectives at a minimum, as well as limitations related to roads, grazing, recreation, minerals, fire, and lands, would protect soil resources. In general, larger areas that are protected in buffers or RCA stream buffers provide protection to more soil resources. RCA stream buffers under Alternative B would be 14 percent smaller than the RHCA buffers under Alternative A.

Effects from Wildlife and Special Status Wildlife Management

Protecting riparian areas under Alternative B would include preventing adverse impacts to water quality. Soil erosion would be managed to achieve this goal. Measures to address grazing in riparian areas under Alternative B would be more restrictive than under Alternative A. Alternative B would go beyond grazing restrictions by implementing appropriate management and conservation measures to promote the maintenance or enhancement of habitats for rangeland. If riparian grazing limitations were implemented to protect wildlife habitat, such measures could include limiting riparian grazing by season or restricting stream bank use, less soil compaction would occur than under Alternative A.

In addition, no net increase in routes designated open for motorized use would be allowed on 101,526 acres in specific areas, which would protect soil resources.

Effects from Aquatic Resources, Fish, and Special Status Fish Management

To the extent that promoting conservation and restoration and precluding long-term degradation for special status fish under Alternative B would involve reducing sediment to streams by stabilizing soil erosion, this action would improve soil conditions. Similarly, restricting activities in RCA stream buffers under Alternative B would protect soil resources within those buffers.

Managing conservation watersheds would minimize soil erosion by performing regular maintenance on existing roads and trails. Managing restoration watersheds could include active management to restore hydrologic and biological functions. If these activities reduced soil compaction and soil erosion and increased nutrient cycling, they would impact soil resources. The greater the area that would be managed as conservation and restoration watersheds, the greater the potential improvements to soil. Alternative B would identify ~~32~~ 28 restoration and ~~1~~ 3 conservation watersheds totaling 64,481 acres, 2 percent less than the prescription watersheds in Alternative A.

Effects from Wildland Fire Management

In addition to the effects described above under Effects Common to All Alternatives, Alternative B would restrict wildland fire use in the Elk City, Clearwater, and portions of the Salmon ~~FMU~~FMAs (**Figure H-2**, Areas Available for Wildland Fire Use—Alternative B [see **Appendix H** in Volume II~~I~~]).

Under Alternative B, up to 40 percent of the CFO classified as FRCC 2 or 3 (moderate to high risk) WUI areas could be treated in any 5-year period; an estimated 3,766 acres could be treated under Alternative B (see Section 4.2.12, Wildland Fire Management). Treatments would be designed to alter vegetation composition, structure, and fuels to recreate historic or maintain desired fire behaviors, severities, and patterns. Alternative B would include approximately 1,182 to 3,545 acres annually of mechanical treatments and prescribed fire (see Section 4.2.5, Vegetation—Forests). The short-term impacts to soils could involve potential soil compaction and soil erosion, but the long-term impacts would protect soils by reducing the risk of large, high-intensity wildland fires.

Standards and guidelines and BMPs described in **Appendices F** (Aquatic and Riparian Management Strategy) and **B** (Best Management Practices) (see Volume II~~I~~) would be applied to these treatments to mitigate or minimize potential impacts on soils, especially those from the use of prescribed fire and heavy machinery. The standards and guidelines allow for avoiding wet seasons. Fuels-reduction treatments would emphasize biomass utilization. Removal of biomass could result in long-term reductions in soil nutrient cycling.

Alternative B also would not allow livestock grazing for a minimum of two growing seasons in prescribed burn areas, which would reduce the potential for soil compaction, particularly where soils are most fragile from burn activities.

Fuel treatments that would be restricted or prevented under Alternative A could occur in WUIs in VRM Class I and II areas given safety and infrastructure risks under Alternative B. These treatments could result in more short-term soil compaction and soil erosion and long-term soil protection, as described above under Effects from Wildland Fire Management.

Effects from Cultural Resources Management

Geomorphic relationships would be assessed. Conducting geomorphic analyses for cultural sites might protect soil resources by improving the understanding of soil characteristics and formation processes at these sites. The information could be used to improve management of soil resources.

Effects from Visual Resources Management

Effects would be the same as those described under Alternative A.

Effects from Forest Products Management

Effects would be similar to those described under Effects from Vegetation—Forests Management. Alternative B would include 40,598 acres of commercial forest land and would decrease the current estimated annual PSQ by 53 percent (to 3,129 MBF), with an estimated 242 acres treated per year (an estimated 32-percent decrease from current management). Because less timber would be extracted under this alternative than under Alternative A, potential impacts to soils (including soil compaction, erosion, and loss of nutrient cycling) would be less.

Effects from Livestock Grazing Management

In addition to the Effects Common to All Alternatives, Alternative B would consist of 105,619 acres, 166 allotments with a total ~~6,254~~6,263 AUMs available for livestock authorizations. In general, fewer acres of livestock grazing would result in more soil protection, including lower rates of soil erosion and compaction.

Effects from Minerals Management

In addition to Effects Common to All Alternatives, under Alternative B, NSO restrictions would apply on 43,590 acres, CSU restrictions would apply on 42,403 acres, and TLs would apply in deer and elk winter range and fawning and calving areas, and in bald eagle winter feeding areas. As a result, fewer potential adverse impacts (such as soil erosion or compaction) from mineral leasing would be likely under this alternative than under Alternative A. Mineral material disposals could be subject to the same restrictions as leasable minerals, on a case-by-case basis. In general, fewer potential adverse impacts (such as soil erosion or compaction) from mineral material disposal would be likely under this alternative than under Alternative A.

Effects from Recreation Management

Alternative B would include 55,201 acres of SRMAs. This alternative would include more acres of SRMAs than Alternative A, providing more soil protection. Alternative B also would include 42,695 acres of nonmotorized ROS designations (including 6,200 acres Primitive and 36,495 acres Semiprimitive Nonmotorized), which is more than Alternative A. In these areas, soils would not be impacted by motorized vehicle uses. Because Alternative B would include a slightly larger area where these uses were restricted, fewer soils would be open to potential impacts.

Effects from Renewable Energy Management

Alternative B would emphasize biomass. If vegetation treatments increased under these alternatives, potential impacts to soils could also increase, as described under Effects from Vegetation—Forests Management.

Effects from Transportation and Travel Management

Unlike Alternative A, Alternative B would include no areas Open to yearlong, cross-country motorized travel. A total of 125,729 acres would be Limited to designated routes. Within Limited

areas, approximately 206 miles of routes would be open yearlong. However, almost half of these (100 miles) would not have legal public access so these would receive little to no use. An additional approximately 107 miles would be restricted in Limited areas, the majority (93 percent) of these being closed yearlong to motorized use. Route restrictions and closures would protect soil conditions by reducing or eliminating traffic, which can contribute to localized erosion of the roadbed. Because cross-country motorized use would be most damaging to soils, resulting in soil compaction and erosion, Alternative B would have less adverse impacts on soil resources because there would be no Open areas.

Alternative B would involve updating route designations annually, developing outreach materials for public distribution, and enforcing restrictions. Educated recreation users would be more likely to observe closures and other limitations, particularly with increased enforcement measures. Effects of recreation, including potential soil erosion, also would be monitored. The comprehensive planning, communication, enforcement, and monitoring efforts would protect soil resources more than under Alternative A. In addition to the Effects Common to All Alternatives, Alternative B would add soil stability as a criterion for future route designation. This consideration would protect soils beyond the general guidance described under Alternative A.

In addition, unneeded roads and trails would be decommissioned with emphasis on restoration and conservation watersheds. Alternative B would identify ~~32~~ 28 restoration and ~~1~~ three conservation watersheds totaling 64,481 acres, 2 percent less than the prescription watersheds in Alternative A.

Effects from Lands and Realty Management

In addition to the effects described above under Effects Common to All Alternatives, Alternative B would use conservation easements to protect resources, including soils. This alternative also would mitigate and rehabilitate damage to soil resources from unauthorized activities on public lands.

Effects from ACEC/RNA Management

Alternative B would not protect Craig Mountain or the Elk City Dump/American Hill Lake as ACECs. Management activities in these areas could impact soils. Alternative B would allow timber harvest and vegetation treatments but no livestock grazing in the Wapshilla Ridge ACEC/RNA. Alternative B would allow timber and vegetative treatments in the Captain John Creek ACEC/RNA. Alternative B would recommend expanding the Lower Salmon River ACEC by 3 percent (from 15,702 acres to 16,199 acres). No new road construction would be allowed in this ACEC under any alternative. Alternative B would involve vegetation treatments in the Lower Salmon River ACEC. Impacts on soils from timber harvest and vegetation treatments are described under Effects from Vegetation—Forests and Effects from Forest Products Management. Alternative B would include vegetative treatments in the Lucile Caves or Skookumchuck ACEC/RNAs to support long-term improvement of ecological condition. These treatments could have localized, short-term impacts to soils, including soil compaction and erosion.

Alternative B would limit soil disturbance in the Lower and Middle Cottonwoods Islands ACEC/RNA, which would prevent impacts to soils. Vegetation treatments would be allowed that support long-term achievement of ecological goals and objectives for native vegetation and soil resources.

In the Long Gulch ACEC/RNA, Alternative B would only allow ground-disturbing activities that would not result in long-term adverse impacts to MacFarlane's' four-o'clock and suitable habitat.

These activities could result in localized soil compaction and erosion related to ground-disturbing activities.

Under Alternative B, construction of hydroelectric facilities would not be allowed in the Upper or Lower Lolo Creek ACECs, which would prevent impacts to soils. Under Alternative B, roads also would be decommissioned and new roads would not be allowed within 300 feet of Lower Lolo Creek or on slopes greater than 50 percent. Vegetative treatments would include maximum protection to protect soils.

Alternative B would create an ACEC in the East Fork American River and Upper Lolo Creek. Ground disturbance would be minimized on slopes greater than 40 percent in the East Fork American River ACEC, and vegetation treatments would incorporate soil protection measures. Alternative B also would require that timber harvest roads be decommissioned within three years of construction. No new road construction would be allowed within RCA stream buffers in the East Fork American River ACEC.

Overall, Alternative B could allow some short-term impacts to soil resources if long-term benefits would occur to ecological condition and soil resources, and would support achievement of objectives for which the ACEC or ACEC/RNA designation was made.

Effects from Wilderness and Wilderness Study Areas Management

In addition to Effects Common to All Alternatives, if Congress were to release the WSAs from wilderness consideration, Alternative B would continue to protect these areas from surface disturbances.

Alternative C

Effects from Soils Management

Effects would be the same as those described under Alternative B.

Effects from Water Resources Management

Effects would be the same as those described under Alternative B.

Effects from Vegetation—Forests Management

Effects would be similar to those described under Alternative B, except that vegetative treatments would emphasize achievement of DFC on timbered tracts that are 500 acres or more in size, comprising 28,087 acres, which is 28 percent of forested vegetation or 20 percent of the CFO) and would involve more preservation of large trees and old growth areas than under Alternative B. Treating existing contiguous forests would protect soil resources by adding nutrients, establishing contiguous duff layers, and increasing surface roughness, which would reduce soil erosion. Each of these actions would stabilize soils and contribute to nutrient cycling, resulting in long-term protection to soils.

Effects from Vegetation—Weeds Management

Effects would be the same as those described under Alternative B.

Effects from Vegetation—Riparian and Wetlands Management

Effects would be similar to those described under Alternative B, except that RCA stream buffers under Alternative C would be largest (covering 27,624 acres), which would provide the most protection to soils.

Effects from Wildlife and Special Status Wildlife Management

Protecting riparian areas under Alternative C would include reducing utilization beyond the levels that could occur under other alternatives. This reduction in riparian grazing to protect wildlife habitat would result in less soil compaction.

The areas in which no net increase in vehicle use of roads or trails would be allowed would be smaller under Alternative C (75,772 acres) than under Alternative B (101,526 acres); however, Alternative C would also decrease vehicle use on some roads and trails on 38,733 acres, which, overall, would provide protection of soil resources on 11 percent more areas (114,505 acres) than Alternative B (101,526 acres).

Effects from Aquatic Resources, Fish, and Special Status Fish Management

Effects would be similar to those described under Alternative B, except that RCA stream buffers would be larger under Alternative C, resulting in more soil protection. Also, Alternative C would include 3 conservation and ~~40~~ 37 restoration watersheds totaling 68,359 acres, 3 percent more than prescription watersheds in Alternative A.

Effects from Wildland Fire Management

In addition to the effects described above under Effects Common to All Alternatives, Alternative C would not restrict wildland fire use in any areas, unlike Alternatives B and D (**Figure H-1**, Areas Available for Wildland Fire Use—Alternatives A and C [see **Appendix H** in Volume II~~I~~]). Effects would be the similar to those described under Alternative B, except that, under Alternative C, up to 20 percent of the CFO classified as FRCC 2 or 3 (moderate to high risk) WUI areas, 16,833 acres, could be treated in any 5-year period (see Section 4.2.12, Wildland Fire Management), 50 percent less than Alternative B. Treatments in areas with FRCC 2 or 3 would be similar to those described under Alternative B, except that Alternative C would increase the use of prescribed fire for fuels reduction and include up to 20 percent prescribed burning, slightly more than Alternative B. Alternative C would include approximately 1,182 to 4,390 acres annually of mechanical treatments and prescribed fire (see Section 4.2.5, Vegetation—Forests). Alternative C proposes a higher combined level of prescribed burning and mechanical treatments than Alternative B; therefore, it would have potentially higher short-term impacts. Overall, Alternative C would also include reduced potential long-term protection of soils and greater risk of wildland fire impacts than Alternative B.

Effects from Cultural Resources Management

Effects would be the same as those described under Alternative B.

Effects from Visual Resources Management

Soil resources would be protected from impacts in areas with restricted ground-disturbing activities, including VRM Classes I and II. Alternative C would include 26,945 acres of VRM Class I and 46,753 acres of VRM Class II, the most of the alternatives.

Effects from Forest Products Management

Effects would be similar to those described under Effects from Vegetation—Forests Management. Alternative C would include 34,611 acres of commercial forest land (less than Alternative A) and would decrease the current estimated annual PSQ by 53 percent (to 3,101 MBF, less than Alternative A), with an estimated 191 acres treated per year (an estimated 47-percent decrease from current management). Fewer trees would be extracted per acre. Alternative C would involve less biomass removal than under the other alternatives, which would allow for more soil nutrient cycling in the long term.

Effects from Livestock Grazing Management

Effects would be similar to those described under Alternative B, except that a smaller area (101,350 acres in 145 allotments) would be available for livestock grazing and fewer AUMs (6,020) would be permitted under Alternative C than under the other alternatives.

Effects from Minerals Management

Effects would be similar to those described under Alternative B, except that, under Alternative C, NSO restrictions would apply on 68,854 acres (more than the other alternatives), and CSU restrictions would apply on 59,122 acres (more than the other alternatives). As a result, fewer potential adverse impacts (such as soil erosion or compaction) from mineral leasing would be likely under this alternative than under the other alternatives. Mineral material disposals could be subject to the same restrictions as leasable minerals, on a case-by-case basis. In general, fewer potential adverse impacts (such as soil erosion or compaction) from mineral material disposal would be likely under this alternative than under the other alternatives.

Effects from Recreation Management

Effects would be the same as those described under Alternative B.

Effects from Renewable Energy Management

Effects would be the same as those described under Alternative B.

Effects from Transportation and Travel Management

Effects would be similar to those described under Alternative B, except that Alternative C would include 3 conservation and ~~40~~ 37 restoration watersheds totaling 68,359 acres, 3 percent more than the prescription watersheds in Alternative A. These watersheds provide improved management opportunities for watershed restoration, particularly when cooperative management is undertaken with the Forest Service, Idaho Department of Fish and Game, and other partners.

Unneeded roads and trails would be decommissioned, with emphasis on restoration and conservation watersheds totaling 68,359 acres, 3 percent more than the prescription watersheds in Alternative A.

Effects from Lands and Realty Management

Effects would be the same as those described under Alternative B.

Effects from ACEC/RNA Management

Effects would be similar to those described under Alternative B, except for the following differences. Alternative C would protect Craig Mountain as an ACEC. In Craig Mountain ACEC, timber would be removed only when necessary to protect resource values. Timber harvest would

incorporate resource protection measures. New road construction for timber harvest would be temporary, decommissioned within three years of construction, and seeded/planted with native species. Alternative C also would exclude livestock grazing, which would prevent potential future impacts to soils.

~~Alternative C would not allow construction of hydroelectric facilities in the Upper Lolo Creek ACEC, which would protect soils from localized impacts. This alternative would also require non-ground-based yarding methods on slopes greater than 50 percent. Roads not needed for long-term management would be decommissioned. These actions would improve soil conditions.~~

Alternative C would create the ~~Upper Lolo Creek ACEC,~~ Partridge/Elkhorn~~,~~ and Little Salmon ACECs, which would minimize new road construction. Roads constructed for forest management would be decommissioned within three years of construction. Prescribed burning or vegetation treatments would be applied to achieve DFCs. The potential impacts of these activities are described under Effects from Vegetation—Forests Management and Effects from Forest Products Management.

Overall, Alternative C would create more ACECs than the other alternatives. Ground-disturbing activities would be minimized in these areas; therefore, soils would be most protected under Alternative C.

Effects from National Trails Management
Effects would be the same as those described under Alternative B.

Effects from Wilderness and Wilderness Study Areas Management
Effects would be the same as those described under Alternative B.

Alternative D

Effects from Soils Management
Effects would be the same as those described under Alternative B.

Effects from Water Resources Management
Effects would be the same as those described under Alternative B.

Effects from Vegetation—Forests Management
Effects would be similar to those described under Alternative B, except that Alternative D would not include treatments to establish DFCs.

Effects from Vegetation—Weeds Management
Effects would be the same as those described under Alternative B.

Effects from Vegetation—Riparian and Wetlands Management
Effects would be similar to those described under Alternative B, except that RCA stream buffers would be the smallest under Alternative D (20,710 acres). Smaller areas would provide the least protection to soil resources.

Effects from Aquatic Resources, Fish, and Special Status Fish Management
Effects would be similar to those described under Alternative B, except that RCA stream buffers would be the smallest under Alternative D, providing the least protection to soils. Also, Alternative

D would include ~~1~~ three conservation and ~~27~~ 24 restoration watersheds totaling 52,118 acres, 21 percent less than the prescription watersheds in Alternative A, resulting in less emphasis for restoration activities in some watersheds and less improvement of soil resources.

Effects from Wildland Fire Management

In addition to the effects described above under Effects Common to All Alternatives, Alternative D would allow wildland fire use if the fire would not adversely impact commercial forest land management areas or authorized livestock grazing areas (**Figure H-3**, Areas Available for Wildland Fire Use—Alternative D [see **Appendix H** in Volume II~~I~~]). Alternative D would include 45,190 acres of commercial forest land and 135,850 acres of authorized livestock grazing areas, more than under Alternatives A, B, or C. Although the commercial forest land management and authorized livestock grazing areas would be larger under Alternative D than under Alternatives A, B, and C, wildland fire could still be used within them, as long as it did not adversely impact them.

The types of effects would be similar to those described under Alternative B, except the overall program impacts could be greater under Alternative D. under Alternative D, up to 60 percent of the CFO classified as FRCC 2 or 3 (moderate to high risk) WUI areas (50,650 acres) could be treated in any 5-year period, 50 percent more than under Alternative B and three times more than Alternative C. Treatments would be designed to alter vegetation composition, structure, and fuels to recreate historic or maintain desired fire behaviors, severities, and patterns. Treatments in areas with FRCC 2 or 3 would be similar to those described under Alternative B, except that Alternative D would include 2 to 15 percent mechanical treatments. Alternative D would include approximately 2,870 to 7,597 acres annually of mechanical treatments and prescribed fire (see Section 4.2.5, Vegetation—Forests). Alternative D proposes a higher combined level of prescribed burning and mechanical treatments than Alternative B; therefore, it would have higher potential of resulting in short-term impacts to soil resources than Alternative B. Alternative D would also include the most potential long-term protection of soils in reduced risk of wildland fires.

Effects from Cultural Resources Management

Effects would be the same as those described under Alternative B.

Effects from Visual Resources Management

Effects would be similar to those described under Alternative B, except that Alternative D would include 7,205 acres of VRM Class I and 36,180 acres of VRM Class II, the least of the alternatives.

Effects from Forest Products Management

Alternative D would include 45,190 acres of commercial forest land and would decrease the estimated PSQ by 27 percent (to 4,823 MBF) with an estimated 361 acres treated per year (an estimated 1-percent increase from Alternative A).

Effects from Livestock Grazing Management

Effects would be similar to those described under Alternative B, except that a larger area (135,850 acres in 170 allotments) would be open to livestock grazing and more AUMs (~~8,540~~8,549) would be permitted under Alternative D than under the other alternatives.

Effects from Minerals Management

Effects would be similar to those described under Alternative B, except that, under Alternative D NSO restrictions would apply on 35,045 acres (more than Alternative A), and CSU restrictions

would apply on 32,013 acres (more than Alternative A). As a result, more potential adverse impacts (such as soil erosion or compaction) from mineral leasing would be likely under this alternative than under Alternatives B or C and fewer would be likely than under Alternative A. Mineral material disposals could be subject to the same restrictions as leasable minerals, on a case-by-case basis. In general, more potential adverse impacts (such as soil erosion or compaction) from mineral material disposal would be likely under this alternative than under Alternatives B or C and fewer would be likely than under Alternative A.

Effects from Recreation Management

Effects would be similar to those described under Alternative B, except that under Alternative D access routes would be improved in the Craig Mountain WMA, which could potentially result in impacts to soil, including soil compaction and erosion.

Effects from Renewable Energy Management

Effects would be the same as those described under Alternative B.

Effects from Transportation and Travel Management

Effects would be similar to those described under Alternative B, except that Alternative D would include 23,189 acres Open to yearlong, cross-country motorized travel, an area 25 percent the size of that under Alternative A. An additional 102,542 acres would be Limited to designated routes. Within Limited areas, approximately 179 miles of routes would be open yearlong. However, almost half of these (82 miles) would not have legal public access so these would receive little to no use. An additional approximately 107 miles would be restricted in Limited areas, the majority (93 percent) of these being closed yearlong to motorized use. Route restrictions and closures would protect soil conditions by reducing or eliminating traffic, which can contribute to localized erosion of the roadbed. Because cross-country OHV use would be most damaging to soils, resulting in soil compaction and erosion, Alternative D would have more impacts on soil resources than Alternatives B and C because Alternative D would designate Open areas. Alternative D would have less potential impacts on soils resources than Alternative A.

Alternative D would include ~~1~~ three conservation and ~~27~~ 24 restoration watersheds totaling 52,118 acres, 21 percent less than the prescription watersheds in Alternative A. These watersheds provide improved management opportunities for watershed restoration, particularly when cooperative management is undertaken with the Forest Service, Idaho Department of Fish and Game, and other partners. Unneeded roads and trails would be decommissioned, with emphasis on restoration and conservation watersheds, fewer than under Alternatives A, B, or C.

Effects from Lands and Realty Management

Effects would be the same as those described under Alternative B.

Effects from ACEC/RNA Management

Effects would be similar to those described under Alternative B, except that Alternative D would allow livestock grazing in the Wapshilla Ridge ACEC/RNA. Potential impacts to soils from livestock grazing are described under Effects from Vegetation—Rangelands Management and Effects from Livestock Grazing Management. Alternative D would not continue ACEC designation of the Lower Lolo Creek ACEC. As a result, without such restrictions, soils could be impacted by road construction, ground-based yarding, mineral entries, or other activities.

Overall, Alternative D would protect the fewest ACECs and ACEC/RNAs and would involve the most potential ground-disturbing activities, such as roads and vegetative treatments, in areas that would be restricted under the other alternatives. As a result, the potential impacts to soils would be greatest under this alternative.

Effects from National Trails Management

Effects would be the same as those described under Alternative B.

Effects from Wilderness and Wilderness Study Areas Management

Effects would be the same as those described under Alternative B.

Cumulative Effects

Limited mass movements, localized erosion (caused by roads and other concentrated uses), and soil compaction (in heavily-grazed allotments, log landings, and roads) have occurred and continue to occur in the planning area. However, the extent of adverse soil impacts has decreased since 1981 because of reduced road construction and improved road construction methods, reduced timber harvesting and improved timber management practices, and positive watershed restoration efforts, including road obliteration, undersized culvert removal or replacement, and revegetation. Improved land management as a result of federal requirements for listed fish also has contributed to reduced erosion during the past decade. As management restrictions, particularly those on federal lands, have focused more on watershed conditions, activities have been restricted and BMPs have been developed to protect soil resources. This trend would continue in the future.

Several foreseeable future actions are expected within the planning area that would impact soils. More soils under federal management would be protected if the trend of increasing public lands (7 percent since 1981) continues (Forest Service 2003b). As more fuels treatments (including areas affected by insect and disease) occur in the CFO and on adjacent lands under the National Fire Plan and other programs, short-term, localized effects to soils could occur. The long-term benefits to soils if treatments successfully prevent large, high-severity fires would outweigh these potential short-term impacts. The combination of the reduced timber harvest activities near the CFO and more environmental regulations would result in few effects to soils (particularly on public lands) in the future. Similarly, future effects to soils from road construction would decrease on federal lands because better BMPs are available to reduce effects to soils. Timber and road BMPs are less protective of soils on private and State of Idaho lands, and future activities in these areas could result in effects to soils. The long-term effects of livestock grazing would result in soil compaction and erosion in areas of concentrated use. Efforts to control noxious weeds would continue, reducing invasive plants, which can have dramatic and irreversible effects on soil productivity and erosion because of changes in soil characteristics. If commodity prices increase and mining activities increase in the future, potential effects to soils would also increase. Drilling one or two exploratory oil and gas holes or geothermal wells or increased salable mineral activities could involve localized effects to soils. Trends of increasing population in the CFO will likely result in greater demand for infrastructure, including roads, as well as for forest products, minerals, and recreation activities, all of which could result in increased effects to soils. Along with population, recreation use is increasing, resulting in greater potential effects to soils. The BLM's efforts to implement BMPs and monitor their effectiveness, combined with efforts to concentrate OHV users to established trails, could reduce potential effects to soils from recreation uses. Federal listing of fish has resulted in additional conservation and restoration measures for soil, particularly on federal lands or federally funded

projects. The BLM lands that occur in prescription (Alternative A) or conservation/restoration watersheds (Alternatives B, C, and D) that are in common with Forest Service would realize indirect effects for soil conservation measures that occur on Forest Service lands. Implementing the revised Payette National Forest Plan would protect soil resources because management standards and guidelines emphasize restoring or maintaining watershed conditions, including soil resources. Other adjacent forest plans are expected to provide similar protection for soil resources.

Alternatives A and B would be less likely to affect soil resources than Alternative D. Alternative C would be more protective of soil resources than the other alternatives. Because of the protective measures adopted on the CFO under Alternative C, when compared to the other alternatives, Alternative C would mitigate potential effects to soils from other past, present, and reasonably foreseeable future actions. Alternative D would be more likely to affect soil resources than the other alternatives, potentially resulting in measurable soil erosion and soil compaction in the CFO.

4.2.4 Water Resources

Goal: Manage water resources to protect beneficial uses and to meet or exceed state and federal water quality standards. Maintain or improve the chemical, physical, and biological integrity of water resources.

Summary

The alternatives vary in their contributions to improving or impacting water quality. As summarized in **Table 4-4**, Alternative C is most favorable for protecting beneficial uses of water and maintaining and/or improving water quality, followed by Alternatives B, A, and then D. Increased levels of fuel treatments in Alternatives B and D would result in short-term impacts to water quality while reducing the potential for stand-replacing fires and potential impacts from these fires in the long term.

The BLM's ability to influence future conditions in watersheds, including those that affect water resources, is limited because of scattered and minority land ownership in many watersheds. Therefore, impacts on water resources are highly influenced by other landowners, and particularly by the Forest Service in forested areas. The BLM, Forest Service, and other entities have coordinated and would continue to coordinate under all alternatives to identify regional objectives and approaches to restoring and protecting aquatic habitat and water quality in initiatives such as the ICBEMP and PACFISH and other more-localized planning efforts. Emphasis for water and fisheries conservation and restoration management would occur in prescription watersheds (Alternative A) and conservation and restoration watersheds (Alternatives B, C, and D). **Table 4-4** identifies the indicators that were used to analyze effects on water resources management under each alternative.

Table 4-4
Comparison of Water Resources Indicators by Alternative

Indicator	Alternative A	Alternative B	Alternative C	Alternative D
Miles of PFC[1]	Continued gradual long-term increases in riparian miles and acreage in PFC	More rapid increases in miles and acreage in PFC than Alternative A	More rapid increases in miles and acreage in PFC than Alternative B	More rapid increases in miles and acreage in PFC than Alternative A
Road density in RHCAs and RCAs (higher road density is associated with greater impacts on water resources)[1]	No decrease in road density proposed	Reduced road density relative to Alternatives A and D	Reduced road density relative to Alternative B	Slightly higher road densities relative to Alternatives A and B
Acres disturbed by proposed management activities within RHCAs and RCAs	Acreage disturbance limited by Riparian Management Guidelines, PACFISH, MFP Supplement	Acreage disturbance limited by Riparian Management Guidelines, PACFISH, MFP Supplement	Less disturbance than Alternatives A and B	Slightly more disturbance than Alternatives A and B

[1]Source: BLM 2004a

Methods of Analysis

Indicators

Indicators are used to identify the level of impact. For water resources, the indicators used for impact analysis are identified in **Table 4-4**, Comparison of Water Resources Indicators by Alternative.

Methods and Assumptions

Impacts on water resources are assessed based on both quantitative and qualitative criteria. For example, it is generally expected that alternatives that would involve ground-disturbing activity would have a potentially adverse impact on water quality because sediment could be transported from the disturbance site to a nearby waterbody. Qualitatively, impacts would be expected to be greater with more ground disturbance, or when the disturbance occurs in sensitive areas, such as areas with steep slopes, existing landslide deposits, or in RHCAs (Alternative A) or RCA stream buffers (Alternatives B, C, and D). Under all Alternatives, potential adverse impacts from land uses that could occur in sensitive riparian habitats or landslide prone areas would be avoided or minimized.

Road density, or changes in road density, is used as a quantitative indicator of the indirect impacts of erosion on water quality. Geology and slope, in addition to distance from a waterbody, influence the impacts of roads on water quality. Therefore, even if the analysis is limited to disturbed acres or road density within RHCAs or RCAs, these are only imperfect indicators of the potential for effects on water quality.

PFC is an indirect indication of the effects of current management on bank condition, which can relate to water quality via sediment and temperature attributes if bank erosion is a significant source of sediment and/or bank cover is important to providing shade.

It is assumed that water quality requirements would be achieved through the use of BMPs and by working with the IDEQ in the future development of Water Quality Restoration Plans. Additionally, reclamation actions would continue on some historically mining-impacted lands. These actions, together with implementing Water Quality Restoration Plans or the establishing of TMDLs, are expected to improve water quality.

Existing roads within the CFO would continue to erode from motorized use and natural processes, resulting in impacts to water quality in adjacent streams.

Within the planning area, it is assumed that poor bank vegetation can be a key factor in streambank and floodplain stability. Consequently, it is assumed that improved ecological condition and proper functioning riparian habitats would lead to improved floodplain, channel, and streambank stability and reduced bank erosion.

It is assumed that Alternative A would involve the most ground-disturbing activities (e.g., more acres, miles of road) compared to the other alternatives, and that Alternative C would have the least. Alternative B would have less ground-disturbing activities than Alternative D. This assumption takes into consideration RHCA/RCA widths; prescription, conservation, and restoration watersheds; timber harvest; proposed ACEC/RNAs; land use acres or miles of disturbance; BMPs; and various land use restrictions.

Effects Common to All Alternatives

Effects from Air Quality Management

Air management actions would generally consist of compliance with existing regulatory requirements. These could indirectly benefit water resources, where this compliance resulted in reductions in soil erosion (dust creation) or reductions in air emissions that could result in deposition of pollutants (such as metals or other chemical contaminants from mining operations) on soils or in waterbodies downwind of a source. No adverse impacts on water resources would occur from air management actions under any alternatives.

Effects from Soils Management

Conditions that affect soil erosion also tend to impact water resources. Soil erosion is a natural process, and all streams function to transport eroded sediments. The amount of sediment a stream can move depends on factors that vary with location and time, such as the velocity and turbulence of the stream and the abundance and size of the sediment particles. For a given stream segment and time of year, the sediment load carried by the stream tends to fall within a characteristic range, just as rainfall and runoff do. Nutrients, metals, and other chemicals in the soils can also be transported to streams and influence surface water quality.

As shown in Chapter 3, **Table 3-3** (303[d] Listed Waterbodies with BLM Lands in Watershed), sediment and temperature are two of the most common sources of stream impairment in the CFO. In many cases, the historic data for a given stream segment are not sufficient to establish the normal range of conditions.

Management under all alternatives could impact rates of soil erosion and therefore could affect water quality and the hydraulic characteristics of streams. BMPs are interventions designed to minimize the impacts of human activities on water quality caused by discharge of sediment or chemical constituents. BMPs are operating procedures designed to minimize the impacts of human activities on water quality. Since the effectiveness of BMPs vary, and since they are seldom 100 percent effective, the net impact on water quality that would result from activities that introduce chemical contaminants to soils, or that affect soil erosion rates, would depend on the type, duration, and amount of activity.

Identifying landslide prone and other sensitive land types, avoiding these areas, and prioritizing the reclamation or obliteration of existing roads in such areas would help to reduce the potential for sediment delivery to streams from these areas. These actions would not necessarily prevent slope failure, but they could benefit water quality by reducing the frequency and severity of landslides, and by preventing pollutants from being introduced in landslide-prone areas where they could have a higher potential for release. Assessing naturally occurring failures for potential stabilization and/or restoration could reduce sediment impacts on waterbodies. For some sites, such as mine or mill tailings piles on steep slopes, short-term or emergency stabilization of the tailings and the slopes on which they are deposited may be desirable as an interim measure to prevent water quality impacts until more permanent solutions can be implemented.

Effects from Water Resources Management

There are few watersheds within the planning area that are managed predominately by the BLM. However, subwatersheds where the BLM has significant management responsibility are outlined in **Appendix C**, Conservation and Restoration Watersheds (see Volume II~~I~~). Vegetative management, mineral development, and road building all affect watershed conditions and the quality of surface water and groundwater on BLM-managed lands. How these uses are managed could be affected by managing water resources to maintain nonimpairment standards and to promote conditions that enhance beneficial uses.

Implementing BMPs related to road construction and maintenance, timber harvesting activities (**Appendix D**, Desired Future Conditions for Forest Vegetation/Wildlife Habitat [see Volume II~~I~~]), fire prevention activities, noxious weed control, and other management actions would minimize or prevent soil erosion, slow runoff, and minimize discharge of chemicals or nutrients to surface and groundwater. As a result, impacts on surface water quality would be minimized, and the potential for flooding and extreme fluctuations in stream flows would be reduced. Activities that convert vegetation cover (e.g., timber harvest) or intercept and route water (e.g., roads) could affect, dependent on the level of disturbance, retention of water within watersheds. This would promote groundwater recharge and increased soil moisture, contributing to more stable stream flow regimes. BMPs are seldom 100 percent effective. Since BMPs would be implemented in response to, or in conjunction with, activities that alter watershed conditions, such as general construction and excavation activities, road construction, timber harvesting, and mining activities, the net impacts on water resources from implementing BMPs would depend not only on the appropriateness of the BMPs, and the skill with which the BMPs are applied, but on the volume and nature of the activity requiring implementation of BMPs. Therefore, while BMPs are expected to have similar effectiveness under all alternatives, per unit linear distance or land area on which they are applied, the resulting net benefit or impact on water resources would vary by alternative because of differences in the amount of land subject to alteration. Differences in the net impacts of each

alternative are discussed under effects from other resource management (e.g., Effects from Wildland Fire Management), below.

Compliance with state and federal requirements to protect groundwater would be pursued under all alternatives, even if not specifically included in them. The likelihood of success in meeting this objective could vary somewhat among the alternatives, but the impacts would be the same if successful.

Effects from Vegetation—Weeds Management

Weed-control actions could have direct or indirect impacts on water quality. Direct effects would include the use of herbicides, which could be carried by runoff to a stream or other waterbody or could infiltrate soils and percolate to groundwater. Integrated weed-control methods would be used. Indirect impacts to water quality could also occur as a result of temporary soil disturbance during treatment activities. Nonpersistent herbicides would be used in sensitive areas (e.g., near water bodies) to avoid potential impacts to water quality. Chemical applications would be conducted by trained personnel and designed to minimize the potential for impacts on water. Invasive plants can create or exacerbate conditions that reduce water quality. Reduction of total acres impacted by invasive plants would benefit water quality.

Among the potential control measures would be manual removal, which has the potential for disturbing soils. These activities would be conducted using BMPs (**Appendix B** in Volume II~~I~~) to reduce the potential for impacts on surface water. Another control measure that could be used is avoidance of ground-disturbing activity as a means of preventing the introduction of weeds. This would reduce the potential for soil erosion and for impacts on water quality.

Effects from Vegetation—Rangelands Management

Nonforested lands represent about 30 percent of the CFO. Idaho Standards for Rangeland Health (BLM 1997a) (**Appendix A** in Volume II~~I~~) would continue to be applied to management of these lands under all alternatives. These would benefit water resources because these standards are designed in part to reduce soil erosion and restore damaged soils and vegetation cover.

Effects from Vegetation—Riparian and Wetlands Management

Riparian areas would be managed to maintain them in PFC or to move them toward PFC. Alternatives B, C, and D rely on the Aquatic and Riparian Management Strategy (**Appendix F** in Volume II~~I~~) and its associated standards and guidelines to achieve PFC. A similar strategy exists under Alternative A with use of PACFISH (BLM and Forest Service 1995), Fisheries and Water Quality Objectives and Sediment Budgets (BLM 1985d), designated prescription watersheds, and identification of desired conditions for fisheries and water quality. Water resource management emphasis for all alternatives is identified in prescription, conservation, or restoration watersheds, which vary by alternative. Alternative A identifies a goal of improving one-half of the streams in poor condition within 15 years. However, there is no guarantee that the causes of current less-than-PFC conditions are within BLM-administered lands, or could be solved by BLM management actions. Nor is it necessarily feasible for BLM to ensure that surface and groundwater, which may be impacted by upstream or upgradient sources, would comply with Idaho water quality standards.

Effects from Wildlife and Special Status Wildlife Management

Many actions implement existing requirements to identify and protect special status species habitat. Habitat protection could involve restrictions on other land uses, which would help reduce potential

water resources impacts. Improvements in wildlife habitat, such as measures that increase vegetation cover density, could also reduce soil erosion potential and indirectly reduce water quality impacts.

Effects from Special Status Plants Management

Management measures to protect special status plant species would have similar water resources impacts under all alternatives. Plant species protection could involve avoiding activities that disturb soils or would otherwise adversely impact the sensitive plant species. Avoidance or limitations on soil-disturbing activities would help reduce potential for water resources impacts.

Effects from Wildland Fire Management

Wildland fire can result in substantial water resources impacts in a short time period. Fire can reduce soil infiltration rates, resulting in less retention of water and more runoff, leading to increased soil erosion and larger peak flows. Loss of vegetation also contributes to these effects. Fires create openings where snow and ice accumulate to greater depths than in forested areas. These openings can produce high runoff during short periods of rapid thawing, resulting in soil erosion and high peak flows. Excessive sediment delivery to stream channels can result in water quality impacts for long periods of time, while sediment-clogged channels can cause flooding. Similarly, chemical products of wood combustion are carried into streams with runoff.

All alternatives call for limiting the use of prescribed fire so that the combination of prescribed fire and wildfire would burn no more than 30 percent of CFO acres (about 40,000 acres) during any 5-year period. By comparison, as indicated in Section 3.2.12, Wildland Fire Ecology and Management, a total of about 26,000 acres of BLM-managed lands burned during the 20-year period from 1983 to 2002. While prescribed fire can be contained on BLM-managed land, wildland fires cannot. Large fires could affect even larger amounts of Forest Service lands or privately owned lands. For example, the 26,000 acres represented about 2 percent of the total acreage burned within the planning area during the period. Thus, the effects on water resources managed by BLM could be influenced more by fires on other lands within the watershed than by fires on BLM lands. Based on these figures, the 30-percent maximum (which is equivalent to about 8 times the recent historic rate) provides a great deal of flexibility to BLM in the use of prescribed fire to reduce fuel or as a tool in promoting a desired mix of woodland species. Prescribed fire generally has less impact on water resources than uncontrolled fire. Prescribed fire can be managed to remove excess fuel selectively, leaving desired species (for example, ~~P~~ponderosa pine) intact. The effects on water resources if prescribed fire were used to the maximum extent allowed during a given five-year period would be much less than if uncontrolled fire accounted for most of the burned acreage. By burning some of the excess fuel under controlled conditions, the more devastating effects of uncontrolled fires, and the potential for them to spread to adjacent areas, are lessened. Prescribed fire effects would be dependent on severity of burn, particularly within riparian areas and if excessive stand replacement would occur at a watershed level. Overall, under all alternatives, this is not anticipated.

Effects from Cultural Resources Management

Protection of cultural resource sites could indirectly benefit water quality to the extent that soil-disturbing activities, such as road construction and resource extraction, are limited. Such benefits would generally be negligible at a watershed level because of the small area attributed to cultural resource management restrictions.

Effects from Paleontological Resources Management

Protecting paleontological resources could indirectly benefit water quality to the extent that soil-disturbing activities, such as road construction and resource extraction, are limited. Such benefits would be discountable at a watershed level because of the small area attributed to paleontological resource management restrictions.

Effects from Forest Products Management

Timber harvest activities, including construction of permanent and temporary roads, can adversely affect water quality; vegetation cover reduction and soil disturbance can expose soils to enhanced erosion and increased sediment delivery to streams. The largest source of erosion in most harvesting operations is ground disturbance and drainage alteration that occurs from building roads to access trees.

BMPs would be implemented to mitigate or reduce impacts. Site-specific impacts and mitigation measures would be identified in the plans and documentation required prior to each timber harvest. For purposes of this RMP, assuming that all areas are similar, the combined impacts on water resources associated with each of the alternatives would be primarily a function of the number of acres to be harvested.

Effects from Livestock Grazing Management

In the CFO, season-of-use restrictions and riparian use standards decrease the impact of livestock grazing in sensitive channel types, thereby mitigating some grazing impacts. Annual monitoring of riparian area use in the CFO shows that impacts have been reduced to acceptable levels in most areas. These riparian use standards would apply under all alternatives. Grazing animals can impact water quality by altering the quantity and quality of vegetation cover, disturbing soils and vegetation in riparian areas, altering overland flow patterns by creating trails that conduct runoff, compacting soils, and contributing to nutrient and pathogen loading to surface water. As water and forage areas shrink during the summer, effects become increasingly localized and concentrated. If animals have access to streams and springs, these areas can become impacted.

Carrying capacities have been determined to minimize adverse impacts; however, it is often difficult to manage livestock use because of fragmented ownership. Generally such use is in conjunction with unfenced private lands. Overall, because of small amounts of BLM ownership in many watersheds (less than 1 to 5 percent), livestock grazing at a watershed level would typically have negligible impacts on water resources under current management (Alternative A). No additional impacts are expected under Alternatives B, C, and D, which would maintain current management or would reduce grazing lease acreage.

Effects from Minerals Management

Despite the relatively large land area available for mineral development, leasable mineral potential within the CFO is generally low. Potential for precious metals is high within limited areas. Salable mineral resources are widely distributed. Based on this, the most likely source of future impacts on water resources from mineral management would be, as in the past, from lode gold and silver mining operations in the Elk City and Marshall Mountain Mining Districts and from placer (recreational) mining in the Salmon River, Clearwater River, and American River areas.

Leasable minerals and mineral materials activities have the potential to affect water resources through soil disturbance, modification of surface drainage patterns, road construction, transmission

line construction, drilling and installation of wells, groundwater extraction, wastewater generation and management, hazardous material storage, use, and disposal, and other activities associated with fluid mineral development and production. Impacts could include degradation of surface water or groundwater quality, depletion of groundwater resources, alteration of surface drainage patterns or runoff quantity, and flooding. These impacts would occur under all alternatives, but the net impact on water resources would depend on the amount of land developed, site-specific conditions, and the type of mineral resource involved. Site-specific impacts could vary widely. The impacts of each lease would be analyzed in a site-specific NEPA documentation.

The impacts on water resources from locatable mineral exploration and development could vary greatly depending on location, type of mineral, and size of operation. Impacts can include discharge of contaminants to surface water; leaching of heavy metals, acids, or other mineral constituents from tailings piles to groundwater or surface water; impacts on groundwater levels from dewatering operations, chemical spills, air deposition of particulates, or other chemicals from ore processing operations; and more generic impacts from installation of utilities, road construction, and other ancillary activities. Modern mining operations must conform to federal and state environmental laws, such as the Clean Water Act, Resource Conservation and Recovery Act, ESA, and others. Even with these laws and their implementing regulations, large-scale locatable mineral development involves major environmental risk associated with the storage of tailings, management of water from dewatering operations, and management of chemicals used in the processing of ore. After completion of mining activities, site restoration may require many years, is likely to be costly, and may encounter problems that were not anticipated at the onset of operations. For example, it is difficult to estimate the ultimate size of the operation. Site-specific impacts would be evaluated and reviewed during the permitting process. At the programmatic level, the potential for impacts to occur would be related to the amount of land available for development and the nature of the restrictions on development. In addition to current mining exploration and development, future AML investigations may reveal possible impacts to water quality from AML sites in the Elk City or Marshall Mountain areas.

Under all alternatives, 121,961 acres would be subject to the operation of the mining laws (locatable mineral exploration and development) and 21,869 acres would be withdrawn from the mining laws. All alternatives would open 131,044 acres to the mineral laws (leasable minerals and mineral materials) and close 12,786 acres. The BLM's control over how mineral operations impact water resources can be reduced because lands managed by the BLM are scattered and discontinuous. A single mining operation may extend over lands under both private and public ownership.

Effects from Recreation Management

The impacts of recreation on water resources depend on the nature and intensity of recreational use. Some recreational activities are more likely to impact water resources than others. For example, motorized vehicle use can lead to soil erosion or drainage problems and introduce potential for fuel spills or releases. Motorized vehicles also increase accessibility of remote sites and can increase intensity of use (for example, more visitors can visit remote sites, bring more equipment and supplies, and stay longer in one place). High-intensity use concentrated on a limited area can result in adverse impacts, while low-intensity use tends to cause negligible adverse impacts. Recreational use tends to displace other uses, resulting either directly or indirectly in greater protection of water resources. Impacts of recreation management on water resources could include increased demand for potable water in areas of limited supply; water quality impacts from increased erosion from use

of trails, facilities, or construction and maintenance of roads; and introduction of contaminants to surface water or groundwater from sanitary waste disposal (pathogens and nutrients) or from boating (for example, releases of gasoline or additives such as methyl tertiary-butyl ether in surface water). Increased recreational access to remote areas can cause small adverse impacts on water resources that might not be considered significant in another context. For example, a recreational use might not result in exceedance of numerical water quality criteria but might still conflict with the state antidegradation policy.

Increased public awareness of the value of high-quality water for recreation could lead to increased demand for protection of water resources, or the protection of other resources (such as wildlife) that depend on high-quality water resources.

Under all alternatives, the BLM would attempt to acquire more lands to increase access to recreation sites and for conservation easements. Acquisition of lands could enhance the BLM's ability to manage the lands for improved recreational value. This could result in fewer competing uses and in more protection of water resources.

Effects from Transportation and Travel Management

Under all alternatives, about 100,861 acres (70 percent) would be Open to over-snow motorized use, and 24,779 acres (17 percent) within the Craig Mountain WMA would be managed for over-snow motorized travel limited to designated routes, dependent on a minimum of 18 inches of snow cover.

Effects from National Trails Management

Protection of 21 miles of National Trails could result in restrictions on some land uses that would indirectly reduce the potential for water resources impacts.

Effects from Wild and Scenic Rivers Management

The Salmon River from Long Tom Bar to the Snake River would continue to be managed to protect outstandingly remarkable values unless redirected by Congress. This would continue to provide protection of water quality on this 112-mile segment and would also support other protections of upstream segments consistent with protection of the 112-mile segment.

For all segments found suitable, the BLM is mandated by the WSR Act to maintain or enhance water quality. The majority of areas found suitable for inclusion in the NWSRS are already managed as riparian buffer zones under the Riparian Management Guidelines (BLM 1985e), Fisheries and Water Quality Objectives and Sediment Budgets (BLM 1985d), and PACFISH (BLM and Forest Service 1995). The remaining areas would be managed as such under the Aquatic and Riparian Management Strategy (**Appendix F** in Volume II~~I~~), but would receive another layer of protection by being managed to protect the outstandingly remarkable values of each suitable segment.

Effects from Wilderness and Wilderness Study Areas Management

Continued management of 750 acres under the Wilderness Act and management of 12,034 acres of WSAs under BLM's Interim Management Policy for Lands under Wilderness Review would continue to provide a high degree of protection to water resources within these areas by restricting activities that could cause impacts.

Effects from Native American Tribal Uses Management

No specific effects have been identified from management actions regarding Native American tribal uses. The BLM would continue to consult with tribes regarding treaty rights, cultural access and use of plants, animals, fish and habitats. Consultation could result in identifying areas where watershed restoration actions or timing of actions could need to be modified to accommodate tribal uses. However, it is unlikely that accommodating tribal uses would be inconsistent with water resource goals in the long term.

Effects from Public Safety—Abandoned Mines and Hazardous Materials Management

Compliance with state and federal laws and regulations relating to hazardous material management, including AML, should provide an effective minimum level of water resources protection. These regulations require reporting spills and leaks, investigating and remediating uncontrolled hazardous waste sites, reporting hazardous material use, and proper waste generation and disposal. To the extent that BLM procedures ensure compliance with these laws and regulations, water resources would be protected to the extent practicable. Remediation efforts would continue on AML and hazardous materials sites. Protective measures placed on these sites after clean-up (e.g., closing them to motorized vehicles, withdrawing them from mining laws, designating them as ACECs) would benefit water resources. Continued monitoring and maintenance of AML cleanup sites would also benefit water quality by ensuring that the measures continue to be effective.

Alternative A

Effects from Soil Resources Management

Implementing the MFP Road Guidelines (BLM 1981a), Fisheries and Water Quality Objectives (BLM 1985d), Riparian Management Guidelines (BLM 1985e), and PACFISH (BLM and Forest Service 1995) would continue to help prevent water quality impacts from soil disturbance. Although the guidelines do not reflect the most recent standards and practices, under current management, the BLM would implement necessary additional BMPs for soil-disturbing activities.

Effects from Water Resources Management

Among the federal and state requirements for water resources would be compliance with the Clean Water Act, which involves complying with federal and state numerical water quality standards, and will increasingly involve complying with state TMDL implementation plans for watersheds with impaired waterbodies. While the state is responsible for implementing provisions of the Clean Water Act, ultimate authority for enforcement is with the US EPA. The effectiveness of compliance may be influenced by the level of human activity and development that occurs under the alternatives. Alternative A would result in the highest potential for conflict with state and federal water quality regulations, because it involves the fewest restrictions on human activities in watersheds.

The objective of protecting water quality by focusing on watershed function is the same for all alternatives, but would differ in its implementation. Under Alternative A, streams would be managed to maintain or restore designated beneficial uses and to achieve delisting of impaired waterbodies. There are no specific actions identified to meet this objective other than those discussed above. However, within the scope of developing plans to alleviate watershed problems, the issue of water quality impairment and potential threats to water quality could be addressed.

In the course of attempting to meet the objective of maintaining fish habitat by pursuing water quality and watershed quality objectives, and supplementing current water quality objectives with

updated objectives and criteria, potential impacts on water quality from BLM management actions could be prevented or reduced.

Effects from Vegetation—Forests Management

Forest management can impact surface and groundwater quality and quantity by influencing soil and slope stability, runoff and infiltration rates (retention of moisture within upper watersheds), nutrient and other chemical loading to waterbodies, and channel morphology, among other factors. Dense vegetation protects soils from direct impact by raindrops and slows runoff. Roots of trees and other plants anchor soils. Organic debris that covers the forest floor also retains moisture and slows runoff. By contrast, reduction in vegetation cover, such as from fire or timber harvesting, can result in abrupt increases in soil erosion, with potentially long-lasting water quality impacts.

About 70 percent (over 100,000 acres) of the CFO is forested. About 25 percent of the forested land would be commercial forest land subject to management to maximize timber production, and about 12 percent of the forested land would be managed for sustained yield timber production. The remaining 63 percent of the forested land would be managed custodially (not for timber production, although harvesting could occur for ecological reasons). Timber harvesting is important to the socioeconomic base of north-central Idaho, so management of forested lands is an important consideration of forest management. The recent trend has been to manage forests to emphasize fire prevention and wildfire suppression, particularly within the WUI. The rural WUI comprises 94,093 acres of CFO-managed lands, and the urban WUI 33,584 acres. Lack of management has resulted in increases in stand density and fuel and resultant fire hazard.

About 90 percent of the CFO forest lands are classified as FRCC 2 and 3, while the remaining 10 percent are in FRCC 1. Lands in FRCC 2 and 3 and within the WUI would be given the highest priority for treatments under Alternative A. Under Alternative A, in order to meet National Fire Plan and MFP goals, between 4,000 and 16,300 acres per year would need to be treated using both prescribed burn and non-fire treatment methods. If these rates are achieved, the risk of severe fires would be reduced, consequently reducing the potential for water resources impacts.

Effects from Vegetation—Riparian and Wetlands Management

Establishing riparian management units and implementing Riparian Management Guidelines and BMPs in them would help to reduce the potential for water quality impacts from other actions. In addition, the Fisheries and Water Quality Objectives (BLM 1985d), identification of prescription watersheds (66,077 acres), and PACFISH (BLM and Forest Service 1995) would provide additional riparian conservation and protection measures. Among the protective actions are establishing and maintaining riparian buffers to control water temperature and to reduce sediment impacts.

The development of Aquatic Management Plans provides protection of aquatic habitat, resulting in reduction in the potential for water quality impacts.

Maintaining or improving riparian condition would help protect water quality. Riparian vegetation shades streams and helps to maintain lower temperature water. Streams that are in PFC reflect, by definition, a state of dynamic equilibrium between the channel and the range of flows carried by the channel, meaning that bank and channel erosion is minimized. Runoff and stream flow conditions within the watershed may not be entirely under BLM management, and upstream conditions can affect the condition of segments of streams or wetlands on BLM lands. Therefore, it is not necessarily feasible to achieve PFC in all riparian areas on BLM land.

Effects from Wildlife and Special Status Wildlife Management

Alternative A would identify use-restriction areas and specific actions based on wildlife habitat, and specifically calls for improving range conditions over a 20-year timeframe. Use restrictions and improving range conditions to support wildlife, as well as other actions under Alternative A that target improvements in wildlife habitat, could indirectly improve or protect water resources by reducing erosion. These effects have not been quantified by surface water monitoring and would not necessarily be observed as improvements in PFC, since rangelands and other wildlife habitat areas extend beyond riparian areas.

Alternative A identifies 13 areas for intensive wildlife management and development of HMPs. Their allocation primarily to wildlife management provides some indirect protection of water resources because it would exclude or limit incompatible uses, some of which could involve potential short-term impacts on water resources.

Effects from Aquatic Resources, Fish, and Special Status Fish Management

Imposing use restrictions in sensitive areas would help to protect water quality by limiting actions that could pollute or degrade water quality. In addition, the Fisheries and Water Quality Objectives (BLM 1985d), identification of prescription watersheds (66,077 acres), identification of DFCs for fisheries management, and PACFISH (BLM and Forest Service 1995) would provide additional riparian and aquatic conservation and protection measures. Studies to identify water quality objectives and developing and implementing aquatic HMPs to manage aquatic species habitat would indirectly improve water quality to the extent that their ultimate implementation improved aquatic habitat.

Effects from Wildland Fire Management

Under Alternative A, specific percentages of the CFO FRCC 2 and 3 (moderate to high risk) WUI areas would not be identified for fire risk/fuels-reduction treatments. Treatment areas are prioritized by FRCC (with no specific treatment acreages or percentages specified). Alternative A calls for FRCC 2 and FRCC 3 forested lands in WUI areas to be treated first, followed by FRCC 1 lands in WUI areas. FRCC 2 and 3 lands are the most prevalent; they also represent the greatest hazard to municipal/urban areas. Given current management, an estimated 1,950 to 5,950 acres could be treated annually under Alternative A (see Section 4.2.12, Wildland Fire Management).

Alternative A would seek to return vegetative communities outside the WUI to their historic fire regime and to FRCC 1 conditions. If this were accomplished, it would reduce the potential for severe or stand-replacing fires on BLM lands, with an accompanying reduction in potential water resources impacts.

Under Alternative A, fire suppression methods would be based on resource values. Fire would be used for a variety of utilitarian functions, including disposal of slash, preparing areas for reforestation, improving browse, or reducing competition among vegetation species. Management techniques would be used to meet resource objectives. Protection of water quality, either directly or indirectly, could be among the objectives for selection of a given fire management technique.

Effects from Visual Resources Management

More acreage in higher VRM classifications (VRM I or II) would limit authorized activities, resulting indirectly in protection of water resources.

Effects from Forest Products Management

Timber harvest activities, including construction of permanent and temporary roads, can adversely affect water quality, since reduction in vegetation cover and soil disturbance can expose soils to enhanced erosion and increased sediment delivery to streams. For example, implementation of PACFISH (BLM and Forest Service 1995) has provided additional measures to avoid or minimize timber harvest impacts on water resources.

The most significant source of erosion in most harvesting operations is the ground disturbance and drainage alteration that occurs as a result of building roads to access the trees. It is estimated that about 80 to 90 percent of the increased sediment yield typically results from the erosion associated with roads.

In the CFO another potential source of erosion from timber harvest is changes to timing and magnitude of peak stream flows due to increases in snow accumulation and melt rate in canopy openings. A dense forest canopy, such as on uncut (or unburned) slopes, tends to limit the amount of snow that accumulates on the ground. The streams in forested watersheds become adjusted to the annual range of variation in runoff associated with the particular pattern of vegetation coverage in the watershed. Timber harvesting, road construction, and fire alter the established pattern of vegetation cover. After harvest, snow and ice accumulate in the new openings and clearings that have been created. Depending on the intensity of tree removal and on snowfall conditions, the additional water stored in the watershed in these areas can be substantially greater than under pre-harvest conditions. When the snow melts, which tends to happen faster in clearings than in the shade of trees, the excess runoff is carried to stream channels, where most of the erosion occurs as the channels widen and deepen to accommodate the excess flow.

Alternative A would allow any harvest method to be used on northeast-, north-, or northwest-facing slopes. The maximum allowed clearcut would be 60 acres, with the average clearcut expected to be about 20 acres (based on the MFP [BLM 1981a]). Selective or partial cutting would be allowed on all other slopes. On slopes exceeding 35 percent, or on fragile sites (based on Timber Production Capability Classification), no ground-based yarding methods may be used. Post-harvest site preparation for reforestation would be done by manual, fire, or chemical methods. These specifications provide a standard level of protection for soils and water quality.

Alternative A would strive for full stocking on 90 percent of reforested areas within 5 years in intensive management areas, and within 10 years in extensive management areas. Stocking is a measure of the actual density of trees relative to the density that fully occupies the growth potential of the land, and full stocking is 100 percent or more. Full stocking density decreases as the forest matures. From a water resources perspective, stocking provides an indirect indication of the degree to which the forest canopy can be expected to intercept precipitation. Higher stocking levels for forests of comparable age, composition, and location would generally be associated with lower potential for water quality impacts from soil erosion.

Effects from Livestock Grazing Management

Under Alternative A there would continue to be 168 allotments, containing 122,732 acres in grazing leases and providing 7,~~204~~ 200 AUMs. This is less than the 7,661 AUMs called for in the 1981 MFP. In 1982, BLM identified 49 allotments that needed improvement of unsatisfactory conditions. Assessments have now been completed on 99 of the 168 allotments. These results suggest that

improvements in resource condition have occurred since 1982. Under current conditions, most riparian areas inventoried were found to be in PFC (see Chapter 3, Section 3.2.8, Vegetation—Riparian and Wetlands), also supporting the conclusion that conditions have been improving under current management, and that there have been less than significant effects on water resources from grazing in recent years in most areas. Additional data will be obtained as the remaining assessments are completed.

Effects from Minerals Management

Impacts on water resources would be reduced through application of standard lease stipulations, since Alternative A does not adopt the 1989 Uniform Format for Oil and Gas Lease Stipulations. Alternative A has the greatest potential for impacts on water resources, since it involves the fewest restrictions on mineral activity.

The impacts on water resources from salable minerals would be generally less than for locatable minerals. Most of these mineral operations are small and relatively simple. Impacts would typically include generation and discharge of contaminated surface water or water from dewatering operations, discharge of sediment, potential for spills or releases of petroleum products or other chemicals, and alteration of drainage patterns. The potential for these impacts would be reduced by complying with existing federal and state laws and regulations. The impacts on water resources from leasable mineral operations could be similar to those described for locatable minerals. However, based on the historically low level of activity involving leasable minerals in the CFO and the geologic environment that is unfavorable for the presence of leasable minerals, impacts from this resource are anticipated to be very low.

Effects from Recreation Management

Each of the alternatives establishes the same SRMAs involving the same number of acres. The alternatives differ in the management emphasis within the SRMAs and on non-SRMA lands. Alternative A prioritizes developing intensive management for Salmon River and Clearwater River SRMAs and managing the remaining SRMAs at a lower, extensive level of management until activity plans are completed.

Commercial permits in SRMAs prioritized for intensive management would be coordinated through the state licensing board for outfitters and guides. Alternative A would consider competitive use and organized group recreation permits on a case-by-case basis. While giving the BLM the opportunity to restrict activities through the permit process, Alternative A includes few actual restrictions. Such restrictions could protect water resources in sensitive areas or during periods of intensive use.

Effects from Renewable Energy Management

Among the impacts on water resources that may result from developing geothermal and other renewable energy resources are short-term impacts on water quality during construction, including soil disturbance in construction sites; road construction; and construction of transmission lines and associated structures. Potential long-term impacts on water resources could occur from: operation of geothermal power plants, depending on the type, size, and location of the plants, relating to increased consumption of surface water or groundwater; waste generation and storage; removal of vegetation cover for conversion of biomass; and extraction and injection of geothermal fluids.

Under Alternative A, only standard lease stipulations would apply. While these would provide a minimum level of protection as required by laws such as the Clean Water Act, management options to control or reduce site-specific impacts on resources would be limited.

Effects from Transportation and Travel Management

Potential impacts on water resources would continue and could increase due to motorized vehicle use, which would include use of existing roads and trails and cross-country travel within Open and Limited designation areas.

Water quality impacts could occur from soil disturbance along trails and from increased recreation use of riparian areas. The total number of miles of roads, and the road density, is an indirect indicator of the potential impacts on water resources of roads.

Vehicle use restrictions and temporary or permanent closure would help reduce impacts on water resources.

Alternative A calls for identifying unspecified mitigation measures to avoid adverse effects on water quality and fish habitat. This would help to reduce impacts on water quality.

Effects from Lands and Realty Management

Alternative A calls for identifying correctable natural and manmade hazards on public lands and for identifying unauthorized dump sites requiring rehabilitation. Rehabilitation of these lands would improve existing water quality and reduce potential for future degradation of water quality.

Non-federal land would be considered for acquisition if it contained important and/or unique resource values, provided access to public lands, eliminated inholdings in special designation areas, or consolidated ownership in areas identified for retention. Acquisitions to meet these criteria could help to improve the BLM's ability to effectively manage water resources, leading directly or indirectly to improvements in water quality or protection of water resources.

Maintaining the withdrawal of 26,594 acres adjacent to the Salmon River from mineral entry would reduce the potential impacts on water quality associated with mineral development, which can include exposure of tailings to leaching by surface water, and soil erosion of roads and tailings, both resulting in surface water quality impacts.

Effects from ACEC/RNA Management

Protecting specific blocks of land as ACECs and RNAs would restrict the types of activities that could occur within these areas, reducing the potential for impacts on water resources. Under Alternative A, 25,600 acres would be protected as ACECs and/or RNAs. The 30-acre Elk City Dump/American Hill Lake ACEC would protect the public from adverse water quality impacts that may be attributed to hazardous materials buried at an old dump and mining site. Management actions would include implementation of reclamation actions and ongoing water quality monitoring efforts.

Effects from Wilderness and Wilderness Study Areas Management

Alternative A includes no specific management in the event that WSAs are released by Congress from wilderness consideration. If released, the areas would revert to adjacent land management with

no special status, with protection of water resources afforded by the Clean Water Act and other relevant statutes.

Effects from Watchable Wildlife Viewing Sites Management

Actions to maintain or improve wildlife habitat resources would indirectly provide protection of water resources, since measures that protect habitat typically also protect water quality. Developing wildlife viewing sites could increase public access to remote areas and could indirectly encourage increased recreational use that leads to adverse impacts on water quality. Such impacts would be prevented or reduced by ensuring that any future development is consistent with the objective of improving habitat and by implementing appropriate BMPs.

Alternative B

Effects from Soils Management

Implementing BMPs for soil-disturbing activities (e.g., road construction, construction site preparation) and reclamation of existing sites where soil erosion has impacted water quality would help reduce or prevent impacts on water quality from soil erosion.

Alternative B proposes that site-specific studies would be conducted in areas of potentially unstable slopes, including all areas with slopes in excess of 55 percent, and that a minimum 100-foot protection zones would be implemented around landslides and landslide-prone areas. These actions would result in reduced soil-disturbing activity within the protection zones, with the indirect result that sediment delivery to streams would not be increased by human activity. Alternative B would not increase the potential for slope failure relative to Alternative A.

Effects from Water Resources Management

Although the implementation of BMPs to limit nonpoint source pollution would be the same under all of the alternatives, Alternative B would be more protective of water quality than Alternative A because there would be more restrictions on human activities (e.g., mineral lease stipulations) that have a potential to impact water quality than under Alternative A.

The objective to protect water quality by focusing on watershed function is the same for all alternatives, but Alternative B has greater potential than Alternative A for success in achieving the objective. Alternative A focuses on data-gathering activities to identify problems and develop plans to alleviate problems, while Alternative B identifies specific actions that focus on achieving improved water quality.

Alternative B would be similar to Alternative A in calling for managing streams to meet the objective of restoring water quality supportive of identified beneficial uses, except that Alternative B also specifies that BLM would cooperate with adjacent landowners and others in order to meet the objective. Cooperative efforts are likely to benefit water resources that are partially managed by the BLM because BLM lands are widely dispersed and because in many watersheds, the BLM manages only a small percentage of the watershed. This cooperation already occurs under Alternative A.

Identifying opportunities for removal of hazardous materials and nonessential structures from floodplains would not be precluded under Alternative A, but it is more likely to be accomplished where specifically called out in Alternative B. Removal of hazardous materials might include historical materials, such as mine or mill tailings, as well as illegally dumped materials and materials

that were inadvertently placed in the floodplain because of lack of delineation of the floodplain boundaries. To the extent that hazardous materials or nonessential structures are actually removed, water quality impacts could be reduced or prevented. Alternative B does not identify methods other than removal, such as isolating or encapsulating hazardous materials in place within the floodplain. It is not clear, therefore, whether such alternative actions might be considered if it was determined that the opportunity for removal does not exist based on cost.

Effects from Vegetation—Forests Management

Alternative B differs from Alternative A mainly in the intensity of management and the degree of specificity with which goals for DFC of forest habitat are defined. The DFC is based on the estimated range of historic variability in the distribution of tree sizes and ages. Blocks over 1,000 acres would be managed to meet the DFCs to improve forest health and vigor in **Appendix D** (Desired Future Conditions for Forest Vegetation/Wildlife Habitat [see Volume II~~I~~]); these areas account for 24,789 acres, which is 24 percent of forest land or 17 percent of the CFO (**Figure 6**, Desired Future Condition Blocks—Alternative B [see Volume IV of the Cottonwood Draft RMP/EIS]). The DFC for Alternative B includes 10 percent old forest, and a moderate percentage of large trees. Stand structure distribution in Alternative B is intended to move further toward the historic range of variation, which is absent under Alternative A. An increase in forest maturity to improve habitat would occur as a result of harvesting fewer large trees. This could indirectly reduce impacts of timber production on water quality (mainly temperature and sediment).

Old growth management goals are included for each DFC management area. Treatments that reduce fuel and reduce the frequency and severity of wildland fires would reduce the impacts of fires on water quality. Short-term impacts on water quality could occur as a result of the treatment. For example, chemical applications could impact water quality, and vegetation removal activities could increase erosion.

Although the emphasis of implementing timber harvest activities to maximize economic return in areas of high risk for stand mortality greater than 30 percent is on capturing an economic value, there would be an indirect impact from reducing the potential for accumulation of fuel and fires by reducing the potential for impacts on water resources associated with fires. There would be short-term impacts on water resources as a result of soil disturbance associated with timber harvesting activities.

Effects from Vegetation—Riparian and Wetlands Management

Appendix F (see Volume II~~I~~) describes the Aquatic and Riparian Management Strategy that would be used to achieve the objective of improving degraded riparian and wetland vegetation and habitat diversity. Under Alternative B, RCA stream buffers would total 22,847 acres, 14 percent more area than RHCAs under Alternative A.

Appendix C (Conservation and Restoration Watersheds [see Volume II~~I~~]) identifies emphasis watersheds for conservation and restoration actions and achievement of DFCs. Alternative B would include ~~1~~ three conservation and ~~32~~ 28 restoration watersheds totaling 64,481 acres, 2 percent less than prescription watersheds under Alternative A.

The RCAs would receive special management per the standards and guidelines listed in **Appendix F**, Aquatic and Riparian Management Strategy (see Volume II~~I~~). These standards and guidelines generally call for additional studies to identify the impacts of management actions on riparian habitat

within RCA stream buffers before projects are undertaken, and for certain restrictions to be implemented to protect the riparian resources. Protecting riparian resources in this way would also protect water quality and reduce hazards from flooding.

Effects from Wildlife and Special Status Wildlife Management

Alternative B would strive to improve the ecological condition status of native grassland and to support winter and spring range areas of game animals with emphasis in the Craig Mountain WMA and Rattlesnake Ridge areas. Improving grassland could help to reduce the potential for soil erosion impacts on water quality.

Alternative B targets forested contiguous areas greater than 1,000 acres as priorities for attainment of DFC. As discussed under Effects from Vegetation—Forests Management, attainment of DFC status would help reduce the potential for impacts on water resources.

Alternative B calls for development of new HMPs and other activity plans, without specifying which areas would be targeted.

Riparian areas would be protected, helping to reduce impacts on water resources (see similar actions and impacts in the discussion of Effects from Vegetation—Riparian and Wetlands Management).

Alternative B identifies 12 areas (101,526 acres) for no net increase in motorized vehicle use of roads or trails on BLM lands. This is a more specific restriction than under the corresponding action in Alternative A, and it targets some different, or more specific areas, than those identified for development of HMPs under Alternative A.

Effects from Aquatic Resources, Fish, and Special Status Fish Management

Conservation easements and land acquisitions to support special status fish could help to protect water quality through additional management actions such as limitations on use of these lands.

Alternative B would promote actions that support good quality aquatic habitat. Since good water quality is an integral element of good-quality aquatic habitat, this action would help to protect or improve water quality. Activities that promote good quality aquatic habitat are not specified in the alternative, but might include creating buffer zones, removing roads, revegetation projects, and removing hazardous materials sites, among other actions.

Alternative B calls for designing and promoting activities that maintain high-quality habitats in ~~1~~ three conservation watersheds, and that help to achieve DFCs in ~~32~~ 28 restoration watersheds totaling 64,481 acres, 2 percent less than prescription watersheds under Alternative A. Among the elements of DFCs are water quality, channel condition, and flow and hydrology. The Aquatic and Riparian Management Strategy (**Appendix F** in Volume II~~I~~) identifies default buffer widths and land use restrictions to protect water quality and fish habitat. These actions would help protect and restore water quality.

Effects from Wildland Fire Management

Many of the actions under Alternative B would be similar to those under Alternative A. However, Alternative B relies less on wildfire and prescribed fire. A total of 33,766 acres could be treated under Alternative B (see Section 4.2.12, Wildland Fire Management). However, Alternative B relies less on wildfire and prescribed fire than Alternative A. Alternative B allows treatment of 40 percent

of CFO FRCC 2 or 3 lands (moderate to high risk) WUI areas in any 5-year period, of which 5 to 15 percent can be fire. Chemical and/or biological treatments would be used on up to 36 percent of CFO lands. Chemicals would be applied under restricted conditions, by trained personnel, to minimize the potential for impacts.

In addition to emphasizing non-fire methods of reducing fuel loads, Alternative B would encourage the use of biomass generated by fuels-reduction projects as a source of fuel for energy production or other uses. Reduced use of fire as a fuel management tool would probably reduce potential for short-term impacts on water resources from soil erosion resulting from vegetation loss, although biomass collection may involve substantial potential for soil disturbance from roads and equipment use.

Alternative B allows for the potential of 2 to 6 percent of the FRCC 2 and 3 treatments to be completed with mechanical operations. Although the type of impacts from mechanical operations would be similar, the maximum application of mechanical treatments would be 50 percent less than proposed in Alternative A, resulting in consummately less potential impacts to water resources.

Effects from Visual Resources Management

Effects would be the same as those described under Alternative A.

Effects from Forest Products Management

Alternative B identifies an annual timber harvest potential of 3,129 MBF from a commercial forest land base of 40,598 acres. The commercial forest land base is larger than under Alternative A and would allow timber harvesting on 13 percent more acres that would not be managed for timber production under Alternative A. The reduction in PSQ by over 50 percent would result in less ground disturbance and, subsequently, less potential for impacts on water quality relative to Alternative A. However, timber production would be approximately 53 percent lower than under Alternative A.

Alternative B would allow any harvest method to be used on all lands. This is a more-flexible approach than Alternative A, which limits the methods that can be used based on slope and slope aspect. The greater flexibility would allow more clearcutting, for example, than under Alternative A and would allow the use of ground-based equipment on slopes greater than 35 percent. The actual treatment systems used would be determined by the BLM through evaluation of site-specific harvest plans. While this flexibility presents greater risk that soil erosion and water quality impacts would occur than under Alternative A, it also gives the BLM a greater role in identifying the site-specific conditions that need to be addressed. Thus, the BLM may also conclude that low-impact methods be used on slopes of less than 35 percent if the conditions warrant. The impacts on water resources would depend on site-specific conditions. Modeling tools would be used to predict the site-specific impacts and to identify appropriate measures to avoid impacts.

As with harvesting, Alternative B would not restrict the available methods for reforestation. All projects would be designed to achieve full stocking on 90 percent of the reforested area within 5 years. The shorter overall timeframe relative to Alternative A corresponds to the lack of distinction between lands designated for intensive versus extensive management under Alternative B. The production goal under Alternative B is 54 percent lower than under Alternative A. This could result in reduced potential for impacts on water resources than under Alternative A, but the actual impacts would depend on site-specific management decisions.

Alternative B would adopt the BMPs for road construction (**Appendix B**, Best Management Practices) and the Aquatic and Riparian Management Strategy for Alternative B (**Appendix F** [see Volume II~~I~~]). Implementing these guidelines would help prevent or reduce the impacts on water resources.

Effects from Livestock Grazing Management

Under Alternative B, three allotments currently not leased and where grazing is not compatible with other management objectives would be retired. One allotment would be added to solve an administrative issue resulting from an acquisition in an area being historically grazed by a lessee. In total, two allotments would be removed from livestock grazing, resulting in 166 allotments, ~~6,254~~6,263 AUMs (an almost 1,000-AUM reduction), and 105,619 acres (an almost 15,000-acre reduction). There would be no change in impacts on water resources compared to Alternative A.

Effects from Minerals Management

Impacts on water resources from leasable minerals and mineral materials would be lower than under Alternative A because of the identification of lands open to leasing/sale but subject to surface use restrictions (stipulations) in addition to those on the standard lease/permit form. Under Alternative B, 43,590 acres would be subject to NSO stipulations; 42,403 acres would be subject to CSU stipulations, which would restrict certain types of activities; and an unknown number of acres would be subject to TL stipulations, which would place seasonal limitations on some activities. Among other foreseeable restrictions would be NSO stipulations on land within 0.25-mile of river segments suitable for inclusion in the NWSRS. These restrictions on use, particularly the NSO stipulations, would greatly reduce the potential impacts on water resources relative to Alternative A. Some stipulations would not be defined until site-specific studies were completed prior to leasing, but many of the stipulations would be established based on existing studies and knowledge of the existing resources. The increased foreknowledge of the restrictions on any given lease would help to focus industry attention on the least-restricted areas, reducing the risks (and costs) of planning and permitting, and could result in somewhat increased interest in those areas, compared to current conditions. However, because leasable mineral potential in the CFO is low overall, the actual differences in level of impact on water resources between Alternatives A and B would also likely be small. The same may not be true for mineral materials, as the future need for this resource is anticipated to increase with population growth in the CFO.

Site-specific mitigation measures and BMPs developed during project review would be used in conjunction with the lease/permit stipulations to reduce potential impacts on water resources.

Effects from Recreation Management

Alternative B would manage the Lolo Creek SRMA for activities that would have a low impact on water resources (nonmotorized, primitive uses), with an emphasis on whitewater boating and fishing. Therefore, Alternative B would probably be more protective of water quality in the Lolo Creek SRMA than Alternative A.

Alternative B would provide additional restrictions on commercial use permits compared to Alternative A. It would close some areas to competitive use permits. It would establish parameters for organized group recreation permits in SRMAs. These actions would probably result in a small amount of additional protection of water resources compared to Alternative A.

Effects from Renewable Energy Management

Under Alternative B lease stipulations would apply to fluid mineral leases, including geothermal leases, as described above. Similar stipulations would also apply to other renewable energy leases. The stipulations would greatly reduce the potential for impacts on water resources by restricting activities or timing of activities that could impact water quality, and by limiting the area open to leasing. Many of the sensitive habitat areas would also be areas in which water resources are most sensitive to degradation.

Effects from Transportation and Travel Management

No lands would be Open to year-round cross-country motorized travel, and 125,729 acres would be managed for motorized use Limited to designated routes. The action puts more emphasis on evaluating site-specific issues when defining vehicle use restrictions. Within Limited areas, approximately 205 miles of routes would be open yearlong, which equates to an average route density of 1.05 miles per square mile in Limited areas. An additional approximately 107 miles would be restricted in Limited areas, the majority (93 percent) of these being closed yearlong to motorized use.

Obliterating roads and trails not needed for long-term management could have short-term impacts on water quality associated with soil disturbance but would result in reduced impacts over the long term, from revegetation, return to a natural drainage pattern, improved infiltration, and reduced erosion from road use and maintenance.

Environmental considerations would be included in future route designation modifications, which would help to ensure that road construction and use do not adversely impact water resources.

Alternative B calls for annual monitoring of the effects of the travel plan on resources. Among the problem areas to be monitored would be soil erosion, sediment and water quality, riparian and wetland impacts, and restoration/rehabilitation project effects. Monitoring would identify and document problems, causes, and the effectiveness of solutions. These actions would increase the detection of any impacts on water resources to occur.

Road management guidelines/BMPs (**Appendix B**, Best Management Practices [see Volume II~~I~~]) would help prevent or reduce impacts on water quality.

Effects from Lands and Realty Management

Alternative A calls for identifying correctable natural and manmade hazards on public lands and for identifying unauthorized dump sites requiring rehabilitation. Although there is no similar action specified in Alternative B, these actions are implied by compliance with existing laws and regulations. Therefore, the effects would be the same or similar to Alternative A.

A total of 30,098 acres would be outside of areas identified as management blocks and would be considered for disposal on a case-by-case basis. Alternative B calls for using land exchange or disposal to reduce scattered parcels that are difficult to manage, and to acquire lands with high public resource value. Transfers and acquisitions could be used to improve the BLM's ability to effectively manage water resources, among the other public values of interest, leading directly or indirectly to improvements in water quality or protection of water resources. Alternative B is similar to Alternative A in this respect.

Alternative B calls for using withdrawals to protect high-value resources. An example is renewing the existing withdrawal on the Lower Salmon River and expanding that withdrawal. Withdrawals from uses that conflict with maintaining water quality objectives would reduce the potential for impacts on water quality.

Effects from ACEC/RNA Management

As under Alternative A, protecting specific blocks of land as ACECs would restrict the types of activities that could occur within these areas, reducing the potential for impacts on water resources. Under Alternative B, all but one of the current ACECs under Alternative A would be maintained (Craig Mountain ACEC [3,956 acres] would not). Within these maintained ACECs, specific actions affecting water resources in each would differ, as indicated by the following:

- 401 acres of Wapshilla Ridge (would allow maintenance timber harvests, permanently exclude grazing by retiring the grazing allotment containing the ACEC [although the area is available for grazing, it has not been leased for the past eight years], and allow prescribed burning and wildland fire use). These measures would have impacts as described above for each resource;
- 43 acres of Lower and Middle Cottonwoods Islands (would prohibit any soil or vegetation disturbance that does not support long-term improvement of ecological condition). This would better protect water resources than Alternative A;
- 1,321 acres of Captain John Creek (would allow limited timber harvesting to address disease or insect control and to achieve DFC and would allow limited vegetation treatments). These actions would have impacts as described above for each resource;
- 47 acres of Long Gulch (would allow no ground-disturbing activities that would impact MacFarlane's four-o'clock). This would reduce the potential for impacts on water quality;
- 18 acres of Skookumchuck and 136 acres of Lucile Caves (would use integrated pest management to control nonnative vegetation. This is a slight departure from Alternative A, which prohibits herbicide spraying). Integrated pest management allows discretion on the part of BLM to identify the best technologies and methods to control weeds;
- 3,678 acres of Lower Lolo Creek (Alternative B would develop a strategy to restore riparian and floodplain areas in Cottonwood Flats and provide custodial management of forest lands). These measures would provide additional protection to water resources if they further restricted land uses; and
- Lower Salmon River (Alternative B would increase the acreage in the ACEC by 497 acres relative to Alternative A to 16,199 acres).

In addition to the actions under Alternative A, Alternative B would protect ~~three~~ four additional sites as ACECs: 5,759 acres on the Salmon River east of Riggins; 570 acres on the East Fork American River, including restricting ground disturbance on slopes greater than 40 percent; 1,625 acres of Upper Lolo Creek, including requiring yarding methods to be utilized for timber harvest activities on slopes over 35 percent, obliterating roads not needed for long-term management, development of a restoration strategy of riparian /flood-prone areas in Cottonwood Flats, and a recommended mineral withdrawal; and 6,356 acres on the American River for preserving historical mining sites. Implementing these additional ACECs would restrict other uses within the area, reducing potential for future impacts on water.

Effects from Wilderness and Wilderness Study Areas Management

Under Alternative B, if Congress released WSAs from wilderness consideration, specific management would be implemented. This would provide a somewhat lesser degree of protection of water resources than if areas were managed as wilderness, but it would be more protective than if WSAs were released under Alternative A.

Effects from Watchable Wildlife Viewing Sites Management

The impacts of Alternative B would be similar to those of Alternative A, except that Alternative B would provide formal documentation and identification for wildlife viewing areas, expanding public information efforts, and promoting cooperative management efforts. Such efforts could result in further indirect protection of water resources but could also increase intensity of recreational use and associated impacts on water resources.

Alternative C

Effects from Soils Management

Effects would be the same as those described under Alternative B.

Effects from Water Resources Management

All of the water resource management actions are intended to reduce or prevent impacts on water resources. The potential for the water resource management actions to have the desired result would be greater under Alternative C, because Alternative C places the most restrictions on human activities that could adversely impact water resources. For example, Alternative C identifies larger default buffers for RCA stream buffers, more restoration and conservation watersheds (68,359 acres), larger land areas subject to NSO mineral lease stipulations, the largest number of acres in ACECs, and the fewest acres for land-disturbing actions, among other restrictions on development.

Effects from Vegetation—Forests Management

Effects would be similar to those described under Alternative B, except that Alternative C identifies a DFC consisting of a higher percentage of larger trees and more old forest than Alternative B. Blocks over 500 acres would be managed for DFC and account for 28,087 acres of forested vegetation (**Figure 7**, Desired Future Condition Blocks—Alternative C [see Volume IV of the Cottonwood Draft RMP/EIS]). This could indirectly reduce impacts of timber production on water quality (mainly temperature and sediment).

Effects from Vegetation—Riparian and Wetlands Management

Effects would be similar to those described under Alternative B, except that Alternative C includes wider default widths for RCA stream buffers (covering 21 percent more area than Alternative B and 14 percent more than Alternative A) and 6 percent more conservation and restoration watersheds (totaling 68,359 acres). This would afford somewhat more protection of water quality than under Alternative B.

Effects from Wildlife and Special Status Wildlife Management

Effects would be similar to those described under Alternative B, except that Alternative C would add the Lower Salmon River to areas that emphasize management of native grassland to support winter and spring range areas of game animals. The larger area under this type of management would have a greater potential to reduce soil erosion impacts on water quality than Alternatives A and B.

Alternative C targets forested contiguous areas greater than 500 acres as priorities for attainment of DFC, totaling 28,087 acres. By targeting smaller areas than Alternative B, 3 percent more CFO lands would come under this management, resulting in greater indirect protection of water resources.

Riparian areas would be protected as described for Alternative B; however, as described in Effects from Vegetation—Riparian and Wetlands Management, Alternative C includes wider RCA stream buffers than Alternative B and wider RHCAs than Alternative A. These actions would help to protect water resources more than Alternatives A or B.

Alternative C identifies five of the areas (38,733 acres) targeted in Alternative B for no net increase in motorized vehicle use of roads or trails, for a decrease in motorized vehicle use. This would provide greater protection of water resources from erosion impacts resulting from road use.

Effects from Aquatic Resources, Fish, and Special Status Fish Management

Effects would be similar to those described under Alternative B, except that Alternative C would be applied to 6 percent more watershed acreage than Alternative B, as indicated in **Appendix C**, Conservation and Restoration Watersheds (see Volume II~~I~~), and 3 percent more than prescription watersheds under Alternative A. This would result in more opportunities for improvements in water quality than under Alternatives A or B.

Effects from Wildland Fire Management

Effects would be similar to those described under Alternative B, except that 20 percent (16,833 acres) of the CFO classified as FRCC 2 or 3 (moderate to high risk) WUI areas could be treated in any 5-year period under Alternative C (see Section 4.2.12, Wildland Fire Management), 50 percent less than Alternative B and 80 percent less than Alternative A. Alternative C would include approximately 1,182 to 4,390 acres annually of mechanical treatments and prescribed fire (see Section 4.2.5, Vegetation—Forests).

Chemical and/or biological treatments could be used on up to 20 percent of CFO lands. Chemicals would be applied under restricted conditions, by trained personnel, to minimize the potential for impacts.

Effects from Visual Resources Management

Effects would be similar to those described under Alternative B, except Alternative C would assign more acres to more-stringent VRM classes. Specifically, Alternative C would have more than twice as many acres in VRM Class I than Alternative B, slightly more in VRM Class II, and less in VRM Class III. Alternative C also would have more acres in VRM Classes I and II than Alternative A. The shift toward more-stringent VRM classes would result in more restrictions on the authorized land uses, indirectly reducing the potential for water resources impacts.

Effects from Forest Products Management

The impacts would be similar to the impacts of Alternative B. Compared to current management, the commercial forest land base would be reduced by about 3 percent, and annual estimated timber production would be about 53 percent lower, resulting in less potential for impacts on water resources.

Effects from Livestock Grazing Management

Effects would be similar to those described under Alternative B, except Alternative C would reduce the total number of allotments to 145 (from 168 in Alternative A), 101,350 acres, and 6,020 AUMs. The reduction in allotments would include removing vacant allotments that are not currently being used. There would be no change in impacts on water resources compared to Alternative A or B.

Effects from Minerals Management

Effects would be similar to those described under Alternative B, except impacts on water resources would be lower than under Alternative B because more open lands would be subject to surface use restrictions. Under Alternative C, 68,854 acres would be subject to NSO stipulations, and 59,122 acres would be subject to CSU stipulations. As indicated for Alternative B, the overall leasable mineral potential in the CFO is low, so the actual differences in level of impact on water resources between Alternatives B and C would also likely be small.

Effects from Recreation Management

Effects would be the same as those described under Alternative B.

Effects from Renewable Energy Management

Effects would be the same as those described under Alternative B.

Effects from Transportation and Travel Management

The effects of obliterating roads and trails not needed for long-term management would be similar to those described for Alternative B, except that under Alternative C, the areas where this action would occur would be expanded to include 6 percent more watershed acreage than Alternative B, as identified in **Appendix C**, Conservation and Restoration Watersheds (see Volume II~~I~~), and 3 percent more than prescription watersheds under Alternative A.

Effects from Lands and Realty Management

Effects would be the same as those described under Alternative B.

Effects from ACEC/RNA Management

Effects would be similar to those described under Alternative B, except:

- Alternative C would increase the existing Craig Mountain ACEC to 23,342 acres, an almost five-fold increase from Alternatives A and B. Custodial timber harvesting would be allowed to achieve desired size classes. New roads for timber harvesting would be decommissioned. These actions would provide additional protection of water resources compared to Alternatives A and B;
- On 570 acres on the East Fork American River, vegetation treatments would be reduced and vegetation and aquatic condition/trend monitoring would be conducted every 10 years. The impacts on water resources would be similar but slightly less than Alternative B because of the additional restrictions on timber harvesting and additional monitoring;
- ~~Alternative C would designate 1,625 acres of Upper Lolo Creek as an ACEC and restrict timber harvesting on slopes over 50 percent, recommended a mineral withdrawal, obliterate roads not needed for long-term management, and develop a restoration strategy for riparian/floodplain areas in Cottonwood Flats. These actions would help to reduce the potential for impacts on water resources;~~

- 576 acres of the Partridge/Elkhorn area would be managed to protect natural processes, old growth ~~P~~ponderosa pine stands, and Idaho BLM sensitive species. Management measures would include minimizing new road construction and removing timber roads. These actions would help to protect water resources; and
- 590 acres of the Little Salmon River would be managed for a similar purpose and in a similar way to the Partridge/Elkhorn area, above.

Effects from Wilderness and Wilderness Study Areas Management

Effects would be the same as those described under Alternative B.

Effects from Watchable Wildlife Viewing Sites Management

Effects would be the same as those described under Alternative B.

Alternative D

Effects from Soils Management

Effects would be the same as those described under Alternative B.

Effects from Water Resources Management

All of the water resource management actions in Alternative D are intended to reduce or prevent impacts on water resources. The potential for the water resource management actions to have the desired result would be less under Alternative D than under Alternative A, because Alternative D has smaller RCA widths, fewer conservation and restoration watersheds (21 percent less than prescription watersheds under Alternative A), and more potential for ground-disturbing actions.

Effects from Vegetation—Forests Management

Effects would be the same as those described under Alternative A.

Effects from Vegetation—Riparian and Wetlands Management

Effects would be similar to those described under Alternative B, except Alternative D would have a slightly higher potential for water quality impacts overall. Under Alternative D, fewer conservation and restoration watersheds would be designated (21 percent less than prescription watersheds under Alternative A).

Effects from Wildlife and Special Status Wildlife Management

Effects would be similar to those described under Alternative B, except Alternative D would be somewhat less protective overall, based on the RCA widths and priority watersheds listed in **Appendices F** (Aquatic and Riparian Management Strategy) and **C** (Conservation and Restoration Watersheds) (see Volume II~~I~~).

Effects from Aquatic Resources, Fish, and Special Status Fish Management

Effects would be similar to those described under Alternative B, except Alternative D would have smaller RCA widths and fewer conservation and restoration watersheds (21 percent less than prescription watersheds under Alternative A). Alternative D would have higher potential for overall water quality impacts than the other alternatives.

Effects from Wildland Fire Management

Effects would be similar to those described under Alternative B, except that 50,650 acres of the CFO classified as FRCC 2 or 3 (moderate to high risk) WUI areas could be treated in any 5-year

period under Alternative D (see Section 4.2.12, Wildland Fire Management), 50 percent more than Alternative B and triple that under Alternative C. Additional areas could be treated outside the WUI. Alternative D would include approximately 2,870 to 7,597acres annually of mechanical treatments and prescribed fire (see Section 4.2.5, Vegetation—Forests).

Chemical and/or biological treatments would be used on up to 36 percent of CFO lands. Chemicals would be applied under restricted conditions, by trained personnel, to minimize the potential for impacts.

Effects from Visual Resources Management

Effects would be similar to those described under Alternative B, except Alternative D would shift more acres to less-stringent VRM classes. There would be about half as many acres in VRM Class I as in Alternative B, slightly fewer acres in VRM Class II, and about 10,000 more acres in VRM Class III. Alternative D also would have more acres in less-stringent VRM classes than Alternative A. Based on acreage, VRM under Alternative D would indirectly have the largest impacts on water resources among the alternatives.

Effects from Forest Products Management

Effects would be similar to those described under Alternative B. Compared to current management, the commercial forest land base would be reduced by about 26 percent, and annual estimated timber production would be about 27 percent lower, resulting in less potential for impacts on water resources.

Effects from Livestock Grazing Management

Effects would be similar to those described under Alternative B, except that under Alternative D, 135,850 acres consisting of 170 allotments and 8,54~~0~~9 AUMs would be available for livestock grazing. The increase in AUMs would result in increased potential for impacts on water resources overall because a greater number of streams would be accessed by livestock ~~(more streams would be impacted)~~. While the acres per AUM are similar for all alternatives, the carrying capacity of the land varies; because Alternative D involves more acres than the other alternatives, livestock grazing under Alternative D is likely to have the greatest impact on water resources among the alternatives.

Effects from Minerals Management

Effects would be similar to those described under Alternative B, except impacts on water resources would be slightly greater than under Alternative B, because slightly fewer lands would be subject to surface use restrictions. Under Alternative D, 35,045 acres would be subject to NSO stipulations and 32,013 acres would be subject to CSU stipulations.

Effects from Recreation Management

Effects would be the same as those described under Alternative B.

Effects from Renewable Energy Management

Effects would be the same as those described under Alternative B.

Effects from Transportation and Travel Management

Effects would be similar to those described under Alternative A, except that Alternative D would include 23,189 acres Open to yearlong, cross-country motorized travel, an area 25 percent the size of that under Alternative A. An additional 102,542 acres would be Limited to designated routes. Within

Limited areas, approximately 179 miles of routes would be open yearlong. However, almost half of these (82 miles) would not have legal public access so these would receive little to no use. An additional approximately 107 miles would be restricted in Limited areas, the majority (93 percent) of these being closed yearlong to motorized use. Route restrictions and closures would indirectly protect water resources by reducing or eliminating traffic, which can contribute to localized erosion of the roadbed and can ultimately increase sediment in water bodies. Because cross-country OHV use would be most damaging to soils, resulting in erosion that could reach water bodies, Alternative D would have more potential indirect impacts on water resources than Alternatives B and C because Alternative D would designate Open areas. Alternative D would have less potential indirect impacts on water resources than Alternative A.

Effects from Lands and Realty Management

Effects would be the same as those described under Alternative B.

Effects from ACEC/RNA Management

Effects would be similar to those described under Alternative B, except that Alternative D would not include the following:

- The Lower Lolo Creek ACEC, which is included in Alternatives A, B, and C;
- The East Fork American River ACEC, which is included in Alternatives B and C; and
- Designation of the American River Historic Sites District ACEC, which is included in Alternatives B and C.

Effects from Wilderness and Wilderness Study Areas Management

Effects would be the same as those described under Alternative B.

Effects from Watchable Wildlife Viewing Sites Management

Effects would be the same as those described under Alternative B.

Cumulative Effects

Past sediment, erosion, and associated water quality and drainage impacts have resulted from mining activities, road construction and maintenance, and to a lesser extent grazing and agricultural use. Nearly all of the projects listed in Section 4.1.3, Cumulative Impacts have in the past or would in the future contribute to a cumulative effect on water resources in the region. Many of these projects include a component intended to reduce or prevent effects on water resources or to reverse past effects.

Many of the Cottonwood RMP management actions parallel or are designed to be implemented in coordination with other projects. The cumulative effect would be the increased protection, maintenance, or restoration of water quality and the designated beneficial uses of water in the region. This general cumulative effect would occur under each of the alternatives with small variations in the magnitude of the effect, especially within the CFO, resulting from the different emphases of the alternatives. The projects that fall within this category of impact include land tenure actions, the Idaho Statewide Implementation Strategy for the National Fire Plan, wildland fire management strategies, fish and wildlife conservation measures, and implementation of the ESA, the Idaho Standards for Rangeland Health and Guidelines for Livestock Grazing Management (BLM 1997a) (**Appendix A** in Volume II~~I~~), the ICBEMP, and resource-protection measures in the National

Forest Plan revisions. Other projects or regional trends could impact water resources unless mitigated by implementing BMPs, complying with existing laws and regulations, or designing measures specifically to address water resources impacts.

In the foreseeable future, fuels management actions that disturb soil or remove vegetation could result in short-term effects on water quality but are expected to reduce the risk of more potential for stand-replacing fires and potential effects on water resources in the long term. These fire management actions include fuel-reduction measures such as prescribed burns, thinning, slash removal, herbicide treatments, or wildland fire use. Similarly, management that emphasizes allowing natural processes such as fire to proceed with minimal human intervention could substantially affect water resources over time but would reduce short-term effects on water resources. Fire management on National Forest and private land is an example of an area where the cumulative effects of fire management decisions (whether to suppress fire, reduce fuel, or minimize human intervention) would influence outcomes on regional water resources to a much greater extent than the individual decisions associated with BLM management, because BLM manages relatively few acres of forest in the planning area.

Timber, grazing lands, and mineral resource management actions throughout the region would have similar effects to those described above for the Cottonwood RMP alternatives. Timber-harvesting activities on Idaho Department of Lands and private lands are not as protective as on federal lands and, as such, could have greater impacts to water resources. In the case of timber management, Forest Service management actions under the National Forest Plans and revisions are much more influential on regional water resource outcomes than BLM actions, due to the vastly larger amount of land area in the National Forests. However, BLM and the Forest Service are constrained by the same set of rules and guidelines to protect water resources, wildlife habitat, and threatened and endangered species and other resources. In addition, BLM and the Forest Service increasingly coordinate their plans and management actions to achieve common objectives for any given watershed, including actions that emphasize watershed-scale planning and actions such as the ICBEMP or PACFISH that emphasize regional-scale planning. Thus, cumulative effects on regional water resources resulting from forest management practices would increase protection of water resources. This would occur by monitoring effects to allow implementation of corrective measures and by employing effective adaptive resource management. Differences in the level of emphasis on timber productivity under each of the Cottonwood RMP alternatives would result in relatively minor differences in the cumulative regional effects on water resources due to the relatively small BLM land ownership and the general consistency in management between the BLM and Forest Service.

A high potential for the occurrence of locatable minerals continues to exist in historic mining districts in the CFO. The activity level for this resource is anticipated to be relatively low but usually is dependent on commodity prices and thus hard to predict. Mineral material sites could have the greatest potential to impact water resources because the potential for increased activity related to mineral materials is higher than any of the other mineral types. Although past mining activity has resulted in moderate to substantial effects on water resources at some sites, notably in the Elk City and Marshall Mountain areas, future mining activity would result in fewer effects, because current laws and regulations provide a higher level of protection for water and other resources, and because more substantial planning of mineral development with increased financial assurances for reclamation is required.

No net increase in roads is expected on BLM lands, however, road construction and use to facilitate timber harvest, recreational access, and (to a lesser extent) mineral development will continue to occur throughout the region. In recent years this activity has slowed, techniques for road building have improved, and regulatory and planning restrictions on roads across ownerships have become more effective in reducing water resources effects. Therefore, the contribution of road construction and use to the cumulative effects on water resources would gradually decrease over time.

Population growth can put increased demand on water resources. In the CFO planning area, land uses, such as residential development, urban growth, changing land uses, vegetation treatments, and agricultural demands are having various impacts on water supply. Such impacts may affect water quality, flow regimes, peak flows, and available water supply. ~~Population growth can put increased demand on water resources. In the CFO region, high quality water supplies are plentiful in most areas. Increased municipal demand is not expected to stress the available supply, and there is limited agricultural and industrial demand.~~ Regional demand for electric power, including hydroelectric power, is increasing, but there is intense public resistance to siting new dams in the region, and most feasible sites have already been developed. Protecting migratory fish and preserving Wild and Scenic Rivers also preclude the siting of new dams.

Grazing and agriculture are important land uses in the region, and both can contribute to water quality effects. Agriculture on BLM lands is minimal. Agricultural use contributes to soil erosion and sediment and nutrient delivery to streams. Grazing can also contribute to soil erosion and increased delivery of sediment, nutrients, and pathogens to streams.

The cumulative effects on water resources under each of the Cottonwood RMP alternatives would be similar and would generally parallel the effects each of the alternatives alone. Overall, Alternative C would contribute the greatest to protecting beneficial uses of water and maintaining and/or improving water quality, followed by Alternatives B, A, then D. Independent of BLM discretionary management, improvements in water resources are likely to continue in response to increased regulation of water resources under the Clean Water Act and other legislation.

4.2.5 Vegetation—Forests

Goal: Manage forests to maintain or improve forest health, composition, structure, diversity consistent with site potential, and Historical Range of Variability.

Summary

Forested vegetation would be affected most by fire management and forest vegetation management. Restrictions on management activities for the protection of other resources, primarily visual quality and special status species, would affect the level, location, and effectiveness of forest management actions to improve forest health.

From the standpoint of managing forest stands for maintenance or improvement of vigor, Alternative A would provide the greatest benefit, followed by Alternatives D, B, and then C. All alternatives would allow for managing forest stands for structural diversity. Alternative C would require management for structural diversity on the greatest area. The DFC blocks in the WUI would be managed for the identified structural goals. Alternatives A and D would not have required structural management areas (DFC blocks), although Alternative D would provide for the management of existing old growth stands in the WUI for presuppression old growth characteristics,

provided they would not prevent attainment of the fuels-reduction goals. **Table 4-5** identifies the indicators that were used to analyze effects on forest management under each alternative.

Table 4-5
Comparison of Vegetation—Forests Indicators by Alternative

Indicator	Alternative A	Alternative B	Alternative C	Alternative D
Acres of treatment through forest products removal in 15 years	5,700	3,129	3,101	4,823
Range of acres of mechanical and prescribed[1] fire per year	1,530 to 4,886	1,448 to 4,343	1,448 to 5,377	1,448 to 6,204
Percent change in acres of treatment[1] through fuels reduction compared to Alternative A (current management)	0%	-11.1%	+10.0%	+26.9%

Source: BLM 2004a

[1]Acres for fuel treatment include mechanical and prescribed fire. Acres of prescribed fire for Alternative A were derived from **Appendix H** (Wildland Fire Management) (see Volume II~~I~~), **Table H-2**, multiplied by 72% because approximately 72% of the acres in CFO are forested. Alternatives B, C, and D are based on 103,394 acres of forested vegetation in FRCC 2 or 3, multiplied by the percentage treated in 5 years, divided by 5 to derive annual acres. Chemical and seeding fuel-reduction activities are not typically implemented in the forested environment.

Methods of Analysis

Indicators

Indicators are used to identify the level of impact. For forested vegetation, the indicators used for impact analysis are identified in **Table 4-5**, Comparison of Vegetation—Forests Indicators by Alternative.

Methods and Assumptions

This analysis is based on the following methods and assumptions:

- Social and economic opportunities will be accomplished following vegetation management objectives and actions, and effects are included in the vegetation management discussion;
- Nondisturbance buffers for raptor nests is assumed to mean no human activity during times when nests are being used and not to mean that no vegetation or soil disturbance around a nest at other times;
- Because forested vegetation makes up 70 percent of the CFO, 70 percent of acres treated for FRCC under wildland fire management would occur in forested vegetation types. Types of treatments (mechanical, chemical, seeding, and prescribed fire) would occur in the same distribution in forested types as specified in **Appendix H**, Wildland Fire Management (see Volume II~~I~~);
- For quantitative comparison of fuel-reduction treatments, the percent compared to Alternative A was calculated assuming the maximum amount of treatment in any five-year period for all alternatives;
- For calculating change due to wildland fire management and forest products, it is assumed that goals can be achieved while meeting other management action requirements, and that budget and staffing level would be sufficient to achieve treatment goals;

- For qualitative discussions on impacts from management direction for everything except wildland fire management, actions and objectives for other resources will override fire management goals unless otherwise specified. For example, it is assumed that protecting visual quality will override improving forest health and, therefore, treatments for forest health will be modified to protect visual quality. In the WUI, exceptions will be made for wildland fire management, so this assumption does not apply to wildland fire management in the WUI; and
- Effects are predicted for 20 years from the time the RMP is initially implemented.

Effects Common to All Alternatives

Effects from Air Quality Management

In Idaho, methods used by land management agencies and private landowners to meet air quality standards have been in force since the 1980s, and the BLM's past experience is that daily restrictions on burning to protect air quality may affect the prescribed burning program by reducing opportunities to burn in any given year. However, it is not expected that they would completely prevent implementation and accomplishment over the 20-year planning period. All prescribed fire and wildland fire use would be used in a manner to minimize degradation of airsheds and would be coordinated with the Montana/Idaho Airshed Group.

Effects from Soils Management

Soil protection measures could affect where and what type of vegetation management activities can occur. Protection measures for soil stability and erosion would affect forest management by preventing implementation of treatments in areas determined to have slope instability, including a 100-foot slope distance buffer on these areas.

Effects from Water Resources Management

The effects on forested vegetation would be the same as those described under Effects from Vegetation—Riparian and Wetlands Management for each alternative.

Effects from Aquatic Resources, Fish and Special Status Fish Management

The effects on forested vegetation would be the same as those described under Effects from Vegetation—Riparian and Wetlands Management for each alternative.

Effects from Special Status Plants Management

Modifying actions to avoid impacts on listed or sensitive species or their habitat could alter vegetation management treatments. This could preclude reaching management goals, such as reducing stand density or improving forest health in specific areas (stands).

Effects from Wildland Fire Management

Reducing FRCC would indicate an improvement in forested vegetation. A reduced FRCC would mean that species composition and stand density would be corrected, and insect and disease activity would be reduced to endemic levels. A reduced FRCC represents resilience after wildland fire and resistance to insect and disease epidemics that would indicate improved forest health.

Effects from Forest Products Management

In all alternatives, forest products management actions (including precommercial thinning and timber harvesting) would be tools to improve forest health, including species composition and stand density.

Effects from Livestock Grazing Management

Grazing effects on forests are caused by livestock foraging or trampling planted trees, causing seedling mortality or growth deformity. Areas where seedlings are planted for reforestation would be closed to grazing for a minimum of two years. They could be closed longer if the seedlings are not large enough to withstand grazing use. Grazing in dry conifer types can encourage grazing encroachment by reducing grass competition.

Effects from Transportation and Travel Management

Roads that are closed to motorized travel yearlong could eventually become overgrown with vegetation or could otherwise become impassible because of cut or fill failures, culvert removal, or fallen timber; these areas may not be available for use for forest health monitoring and may increase the cost of forest vegetation management actions. Roads that are obliterated or recontoured would have the same effect.

Effects from Wild and Scenic Rivers Management

Management of the outstandingly remarkable values of river segments found suitable for inclusion in the NWSRS could increase visual quality protection, which could direct or eliminate treatments that would improve forested vegetation.

Effects from Native American Tribal Uses Management

Consulting with tribes to identify culturally significant plants, important habitats, and traditional use locations could place higher treatment priority in areas not previously identified or limit actions in planned treatment areas.

Alternative A

Effects from Vegetation—Forests Management

Alternative A would designate 35,757 acres (35 percent) of forested acres as commercial forest. Treatment acres in this area would improve forest health, desired stand structure, and vigor. This is discussed under Effects from Forest Products Management, below.

Adopting the Idaho Forest Practices Act would reduce fuel loads on treated acres and ensure adequate stocking levels are restored following regeneration harvesting. Both of these activities would improve forest health and resilience.

Treatments in FRCC 3 and FRCC 2 would improve forest health, species composition, and stand densities and would decrease insect- and disease-affected trees. Treatments that restore FRCC 1 would allow forests to be more resilient. Over time, fire would be able to play more of its natural role.

Treating dry ponderosa pine, dry conifer cover types, and whitebark pine would reduce stand densities. Reducing density in overstocked stands would reduce stress due to competition for water, light, and nutrients and would reduce the susceptibility to insect attacks, disease, and the risk of

stand-replacing fire. These vegetation types also need mineral soil and sunlight to reproduce. Reducing stand density would promote ponderosa pine and whitebark pine regeneration.

Effects from Vegetation—Riparian and Wetlands Management

RHCAs could modify the location of some forested vegetation treatments which could impact overall forested vegetation management objectives for forest health and vigor by limiting areas of treatment. In Alternative A, these account for 12,048 acres, or 12 percent of the total forested vegetation acres.

Effects from Wildlife and Special Status Wildlife Management

Modifying actions to avoid impacts on listed species or their habitat could alter forest management treatments. In some cases, this could preclude reaching management goals, such as reducing stand density or improving forest health (Graham et al. 2004).

Maintaining cover-to-forage ratios in areas identified for intensive wildlife management would reduce forest cover in some areas, but not to the extent that it would affect overall forest health or species composition.

A 100-yard nondisturbance buffer around active raptor nests results in 6.5 acres for every active nest. This could affect timber harvesting or prescribed burning activities in the spring and early summer, but it would not preclude these activities from occurring. Prohibiting disturbance in a 100-foot buffer around "active raptor nests" could and has resulted in limiting activities between February 1 and August 1, which is the spring and summer burning and timber harvesting season, making it more difficult and expensive to accomplish goals.

Effects from Wildland Fire Management

Alternative A would result in 1,530 to 4,800 acres of forest being treated by prescribed fire or mechanical fuel reduction per year (**Table 4-5**, Comparison of Vegetation—Forests Indicators by Alternative), which would improve forest health and species composition.

Wildland fire use, where it would be allowed, would reduce stand densities and, in some cases, improve species composition (**Figure H-1**, Areas Available for Wildland Fire Use—Alternatives A and C [see **Appendix H** in Volume II~~I~~]).

Effects from Visual Resources Management

Meeting VRM Class II guidelines would limit the scope of logging, thinning, or prescribed burning activities, which account for between 31 and 49 percent of the treatments proposed (based on acres). Meeting Class II guidelines also would prohibit treatments and prescriptions (e.g., clearcutting) that would change the visual character. In the dry conifer type, encroachment of Douglas-fir is the reason composition and vigor need improvement, and the only way to remove them without increasing fuel loadings would be to log, thin, and in some limited instances, use prescribed fire. Approximately 31 percent of the forested acres would be in VRM Classes I or II in Alternative A (**Table 4-6**) and could not be treated effectively to improve forest ~~vigor~~ health or species composition due to visual quality management.

Table 4-6
VRM and Forested Vegetation under Alternative A

	VRM I	VRM II	VRM III	VRM IV
Forested Vegetation Acres	8,235	23,707	47,367	21,689
Percent of Total Vegetation Acres	8%	23%	47%	21%

Source: BLM 2004a

Effects from Forest Products Management

No acreage goals are established in Alternative A, but recent treatment levels have been approximately ~~380~~ 358 acres annually, which would be approximately 5,700 to 7,600 acres over the next 15 to 20 years. This represents 6 to 8 percent of forested vegetation in the CFO.

Limitations on the size and shape of cutting units could affect forest vegetation by making forest management more costly and reducing patch sizes. Limitations in the MFP on use of silvicultural systems based on aspect could reduce the ability to implement the appropriate silvicultural system for the stand conditions present.

Effects from ACEC/RNA Management

Prohibiting timber harvest and prescribed burns could eliminate the opportunity to improve forest health, species composition, and stand densities in ACECs. These areas are small relative to the remainder of forested vegetation in the CFO; therefore, impacts would be localized. The largest ACECs would not prohibit vegetation treatments, although protecting scenic values could restrict treatments, as described under Effects from Visual Resources Management, above.

Alternative B

Effects from Soils Management

Soil management actions could indirectly impact vegetation by influencing when and how wildland fire is managed. Effects are discussed further under Effects from Soils Management under the Wildland Fire Management section (Section 4.2.12).

Effects from Vegetation—Forests Management

Alternative B designates 40,598 acres (40 percent of forested acres) as commercial forest. Treatment within these areas would improve vigor.

The DFC blocks over 1,000 acres that would be managed to improve forest health and vigor account for 24,789 acres (24 percent) of forest land in Alternative B, of which 3,718 acres (25 percent) are commercial forest land. These areas would be managed to meet the DFCs in **Appendix D** (Desired Future Conditions for Forest Vegetation/Wildlife Habitat [see Volume II~~I~~]), which specifies a minimum level of large trees that would be retained. In 15 years, management of commercial forest lands could be used on an estimated 3,718 acres (15 percent of the DFC block acres) to achieve this goal. The remaining 85 percent would be constrained by other resources values such as VRM, RCA, and wild and scenic river suitability, making achievement of DFC more difficult or even impossible. Leaving large trees would increase the large tree component and, when these trees are healthy and represent the appropriate species composition for the site, would maintain forest health. However, where the large tree component is not in the appropriate species

composition for the site, the large tree component would be retained for a while, but the health and vigor of the stands could decline. Trees growing on sites where natural disturbance historically limited their presence or in dense stands are more susceptible to insects and disease because they are under stress due to competition for resources. Eventually, this could result in increased fuel loadings in some areas.

Treatments to enhance forest vigor would improve forest health, species composition, and stand densities, and would decrease insect- and disease-affected trees. Treatments would allow forests to be more resilient after wildland fires (Graham et al. 2004). Over time, fire would be able to play more of its natural role.

Managing species composition and canopy closure of large trees to promote ponderosa pine and western larch would, over the long term (more than 50 years), increase the amount of old growth in these forest types, which is currently lacking. Treatments could increase the amount of large Douglas-fir. However, Douglas-fir old growth in northern Idaho is not particularly long lived, unlike coastal Douglas-fir. By the time it reaches 230 years, it is exceedingly susceptible to Douglas-fir bark beetles and drought (Powers et al. 1999).

Managing old growth in municipal watersheds to maintain or contribute to the restoration of pre-fire suppression characteristics could reduce fuel loads in old growth stands, making them more resilient after fire, and, in some cases, allowing them to survive fire.

Capturing the value of forest products would remove dead, dying, diseased, and stressed trees from forests. Depending on the agent, this could improve forest health in some areas by removing insects before they can attack other trees and reduce stress on remaining trees. In all forests, this would reduce forest fuels.

Effects from Vegetation—Riparian and Wetlands Management

RCAs could modify the location of some forested vegetation treatments but would not impact overall forested vegetation management objects for forest health and vigor. However, buffers on fish-bearing streams total 72 acres for every mile of stream, and permanent non-fish-bearing streams equate to 36 acres for every mile of stream. In Alternative B, these account for 11,362 acres or 11 percent of the total forested vegetation acres, compared to 12 percent in Alternative A.

Effects from Wildlife and Special Status Wildlife Management

Effects of avoiding impacts on listed species would be similar to as those described for Alternative A. In addition, specific management actions included in Alternative B for wildlife would have the following effects: maintaining bald eagle roosting and nesting habitat and snag-dependent species habitat; avoiding or minimizing adverse impacts on game and nongame species; buffering active raptor nests; and minimizing adverse impacts to wildlife travel corridors and fragmentation of habitats would all impact vegetation management actions to improve forest health, reduce FRCC, reduce fuel loadings, improve tree species composition, and reduce stand densities. These effects vary from very little, where goals and objectives could still be achieved but treatments are less extensive and cost more; to completely prohibitive, where treatments to improve forest health, FRCC, fuels and species composition could not be accomplished and forest health would continue to decline. Additionally, listed (threatened, endangered, and BLM sensitive) species change, which could substantially increase the extent of these effects, depending on the species listed and subsequent requirements for protection.

The effects of implementing **Appendix D** (Desired Future Conditions for Forest Vegetation/Wildlife Habitat [see Volume II~~I~~]) are described under Effects from Vegetation—Forests Management, above.

Effects from Aquatic Resources, Fish, and Special Status Fish Management

BMPs to avoid or minimize adverse impacts to aquatic and riparian habitats could affect where some treatments occur, what method is used, or treatments' effectiveness. Changing management direction to contribute to recovery or conservation of special status species could affect the location, method, and effectiveness of some vegetation treatments, but the extent to which this could occur is unknown.

The effects of implementing **Appendix F** (Aquatic and Riparian Management Strategy [see Volume II~~I~~]) are addressed under Effects from Vegetation—Riparian and Wetlands, above.

Effects from Wildland Fire Management

Fuels reductions are intended to reduce stand-replacing wildland fires and make fire suppression easier to accomplish. Alternative B would result in 1,448 to 4,343 acres of forest being treated by prescribed fire or mechanical fuel reduction per year compared to a maximum of 4,886 acres in Alternative A (an 11-percent decrease) (**Table 4-5**, Comparison of Vegetation—Forests Indicators by Alternative), which would result in less improvement to forest health and species composition. Details of the extent of treatment are included in the Effects from Wildland Fire Management in the Wildland Fire Management section (Section 4.2.12) for Alternative B.

Wildland fire use, where it would be allowed, would reduce stand densities. In some cases, it would improve species composition (**Figure H-2**, Areas Available for Wildland Fire Use—Alternative B [see **Appendix H** in Volume II~~I~~]).

Effects from Visual Resources Management

Effects would be the same as those described under Alternative A.

Effects from Forest Products Management

An estimated ~~233~~ 242 acres would be treated annually in this alternative, which would be approximately 3,495 to 4,660 acres over the next 15 to 20 years. This represents approximately 3 to 5 percent of forested vegetation in the CFO. Treatments would be a tool to restore appropriate species composition and stand density, improve forest health and vigor, restore desired stand structure, and achieve other vegetation management goals. However, only 3 to 5 percent would result in only a slight improvement or achievement of accomplishing the DFC through timber management.

Effects from Renewable Energy Management

Biomass projects would be designed to improve species composition, reduce density and improve vigor. Biomass removal for renewable energy could eventually affect forested vegetation by making it more feasible to treat stands of small trees by creating a market for the smaller diameter material (Forest Service 2005b).

Effects from ACEC/RNA Management

Size of ACECs and ACEC/RNAs would increase from 25,600 acres in Alternative A to ~~34,528~~36,153 acres in Alternative B, including over 1,000 acres of old growth forest that would be

protected. The larger ACECs (Lower Salmon River at 16,199 acres and American River Historic Sites District at 6,356 acres), as well as some smaller areas, would be managed to meet DFC or support long-term ecological health, which would improve forest conditions.

Alternative C

Effects from Soils Management

Effects would be the same as those described for Alternative B.

Effects from Vegetation—Forests Management

Alternative C would designate 34,611 acres (34 percent) of forested acres as commercial forest, where timber harvesting could be used to improve forest health and restore desired stand structure. Effects would be similar to those described for Alternative B, except for the following.

The DFC blocks over 500 acres that would be managed to improve structural diversity account for 28,087 acres of the 100,990 acres (28 percent) of forested vegetation, of which 2,809 acres are commercial forest land. These areas would be managed to meet the DFCs in **Appendix D** (Desired Future Conditions for Forest Vegetation/Wildlife Habitat [see Volume II~~I~~]), which specifies a minimum level of large trees that would be retained. In 15 years, management of commercial forest lands could be used on an estimated 2,809 acres (10 percent of the DFC block acres) to achieve this goal. The remaining 90 percent would be constrained by other resources values such as VRM, RCA, and wild and scenic river suitability, making achievement of DFC more difficult or even impossible.

Alternative C would maintain twice the percentage of old growth and would increase the minimum percentage of large-sized trees (greater than 20 inches diameter) by 5 to 15 percent in the dry conifer types. Where the large tree species composition is not appropriate for the sites, large tree components would still remain, but treatments would not improve the health and vigor of forested stands. Trees growing on sites where natural disturbance historically limited their presence are more susceptible to insects and disease and do not grow as well as appropriate species because they are under more stress.

Effects from Vegetation—Riparian and Wetlands Management

Effects would be similar to those described for Alternative B, except that RCA stream buffers on permanent non-fish-bearing streams would amount to 55 acres for every mile of stream. In Alternative C, these account for 13,994 acres, or 14 percent of the total forested vegetation acres, compared to 12 percent in Alternative A.

Effects from Wildlife and Special Status Wildlife Management

Effects would be the same as those described for Alternative B.

Effects from Aquatic Resources, Fish, and Special Status Fish Management

Effects would be the same as those described for Alternative B. Impacts from implementing **Appendix F** (Aquatic and Riparian Management Strategy [see Volume II~~I~~]) are described under Effects from Vegetation—Riparian and Wetlands, under Alternative B above.

Effects from Wildland Fire Management

Fuels reductions could reduce stand-replacing wildland fires and make fire suppression easier to accomplish. Alternative C would result in 1,182 to 4,390 acres of forest being treated by prescribed fire or mechanical fuel reduction per year compared to approximately 4,886 in Alternative A (a 10-

percent increase) (**Table 4-5**, Comparison of Vegetation—Forests Indicators by Alternative), which would improve forest health and species composition. Details of the extent of treatment are included in the Effects from Wildland Fire Management in the Wildland Fire Management section (Section 4.2.12) under Alternative C.

Wildland fire use could be used much more extensively as all fires would be considered for wildland fire use (**Figure H-1**, Areas Available for Wildland Fire Use—Alternatives A and C [see **Appendix H** in Volume II~~I~~]). In some cases, this could result in reduced understory and decreased stand density, which would be an overall benefit for forest vegetation. In other cases, it could result in stand-replacing fire in dry forest types, trees killed by uncharacteristically severe fire or old growth where it is not desired, which would not meet DFC goals or improve vigor.

Effects from Visual Resources Management

Effects would be similar to those described under Alternative A, except approximately 44 percent of the forested vegetation would be classified as VRM Class I or II in Alternative C (**Table 4-7**), compared to approximately 31 percent in Alternative A (a 42-percent increase), limiting effective treatments that could improve stand density and forest vigor, particularly in the dry conifer types.

Table 4-7
VRM and Forested Vegetation under Alternative C

	VRM I	VRM II	VRM III	VRM IV
Forested Vegetation Acres	14,503	29,807	34,999	21,680
Percent of Total Vegetation Acres	14%	30%	11%	21%

Source: BLM 2004a

Effects from Forest Products Management

Forest products management would treat an estimated 191 acres annually in Alternative C, which would be approximately 2,955 to 3,940 acres over the next 15 to 20 years. This represents approximately 3 to 4 percent of forested vegetation in the CFO. By removing over-represented species, dead and dying or insect-infested trees, and reducing the number of trees per acre, treatments would be tools to restore appropriate species composition and stand density, improve forest vigor, restore desired stand structure, and achieve other vegetation management goals. However, only 3 to 4 percent would result in only a slight improvement or achievement of accomplishing the DFC through timber management.

Effects from Renewable Energy Management

Effects would be the same as those described under Alternative B.

Effects from ACEC/RNA Management

Size of ACECs and ACEC/RNAs would increase from 25,600 acres in Alternative A to 60,661 acres in Alternative C. Effects would be similar to those described under Alternative B, except that more areas (including Craig Mountain at 23,342 acres) would be managed to meet DFC or support long-term ecological health, which would further improve forest conditions.

Alternative D

Effects from Soils Management

Effects would be the same as those described for Alternative B.

Effects from Vegetation—Forests Management

Alternative D would designate 45,190 acres (45 percent) of forested vegetation as commercial forest. Under Alternative D, there would be no requirements for meeting DFCs in large blocks of 1,000 acres or more. The BLM could consider the appropriate species composition of large trees on all areas, and more acres would be treated to achieve historic conditions. Alternative D would not specifically protect large trees, so the large tree component of forests could be reduced where treatments occur. All WUI projects implemented under the authority of the Healthy Forests Restoration Act would support and maintain old growth forests.

Effects from Vegetation—Riparian and Wetlands Management

Effects would be similar to as those described for Alternative B. In Alternative D, these account for 10,301 acres or 10 percent of the total forested vegetation acres, compared to 12 percent in Alternative A.

Effects from Wildlife and Special Status Wildlife Management

Effects would be similar to those described for Alternative B, except that retaining a higher percentage of large trees (as described in **Appendix D**, Desired Future Conditions for Forest Vegetation/Wildlife Habitat [see Volume II~~I~~]) would not apply to any areas in Alternative D, which would allow the BLM to consider the appropriate species composition in all treatment areas. This could result in more acres with appropriate species composition and, therefore, better forest health.

Effects from Aquatic Resources, Fish, and Special Status Fish Management

Effects would be the same as those described under Effects from Vegetation—Riparian and Wetland Management, above.

Effects from Wildland Fire Management

Fuels reduction is intended to reduce stand-replacing wildland fires and make fire suppression easier to accomplish. Alternative D would result in 2,870 to 7,597 acres of forest being treated by prescribed fire or mechanical fuel reduction per year, compared to 4,886 acres in Alternative A (**Table 4-5**, Comparison of Vegetation—Forests Indicators by Alternative), which would result in the greatest improvement to forest health and species composition. Details of the extent of treatment are included in the Effects from Wildland Fire Management in the Wildland Fire Management section (Section 4.2.12) for Alternative A.

Wildland fire use, where it would be allowed, would reduce stand densities. In some cases, it would improve species composition (**Figure H-3**, Areas Available for Wildland Fire Use—Alternative D [see **Appendix H** in Volume II~~I~~]).

Effects from Visual Resources Management

Effects would be similar to those described for Alternative A, except that approximately 21 percent of the forested vegetation would be classified as VRM Class I or II in Alternative D (**Table 4-8**), which would comprise 33 percent fewer restricted acres than currently under Alternative A.

Table 4-8
VRM and Forested Vegetation under Alternative D

	VRM I	VRM II	VRM III	VRM IV
Forested Vegetation Acres	2,856	19,546	56,907	21,679
Percent of Total Vegetation Acres	3%	18%	58%	22%

Source: BLM 2004a

Effects from Forest Products Management

Forest products management would treat ~~340~~ 361 acres annually in Alternative D, which would be approximately 5,100 to 6,800 acres over the next 15 to 20 years. This represents approximately 5 to 7 percent of forested vegetation in the CFO. Treatments would be tools to restore appropriate species composition and stand density, improve forest health and vigor, restore desired stand structure, and achieve other vegetation management and timber production goals.

Effects from Livestock Grazing Management

Effects would be similar to those described under Effects Common to All Alternatives; however, additional grazing allotments would be included in Alternative D, which would expand the effects of livestock grazing on forested vegetation.

Effects from Renewable Energy Management

Effects would be the same as those described for Alternative B.

Effects from ACEC/RNA Management

Size of ACECs and ACEC/RNAs would decrease from 25,600 acres in Alternative A to 23,924 acres in Alternative D. Effects would be similar to those described under Alternative B, except that neither the American River Historic Sites District (6,356 acres) nor the Uppoer Lolo Creek (1,625 acres) would ~~not~~ be designated and would thereby not be managed to support long-term ecological health, which would not result in improved forest conditions.

Cumulative Effects

Effects of past actions, natural events, and region-wide decisions (e.g., fire, logging, insect and disease, road construction, and ICBEMP) that have affected forests are documented in Chapter 3 (Affected Environment). In summary, forest vegetation species composition and structure have been altered and are generally outside their historic range. Logging and fire suppression have had the greatest effects, although wildland fire and insect and disease outbreaks have contributed significantly.

Cumulative effects would be similar among the alternatives. Effects on forested vegetation from any of the Cottonwood RMP alternatives would be overshadowed by reasonably foreseeable stand-replacing fire, continued fire suppression made necessary by WUI and intermingled landownership, and large-scale insect and disease outbreaks that would continue over the life of the RMP. Effects on forested vegetation from management accomplished by other landowners could affect forested vegetation on public lands. When activity fuels are not treated adequately, fuel hazard can increase on adjacent lands and affect fire intensity and severity on public lands. However, fuel treatments and

hazardous fuels are expected to increase on adjacent Forest service and State lands in response to community wildfire protection plans.

Revision of the Nez Perce, Clearwater, and Idaho Panhandle National Forests Plans could result in more or less treatment of adjacent areas; because no decisions have yet been made, the effects are not known. There has been a downward trend in treatment acres for several years. This trend is expected to continue because of endangered species protection and other regulatory restrictions. The Payette National Forest Plan reduces acres of treatment on Forest Service lands adjacent to the CFO. Wildland fire management on Forest Service lands will be determined in the Forest Plan decision, particularly areas where wildland fire use may occur. The BLM will need to coordinate with the Forest Service on all wildland fire use projects. Wildland fire use on Forest Service lands could allow stand structure and density of forests on public lands to continue to remain or move outside historic conditions.

Additionally, a Forest Service decision to increase the level of wildland fire use or prescribed fire, along with agricultural field burning, could impact the BLM's ability to use wildland fire and prescribed fire for forested vegetation management because of air quality concerns and meeting the air quality requirements. This could postpone or eliminate fuel reductions or vegetation treatments that use fire to improve forest structure and density.

Insects have and will continue to cause mortality in all conifer forests. Insect infestations can be exacerbated by inappropriate management, which could affect public lands. Additionally, a lack of appropriate treatment or lack of wildfire suppression or fuel-reduction treatments can cause more mortality on public lands when wildland fire or insects spread. These effects could affect stand structure and density.

Maintaining and protecting old growth is a growing issue for all public land managers in the region. Plans on adjacent public lands could result in more acres with large tree and old growth components over the long term. However, in some areas, a lack of treatment to protect dry conifer old growth would result in a loss of acres with large tree and old growth due to insects, disease, and wildland fire. In the past, the BLM did not specifically manage for old growth, and future management for such is precluded by logging of large tree components. In some areas, this effect would continue for the next 200 to 300 years.

Population increases are likely to expand the WUI, which in turn could alter forest management, taking the emphasis off restoring historic composition and structure and focusing more on fuel reduction. Depending on the forest type, these are sometimes the same thing. Additionally, the Idaho Statewide Implementation Strategy for the National Fire Plan could alter forest management in the WUI as more money becomes available and mitigation plans are implemented. These activities could result in stand structure changes but probably no species composition changes.

4.2.6 Vegetation—Weeds

Goal: Prevent establishment of new invasive plant species and reduce infested acreage of established invasive plant species.

Summary

Overall, management under Alternative D would yield the highest potential for weed introduction or spread of existing populations, and Alternative C would yield the lowest potential, followed by Alternative B then Alternative A. The factors that most differentiate one alternative from another in terms of their potential for weed infestation are the degree to which areas are open to OHV use, amount of lands available for herbicide treatments, and the amount of acreage available for ground-disturbing activities. **Table 4-9** identifies the indicators that were used to analyze effects on weeds under each alternative.

Table 4-9
Comparison of Weeds Indicators by Alternative

Indicator	Alternative A	Alternative B	Alternative C	Alternative D
Potential for increases or decreases in new weed populations and density and extent of existing populations	Potential for occurrences would increase	Potential for occurrences would stay at current levels or would decrease	Greater potential than Alternative B for occurrences to decrease	Greater potential than Alternative A for occurrences to increase

Methods of Analysis

Indicators

Indicators are used to identify the level of impact. For Vegetation—Weeds management, the indicators used for impact analysis are identified in **Table 4-9**, Comparison of Weeds Indicators by Alternative.

Methods and Assumptions

Effects are conditions that change the potential for weed infestation or spread. Effect determinations are based on reasonably predictable responses of weed species to a variety of conditions. Reasonably predictable responses include the following:

- Weeds often exploit disturbed areas and are adept at outcompeting many native species;
- Most actions that disturb soils or vegetation will increase the potential for weed infestation;
- Weed infestation will often follow transportation routes, making roadsides and trails prime habitat for weeds and making vehicles prime vectors for the spread of weeds;
- Rangelands are particularly prone to weed infestation due to disturbances from grazing livestock; and
- Weeds thrive in ecosystems that are out of balance, either from a hydrological or vegetative perspective.

Although many specific populations of weed species are known in the CFO planning area, the entire area has not been inventoried. Therefore, it is difficult to predict which species, if any, may arise in a given area, or to calculate the exact degree to which the CFO is affected. The analysis below focuses on explaining how existing or proposed management actions may contribute to the spread or management of weed populations. This analysis is based on the following assumptions:

Impacts were assessed according to the following assumptions:

- Weeds are most likely to thrive in disturbed areas, including burned areas, along road cuts or in staging areas, and where soils have been disturbed by OHV, equestrian, livestock, or hiker use;
- Current trends in plant succession/vegetation would continue;
- Vegetation communities would be maintained with a mix of species composition, cover, and age classes;
- Changes in weed potential would occur commensurate with changes in PSQ since logging activities contribute to extensive soil disturbance;
- Noxious and invasive weeds would continue to be introduced and spread as a result of ongoing vehicle traffic in and out of the CFO planning area, recreational activities, wildlife and livestock grazing and their movements, and surface-disturbing activities;
- Noxious and invasive weeds would further expand into native plant communities, and disturbances to these communities would expand opportunities for the spread of nonnative invasive plant species;
- As use of BLM lands increases over the life of this RMP, levels of funding for weed control will also increase;
- The CFO will continue to participate in Cooperative Weed Management Areas, ensuring cooperative weed control efforts with other land management agencies;
- Total control of the spread of noxious weeds is unlikely under any alternative;
- The BLM would continue to treat noxious and invasive weeds and pests on public land, as stipulated within other BLM permits and authorizations; and
- Weed and pest control would be carried out in coordination with the appropriate county, weed and pest control district, and owners of adjacent property.

Effects Common to All Alternatives

Effects from Soils Management

Management actions under which the BLM would identify, ~~map~~record, and avoid effects on sensitive land types would reduce the potential for weed infestation by reducing the potential for soil disturbance. Prioritizing existing roads and assessing naturally occurring failures for restoration would allow the BLM to build realistic weed management measures into restoration planning, reducing the potential for weed infestation.

Effects from Water Resources Management

Activities implemented as a way to maintain or increase water quality are likely focused on decreasing soil and vegetation disturbance and would generally reduce the potential for weed introduction and spread. Review of new or ongoing activities involving water resources management would allow the BLM to assess the degree to which actions contribute to or diminish weed infestations, leading to formation of appropriate weed management actions.

Effects from Wildlife and Special Status Wildlife Management

Review of new or ongoing activities for effects on wildlife habitat caused by discretionary actions would allow the BLM to assess the degree to which actions contribute to or diminish weed infestations, leading to formation of appropriate weed management actions.

Effects from Vegetation—Riparian and Wetlands Management

Establishing riparian management units consistent with Riparian Management Guidelines (BLM 1985e) and PACFISH (BLM and Forest Service 1995) (Alternative A) and the Aquatic and Riparian Management Strategy (Alternatives B, C, and D) (**Appendix F** [see Volume II~~I~~]) would restrict actions within established buffer zones to those that would result in enhanced or maintained conditions. Actions that may be restricted include those that may cause a long-term increase in weed potential by disturbing vegetation or soils or by allowing for greater weed seed distribution.

Locating recreation sites in "non-critical" aquatic and terrestrial habitats would minimize disturbance in sensitive riparian areas, reducing weed potential in such areas.

Effects from Aquatic Resources, Fish and Special Status Fish Management

Developing a coordinated plan to maintain fisheries habitat, water quality, and riparian areas along the Salmon and Snake Rivers would include managing for weeds. Management measures may include treatments to reduce or control weed populations and to reduce the potential for new infestations in these areas, as well as restoration of ecological conditions that would favor native species over weeds.

Effects from Special Status Plants Management

Reviewing ongoing discretionary activities for impacts to plants that are federally listed or are listed as an Idaho BLM sensitive plant, or their habitats, and modifying actions to avoid impacts to such plant species would require identifying and minimizing those actions that may favor weed production. Such actions would include those that result in increased soil or vegetative disturbance or distribution of weed seeds, or actions that change the soil moisture regime at the expense of listed plants. Reviewing and modifying proposals for new projects to minimize effects on listed or otherwise sensitive plants would require project proponents to create weed management plans to avoid adverse impacts.

Effects from Cultural Resources Management

Management of cultural resources would have minor and short-term effects on vegetation resources. Management actions focus on avoiding and protecting cultural sites, which in turn decrease surface-disturbing activities, such as limiting OHV use, on or near such sites. Excavations of cultural resource sites disturb the soil surface, which increases the opportunity for the establishment of noxious and invasive weeds. However, the area of disturbed surface associated with cultural site excavations is minimal.

Effects from Forest Products Management

Discouraging grazing in areas that are being reforested after harvest until seedlings have reproduced may reduce weed potential in such areas by minimizing disturbance that could favor weeds and by reducing foraging of seedlings, thereby providing them with an enhanced competitive advantage over weeds.

Use of BMPs and preventative measures including contract stipulations to clean all equipment, perform post project weed inventories and, if needed, treatment of the project area, and use of some sale receipts to fund this treatment would allow BLM to control new weed infestations in areas that have been disturbed by management actions or during harvests.

Restricting timber management activities in RHCAs or RCA stream buffers to only ecological restoration or salvage activities would remove a large potential source of soil and vegetation disturbance as well as weed seed introduction throughout this habitat type, thereby lowering the weed threat throughout riparian areas.

Weed potential can be seen as a function of ~~PSQ~~site disturbance. Higher PSQ means that more harvest activities may take place under that alternative than under alternatives offering lower PSQ. Such activities include construction of access roads, yarding, slash removal, and post-operation treatments. Allowing use of any site preparation or ground-based yarding methods, including use of skidders, on areas with slopes less than 35 percent or unless specifically prohibited by site-specific direction would allow for extensive soil and vegetation disturbance, as well as high potential for weed seed transport. The effects of such high-impact methods would be spread throughout the harvest area, since skidders may need to travel on a variety of routes to bring felled timber to the landings. Weed potential in these areas is very high compared to areas where lower-impact yarding methods are used, such as areas where slopes exceed 35 percent. Soil disturbance and weed threat would be reduced if yarding occurred during the winter when ground is snow-covered or frozen, or if helicopters were used for yarding rather than skidders. Weed potential in these areas is reduced because weeds have less of a competitive advantage in forested areas compared to other cover types.

Complete or partial clearcuts are vulnerable to weed infestation due to disturbances incurred during forest products removal and the wholesale changes in amount of sunlight and moisture retention.

Effects from Livestock Grazing Management

Livestock may disturb soil and vegetation and contribute to weed infestations or may be used a tool to control them, dependent on level of grazing use and existing ecological condition of grazed areas. Weed seeds can attach to animals or be ingested. They can then be transported to other areas, where they are spread by the animal physically removing the seed or fruit or through droppings. Areas where animals concentrate and disturb the soil are particularly vulnerable to infestations of noxious and invasive weeds. ~~Minor disturbance caused by livestock also provides seed coverage for rehabilitation on steep slopes.~~Livestock grazing can be used as a tool to manipulate and improve plant community composition. Livestock can transport seeds and fruits of native and nonnative species to other areas by physically removing the seed or fruit, or through the deposition of fecal matter. Although this can increase weed potential in rangelands, it also serves as a tool for distribution of seeds of native plants into areas that are otherwise difficult to access. Grazing plans that promote healthy rangelands and vegetation create conditions resistant to the spread of noxious and invasive weeds.

Continued compliance with Idaho Standards for Rangeland Health and Guidelines for Livestock Grazing Management (BLM 1997a) (**Appendix A** [see Volume II~~I~~]) would provide a framework under which the BLM would minimize effects from grazing livestock.

Effects from Minerals Management

Exploration and development operations associated with minerals typically disturb some level of vegetation. These disturbances result in increased weed potential, including import and export of weed seeds. Areas closed to the mineral laws and areas withdrawn from the mining laws would reduce the weed potential from mineral activities equally across all alternatives. Reclamation would be necessary for reestablishing desired vegetation on disturbed areas.

Effects from Recreation Management

Recreational activities can introduce and spread noxious and invasive weed seeds from vehicles, shoes, clothing, and recreational equipment. As recreation use increases, people from outside the area could bring in noxious and invasive weeds, including new invasive species. Recreation activities that occur in undisturbed and remote areas have the potential to distribute weed seeds into weed-free areas. Education activities implemented as part of an integrated weed management program may assist the BLM in locating new invasive plant populations found by the recreating public.

Effects from Renewable Energy Management

All alternatives propose to allow some development of renewable energy projects, which could introduce weed seeds or produce soil disturbance that favors weeds. Development of such projects may include construction of staging areas for chippers or other heavy equipment, construction of access roads, and timber harvest practices that could disturb soils and vegetation.

Effects from Transportation and Travel Management

OHV use would result in impacts on vegetation, such as loss of vegetation cover and density and composition changes. OHV users would introduce and spread noxious and invasive weed seeds from their vehicles, shoes, clothing, and recreational equipment. As OHV use increases, people from outside the area could bring in noxious and invasive weeds, including new invasive species. OHV activities in undisturbed and remote areas have the potential to distribute weed seeds into weed-free areas.

Other types of travel, including by foot, horse, or bike, cause fewer impacts, although all have the potential to disturb soils or allow for weed seed transport. Horses in particular have a high capacity for introducing weed seeds from manure into previously unaffected areas. Groups of horses may also create significant soil and vegetation disturbance in areas where they are tethered overnight, increasing the weed potential in confined areas.

Implementation of a travel plan and management of vehicles and other travel methods may restrict disturbance to known routes. Focused monitoring and control of new weed locations along active travel corridors would be more effective in reducing the establishment and spread of new weeds.

Effects from Lands and Realty Management

Lands and realty management actions, such as construction of rights-of-way or leasing actions, often result in surface disturbance, which increases the lands' susceptibility to weed invasion or spreads existing weed patches. Incorporation of requirements for weed control and rehabilitation into rights-of-way and other realty management actions would reduce the incidence of new weed introductions due to this program. Timely reclamation of disturbed areas diminishes the probability of weed proliferation in these areas. Failure to comply with existing weed control stipulations would increase weed abundance and proliferation. Right-of-way exclusion areas would reduce weed potential over ~~totaling~~ 11,622 acres. ~~would reduce weed potential over that amount of land.~~

Effects from Wild and Scenic Rivers Management

Managing the Salmon River to protect its outstandingly remarkable values and free-flowing conditions would ensure that BLM lands within the river corridor would remain closed to activities that would affect the visual or functional landscape of this waterway. This would minimize activities that commonly increase weed potential, including mining, timber harvest, OHV use, and livestock grazing, thus lowering the weed potential in this area.

Management of the outstandingly remarkable values of river segments found suitable for inclusion in the NWSRS could reduce weed potential because the chance of disturbing activities would be reduced. Activities that commonly increase weed potential, including mining, timber harvest, OHV use, and intensive livestock grazing, would be minimized, lowering the weed potential in this area.

Effects from Wilderness and Wilderness Study Areas Management

Managing 750 acres of the Frank Church/River of No Return Wilderness and 12,034 acres of WSAs would minimize activities that would normally increase weed potential. By continuing to restrict mining, timber extraction, and OHV use, weed potential would be maintained at current levels, assuming management occurs for weeds from sources such as hikers and equestrians.

Effects from Native American Tribal Uses Management

No effects have been identified from management pertaining to Native American tribal uses. The BLM would continue to consult with tribes before starting actions that could affect tribal values, including the possibility for an action to increase weed potential in areas that could contain resources significant to tribes in the area. The use of chemical treatments could be prohibited in some areas determined to be plant collection areas through Native American consultation. Similarly, consultation could provide locations where weeds control should be focused so Native Americans can have more access to desirable plants.

Alternative A

Effects from Soils Management

Implementing MFP Road Guidelines (BLM 1981a) and 1985 Riparian Management Guidelines (BLM 1985e), restoring abandoned roads, and restoring naturally occurring failures would reduce weed potential from road construction and other soil disturbing activities.

Effects from Water Resources Management

Managing 42 sixth-code HUC watersheds as prescription watersheds would involve controlling invasive species that may affect habitat quality or water quality, leading to increased management of such species.

Effects from Vegetation—Forests Management

Potential for weeds increases as the level of disturbance increases, although weeds have less of a competitive advantage in a forested environment than in other cover types and rarely result in total site occupancy. Although forest management actions would generally employ a weed management plan for affected areas, any increase in disturbance would increase the BLM's burden for future weed management. Due to this concern, contract stipulations implementing preventative measures are a part of harvest actions and a portion of the sale receipts are held for weed monitoring and control. Rehabilitation of the disturbed site is also implemented, further reducing the disturbance impacts and potential for weed introduction and spread. Intensive management means more management than in areas managed extensively or custodially, translating to greater vehicular traffic and more soil disturbance. This increases the weed threat on 24,257 intensively managed acres, relative to the weed threat on 11,500 acres of extensively managed land, and 37,549 acres of land managed on a custodial basis (not be managed for timber, although harvesting could occur for ecological reasons). Actions to treat FRCC 2 and FRCC 3 forested lands in WUI lands would partially focus on weed control to reduce the fire threat. A short-term effect would occur in the form of increased weed potential in treated areas due to increased soil disturbance and increased use

of vehicles that could introduce or spread weed seeds. A long-term impact would occur in the form of decreased weed potential in WUIs due to less frequent or less intense fires and a healthier forest community.

Effects from Vegetation—Weeds Management

Continued participation with Cooperative Weed Management Areas and following BLM guidance would allow the BLM to contain new weed outbreaks and maintain current conditions within designated weed control focus areas. However, greater use of BLM lands is expected over time, which would increase potential for weed introduction and spread, and also increase the potential for soil and vegetative disturbance, thereby increasing the weed threat. Identifying areas where rehabilitation or restoration would be cost effective and successful would allow the BLM to prioritize weed management strategies given the weed control resources at hand.

Use of biological controls may assist BLM ecologists in controlling select weed species on a limited basis. Grazing livestock such as goats and sheep, as well as released insects, have been used successfully to control leafy spurge *(Euphorbia esula)* and may be used to reduce or control existing weed populations.

Effects from Vegetation—Rangelands Management

Current management is consistent with Idaho Standards for Rangeland Health and Guidelines for Livestock Grazing Management (BLM 1997a) (**Appendix A** [see Volume II~~I~~]), which amended the MFP (BLM 1981a) in 1997 and are designed to maintain rangeland health. Because of lack of grazing management control on many small allotments, current conditions and trends would probably continue for weed infestations and weed control would be dependent on adjacent land owners. These conditions would apply to 122,732 acres of grazed rangelands.

Effects from Vegetation—Riparian and Wetlands Management

Implementing BMPs and riparian management guidelines would lead to lower rates of disturbance in areas that would be protected as riparian management units. Although designating RHCAs totaling 24,290 acres would not completely protect riparian zones from disturbance, such designation would require that activities in riparian buffers would be minimally disruptive to soils and vegetation, thus lowering the potential for weed establishment. Restricting timber harvest along Class I streams would remove a significant amount of potential disturbance in such areas, lowering the possibility of weed infestation in these areas. Weed infestation can be sufficient by itself to cause poor function in riparian zones by reducing vegetative diversity, canopy diversity and structure, and causing altered fire regimes and water retention rates. Therefore, improving 7.75 miles of streams in poor condition to fair or better condition would necessitate weed management plans in affected areas, leading to greater management control over weeds in these areas.

Effects from Wildlife and Special Status Wildlife Management

Reviewing ongoing discretionary actions to assess impacts on listed species habitat would include assessing changes in the potential for weed infestation, leading to the opportunity for greater management control over weed populations. Environmental review of new federal actions proposed within listed species habitat would include assessment of potential for weed increase and would include measures to mitigate for such increases, if found.

Improving range conditions over 8,803 acres and developing HMPs for 13 specific areas would require implementing measures to restore or enhance native or desirable plant communities. Doing

so would require controlling weeds, which would be accomplished by extending current management measures to these areas. Over time, this would lead to a reduction in both the number and extent of weed populations.

Effects from Aquatic Resources, Fish, and Special Status Fish Management

Identifying actions that may occur in areas identified for various levels of aquatic management would include assessment of increased potential for weed infestation arising from those actions. This would allow the BLM to create or require actions to reduce the weed threat arising from those actions, or to eliminate actions that may increase weed populations.

Effects from Special Status Plants Management

Protecting the Long Gulch and Skookumchuck populations of MacFarlane's four-o'clock would require the BLM to create a weed management plan for these populations. Such a plan would include measures to minimize disturbance, possibly limiting access by hikers and grazing livestock, and restricting use of OHVs. If the population were threatened by existing weed populations, the plan would include weed-eradication measures for these management areas.

Effects from Wildland Fire Management

Under Alternative A, specific percentages of the CFO FRCC 2 and 3 (moderate to high risk) WUI areas would not be identified for fire risk/fuels-reduction treatments. Given current management, an estimated 1,950 to 5,950 acres could be treated annually with mechanical treatments and prescribed fire under Alternative A (see Section 4.2.12, Wildland Fire Management). Under any wildfire control scenario, suppression activities and fuels treatment actions have the potential to spread weed seeds or create conditions that favor weeds. Striving for control status in one operational period would require an aggressive suppression response that may result in greater soil disturbance or use of vehicles than other, less-aggressive methods. This higher level of disturbance and higher number of vehicles would lead to greater weed potential. Rehabilitating effects of fire would include a revegetation/weed management plan to ensure that burned areas respond with a majority of native or desirable plant species and a minimum of noxious weed species. Therefore, in some areas, short-term weed potential may increase, but long-term weed potential may decrease as a result of better habitat quality. Areas that are already affected by species that thrive in post-burn conditions, such as cheatgrass, may experience long-term increase in weed potential as a result of wildland fire use.

Implementation of hazardous fuels-reduction projects that are consistent with fuels treatment priorities would use inventories, post-burn treatments, and native species where they would meet revegetation goals for greater management control of weeds throughout burned areas.

Use of nonfire fuel-management strategies to help maintain or improve range conditions would necessitate weed removal, using herbicides, biocontrols, or other methods. Under Alternative A, 1,700 to 10,680 acres could be treated annually to reduce weeds and reduce hazardous fuel conditions. This would ultimately reduce the weed threat while causing little disturbance that would increase the weed threat.

Effects from Visual Resources Management

Weed potential can be seen partially as a function of the amount of acreage in various VRM categories. In general, alternatives that have more acres in VRM Classes I and II have lower weed potential than those that have more acres in VRM Classes III and IV since disturbance potential is minimized in Class I and II areas. Exceptions to this are in VRM Class I and II areas along CFO

rivers, where climate and ecosystem changes have allowed for weed infestations. This alternative has a moderate weed potential due to the number of acres in VRM Classes I and II.

Effects from Forest Products Management

Possible effects of forest products management are summarized under Effects Common to all Alternatives, above. Such actions would be restricted in 24,290 acres of riparian buffers under this alternative. At 6,600 MBF per year, the estimated annual ASQ would be highest under this alternative.

Effects from Livestock Grazing Management

The Idaho Standards for Rangeland Health and Guidelines for Livestock Grazing Management (BLM 1997a) (**Appendix A** [see Volume II~~I~~]) contain standards that, if met, would allow for greater control of invasive weeds. These standards stipulate that a measure of proper range health is that invasive weed species are not increasing and that grazing measures must be designed to assist in containing weed species. Because of lack of grazing management control on many small allotments, current conditions and trends would probably continue for weed infestations and weed control would be partially dependent on adjacent landowners' management actions. Under this alternative, improvements planned for grazed rangelands include implementing noxious weed control on 1,900 acres, which would lower weed potential in these areas.

Effects from Minerals Management

Keeping public lands within 0.25-mile of the Salmon River withdrawn from mineral entry would reduce ~~mineral~~mining -related weed potential on approximately 18,532 acres of land by reducing the potential for soil and vegetation disturbance and changed drainage and erosion patterns and by reducing potential for weed introduction from vehicles. Although all alternatives would designate 131,044 acres of CFO lands as being open to leasing, this alternative is not subject to mineral lease stipulations that include NSOs. Lack of NSOs can increase the weed potential. Requiring that all mineral actions remain subject to site-specific mitigation measures developed during environmental review would require mining operators to prepare site-specific weed control plans.

Effects from Recreation Management

Under Alternative A, the CFO would continue to manage the Lower Salmon River—Scenic, the Lower Salmon River—Recreational, and the Clearwater River SRMAs (totaling approximately 26,682 acres). Management actions pertaining to SRMAs may result in greater recreational use of these areas, thus increasing weed potential by increasing soil and vegetation disturbance and increasing potential weed seed vectors. Increases in management of such areas would offset these effects by ensuring that SRMA management plans address weed potential and include measures to minimize such risk. Measures may include steering users away from areas that have high weed potential or closing sensitive areas.

A Special Recreation Permit process used to accommodate commercial, competitive, or organized group activities allows the BLM to monitor activities that may contribute to increased weed potential, thereby having greater opportunity to prepare specific weed control and revegetation plans, if needed.

Activities occurring in areas designated as ROS classes Primitive or Semiprimitive Nonmotorized are more likely to be low impact and lead to less soil and vegetation disturbance than activities occurring

under other ROS classes. Activities in these areas include hiking, backpacking, and kayaking. Under current management, 33,197 acres are managed according to these ROS guidelines.

Effects from Transportation and Travel Management

Under this alternative, the BLM would manage 85,335 acres as Open to cross-country motorized vehicle travel. Open designations greatly increase the potential for soil and vegetation disturbance and for weed seed introduction, thereby greatly increasing weed threat. This alternative would also manage 40,437 acres designated as Limited to existing routes. The weed potential in Limited areas would be lower than under the Open designation, since effects on soil and vegetation beyond existing conditions would be relatively minimal. Areas designated as Closed further lower the opportunity for weed potential because most motorized travel is prohibited except for specific routes that have been grandfathered in for. Controls on vehicle use on lands identified for less intensive use would give the BLM greater control over potential weed vectors.

Effects from Lands and Realty Management

Acquiring road easements may change weed potential if acquired roads need to be modified for BLM purposes. Any alterations that would occur outside of the established roadbed would increase soil disturbance, thereby increasing weed potential. All roads acquired through easements are assumed to be compatible with BLM road design requirements.

Effects from ACEC/RNA Management

Keeping public lands within 0.25-mile of the Lower Salmon River withdrawn from mineral entry would reduce ~~mineral~~ mining related weed threats on 15,072 acres by minimizing the potential for soil and vegetation disturbances and for changes in soil moisture retention.

Protecting particular areas as ACEC/RNAs by the following actions would reduce or maintain the weed potential in a number of ways: prohibiting timber harvest in some areas, water development, road construction, rights-of-way, or salt placement; initiating intensive allotment management plans for certain areas; conducting intensive vegetation and botanical inventories and recording~~mapping~~ specific habitat types; and restricting timber harvest methods on areas with over 50-percent slopes.

BLM control over weed infestation would increase by minimizing soil and vegetation disturbance, by managing livestock, and by giving the BLM a better overall picture of existing conditions from which to base monitoring. The area affected by these actions would total 25,600 acres and would include Wapshilla Ridge, Lower and Middle Cottonwoods Islands, Captain John Creek, Long Gulch, Lucile Caves, Skookumchuck, and Craig Mountain.

Restricting herbicide use in Long Gulch, Skookumchuck, and in the vicinity of Lucile Caves would impede weed-control efforts over a minimum of 513 acres and lead to increased weed potential in areas where herbicide applications would normally be used to control weeds.

Effects from Watchable Wildlife Viewing Sites Management

Actions designed to maintain or improve wildlife habitat along 235 miles of the Salmon and Snake Rivers and on 24,200 acres of Craig Mountain WMA would require creation of an HMP, a component of which would be a weed management plan. This could lead to actions that would assist in the control of weeds.

Effects from Public Safety—Abandoned Mines and Hazardous Materials Management

Restoring AMLs and streams that have been degraded by past mining practices would include revegetation, restricted site access, and improved soil conditions. All of these measures would diminish the potential for weed infestation and spread.

Alternative B

Effects from Geology Management

Increasing public access to and recreational use of unique geological features would increase the potential for weed seed transport and for soil disturbance that favors the establishment of weeds over Alternative A. At the same time, increasing public awareness of geological features offers an opportunity to educate the public about the effects of weeds and the methods by which they are spread and established.

Effects from Soils Management

Effects would be similar to those described under Alternative A. Also, although increased soil disturbance control measures under this alternative would help to prevent weed infestation, BMPs as written are not sufficient to prevent the spread or establishment of weeds. BMPs for soil disturbance do not directly address measures to reduce the possibility of weed infestation, such as frequent monitoring of disturbed areas. The BLM would combine these measures with project-specific weed control measures to reduce the potential for weed infestation to a manageable level.

Effects from Water Resources Management

Effects would be similar to those described under Alternative A. Also, promoting activities that help achieve DFCs in 3~~2~~28 restoration watersheds would include controlling weeds and reducing occurrences of actions that promote their spread and establishment. Over time, these measures would result in greater control of weeds in restoration watersheds.

Effects from Vegetation—Forests Management

In general, treatments may involve thinning, tree extraction, revegetation with desirable species, use of fire, use of chemicals to control undesirable species, or some combination of these actions. Many of these actions result in disturbance during application of the treatment, leading to such conditions as disturbed soils and vegetation that favor weeds. Although this could cause a short-term impact by increasing weed potential in treated areas, treatments are also designed to increase forest health and restore the balance of species and resources found in a normal healthy forest. Achieving this goal would lead to lower weed potential in treated areas in the long term.

Effects from Vegetation—Weeds Management

Under Alternative B, the BLM would increase cooperative efforts in Cooperative Weed Management Areas to develop and implement annual treatment strategies. Implementing prevention activities as part of field activities would reduce the extent to which weed seeds are spread to other areas. Rehabilitating treated areas, combined with monitoring such areas, would decrease weed potential. Supporting education and awareness efforts would help to diminish the weed threat by enlisting the public's help in avoiding activities that disturb soils or vegetation or that contribute to weed seed spread.

Outside of Cooperative Weed Management Areas, management focus would emphasize implementing weed control goals into other resource goals. For example, a large component of

watershed restoration planning would be weed control planning within the watershed. Travel management planning would continue to implement measures to reduce weed infestation. Although rehabilitation of treated areas would continue in selected areas outside of Cooperative Weed Management Areas, monitoring rehabilitated areas would not necessarily be a component of the rehabilitation. Under both scenarios, the BLM would gain greater control over weed introductions and establishment than it would have under Alternative A.

Under all action alternatives, the BLM would implement BMPs designed specifically to reduce the weed threat associated with project actions. Implementing these BMPs before, during and after projects would reduce weed potential relative to current management by repairing disturbed soils and revegetating where needed, and by taking measures to reduce weed seed spread through vehicle transportation.

Effects from Vegetation—Rangelands Management

Yearly monitoring and the assessment of rangelands would allow the BLM to determine the extent to which noxious and invasive weeds are present in CFO rangelands. Data gathered during monitoring would be used to develop weed management strategies and goals in cooperation with Cooperative Weed Management Areas, leading to greater control over weeds in the CFO.

Implementing actions to convert nonnative plant communities to desired plant communities would result in more acres of native grasslands, contributing to a more stable ecosystem over time in localized areas. This condition could lead to a more natural fire regime, decreased or stabilized soil erosion rates, and more natural moisture retention.

Effects from Vegetation—Riparian and Wetlands Management

Improving riparian conditions would involve, in part, controlling weeds, restoring native plant communities, and restricting activities that contribute to soil or vegetation disturbance. Under this alternative, buffer areas would be reduced by 6 percent compared to Alternative A, leading to reduced protection and therefore greater weed potential.

Effects from Wildlife and Special Status Wildlife Management

Effects would be similar to those described under Alternative A. Additionally, efforts to maintain or improve ecological conditions in native grassland plant communities for wildlife habitat benefits would necessitate controlling invasive species in such areas, particularly on Craig Mountain and Rattlesnake Ridge.

Implementing appropriate riparian management strategies to prevent adverse impacts on riparian areas, fish habitat, and water quality, may include specific riparian grazing season of use and stream bank use criteria. Such management would ensure that riparian areas are not overgrazed or grazed during sensitive times of the year or during vulnerable seral stages, contributing to more stable riparian areas and thus lower weed potential.

Effects from Aquatic Resources, Fish, and Special Status Fish Management

Effects would be the same as those described under Effects from Wildlife and Special Status Wildlife Management.

Effects from Special Status Plant Management

New management plans or updates to existing plans to properly manage MacFarlane's four-o'clock and Spalding's silene *(Silene spaldingii)* would identify and ameliorate threats to these populations, including threats from invasive weeds. Implementing control measures for invasive weeds in the vicinity of populations of these species would result in greater chances of survival of these populations and result in increased control of noxious weeds.

Effects from Wildland Fire Management

Treating CFO lands to move them into a lower FRCC (for example, FRCC 3 to FRCC 2) would result in lower potential for stand-replacing wildfire, thus lowering weed potential in these areas in the long term. However, short-term effects, in the form of increased weed potential, could arise from the treatments themselves, assuming that they would increase soil disturbance and vehicular traffic.

Under Alternative B, up to 40 percent of the CFO classified as FRCC 2 or 3 (moderate to high risk) WUI areas could be treated in any 5-year period; an estimated 33,766 acres could be treated under Alternative B (see Section 4.2.12, Wildland Fire Management). Use of prescribed fire would increase short-term, disturbance-related weed potential but, combined with suspension of livestock grazing until objectives are met, would decrease long-term weed potential due to enhanced conditions favoring native species in areas that are in relatively good ecological health. Alternative B would include approximately 1,182 to 3,545 acres annually of mechanical treatments and prescribed fire Use of mechanical treatments would have similar effects as use of prescribed fire.

Use of chemical and or biological controls would reduce the potential for short-term, disturbance-related effects compared to prescribed fire and mechanical treatments, while having similar effects on long-term weed potential. Chemical and/or biological treatments would be used on up to 36 percent of CFO lands with the annual treatment range of 844 to 6,078 acres. This is 44 percent less than Alternative A. Under Alternative A, specific percentages of the CFO FRCC 2 and 3 (moderate to high risk) WUI areas would not be identified for fire risk/fuels-reduction treatments; however, current management emphasis and budget is focusing on the WUI. Chemicals would be applied under restricted conditions, by trained personnel, to minimize the potential for impacts.

Effects from Visual Resources Management

Effects would be the same as those described under Alternative A.

Effects from Forest Products Management

Estimated PSQ under this alternative would be 3,129 MBF, as opposed to an estimated annual ASQ of 6,600 MBF under Alternative A. Therefore, weed potential would be lower than under Alternative A. Vegetation treatments in RCA stream buffers would be allowed, but only if they result in restored or enhanced ecological conditions, resulting in lowering of weed potential.

Allowing all harvest systems on the commercial land base of 40,598 acres could increase weed potential compared to Alternative A, where certain restrictions would decrease or maintain weed potential.

Effects from Livestock Grazing Management

Reducing AUMs by approximately 15 percent and allotments by approximately 12 percent compared to Alternative A would not reduce overall weed potential since reductions would occur on lands that

are not currently grazed. Overall, existing trends and conditions are expected to continue on these allotments.

Ensuring that Idaho Standards for Rangeland Health and Guidelines for Livestock Grazing Management (BLM 1997a) (**Appendix A** [see Volume II~~I~~]) are being met would require that weeds are not compromising value and function of rangelands and that grazing levels are such that they do not contribute to an increase in weed potential.

Effects from Minerals Management

Lands designated as NSO would not allow most of the mineral operations that include a permanent presence of equipment or structures, and operations would be limited in areas designated as CSU. Therefore, weed potential is decreased in these areas due to lower potential for soil and vegetation disturbance, as well as less chance of weed seed introduction due to vehicle traffic.

Approximately 43,590 acres open to leasable and salable minerals activities would be subject to NSO stipulations, and 42,403 acres would be subject to CSU stipulations, decreasing the weed threat relative to Alternative A on that amount of land since there are no similar restrictions under Alternative A.

Reduction in weed potential from use of appropriate site-specific mitigation measures would result in the same effects as Alternative A.

Effects from Recreation Management

The acreage of SRMAs managed under this alternative would increase to 55,201 acres, a 28,519 acres increase in comparison to Alternative A. SRMA designations would account for 38 percent of the planning area and would be subject to intensive recreation management. Overall, effects would be the same from SRMA management as described under Alternative A.

Providing developed recreation facilities only when necessary to protect resources may include such development for weed control. However, increases in recreational uses such as camping that are not accompanied by increases in developed facilities may contribute to greater weed spread by forcing users into casual camping or other use arrangements. This could allow for greater weed potential than under current management since it could create soil and vegetative disturbances in areas that are not managed and may be spread over a larger area than if developed facilities were available.

Under this alternative, an additional 9,498 acres would be managed as Primitive or Semiprimitive Nonmotorized. As a result, the weed threat, as discussed under Alternative A, would further decrease.

Effects from Renewable Energy Management

Consideration of suitable sites for renewable energy projects would include appropriate NEPA analysis, including potential for weed infestation from any proposed project. All renewable energy projects would include use of BMPs designed to reduce soil disturbance or weed seed introduction. Affected areas would be revegetated at the completion of the project, and BLM would conduct follow-on weed monitoring as appropriate.

Effects from Transportation and Travel Management

Reclassifying 85,308 acres as Limited to designated routes rather than Open to cross-country motorized vehicle use would drastically reduce the potential for weed infestation relative to Alternative A by reducing soil disturbance and diminishing the possible extent of weed seed spread. The area designated as Closed to OHVs is approximately the same throughout all alternatives, so weed potential in these areas is the same. Efforts to decommission or obliterate roads and trails that are no longer needed would reduce these important weed vectors, thereby reducing the threat of weed seed transport and also vehicular disturbance of soils and vegetation, thereby reducing disturbance-related weed potential.

Allowing for future route modifications would allow the BLM to close certain travel routes if it became clear that resources were being damaged beyond an acceptable level. One indicator of such damage would be if weed infestations increased significantly. Considering the possibility of effects on resources, including changes in weed potential, would affect the BLM's decision making process in terms of designating new travel routes in the future and would include effects of increasing weed potential on actions that could affect soils, vegetation, watersheds, and other resources. Also, establishing kiosks at primary trailheads and posting signs at other main access points would help to reduce weed potential by giving the BLM opportunity to educate the public about the effects of weeds and the role of their actions in either contributing to or reducing weed potential.

Annual monitoring of travel routes would allow the BLM to assess weed infestation before new populations became uncontrollable or before disturbances had a chance to contribute significantly to the spread of established populations. If needed, measures would be taken as a result of monitoring to reduce weed potential. All of these factors contribute to decreased weed potential relative to Alternative A.

Effects from Lands and Realty Management

Effects on weed potential from land exchanges cannot be determined since it is not known if current management on lands that could be acquired is superior or inferior to BLM management in terms of controlling factors that affect weed potential.

Avoidance zones would occur in areas that are already given a fairly high level of protection from activities that cause soil and vegetation disturbance and would not affect weed potential. However, weed potential could be lowered by consolidating rights-of-way and encouraging applicants to co-locate rights-of-way with other rights-of-way. Overall, this would reduce the amount of land that is disturbed, lowering the weed potential.

Effects on lands not designated as exclusion or avoidance areas would be those described under Alternative A.

Effects from ACEC/RNA Management

Keeping public lands within 0.25-mile of the Salmon River withdrawn from mineral entry would reduce mining-related weed threats on 6,785 acres by minimizing the potential for soil and vegetation disturbances, and changes in soil moisture retention.

Protecting particular areas as ACEC/RNAs by such actions as authorizing timber harvest only to support maintenance of timber stand health and achievement of management objectives would increase the weed potential in harvested areas due to increased soil and vegetation disturbance and

changes to soil moisture retention. Instituting vegetation treatments in grasslands and forests, including prescribed burns and use of wildland fire, would lead to a short-term increase in weed potential as a result of creating hot dry conditions that favor weeds. However, long-term effects on weed potential would result if treatments resulted in healthier grasslands and forests with more native species that would be more resistant to weed infestations.

In all areas, using integrated pest management measures would create lower weed potential by giving the BLM numerous options for weed control, allowing it to adapt its weed-control approach to a variety of conditions and instituting a speedier response to new weed outbreaks.

Effects from measures to preserve MacFarlane's four o'clock and Spalding's silene would be similar to those described under Alternative A.

This alternative does not rule out allowing new rights-of-way or road construction at Craig Mountain. The effect from either of these actions would be increased weed potential.

Under this alternative, minimizing ground disturbance on slopes greater than 40 percent in the East Fork American River ACEC would decrease weed potential from soil disturbances in these areas. Weed potential would further decrease as a result of vegetation treatments performed to enhance resource values on 570 acres. Decommissioning roads within three years after construction would decrease weed potential in this area, although constructing them in the first place would increase weed potential.

Effects from Watchable Wildlife Viewing Sites Management

Effects would be similar to those described under Alternative A. Also, supporting efforts that designate new high-value wildlife viewing areas would require the BLM to maintain this habitat to a high degree, which would include developing and instituting a weed management plan. Also, supporting efforts that provide information and educational material regarding wildlife viewing would allow the BLM to incorporate educational information about weeds, which would increase public awareness of this problem.

Effects from Public Safety—Abandoned Mines and Hazardous Materials Management

Effects would be similar to those described under Alternative A. Also, restricting all closed and remediated sites as NSOs would reduce the future weed potential from mining or other uses.

Alternative C

Effects from Geology Management

Effects would be the same as those described under Alternative B.

Effects from Soils Management

Effects would be the same as those described under Alternative B.

Effects from Water Resources Management

Effects would be the same as those described under Alternative B.

Effects from Vegetation—Forests Management

Effects would be similar to those described under Alternative B, except that DFC blocks under Alternative C would be 500 acres (totaling 20 percent of the CFO) rather than 1,000 acres (17 percent of the CFO).

Effects from Vegetation—Weeds Management

Effects would be the same as those described under Alternative B.

Effects from Vegetation—Rangelands Management

Effects would be similar to those described under Alternative B, except the extent of actions to promote native plant community health would expand to include Salmon River and canyon grasslands, increasing the area where the weed potential would decrease.

Effects from Vegetation—Riparian and Wetlands Management

Effects would be similar to those described under Alternative B, except RCA areas would increase by 21 percent over Alternative B (and 14 percent over Alternative A), decreasing the weed potential in these areas.

Effects from Wildlife and Special Status Wildlife Management

Effects would be the same as those described under Alternative B.

Effects from Aquatic Resources, Fish, and Special Status Fish Management

Effects would be similar to those described under Alternative B, except that acres of conservation and restoration watersheds would increase by 6 percent over Alternative B and by 3 percent over prescription watersheds in Alternative A. Restoration and conservation of these areas would include reducing the possibility of actions that contribute to weed spread, including actions that disturb soil and vegetation, increase erosion, or allow for greater potential for import of weed seeds. Therefore, weed potential would decrease in these areas.

Effects from Special Status Plant Management

Effects would be the same as those described under Alternative B.

Effects from Wildland Fire Management

Effects would be similar to those described under Alternative B, except that each unplanned fire would be evaluated for its potential for wildland fire use (**Figure H-1**, Areas Available for Wildland Fire Use—Alternatives A and C [see **Appendix H** in Volume II~~I~~]). This differs from Alternatives B in that it increases the potential to use wildland fire for resource objectives throughout the CFO, potentially increasing resource benefits, including long-term weed control efforts. Also, use of prescribed fire to treat various FRCC classes would potentially increase by 5 percent, resulting in an increase in weed potential in the short-term in these areas but followed by a long-term decrease in weed potential due to a healthier ecosystem. Up to 16,883 acres of the CFO classified as FRCC 2 or 3 (moderate to high risk) WUI areas could be treated in any 5-year period under Alternative C (see Section 4.2.12, Wildland Fire Management), 50 percent less than Alternative B. Treated FRCC 2 and 3 areas, including those treated for weeds by biological or chemical methods, would decrease by 16 percent relative to Alternative B, reducing the chances of reaching long-term weed management goals.

Alternative C would include approximately 1,182 to 4,390 acres annually of mechanical treatments and prescribed fire. This is a 24-percent increase compared to Alternative B.

Effects from Visual Resources Management

Disturbance potential under this alternative would be lowest compared to other alternatives, due to there being the highest number of acres in VRM Classes I and II. Therefore, weed potential due to this type of management is lowest among all alternatives.

Effects from Forest Products Management

Effects would be similar to those described under Alternative B, however, weed potential under this alternative would be lowest compared to other alternatives, due to it offering the lowest PSQ (3,101 MBF) on the smallest commercial land base (34,611 acres).

Effects from Livestock Grazing Management

Effects would be similar to those described under Alternative B. However, there could be a reduction in weed potential by reducing AUMs by a further 3 percent and grazed lands by a further 4 percent compared to Alternative B. Alternative C would reduce overall weed potential due to grazing impacts to the greatest degree of any alternative.

Effects from Minerals Management

Effects would be the same as those described under Alternative B, except NSO areas would increase by 25,264 acres (58 percent), and CSU areas would increase by 16,719 acres (39 percent), decreasing the weed potential from mining ~~mineral~~ related disturbances to the greatest degree of any of the alternatives.

Effects from Recreation Management

Effects would be the same as those described under Alternative B.

Effects from Renewable Energy Management

Effects would be the same as those described under Alternative B.

Effects from Transportation and Travel Management

Effects would be the similar to those described under Alternative B. Also, striving for a decrease in motorized vehicle use on BLM-controlled lands, roads or trails in Sheep Creek, Hat Creek, Denny Creek, and other specified areas would increase the area where weed potential from OHV-related disturbances would decrease.

Effects from Lands and Realty Management

Effects would be the same as those described under Alternative B.

Effects from ACEC/RNA Management

Increasing the Craig Mountain ACEC by 19,386 acres would increase management and decrease certain types of disturbing uses, including mining, over this amount of land relative to Alternative A.

Similar to Alternative A, allowing lands within the ACEC to be classified for custodial management would increase the short-term weed potential but would decrease the long-term weed potential.

Minimizing new road construction and obliterating old roads and assigning high priority for control of undesirable nonnative vegetation using integrated pest management methods would decrease the

weed potential in this area and in others where similar management is applied, to the lowest of any alternative.

Effects from Watchable Wildlife Viewing Sites Management
Effects would be the same as those described under Alternative B.

Effects from Public Safety—Abandoned Mines and Hazardous Materials Management
Effects would be the same as those described under Alternative B.

Alternative D

Effects from Geology Management
Effects would be the same as those described under Alternative B.

Effects from Soils Management
Effects would be the same as those described under Alternative B.

Effects from Water Resources Management
Effects would be the same as those described under Alternative B.

Effects from Vegetation—Forests Management
Weed control measures that would occur under forest management or enhancement actions described under Alternatives A, B, and C would not occur under this alternative; therefore, weed potential would increase relative to the other alternatives.

Effects from Vegetation—Weeds Management
Effects would be the same as those described under Alternative B.

Effects from Vegetation—Rangelands Management
Effects would be the same as those described under Alternative B.

Effects from Vegetation—Riparian and Wetlands Management
Effects would be similar to those described under Alternative B, except RCA areas would decrease by 9 percent from Alternative B (and 15 percent from Alternative A), lowering management levels and increasing weed potential.

Effects from Wildlife and Special Status Wildlife Management
Effects would be the same as those described under Alternative B.

Effects from Aquatic Resources, Fish, and Special Status Fish Management
Types of effects would be similar to those described under Alternative B, except that acres of restoration and conservation watersheds would decrease by 19 percent from Alternative B and by 21 percent from prescription watersheds under Alternative A. Restoration and conservation of these areas would include reducing the possibility of actions that contribute to weed spread, including actions that disturb soil and vegetation, increase erosion, or allow for greater potential for import of weed seeds. Therefore, weed potential would decrease in these areas relative to Alternative A, but to a lesser degree than Alternatives B and C.

Effects from Special Status Plant Management
Effects would be the same as those described under Alternative B.

Effects from Wildland Fire Management

This alternative would treat the greatest amount of acreage. Effects would be similar to those described under Alternative B, except that 50,650 acres of the CFO classified as FRCC 2 or 3 (moderate to high risk) WUI areas could be treated in any 5-year period under Alternative D (see Section 4.2.12, Wildland Fire Management), 50 percent more than Alternative B and triple that under Alternative C. Alternative D would include approximately 2,870 to 7,597 acres of mechanical treatments and prescribed fire and 844 to 6,078 acres of biological or chemical treatments annually.

Much of this chemical treatment intended to reduce weed populations and to move FRCC 3 lands into FRCC 2, or FRCC 2 lands into FRCC 1. This alternative would allow for chemical or biological weed treatments on 80 percent more land area than under Alternative C and the same area as Alternative B, lowering the weed potential from this type of action the most of any alternative.

Effects from Visual Resources Management

Disturbance potential under this alternative would be highest compared to other alternatives, due to there being the lowest number of acres in VRM Classes I and II. Therefore, weed potential due to this type of management is highest among all alternatives.

Effects from Forest Products Management

Effects would be similar to those described under Alternative B; however, weed potential under this alternative would be highest compared to other alternatives because it would offer the highest PSQ (4,823 MBF).

Effects from Livestock Grazing Management

This alternative would offer a 16-percent increase in AUMs and increase the grazed area by 13,118 acres relative to Alternative A. Although grazing density would not be greater, possible effects, including soil disturbance, defoliation and crushed banks in riparian areas, and weed seed transport, would be spread over a wider area. Weed potential from grazing-related effects would be highest under this alternative. However, existing range trends and conditions would probably continue, because these allotments have been vacant and have not been grazed for over a decade. A large amount of these areas identified for grazing are intermingled with The Nature Conservancy and Idaho Department of Fish and Game lands, which at present do not have plans to graze lands they administer.

Effects from Minerals Management

Effects would be similar to those described under Alternative B, except that weed potential would increase as NSO areas decrease by 8,545 acres (20 percent) and CSU lands decrease by 10,390 acres (25 percent). Alternative D would be more restrictive than Alternative A because of NSOs and CSUs, which would not apply under Alternative A where weeds are managed case by case. Alternative D has the second-highest weed potential from mining-related effects, second to Alternative A.

Effects from Recreation Management

Effects would be the same as those described under Alternative B.

Effects from Renewable Energy Management

Effects would be the same as those described under Alternative B.

Effects from Transportation and Travel Management

Effects would be similar to those described under Alternative B. Under this alternative the BLM would continue managing 23,189 acres as Open to cross-country motorized travel yearlong, which would increase weed potential relative to Alternatives B and C, and to a lesser degree than under Alternative A. Increased weed potential would occur as a result of increased soil and vegetation disturbance and higher possibility of weed seed transport from OHVs.

Effects from Lands and Realty Management

Effects would be the same as those described under Alternative B.

Effects from ACEC/RNA Management

Effects would be similar to those described under Alternative B, except that use of livestock grazing to accomplish management goals in ACEC/RNAs could allow for increased introduction of weed seeds.

Effects from Watchable Wildlife Viewing Sites Management

Effects would be the same as those described under Alternative B.

Effects from Public Safety—Abandoned Mines and Hazardous Materials Management

Effects would be the same as those described under Alternative B.

Cumulative Effects

Past, present, and reasonably foreseeable actions that are relevant to weed management in the cumulative impact area include land tenure changes, wildland fire use and suppression, fuel and vegetation treatments, minerals management, population growth, urban development, recreational use, OHV use, stream and watershed restoration activities, regional planning efforts, weed management efforts, and grazing. The types of impacts that have occurred and would continue to occur from weed infestations include loss of plant diversity, loss of wildlife habitat, loss of soil integrity, changes in fire intensity and water retention rates, and reduced ecosystem function.

Several proposed actions in the Cottonwood RMP would address FRCC classes and work to move FRCC 3 areas into FRCC 2 or 1. Many areas that are in FRCC 3 are degraded primarily because of weed infestations, and chemical weed treatments are proposed that would reduce this effect. Such measures are proposed in other land management plans, and are helping to create a regional approach to weed control, limited resources in all areas mean that, at best, these measures would slow the rate of weed infestation, or reduce weed threat in particular areas of concern. Consistent with other regional plans, areas where open OHV use would be allowed would be further restricted under all Cottonwood RMP alternatives, except Alternative A. Although increasingly more OHVs are used throughout the cumulative impact area, the trend towards concentrating them into designated areas would enhance weed management efforts in most habitat types by reducing the extent of disturbance and seed spread.

Cumulative effects would be similar among the alternatives. Alternative A would contribute to more regional cumulative effects resulting from land tenure adjustments, open OHV use, and wildland fire suppression. In general, Alternatives B, C, and D would provide more management measures than Alternative A that would directly or indirectly reduce the potential for cumulative impacts.

4.2.7 Vegetation—Rangelands

Goal: Maintain or improve rangeland plant community health (diversity, composition, function, and vigor) relative to site potential.

Summary

Actions under most resource categories have the potential to affect rangeland vegetation. In general, actions under Alternative C would have the greatest potential to maintain or improve rangeland plant community health, followed by Alternative B, and then Alternative A. Actions under Alternative D would have the greatest potential to negatively affect rangeland vegetation. **Table 4-10** identifies the indicators that were used to analyze effects on rangeland vegetation management under each alternative.

Table 4-10
Comparison of Vegetation—Rangelands Indicators by Alternative

Indicator	Alternative A	Alternative B	Alternative C	Alternative D
Change in acres of mid-elevation shrub, mountain shrub, perennial grasslands, and grazed forested areas	Acres of these cover types are not projected to change	Changes may occur as a result of treatments, but those changes would affect various cover types differently	Changes may occur as a result of treatments, but to the least degree of any alternative	Changes may occur as a result of treatments, to the greatest degree of any alternative
Change in composition and structure	No change	May increase amount of native vegetation	May increase amount of native vegetation and decrease tree encroachment into grasslands	No change
Potential for increases in weed infestation	Potential for occurrences would increase	Potential for occurrences would stay at current levels or would decrease	Greater potential than Alternative B for occurrences to decrease	Greater potential than Alternative A for occurrences to increase

Methods of Analysis

Indicators

Indicators are used to identify the level of impact. For nonforested vegetation, the indicators used for impact analysis are identified in **Table 4-10**, Comparison of Vegetation—Rangelands Indicators by Alternative.

Methods and Assumptions

Impacts are determined by assessing which actions, if any, would change vegetation structure or composition, decrease the extent of rangeland vegetation, allow for increased dominance of invasive weeds, affect habitat value for wildlife species, or decrease grazing potential.

Impact analysis and conclusions are based on interdisciplinary team knowledge of the planning area and of interaction among different management activities, and on scientific literature. The effects of each action on vegetation resources are quantified when possible; however, many impacts must be qualitatively assessed when suitable data are not available. The following assumptions were made for the purpose of this analysis:

- Seeding on rangeland habitat for restoration purposes would use a native seed mix, or a mix of native seeds and approved nonnative species;
- Current trends in plant succession/vegetation would continue;
- Noxious and invasive weeds would continue to be introduced and spread as a result of ongoing vehicle traffic in and out of the CFO planning area, recreational activities, wildlife and livestock grazing and their movements, and surface-disturbing activities;
- Biocontrol would continue and potentially expand;
- Noxious and invasive weeds would further expand into native plant communities, and disturbances to these communities would expand opportunities for the spread of nonnative invasive plant species; and
- Many actions that would occur within the CFO would be subject to BMPs. Although BMPs are designed to minimize the effects of projects, they generally cannot eliminate all impacts. This impact analysis assumes that BMPs will minimize but not eliminate possible effects.

Effects Common to All Alternatives

Effects from Soils Management

Canyon grasslands are considered a sensitive land type since they are relatively scarce in the CFO. Identifying and recording~~mapping~~ such areas, designing projects to avoid or minimize the potential for adverse effects on sensitive land types, and restoring or obliterating unneeded roads would minimize potential for effects on this cover type, including mass wasting and erosion.

Effects from Water Resources Management

Effective watershed management would result in healthy and diverse plant communities, including rangelands. The restriction of surface disturbance around wetland/riparian areas, perennial surface waters, identified floodplains, and ephemeral channels would further protect vegetation from disturbance. Considering water quality standards and watershed guidelines during construction of other program projects would assist in achieving the desired plant and litter cover objectives.

Effects from Vegetation—Forests Management

Impacts to nonforested areas from forest and woodlands management would be indirect and would relate to treatments and the need to access treatment areas through rangelands. Fire treatments that reduce the chances of stand-replacing wildfire in forested areas would reduce the chances of such fires in rangelands as well. Fire treatments that occur at edges between rangelands and forested areas could decrease the occurrence of forest encroachment into rangelands. Treatments that require constructing access roads, fire breaks, or staging areas in rangeland areas would affect this habitat by allowing for greater weed dispersal, soil disturbance, loss of vegetation, and habitat fragmentation.

Effects from Vegetation—Weeds Management

Rangelands are particularly prone to weed infestation due to disturbances from grazing livestock. Livestock can also transport weed seeds in their feces or by having them attached to their coat.

Weed management under all alternatives would affect nonforested vegetation areas equally by reducing or controlling the degree to which desirable plants would have to compete with weeds.

Effects from Vegetation—Rangelands Management

Meeting the Idaho Standards for Rangeland Health and Guidelines for Livestock Grazing Management (BLM 1997a) (**Appendix A** [see Volume II~~I~~]) would require, in part, that existing native plant communities were maintained and that nonnative plant communities were appropriate for the site. Other parameters to ensure that vegetative health and proper function of rangelands are being maintained are included in the standards and guidelines. The BLM is currently meeting the goals stated in these standards and guidelines.

Effects from Vegetation—Riparian and Wetlands

Riparian areas/wetlands cover only a small amount (approximately 2 percent) of rangelands in the CFO. Livestock are likely to be found in these areas much of the time, because, the riparian vegetation is most likely to be green and lush even during the summer months; these areas are where livestock's water supply is located; and riparian zones are cooler than associated uplands. Management of these areas would affect rangelands by requiring range management practices, primarily livestock grazing, do not cause degradation of these riparian areas. The BLM would monitor livestock use of such areas and adjust livestock use as necessary to comply with Idaho Standards for Rangeland Health and Guidelines for Livestock Grazing Management (BLM 1997a) (**Appendix A** [see Volume II~~I~~]). This would ensure that no adverse effects occur to riparian areas from grazing livestock.

Effects from Wildlife and Special Status Wildlife

Striving to maintain or improve ecological condition status of native grassland communities or rangelands to benefit wildlife would affect rangelands by increasing management efforts to maintain appropriate native vegetation cover and diversity, weed control, and effects from grazing.

Effects from Aquatic Resources, Fish and Special Status Fish Management

Developing a Salmon and Snake Rivers coordinated plan to maintain fisheries habitat, water quality, and riparian areas would require management of sediment from upland sources. Such management would affect rangelands by requiring that range management practices, including livestock grazing, fire management, road construction, or weed management, would not increase the potential for erosion. Measures to control erosion would require maintenance of adequate range conditions including plant cover and density, as well as proper species composition.

Effects from Special Status Plants Management

Protection of certain special status plant species would indirectly affect rangelands. Populations of special status plant species found in grasslands, including MacFarlane's four-o'clock and Spalding's silene, Tolmie's onion *(Allium tolmiei var. persimile)*, Jessica's aster *(~~Asteraceae~~ Aster jessicae)*, green-band mariposa lily *(Calochortus macrocarpus var. maculosus)*, broad-fruit mariposa lily *(Calochortus nitidus)*, and Palouse goldenweed *(Haplopappus liatriformis)*, would be preserved by such measures as grazing restrictions, increased weed management efforts, increased monitoring, travel restrictions, and creation of specific management plans. To the degree that populations of these species occur in rangelands of the CFO, this increased management would result in healthier grassland communities and increased preservation of such areas.

Effects from Cultural Resources Management

Excavations of cultural resource sites disturb the soil surface, which increases the opportunity for noxious and invasive weeds to become established. However, the amount of disturbed surface associated with cultural site excavations is minimal, and these sites are reclaimed immediately.

Effects from Livestock Grazing Management

Direct effects on rangeland vegetation from livestock grazing management actions include the removal of forage by livestock, which could alter the amount, condition, and vigor of vegetation in grazed areas. Impacts from livestock grazing usually occur over a long duration of use during the growing season, resulting in lower vigor of desired species and a change in species composition. Salting areas and bed grounds often have disturbed soil and a loss of plant cover, which results in localized areas dominated by invasive plants. Such effects are most likely to occur in areas where management is inadequate. The BLM range management program is consistent with Idaho Standards for Rangeland Health and Guidelines for Livestock Grazing Management (BLM 1997a) (**Appendix A** [see Volume II~~I~~]) and allows BLM land managers to adjust grazing levels as needed to meet resource goals. The BLM monitors range conditions as needed to establish appropriate grazing levels to meet the standards and guidelines. This level of management is adequate to ensure proper range conditions.

Livestock grazing can be used as a tool to manipulate and improve plant community composition. Livestock can transport seeds and fruits of native and nonnative species to other areas by physically removing the seed or fruit, or through the deposition of fecal matter. Although this can increase weed potential in rangelands, it also serves as a tool for distribution of seeds of native plants into areas that are otherwise difficult to access. Grazing plans that promote healthy rangelands and vegetation create conditions resistant to the spread of noxious and invasive weeds.

Grazing management strategies, such as rotation, deferment, rest from use, and the manipulation of season of use and grazing intensity, would be implemented to manage composition, cover, and the vigor of vegetation. These provide rest periods for plant growth and seed production to maintain plant vigor. The objective of these strategies is to maintain or reach rangeland standards for upland plant communities.

Effects from Minerals Management

Minerals management actions would result in the localized removal of vegetation during both exploration and development work. Mineral development actions would also ~~fracture~~ fragment continuous vegetation communities, change plant community structure and diversity, and alter vegetation landscapes. Long-term impacts would mostly be associated with the location and design of roads. Increased erosion and decreased vegetation cover would occur from soils compaction and the channelization of surface runoff in ruts and road ditches. Areas below mid-slope roads become drier, which reduces plant productivity and can potentially change species composition. Similar impacts would occur for leasable, locatable, or mineral materials.

Effects from Recreation Management

Although occurrence of recreational activities may be increased in SRMAs compared to Extensive Recreation Management Areas, management of these areas is intensified to reduce potential effects. This effect is common to all alternatives, although under current management, fewer acres would be managed as SRMAs than under other alternatives.

Actions occurring in areas designated as Primitive and Semiprimitive Nonmotorized generally have the lowest impact and the least potential to affect rangeland vegetation. Actions occurring in areas that allow motorized recreation have a higher potential to affect rangeland vegetation.

Effects from Renewable Energy Management

Renewable energy development actions could fracture continuous vegetation communities, change plant community structure and diversity, and alter vegetation landscapes. Long-term impacts would mostly be associated with the location and design of roads. Increased erosion and decreased vegetation cover would occur from soils compaction and the channelization of surface runoff in ruts and road ditches. Effects to rangeland vegetation could arise from actions such as geothermal or wind energy projects.

Effects from Transportation and Travel Management

OHV use and road construction would result in impacts on vegetation such as loss of vegetation cover, change in density, and composition changes. OHV users would introduce and spread noxious and invasive weed seeds from their vehicles, shoes, clothing, and recreational equipment. As OHV use increases, people from outside the area would bring in noxious and invasive weeds, including new invasive species. OHV activities in undisturbed and remote areas have the potential to distribute weed seeds into weed-free areas, to disturb soil, and to fragment habitat. Such effects can diminish the value of rangeland forage and increase the degree to which the BLM must manage the lands. **Table 4-11** shows the acres of nonforested and rangeland vegetation that would be Closed, Limited, and Open to motorized travel under each alternative. Potential for effects is greatest in areas designated as Open; and therefore greatest under current management and lowest under Alternatives B and C.

Table 4-11
Acres of Rangeland Vegetation Affected by Travel Designations

Travel Area	Alternative A	Alternative B	Alternative C	Alternative D
Open	11,171	0	0	3,159
Limited	11,461	22,638	22,638	0
Closed	3,895	3,895	3,895	3,895

Source: BLM 2004a

Under all alternatives, approximately 340 miles of roads exist. The existence of roads leads to direct effects including loss of rangeland vegetation and also serve as vectors for weeds. Under all alternatives, the effect of the presence of roads is equal.

The greatest amount of unrestricted road access would be allowed under current management, with fewer miles of unrestricted roads available under the action alternatives. Therefore, potential for effects from use of roads, including introduction of weed seeds, is least under the action alternatives.

Effects from Lands and Realty Management

Installing utility systems and other rights-of-way actions would result in short-term vegetation removal until the area has been reclaimed. Native grasses and forbs may dominate reclaimed sites initially, assuming both that healthy conditions existed prior to disturbance and that revegetation seed mixes contained only native species. Areas where weeds populations were established prior to disturbance, where weed seeds may have been introduced by equipment, or areas adjacent to weed-

infested areas, may be more prone to initial colonization by weeds. In all cases, areas that have been disturbed for rights-of-way or other lease actions would be more prone to weed infestation and would require greater monitoring than nondisturbed areas. Long-term impacts would mostly be associated with constructing access routes.

Effects from Native American Tribal Uses Management

Tribal interests include treaty rights, tribal sovereignty, freedom of religion, protection of sacred and archaeological sites, and contemporary political and social rights, including economic viability. Coordinating with the Tribe on these tribal interests may affect the extent, timing, and type of vegetation management.

It is unlikely that such interests would affect the long-term objective to improve range vegetation, because the BLM has a long-standing practice of consulting with tribes on projects affecting public lands. The BLM would continue to solicit input from tribes on future projects, which would reduce, if not eliminate, the effect on vegetation resources.

Alternative A

Effects from Soils Management

Alternative A would prioritize restoration of existing roads on sensitive land types; this would result in improved habitat conditions in any habitat where this type of action occurred. Road closures would minimize potential for soil compaction, weed distribution, and vegetation disturbance.

Designing projects to avoid or minimize adverse effects on sensitive land types may help to protect rangelands, since canyon grasslands may be considered sensitive.

Effects from Water Resources Management

Effective watershed management would result in healthy and diverse plant communities. Considering water quality standards and watershed guidelines during construction of other program projects would assist in achieving the desired plant and litter cover objectives. Managing 39 sixth-code HUC watersheds (66,077 acres) as prescription watersheds would focus management actions on factors such as those that cause erosion or invasive weed species infestation, indirectly allowing for enhanced rangeland vegetation conditions.

Effects from Vegetation—Weeds Management

Weed treatment and prevention would affect native plant communities in rangelands by reducing competition, particularly for grasslands that are especially susceptible to weed infestation. Maintaining Cooperative Weed Management Areas throughout the planning area would allow the BLM to coordinate weed control efforts on a scale that includes surrounding lands, lowering the potential for weed infestation occurring as a result of weeds imported from other areas. Measures proposed under Cooperative Weed Management Areas may include restrictions on grazing in rangelands where it is clear that grazing is contributing to weed spread. Therefore, maintaining Cooperative Weed Management Areas may result in lowered weed potential in rangelands that lie within these areas.

Although identifying weed-affected areas that may be successfully restored would help the BLM prioritize funding that is available for such actions, this action itself prescribes no activities that would have a direct effect on rangeland health.

Effects from Vegetation—Rangelands Management

Managing lands to meet the Idaho Standards for Rangeland Health and Guidelines for Livestock Grazing Management (BLM 1997a) (**Appendix A** [see Volume II~~I~~]) helps to maintain plant community composition and can be used to increase the health and diversity of natural vegetative systems. Meeting standards and guidelines would ensure that BLM rangelands are maintained in or restored to target ecological health in regards to plant diversity and degree of weed infestation.

Effects from Vegetation—Riparian and Wetlands

This alternative offers 2,128 acres of riparian areas to grazing livestock (out of 122,732 acres of rangelands). The riparian/wetlands acres would be 1.73 percent of the total rangeland acres.

Effects from Wildlife and Special Status Wildlife Management

Some listed species, including several birds, and other wildlife such as deer rely on rangelands throughout all or part of their lifecycle; these species may be affected by loss or degradation of habitat. Periodic review of ongoing activities would reveal the extent to which these activities may be affecting listed species' habitat in rangelands, allowing the BLM to prioritize management actions to preserve such habitat. This action in itself would not constitute a direct effect but would allow more direct approaches to rangeland management to occur. Modifying actions that occur as a result of reviewing rangeland habitat conditions would result in direct effects, including lower rates of soil and vegetation disturbance and loss.

Effects from Aquatic Resources, Fish, and Special Status Fish Management

Identifying actions that may occur in areas targeted for intensive or less intensive aquatic management may reveal range activities that contribute to erosion or sedimentation. Because erosion and sedimentation occur in areas where range conditions have been degraded, identifying such actions may precipitate management actions that would improve range conditions.

Effects from Special Status Plants Management

Potential effects are listed under Effects Common to all Alternatives. In addition, this alternative would designate the Long Gulch and Skookumchuck populations of MacFarlane's four-o'clock as areas to be protected, indirectly protecting the rangelands in which they are found.

Effects from Wildland Fire Management

Limiting burned acres to 30 percent of the CFO over a given 5-year period may result in reduced use of prescribed fire during periods when wildfires burn large amounts of land. While use of prescribed fire has potential use for management in rangelands that are in good or excellent ecological conditions, burning in poor or fair condition rangelands may result in increased nonnative species infestations. This could reduce the potential benefits produced by prescribed fires, including more diverse grassland conditions and reversal of woodland encroachment into grasslands or shrublands. Suppressing wildfires within one operational period would require an aggressive response that may increase disturbance of rangeland soils and vegetation.

Use of non-fire fuel management strategies would include chemical applications, biological treatments, and/or seedings of between 1,700 and 11,200 acres annually. Since these treatments are designed for weed control, such actions would improve conditions where they were applied by reducing competition between range species and weeds and lowering wildfire potential.

Effects from Visual Resources Management

Under Alternatives A, 53,899 acres would be protected under VRM Classes I and II. Activities in VRM Class I and II areas would be restricted to those that do not result in significant disturbance, which would provide protection to rangelands in these categories by limiting the degree of mining, timber extraction, or road construction that could occur there. Effects would include less fragmentation of habitat, less direct loss of rangeland, and less disturbance than could occur in VRM Class III and IV areas.

Effects from Livestock Grazing Management

Under current management, 122,732 acres are allotted for grazing. Possible effects of livestock grazing are listed under Effects Common to All Alternatives.

Implementing improvements, including constructing additional fences, spring developments, cattle guards, and noxious weed control, would affect 52,854 acres of rangeland vegetation by allowing the BLM greater control over grazing livestock. These improvements would allow the BLM more opportunities for rangeland rest and rotation, increasing the possibility of keeping livestock out of sensitive areas. Vegetation improvements would result from lowered competition from noxious weed infestation.

Lowering AUMs by 12 percent over 5 years would be commensurate with reductions in grazed areas, and allow for improved rangeland vegetation conditions. However, these benefits would be negated by raising AUMs by 13 percent later in the life of the RMP.

Implementing appropriate actions that would result in maintenance of conditions according to standards identified in the Idaho Standards for Rangeland Health and Guidelines for Livestock Grazing Management (BLM 1997a) (**Appendix A** [see Volume II~~I~~]) would improve rangeland health. Effects would include lowered grazing pressure, improved native plant communities, and a vegetation matrix appropriate to its situation.

Effects from Minerals Management

Under this alternative, 131,044 acres of the CFO would remain open to leasing subject to the standard lease form. Potential effects are described under Effects Common to All Alternatives. Effects of mineral activity in rangeland areas may be reduced in ACECs due to NSO stipulations, depending on proposed management of each area.

Effects from Recreation Management

This alternative would designate 33,197 acres as Primitive or Semiprimitive Nonmotorized. Areas under these designations have the lowest potential for effects of any ROS class. This alternative would designate 26,682 acres as SRMAs, under which recreational activities would be more heavily monitored. Potential effects of recreational activities include habitat fragmentation, introduction of weeds, and increased unauthorized road and trail construction. Effects would increase from increased OHV use over time. These effects are described under Effects from Transportation and Travel Management.

Considering competitive or organized group recreation permit applications on a case-by-case basis would allow the BLM to reduce effects on sensitive rangeland vegetation, including canyon grasslands or other vegetation types, by not permitting such activities or by inserting stipulations that would cause such events to avoid sensitive range types.

Effects from Transportation and Travel Management

Under this alternative, 85,308 acres would remain Open to cross-country motorized travel. Therefore, current effects described under Effects Common to All Alternatives would continue or increase over time.

Considering temporary or permanent closure of all dead-end roads or roads with an expected duration of use of five years or less would allow the BLM to prioritize closures but would have no effects on its own since it proposes no direct actions. Under this alternative, approximately 39 miles of roads would be subject to restrictions on motor vehicle use. This relatively low amount of restricted access would lead to increased potential for the types of impacts listed under Effects Common to All Alternatives.

Road easement acquisition occurring after development of activity plans may allow better access to BLM-administered land for rangeland management, which could improve rangeland conditions.

Effects from Lands and Realty Management

Outside of rights-of-way exclusion areas, rangeland vegetation could be affected by lands and realty actions. Impacts could occur if rights-of-way, leases, or permits ran through rangeland areas, resulting in fragmentation, loss of vegetation from access roads or maintenance of the rights-of-way, and introduction of weeds.

Effects from ACEC/RNA Management

Protecting canyon grasslands of Wapshilla Ridge would minimize actions that could disturb rangeland and nonforested vegetation on 401 acres. Salt licks or water supplies would be placed outside of the area and new rights-of-way and roads would be restricted, resulting in less soil and vegetation disturbance, less direct loss of rangeland, and less potential for weed distribution.

Similar effects would occur by protecting Palouse prairie of the Lower and Middle Cottonwood Islands as an ACEC/RNA (43 acres), canyon grasslands and associated habitat types in Captain John Creek (1,321 acres), and habitat for MacFarlane's four-o'clock in Long Gulch (47 acres), Lucile Caves (404 acres) and Skookumchuck (18 acres).

NSO-1 stipulates that no surface occupancy would occur within ACECs or RNAs. This would reduce the potential for impacts described under Effects Common to All Alternatives, to the degree that rangelands are found within ACEC/RNAs.

Effects from Public Safety—Abandoned Mines and Hazardous Materials Management

AMLs contain severely degraded vegetative communities due to the high level of disturbance they have experienced from past mining practices. Rehabilitating AMLs in rangeland areas would include restoration of soils and vegetation, resulting in better quality habitat.

Alternative B

Effects from Soils Management

Effects would be the same under this alternative as described under Alternative A. In addition, implementing BMPs for soil-disturbing activities would reduce potential for future effects by minimizing road building and retention to only those roads that are necessary. Doing so would minimize existing effects such as erosion and weed seed introduction by eliminating and restoring unnecessary roads or by improving design of existing or planned roads.

Effects from Water Resources Management

Effects would be similar to those described under Alternative A. In addition, restoring watersheds and subwatersheds may improve rangeland conditions by requiring actions that would reduce erosion, weed potential, or deforestation.

Effects from Vegetation—Weeds Management

Under Alternative B, the BLM would increase cooperative efforts in Cooperative Weed Management Areas to develop and implement annual treatment strategies. This alternative increases management of weeds in rangeland and other areas over Alternative A. Implementing prevention activities as part of field activities would reduce the extent to which weed seeds are spread to other areas. Rehabilitating treated areas, combined with monitoring of such areas, would decrease weed potential. Supporting education and awareness efforts would help to diminish the weed threat by enlisting public help in avoiding activities that disturb soils or vegetation or that contribute to weed seed spread in rangeland areas.

Outside of Cooperative Weed Management Areas, management focus would emphasize implementing weed control goals into other resource goals. For example, a large component of watershed restoration planning would be weed control planning within the watershed. Travel management planning in rangeland areas would continue to implement measures to reduce weed infestation. Although rehabilitation of treated areas would continue in selected areas outside of Cooperative Weed Management Areas, monitoring of rehabilitated areas would not necessarily be a component of the rehabilitation. Under both scenarios, the BLM would gain greater control over weed introductions and establishment than under Alternative A.

Effects from Vegetation—Rangelands Management

Yearly monitoring and assessment of rangelands would allow BLM to determine if they are meeting standards and to adjust management as needed to maintain range conditions. Adjustments may include changes in grazing practices or increased weed management.

Effects from Vegetation—Riparian and Wetlands

Livestock grazing would be permitted on 1,880 aces of riparian areas (out of 105,619 acres of rangelands) under Alternative B. The riparian/wetland acres would be 1.78 percent of the total rangeland acres and would be 11.65 percent less than offered for grazing under Alternative A. Therefore, potential grazing related effects are lower under this alternative than under Alternative A.

Effects from Wildlife and Special Status Wildlife Management

Promoting sensitive species conservation through land tenure adjustments, conservation easements, restoration projects, and cooperative planning may result in more or improved rangeland in the CFO if targeted species rely on rangeland habitat.

Maintaining or improving ecological condition of native grassland communities in important winter and spring range areas may result in greater diversity of native plants and a reduction in weeds and disturbed areas.

Effects from Aquatic Resources, Fish, and Special Status Fish Management

Implementing BMPs to avoid or minimize adverse effects to aquatic and riparian habitats may require altering practices that contribute to erosion in rangeland areas within the same watershed. These practices may pertain to grazing, timber extraction or treatment, or vehicle use. Effects of

altering practices in rangeland areas may include enhanced health or preservation of rangeland areas. Under this alternative, ~~32~~ 28 watersheds would be considered restoration watersheds and ~~1~~ three would be designated~~ a~~ conservation watersheds (totaling 64,481 acres), 2 percent less than prescription watersheds under Alternative A. Increased management of weeds, erosion, and other land disturbances in these watersheds would lead to increased rangeland health to the extent that rangelands occur in these watersheds. A total of 22,847 acres would be protected as RCA stream buffers, meaning that 1,443 fewer acres would be protected as such compared to Alternative A.

Effects from Special Status Plants Management

Protecting listed and BLM sensitive plant populations would protect rangelands to the extent that they occur there. Species such as Spalding's silene, Tolmie's onion, Jessica's aster, green-band mariposa lily, broad-fruit mariposa lily, and MacFarlane's four-o'clock are found within rangeland and may require special management actions, including cessation of grazing, increased weed control measures, and restrictions on travel in areas where they are found. This would indirectly lead to preservation of range habitat.

Land acquisitions, exchanges, or conservation easements to support listed species populations may increase the amount of rangeland within the CFO.

Effects from Wildland Fire Management

Under Alternative B, up to 40 percent of the CFO classified as FRCC 2 or 3 (moderate to high risk) WUI areas could be treated in any 5-year period; an estimated 33,766 acres could be treated under Alternative B (see Section 4.2.12, Wildland Fire Management). Alternative B would include approximately 1,182 to 3,545 acres annually of mechanical treatments and prescribed fire.

Short-term effects would include increased weed potential due to soil and vegetation disturbances associated with fire control, as well as loss of forage in burned areas, although some of these effects would be offset by use of BMPs and implementation of a weed management plan to minimize soil and vegetation disturbance.

Using mechanical and prescribed fire treatments on 1,182 to 3,545 acres of FRCC 2 and 3 lands annually would improve rangeland conditions in terms of weed control to the degree that such treatment occurred in rangeland cover types. Long-term effects would be lower weed potential and greater diversity of native plant species. Although short-term effects would include greater weed potential due to soil and vegetation disturbance associated with the treatments themselves, these effects would be offset by use of BMPs to minimize disturbance.

Chemical and biological treatments could be used on 844 to 6,078 acres annually would improve rangeland conditions in terms of weed control to the degree that these treatments occurred in rangeland areas. Using these treatments for weed control instead of mechanical methods or fire minimizes disturbance of soils and other vegetation, thereby eliminating the ground disturbing factors.

Effects from Visual Resources Management

Effects would be the same as those described under Alternative A.

Effects from Livestock Grazing Management

This alternative allows for a relatively low number of AUMs (~~6,254~~6,263) and allotment acres (105,619), and therefore has a relatively low potential for direct effects relative to current management. Possible effects are listed under Effects Common to All Alternatives. Under this alternative, the vacant Craig Mountain, vacant Wapshilla Ridge, and vacant Corral Creek allotments would be eliminated; and spring grazing on the Lyon Bar allotment would be discontinued. Because AUMs would decrease commensurate with reductions in total allotments, effects would result from having fewer acres grazed compared to Alternative A. Effects of assigning management levels (high or low) to other allotments would be that the BLM would have greater control over factors that affect rangeland vegetation, including number of AUMs and specific areas that should be closed to grazing to achieve resource goals.

Continuing to implement measures to ensure that Idaho Standards for Rangeland Health and Guidelines for Livestock Grazing Management (BLM 1997a) (**Appendix A** [see Volume II~~I~~]) are being met would maintain rangeland health relative to other alternatives.

Effects from Minerals Management

This alternative offers the same amount of land open to locatable minerals (121,961 acres) and leasable minerals (131,044 acres) but has more rangeland (11,516 acres) covered by NSO or CSU stipulations than under current management. Therefore, potential effects as described under Effects Common to All Alternatives, above, would be lower than under Alternative A.

Effects from Recreation Management

All action alternatives would have the same number of acres (55,201) in SRMAs; therefore, effects from recreational activities would be the same on these lands across all action alternatives.

This alternative has more acres in areas classified as Primitive or Semiprimitive Nonmotorized than under current management; therefore, the potential for effects on rangeland vegetation from motorized or other high-impact recreational activities would be lower under this alternative than under current management.

Effects from Renewable Energy Management

Supporting development of electrical generating capabilities from biomass may lead to more development in rangeland areas. Development may be in the form of facilities or roads, both of which could increase the types of effects described under Effects Common to All Alternatives.

Effects from Transportation and Travel Management

Under this alternative there would be no areas designated as Open so no rangeland would be open to cross-country motorized travel. Motorized travel would be Limited to designated routes, which would lead to lower potential for disturbing rangeland vegetation and soils, lowering the potential for weeds to become established and for weed seed transport. Under this alternative, approximately 107 miles of roads would be subject to restrictions on motor vehicle use. Effects would include lower weed potential, which would lead to more stable vegetation communities, greater species diversity, and more normal fire potential and vegetation response. Assuming that the rate of new road construction does not increase, decommissioning, restoring, and obliterating obsolete roads would reduce road density, resulting in more rangeland vegetation, less weed potential, and less disturbance from vehicle use.

Use of signage, kiosks, press releases, and other public outreach materials to explain reasons for OHV closures and limited designation areas would increase public awareness of the effects of travel in sensitive areas, potentially lowering the effects to rangeland from this use.

Developing and implementing monitoring schedules and protocols to use on chosen trails would allow the BLM to determine effects from OHV use and to make adjustments as necessary. This would allow for greater control over travel practices that affect rangeland vegetation, as described under Effects Common to All Alternatives, above. Results would be lowered potential for effects on rangeland vegetation, including lower weed potential and lower direct loss of vegetation.

Implementing Road Management Guidelines would manage variables that cause erosion, changes in drainage patterns, and weed potential. Although many of these variables are addressed under current management, road guidelines codify the management practices so that they can be used on each project. Results of implementing these guidelines would be lower erosion and weed potential.

Effects from Lands and Realty Management

Consolidating landholdings through exchanges or disposal would allow for more efficient rangeland management. Management practices such as preparation of weed management strategies, prescribed burning, and grazing plans would be more efficiently planned for contiguous lands.

Consolidating linear rights-of-way and communication sites would reduce the amount of rangeland and other cover types that are dedicated to rights-of-way. This would reduce potential for direct loss of rangeland and other effects described under Effects Common to All Alternatives, above, relative to current management.

Effects from ACEC/RNA Management

Using integrated pest management to eliminate nondesirable vegetation would improve rangelands in areas where that practice occurred.

Protection measures for MacFarlane's four-o'clock would have the same effects as those proposed under Alternative A, although management of rangelands would be reduced slightly by reducing the Lucile Caves ACEC/RNA by 268 acres. Designating the Salmon River and Upper Lolo Creek ACECs may increase the number of acres of rangeland managed with ACEC restrictions, resulting in a higher level of management than under current management and less potential for effects.

Effects from Public Safety—Abandoned Mines and Hazardous Materials Management

Effects would be similar to those described under Alternative A, except some rangelands may be designated as NSOs due to contamination, which would result in decreased potential for disturbances to soils or vegetation in these areas.

Alternative C

Effects from Soils Management

Effects would be the same as those described under Alternative B.

Effects from Water Resources Management

Effects would be similar to those described under Alternative B, except that acres of conservation and restoration watersheds would increase by 6 percent over Alternative B and by 3 percent over

prescription watersheds under Alternative A. This would potentially increase the amount of rangelands receiving additional restrictions on disturbance factors.

Effects from Vegetation—Weeds Management

Effects would be the same as those described under Alternative B.

Effects from Vegetation—Rangelands Management

Effects would be similar to those described under Alternative B, except increased management of canyon grasslands may result in enhanced or maintained sensitive rangeland communities. Increased management may include greater weed control efforts, greater restrictions on grazing, and restrictions on travel in such areas.

Effects from Vegetation—Riparian and Wetlands

Livestock grazing would be permitted on 1,765 aces of riparian areas (out of 101,350 acres of rangelands) under Alternative C. The riparian/wetland acres would be 1.74 percent of the total rangeland acres and would be 17.06 percent less than offered for grazing under Alternative A and would be less than under any other alternative. Therefore, potential grazing-related effects would be least under this alternative.

Effects from Wildlife and Special Status Wildlife Management

Effects would be similar to those described under Alternative B. In addition, increased management of grasslands in the Lower Salmon River area for big game species could result in better rangeland conditions, including higher diversity of native plant species and reduced or maintained levels of weeds.

Effects from Aquatic Resources, Fish, and Special Status Fish Management

Effects would be similar to those described under Alternative B, except that acres of conservation and restoration watersheds would increase by 6 percent over Alternative B and by 3 percent over prescription watersheds under Alternative A. To the extent that these watersheds contain rangeland vegetation, conditions in rangelands would improve relative to current management and to a greater degree than under Alternative B. Improvements could include less erosion, better water retention, less soil compaction if grazing was reduced, and lower or maintained levels of weeds.

Effects from Special Status Plants Management

Effects would be the same as those described under Alternative B.

Effects from Wildland Fire Management

Effects would be similar to those described under Alternative B, except that 16,883 acres of the CFO classified as FRCC 2 or 3 (moderate to high risk) WUI areas could be treated in any 5-year period under Alternative C (see Section 4.2.12, Wildland Fire Management), 50 percent less than Alternative B. Alternative C would include approximately 1,182 to 4,390 acres annually of mechanical treatments and prescribed fire. This could result in reduced long-term rangeland health by reducing the area treated, but it could also possibly reduce the chances for short-term weed infestation by reducing disturbance related to fire control. Rangeland health may be affected by using prescribed fire to treat up to 100 percent of the CFO FRCC 2 and 3 (moderate to high risk) WUI areas over a 20-year period; however, this is the least of all alternatives. Therefore, potential for increased rangeland health in the long term in the form of diminished weed potential, increased native plant diversity, and reversal of tree encroachment into rangelands would be lower than all

other alternatives. Potential to increase rangeland health through prescribed fire treatments is greatest in rangelands that are in good condition and are attaining the standards specified in the Idaho Standards for Rangeland Health and Guidelines for Livestock Grazing Management (BLM 1997a) (**Appendix A** [see Volume II~~I~~]). Rangelands that are already weed infested or otherwise disturbed may not benefit from such treatments, and such treatments may favor weeds in those cases.

Effects from Visual Resources Management

Effects would be similar to those described under Alternative B, except that the amount of VRM Classes I and II would increase by approximately 30 percent. Acres in VRM Classes I and II would increase about 37 percent from current management, decreasing potential for disturbance of rangelands over this amount of land.

Effects from Livestock Grazing Management

This alternative allows for the lowest number of AUMs (6,020) and allotment acres (101,350), and therefore has lower potential for direct effects relative to Alternative A. Possible effects are listed under Effects Common to All Alternatives, above.

Effects from Minerals Management

Effects would be similar to those described under Alternative B, except that NSOs in nonforested rangeland areas would increase to 18,058 acres, an increase of approximately 28 percent over Alternative B. This would decrease the potential for mining ~~mineral~~ related effects relative to Alternatives A and B.

Effects from Recreation Management

Effects would be the same as those described under Alternative B.

Effects from Renewable Energy Management

Effects would be the same as those described under Alternative B.

Effects from Transportation and Travel Management

Effects would be the same under this alternative as described under Alternative B, except that this alternative would include Craig Mountain and American Hills Lake ACECs. In addition, the BLM's efforts to decrease motor vehicle use of roads and trails on 38,733 acres would reduce potential for direct loss of vegetation and weed seed introduction in these areas.

Effects from Lands and Realty Management

Effects would be the same as those described under Alternative B.

Effects from ACEC/RNA Management

Effects would be similar to those described under Alternative B, except that rangeland in ACEC/RNAs would increase by 1,630 acres.

Effects from Public Safety—Abandoned Mines and Hazardous Materials Management

Effects would be the same as those described under Alternative B.

Alternative D

Effects from Soils Management

Effects would be the same as those described under Alternative B.

Effects from Water Resources Management

Effects would be similar to those described under Alternative B, except that acres of conservation and restoration watersheds would decrease by 19 percent from those in Alternative B and by 21 percent from prescription watersheds under Alternative A, potentially reducing the amount of rangeland restored as a result of this program.

Effects from Vegetation—Weeds Management

Effects would be the same as those described under Alternative B.

Effects from Vegetation—Rangelands Management

Effects would be the same as those described under Alternative B.

Effects from Vegetation—Riparian and Wetlands

Livestock grazing would be permitted on 2,324 aces of riparian areas (out of a total of 135,850 acres of rangelands) under Alternative D. The riparian/wetland acres would be 1.71 percent of the total acres and would be 9.21 percent more than offered for grazing under Alternative A and would be more than any other alternative. Therefore, potential for grazing-related effects is highest under this alternative.

Effects from Wildlife and Special Status Wildlife Management

Effects would be the same as those described under Alternative B.

Effects from Aquatic Resources, Fish, and Special Status Fish Management

Effects would be the same under this alternative as described under Alternative B, except that acres of conservation and restoration watersheds would decrease by 19 percent from those in Alternative B and by 21 percent from prescription watersheds under Alternative A, potentially reducing the amount of rangeland restored as a result of this program.

Effects from Special Status Plants Management

Effects would be the same as those described under Alternative B.

Effects from Wildland Fire Management

Effects would be the same under this alternative as described under Alternative B, except that use of wildland fire for resource benefits would decrease. This could affect rangeland restoration efforts and may allow for greater encroachment of tree species into grasslands.

Effects would be similar to those described under Alternative B, except that 50,650 acres of the CFO classified as FRCC 2 or 3 (moderate to high risk) WUI areas could be treated in any 5-year period under Alternative D (see Section 4.2.12, Wildland Fire Management), 50 percent more than Alternative B and triple that under Alternative C. Alternative D would include approximately 2,870 to 7,597 acres annually of mechanical treatments and prescribed fire. With chemical treatments proposed on up to 36 percent of these areas as well, many of the treatments would be geared towards weed control. Such increased treatments may decrease the amount and density of weed

populations in rangelands of the CFO to a greater degree than Alternative C (80 percent more), the same as Alternative B, and less than Alternative A (57 percent less).

Effects from Visual Resources Management

Effects would be similar to those described under Alternative B, except that the amount of VRM Classes I and II would decrease by approximately 6 percent. Acres in VRM Classes I and II would decrease about 20 percent from current management, increasing potential for disturbance of rangelands over this amount of land. Because the amount of rangeland in VRM Classes I and II would be lowest under this alternative, the potential for disturbance-related effects is highest.

Effects from Livestock Grazing Management

Effects would be similar to those described under Alternative B, except that AUMs (8,54~~0~~9) and acres within allotments (135,850) would increase to the highest amount of any alternative. Therefore, the potential for grazing-related effects is highest under this alternative, although the majority of acres proposed for grazing is intermingled with Idaho Department of Fish and Game and The Nature Conservancy lands and currently are vacant.

Effects from Minerals Management

Effects would be similar to those described under Alternative B, except that NSOs in rangeland areas would increase to 11,782 acres, slightly reducing the potential for effects relative to Alternative B but to a much lesser degree than Alternative C. The least amount of area would be subject to CSU stipulations, which could reduce the amount of protection of rangelands.

Effects from Recreation Management

Effects would be the same as those described under Alternative B.

Effects from Renewable Energy Management

Effects would be the same as those described under Alternative B.

Effects from Transportation and Travel Management

Under this alternative, 23,189 acres would be Open to cross-country motorized travel, which would create the highest potential for disturbance-related effects, including increased erosion and weed potential, to rangeland of any alternative except for Alternative A.

Effects from Lands and Realty Management

Effects would be the same as those described under Alternative B.

Effects from ACEC/RNA Management

Effects would be similar to those described under Alternative B, except that rangeland areas in ACEC/RNAs would increase by 1,630 acres. In addition, potential use of livestock to achieve resource objectives in Wapshilla Ridge may lead to an increase in grazing-related effects on rangeland to the degree that it exists there. Effects may include short-term increases in weed potential followed by long-term decreases as ecological health of such areas increases.

Effects from Public Safety—Abandoned Mines and Hazardous Materials Management

Effects would be the same as those described under Alternative B.

Cumulative Effects

Rangeland vegetation types are of increasing importance because much of what was historically grassland and shrubland of the cumulative impact assessment area has been converted to other cover types or has been heavily grazed. For example, much of the Palouse prairie has been converted to farmland.

Much of the range vegetation of the CFO is noncontiguous, meaning that it is heavily affected by management actions aimed at other resources. Past, present, and reasonably foreseeable actions that are relevant to range management include land tenure changes, wildland fire and wildland fire use and suppression, fuel and vegetation treatments, timber harvest, minerals management, population growth, recreational use, OHV use, watershed restoration activities, regional planning efforts, weed management efforts, and grazing. The types of impacts that have occurred and would continue to occur include loss of plant diversity, loss of soil integrity, changes in seral stage, reduction of forage for livestock and wildlife, changes in fire regime, and reduced ecosystem function.

Consistent with other regional plans, areas where cross-country OHV use is allowed would be further restricted or eliminated under all of the Cottonwood RMP alternatives, except Alternative A. Closures directly affect rangeland vegetation by reducing disturbance and weed seed introduction. Although increasingly more OHVs are in use throughout the cumulative impact area, the trend towards concentrating them into designated areas would enhance range management efforts in most habitat types by reducing the extent of disturbance and fragmentation. Several proposed actions in the Cottonwood RMP would address FRCC classes and work to move Class 3 areas into Classes 2 or 1. Since many rangelands are infested with weeds, this cumulative effect could be substantial throughout the cumulative impact area. Alternative D would offer the greatest amount of treatments, with Alternative C offering the least.

Cumulative effects would be similar among the alternatives. Alternative A would contribute to more regional cumulative effects resulting from land tenure adjustments, open OHV use, and wildland fire suppression. In general, Alternatives B, C, and D would provide more management measures than Alternative A that would directly or indirectly reduce the potential for cumulative impacts. The emphasis in Alternative C on actions that value resource conservation, protection, and minimal human intervention would have the least impact or risk of impacts on rangeland management and would contribute the least to cumulative impacts.

4.2.8 Vegetation—Riparian and Wetlands

Goal: Maintain or improve riparian and wetland areas to achieve proper functioning condition. Manage for riparian plant community types appropriate for the site.

Summary

Measures would be implemented to protect riparian areas under all alternatives. Under Alternative A, riparian and wetlands management for the CFO includes Riparian Management Guidelines (BLM 1985e), PACFISH (BLM and Forest Service 1995), and MFP Supplement for Fisheries and Water Quality Objectives (BLM 1985d). Under Alternatives B, C, and D, an Aquatic and Riparian Management Strategy (**Appendix F** [see Volume II~~I~~]) was developed, and is somewhat similar to Alternative A for providing conservation and restoration measures for fisheries and water resources. The Aquatic and Riparian Management Strategy (**Appendix F**) provides more flexibility for adaptive

management, which is also specific to the incorporation of the aquatic and riparian habitat component of ICBEMP into BLM land use plans.

The default buffer zones sizes for streams and water bodies would vary for these four alternatives; however, Alternative C would provide the most protection, followed by Alternative A, B, and D (least protective). Alternative A identifies prescription watersheds, and Alternatives B, C, and D designate conservation and restoration watersheds to focus management efforts for the maintenance or improvement of riparian areas and aquatic habitats. **Table 4-12** identifies the indicators that were used to analyze effects on riparian and wetlands resources under each alternative.

Table 4-12
Comparison of Vegetation—Riparian and Wetlands Indicators by Alternative

Indicator	Alternative A	Alternative B	Alternative C	Alternative D
Number of miles of streams in PFC flowing across BLM lands	537 miles	537 miles	537 miles	537 miles
Riparian and wetland general management direction.	Management emphasis on riparian guidelines and BMPs	Inventory and prioritize streams, riparian areas, and wetlands for maintenance of PFC or strive to achieve PFC	Inventory and prioritize streams, riparian areas, and wetlands for maintenance of PFC or strive to achieve PFC	Inventory and prioritize streams, riparian areas, and wetlands for maintenance of PFC or strive to achieve PFC
Number of acres of riparian buffer areas in RHCAs (Alternative A) and RCAs (Alternatives B, C, D)	24,290 acres	22,847 acres	27,624 acres	20,710 acres
Total miles of stream flowing across BLM lands within prescription watersheds (Alternative A) and within conservation and restoration watersheds (Alternatives B, C, D)	69 miles	80 miles	81 miles	65 miles

Source: BLM 2004a

Methods of Analysis

Indicators

Indicators are used to identify the level of impact. For riparian and wetlands, the indicators used for impact analysis are identified in **Table 4-12**, Comparison of Vegetation—Riparian and Wetlands Indicators by Alternative.

Methods and Assumptions

Impacts were identified using best professional judgment and were assessed according to the following methods and assumptions:

- The RCA stream buffers under the Aquatic and Riparian Management Strategy (**Appendix F** [see Volume III]), extend to all riparian zones in the CFO and restrict most activities to those that would benefit or restore the quality of habitat within these areas;

- Different program actions are assessed for their effects on vegetation resources;
- Activities generally affect vegetation by changing plant composition, seral condition, structure, production, ground/canopy cover, and soil resources;
- Restoring riparian and wetland vegetation is assumed to include a correction in the species composition and structure, including stand density and age, where appropriate;
- Livestock type and stocking rates would remain the same over the planning period;
- Current trends in plant succession/vegetation would continue;
- Vegetation communities would be maintained with a mix of species composition, cover, and age classes;
- Noxious and invasive weeds would continue to be introduced and spread as a result of ongoing vehicle traffic in and out of the CFO planning area, recreational activities, wildlife and livestock grazing and their movements, and surface-disturbing activities;
- Noxious and invasive weeds would further expand into native plant communities, and disturbances to these communities would expand opportunities for the spread of nonnative invasive plant species;
- The BLM would continue to treat noxious and invasive weeds and pests on public land and grazing allotments, and livestock permit holders, right-of-way holders, mineral lease claim, and permit holders would continue to treat noxious and invasive weeds and pests on public land, as stipulated within their permits and authorizations;
- Weed and pest control would be carried out in coordination with the appropriate county weed and pest control district and with owners of adjacent property; and
- Because snowmobiles do not disturb soils to a significant degree, effects to riparian vegetation from snowmobile use would be minimal and confined to occasional damage to shrubs that emerge from the snow in the path of snowmobiles.

Effects Common to All Alternatives

Effects from Soils Management

Designing projects to avoid or minimize the potential for adverse effects in sensitive land types would help to maintain vegetation quality in riparian zones by reducing erosion.

Effects from Water Resources Management

Since riparian zones are an integral part of floodplains, restricting actions that would cause definable adverse effects to the natural and beneficial functions of floodplains would, by necessity, require that riparian zones are not adversely affected.

Effects from Vegetation—Forests Management

Riparian vegetation would be protected from direct effects from timber harvest and other forest practices by implementing RHCAs according to the Riparian Management Guidelines (BLM 1985e) and PACFISH (BLM and Forest Service 1995) or as RCA stream buffers under the Aquatic and Riparian Management Strategy (**Appendix F** [see Volume II~~I~~]) (see **Table 4-12**, Comparison of Vegetation—Riparian and Wetlands Indicators by Alternative). Although some timber harvest may still be allowed in buffer zones, it would be subject to guidelines that would ensure that soils and vegetation were preserved or enhanced. These plans allow short-term adverse effects for long-term beneficial effects or no net change actions.

Potential for effects can be seen as directly related to PSQ, since higher PSQ means that either a larger area would be subjected to logging or the same amount of area would be logged more intensively. Therefore, alternatives with higher PSQ are more likely to indirectly or directly affect riparian resources.

Effects from Vegetation—Weeds Management

Weed management strategies would reduce competition between riparian vegetation and invasive species, leading to healthier riparian zones. Some strategies may actively restore riparian areas that have been impaired by weed infestation, increasing riparian health. Strategies may require cessation of, or restrictions on, activities occurring in riparian zones that could increase weed potential, including grazing, OHV use, or logging. Potential for such effects is the same across all alternatives.

Working with partners at other land management agencies would increase the scope of weed control efforts and reduce the potential for weed seed introduction from outside the CFO. Partnering would give the BLM greater resources to draw from in terms of local weed knowledge and it could give the BLM a greater labor pool to draw from, creating a regional approach to weed control.

~~*Effects from Vegetation—Riparian and Wetlands*~~

~~Implementing RHCAs as described in the Riparian Management Guidelines (BLM 1985e) and PACFISH (BLM and Forest Service 1995) or RCA stream buffers according to the Aquatic and Riparian Management Strategy (Appendix F [see Volume III]) would improve or maintain riparian habitat by limiting actions within riparian zones to those that would preserve or improve such habitat. Activities most likely to be restricted in such areas are those associated with mining, timber management, grazing, and transportation. Soil erosion, loss of vegetation, and diminished bank stability would decrease as a result of establishing buffers as described.~~

Effects from Special Status Plants Management

Management measures that would protect sensitive riparian plant species would indirectly protect aquatic habitats by maintaining healthy riparian areas where sensitive plant species occur.

Effects from Wildland Fire Management

Suppressing wildfires within one operational period, using Appropriate Management Response, would protect riparian areas from destructive wildfire and would allow for flexibility for using wildfire to achieve resource management goals. Although riparian areas generally do not burn as frequently as grasslands or dry forests, some effects, including maintenance of plant diversity and canopy structure, may be better achieved by use of occasional fires.

Riparian resources could be affected if fire equipment needed to enter these zones for suppression tactics. These effects could include soil disturbance, which could facilitate weed growth and loss of vegetation.

Implementing measures to stabilize burned areas would affect riparian areas by ensuring that proper conditions for vegetative regeneration would be present.

Effects from Forest Products Management

Indirect effects could occur if forest management practices in adjacent areas resulted in clearcuts, significant soil disturbance, or changes in vegetation type or structure. Potential effects such as greater weed potential, changes in water retention, or changes in riparian vegetation resulting from

changes in the amount of sunlight reaching lower levels of riparian vegetation are unlikely to occur since RCA buffer widths are generally much wider than the riparian zone that they protect. Additional effects occur when timber harvest changes the forest canopy cover to result in changes to Equivalent Clearcut Acres, which may affect the flow regimes (high and low) and base flow conditions. Such hydrologic effects may affect stream channels/streambanks, floodplains, and riparian areas.

Effects from Visual Resources Management

VRM Classes I and II contain restrictions that may limit the amount of timber harvest or mineral resource extraction that may occur within riparian buffer areas. Although these restrictions are not intended specifically to protect riparian biological resources, they would protect such resources if proposed activities would affect the visual landscape. VRM Classes III and IV contain few restrictions limiting land uses. The increased restrictions associated with Classes I and II could indirectly protect aquatic and riparian habitats from impacts associated with other land uses.

Effects from Livestock Grazing Management

Although riparian zones may cover only a small amount of a given planning area, grazing cattle are most likely to be found in such areas during the summer. This is due to the fact that riparian vegetation is most likely to be green and lush even during the dry summer months, and also because riparian zones are cooler than associated uplands. The BLM would monitor livestock use of such areas and adjust livestock use as necessary to comply with Idaho Standards for Rangeland Health and Guidelines for Livestock Grazing Management (BLM 1997a) (**Appendix A** [see Volume II~~I~~]). This would ensure that no adverse effects occur to riparian areas from grazing livestock.

Effects from Minerals Management

Minerals management actions would result in the localized removal of vegetation during both exploration and development work. Mineral development actions would also fracture continuous vegetation communities, change plant community structure and diversity, and alter vegetation landscapes. Long-term impacts would mostly be associated with the location and design of roads. Increased erosion and decreased vegetation cover would occur from soils compaction and the channelization of surface runoff in ruts and road ditches. Areas below mid-slope roads become drier, which reduces plant productivity and can potentially change species composition.

Designation of 131,044 acres as open to leasing subject to terms and conditions of the standard lease form, without assigning significant stipulations in those areas, could result in an increased impact on riparian vegetation in these areas. The standard lease stipulations include complying with established acts, laws, and regulations governing BLM land management, including the Riparian Management Guidelines (BLM 1985e) and the Aquatic and Riparian Management Strategy (**Appendix F** [see Volume II~~I~~]). Because of these guidelines, very little mineral activity would be allowed in riparian areas, and most effects would be indirect.

Effects from Recreation Management

Increased recreation use and demand require an increased management response to minimize potential effects, leading to SRMA designation. Potential impacts to riparian areas from increased recreational use may include direct loss of vegetation, fragmentation of habitat from construction of social trails, and increased weed potential. Increased visitor use without increased management and SRMA designation would be expected to result in greater impacts.

Lands in ROS classes Primitive or Semiprimitive Nonmotorized would be subject to the least potential disturbance from recreational activities. Greater amounts of motorized or high-impact recreational activities could occur under the other ROS classes, increasing the potential for direct vegetation disturbance, soil disturbance, or weed seed introduction in riparian areas.

Effects from Transportation and Travel Management

OHV use and road construction would result in effects such as loss of vegetation cover and density, fragmentation of habitat, and composition changes. OHV users would introduce and spread noxious and invasive weed seeds from their vehicles, shoes, clothing, and recreational equipment and would cause soil disturbances that result in increased weed potential and erosion. Potential effects are greatest in areas designated as Open to OHV use and are least in areas designated as Closed to OHV use. The amount of allowable OHV use varies by alternative. In most cases, snowmobiles have minimal impact on riparian vegetation or soils.

Effects from Renewable Energy Management

Potential effects from geothermal, wind, and solar energy development are predominantly associated with the construction, use, and maintenance of roads and facilities. Road-related activities could result in increased fragmentation of riparian habitat and increased weed potential from soil disturbances and increased vehicle traffic. Renewable energy development actions could also change plant community structure and diversity, and alter vegetation landscapes. Long-term impacts would mostly be associated with the location and design of roads. Increased erosion and decreased vegetation cover would occur from soils compaction and the channelization of surface runoff in ruts and road ditches. Areas below mid-slope roads become drier, which reduces plant productivity and can potentially change species composition. Right-of-way avoidance and exclusion areas would protect against these potential impacts.

Renewable energy projects would be unlikely to occur in riparian areas. Those that may occur include biomass projects as part of a salvage operation. Effects on riparian zones could include soil compaction, loss of vegetative cover, and loss of habitat diversity in riparian zones as woody debris was removed. This effect would be minimized by implementing RHCAs under Alternative A or RCA stream buffers under Alternatives B, C, and D, in which guidelines would allow only those activities that resulted in enhanced or maintained riparian conditions.

Effects from ACEC/RNA Management

Protection of the riparian habitat at the Clearwater River Islands Goose Nesting Area would indirectly protect aquatic habitats and fisheries in this section of the Clearwater River. Similar protection would occur at the Lower and Middle Creek Cottonwoods Islands, Captain John Creek, Lower Salmon River, and Lucile Caves ACEC/RNAs.

Timber harvest restrictions and prohibition of livestock grazing would protect riparian and aquatic habitats in the Craig Mountain WMA from impacts associated with these land uses.

Protection of resource values including the riparian habitat along Lower Lolo Creek would result in direct effects on riparian resources, resulting in improved riparian vegetation and maintained soil and bank integrity.

Effects from Wild and Scenic Rivers Management

The majority of areas found suitable for inclusion in the NWSRS are already managed as riparian buffer zones under the Riparian Management Guidelines (BLM 1985e), Fisheries and Water Quality Objectives and Sediment Budgets (BLM 1985d), and PACFISH (BLM and Forest Service 1995). The remaining areas would be managed as such under the Aquatic and Riparian Management Strategy (**Appendix F** [see Volume II~~I~~]), but would receive another layer of protection by being managed to protect the outstandingly remarkable values of each suitable segment.

Effects from Wilderness and Wilderness Study Areas Management

Managing 750 acres of the Frank Church/River of No Return Wilderness per the Wilderness Act would remove potential for effects from mining, forestry practices, or motorized transportation. Similar effects would occur by managing 5,571 acres at Marshall Mountain WSA and 6,463 acres at Snowhole Rapids WSA under the BLM's Interim Management Policy for Lands under Wilderness Review. These types of management would protect vegetation and soils in riparian areas from effects related to these types of activities.

Effects from Public Safety—Abandoned Mines and Hazardous Materials Management

Restoring AMLs would increase health of riparian areas to the degree that cleanups occurred in this habitat type, since part of the cleanup of such areas includes revegetation and grading to conditions similar to those of surrounding areas.

Under all alternatives, AML remediation would include restoration of vegetation. This would benefit riparian vegetation to the extent that such remediation occurred in riparian areas.

Alternative A

Effects from Soils Management

Maintaining buffers of riparian vegetation between streams and roads as described in the Road Guidelines (**Appendix B**, Best Management Practices [see Volume II~~I~~]), the Riparian Management Guidelines (BLM 1985e), and PACFISH (BLM and Forest Service 1995) would minimize effects on riparian vegetation from vehicle use or roadway erosion. Federal listing of salmon, steelhead, and bull trout, provides for increased riparian protection in watersheds with listed fish. All sixth-code HUCs within the planning area provide habitat for one or more listed fish.

Implementing riparian management guidelines would create buffer zones in which actions must protect or improve riparian-dependent resources, ensuring that there would be no adverse effects on vegetation or other riparian resources.

Designing projects to avoid potential for mass wasting could protect riparian vegetation by reducing potential for disturbance from landslides. Such disturbance could increase the weed potential or allow for localized vegetation changes. The PACFISH (BLM and Forest Service 1995) provides measures to restrict land uses on landslide-prone areas.

Effects from Water Resources Management

Implementing road guidelines and riparian management guidelines would have similar effects, as described under Effects from Soils Management.

Wetland and riparian vegetation plays an integral part in ensuring that watersheds capture, retain, and release water appropriately. Therefore, developing plans to alleviate watershed problems would by necessity require maintaining or restoring such vegetation.

Maintaining thermal water quality would require maintaining sufficient riparian vegetation to provide thermal regulation of fish-bearing streams. This would require maintaining normal canopy height, composition, density, and structure in riparian areas. Federal listing of salmon, steelhead, and bull trout provides for increased riparian protection in watersheds with listed fish. All sixth-code HUCs within the planning area provide habitat for one or more listed fish. Riparian Management Guidelines (BLM 1985e) and PACFISH (BLM and Forest Service 1995) provide for various land use restrictions within default buffer areas.

Effects from Vegetation—Forests Management

Riparian vegetation would be protected from direct effects from timber harvest and other forest practices by implementing buffers according to the riparian management guidelines. Although some timber harvest may still be allowed in buffer zones, it would be subject to guidelines that would ensure that soils and vegetation were preserved or enhanced. Riparian Management Guidelines (BLM 1985e) and PACFISH (BLM and Forest Service 1995) provide for timber harvest restrictions within default buffer areas. Under Alternative A, these buffers amount to 24,290 acres.

Effects from Vegetation—Weeds Management

Possible restrictions on use of herbicides in riparian and aquatic areas may reduce the efficiency of BLM weed control efforts.

Inventorying and mapping weed populations would allow the BLM to prioritize treatment areas and minimize infestation of riparian and wetland areas. Instituting weed control measures for particular actions would help to fund and expand the BLM's weed control program.

Incorporating weed-control measures into contracts would diminish the possibility of new infestations in riparian and wetland areas, provided that the measures included such requirements as vehicle pre- and post-washing and restoration actions for disturbed soils/vegetation.

Effects from Vegetation—Riparian and Wetlands Management

A total of 24,290 acres of riparian habitat would be protected as RHCAs under this alternative. Effects are described under Effects Common to All Alternatives, above.

Improving 7.25 miles of streams from poor to fair or better condition would require restoration of riparian zones in these particular areas to the extent that degraded riparian areas could be restored by changed BLM management actions or other site specific restoration actions.

Effects from Wildlife and Special Status Wildlife Management

Measures to protect sensitive animal species, including the yellow-billed cuckoo and willow flycatcher, that depend on riparian areas for all or part of their lifecycle would require preservation or enhancement of riparian conditions. However, few special status animal species in the CFO are riparian-dependent, so wildlife management actions under this alternative would have little effect on riparian areas.

Improving conditions on 8,803 acres of ~~range~~ rangeland for wildlife benefit would involve improvements to riparian habitat to the extent that riparian habitat occurs in this rangeland. Improvements may occur from reduced grazing, prescribed burning, vehicle restrictions, and manipulation of cover/forage ratios.

Development of new or continuation of existing wildlife HMPs would often have direct and indirect beneficial effects for riparian habitats.

Effects from Aquatic Resources, Fish, and Special Status Fish Management

Developing aquatic HMPs to maintain fisheries habitat and riparian areas would result in increased management of vegetation in riparian zones along these waterways. Few actions beyond current management are proposed that would affect riparian areas.

Effects from Special Status Plants Management

Measures to protect sensitive plant species, including Case's corydalis *(Corydalis caseana ssp hastata)*, chatterbox orchid *(Epipactis ~~gigantcum~~gigantea),* Douglas' clover *(Trifolium douglasii)*, western ladies tresses *(Spiranthes porrifolia)*, spacious monkey flower *(Mimulus ampliatus)*, and Idaho barren strawberry *(Waldsteinia idahoensis)*, that depend on riparian areas for all or part of their lifecycle would require preservation or enhancement of riparian conditions. Actions required to accomplish this may require restrictions on soil and vegetation treatments in riparian areas. Such affected land uses may include road construction, timber harvest, and grazing management, leading to direct effects on riparian vegetation and reducing the potential for weed infestation, soil compaction, and erosion.

Effects from Wildland Fire Management

Most effects on riparian vegetation from wildfire management are described under Effects Common to All Alternatives. In general, management measures under this alternative are less proactive than under the action alternatives.

Effects from Visual Resources Management

Under Alternative A, 12,704 acres would be designated as VRM Class I, and 41,195 acres would be designated as Class II. Effects are described under Effects Common to All Alternatives, above.

Effects from Forest Products Management

Under this alternative, logging would only be allowed in riparian areas for salvage operations or to attain PFC goals, assuming that such practices did not affect attainment of riparian management objectives. Some treatments would be allowed but only those that would result in maintenance or enhancement of riparian resources. Therefore, riparian areas would be minimally affected by logging practices. Potential indirect effects are listed under Effects Common to All Alternatives. Such effects are most likely to occur where riparian areas are very wide and are adjacent to the 24,257 acres classified for intensive forest practices and are least likely to occur in areas adjacent to the 37,549 acres classified for custodial forest management.

Effects from Livestock Grazing Management

Despite measures to minimize impacts, grazing has the potential to cause extensive effects on riparian resources as described under Effects Common to All Alternatives. This alternative offers 2,128 acres of riparian areas to grazing livestock (out of 122,732 acres). The riparian/wetlands acres would be 1.94 percent of the total acres. The BLM has consulted with the National Marine Fisheries Service and USFWS in relation to listed species and has implemented riparian use criteria and

monitoring in order to assure grazing use in critical habitat is compatible with listed species, minimizing the potential for adverse effects in critical habitat areas. Other areas not considered critical habitat for listed species must meet the Idaho Standards for Rangeland Health and Guidelines for Livestock Grazing Management (BLM 1997a) (**Appendix A** [see Volume II~~I~~]), which contain criteria for riparian habitat quality. Meeting such criteria would help to minimize effects on riparian habitat from livestock grazing.

Effects from Minerals Management

Managing ACECs as NSO would keep 23,219 acres off limits to surface occupancy associated with leasable mineral activities, and in most cases, mineral material activities. Although this would protect riparian zones within those lands from effects associated with these activities, the protected amount is the least of any alternative; therefore, the potential for effects is greatest under this alternative.

Effects from Recreation Management

Under this alternative, 33,197 acres would be designated as ROS classes Primitive or Semiprimitive Nonmotorized. These areas could be subject to disturbance under the other ROS classes.

Developing SRMA activity plans for Salmon River Scenic, Salmon River Recreational, and Clearwater River SRMAs would take into account potential effects on riparian ecosystems, potentially lowering the possibility of effects to such areas.

Under this alternative, 26,682 acres would be designated as SRMAs. Projected increases in recreation would occur but would be matched by commensurate increases in management on less land. Cross-country motorized vehicle travel can impact riparian vegetation and soils and accelerate spread of weeds.

Effects from Renewable Energy Management

Potential effects from renewable energy projects are similar to those that could occur from minerals management, forest vegetation management, and forest products management (see those sections under Effects Common to All Alternatives).

Effects from Transportation and Travel Management

Potential for the types of effects listed under Effects Common to All Alternatives is greatest under Alternative A. This is because 85,308 acres are Open to OHV use. Also, because there are fewer restrictions and possibly less area covered under riparian management units than under RCA stream buffers, potential effects on riparian areas from OHV use and road construction is generally greater.

Effects from Lands and Realty Management

Initiating road easement acquisition only after development of activity plans would require assessment of potential effects on riparian resources. Such effects would be considered on a project-level basis.

Continued withdrawal of public lands located within 0.25-mile of the Salmon River would provide protection of riparian areas along the Salmon River from potential impacts associated with mining. Although this would affect 18,532 acres, this area is already heavily impacted by weeds, minimizing one of the main benefits of withdrawal.

Effects from ACEC/RNA Management

Prohibiting livestock grazing and logging in the Captain John Creek area would reduce defoliation and promote soil and bank integrity on 1,321 acres, some of which are in riparian areas. Permitting no new rights-of-way or roads within 300 feet of Lolo Creek would protect riparian resources within that buffer strip from direct loss of vegetation or loss of soil and bank integrity. Maintenance and protection of resource values identified for designation of ACEC/RNAs would have direct and indirect benefits to riparian habitats found in Craig Mountain, Lower Salmon, and Lucile Cave ACECs, including bank and soil stabilization and increased protection of vegetation.

Alternative B

Effects from Geology Management

Increasing public awareness of unique geological features would create opportunities for increasing awareness of the value of other unique features, including riparian areas and wetlands.

Increased public access to unique geological sites could affect riparian areas and wetlands if such access brought more people to or through these areas. Potential effects would include creation of social trails, loss of vegetation, fragmentation of habitat, and increased chances of weed introduction; these potential effects would be minimized by proper trail maintenance, placing educational signs, and routing access ways away from sensitive features.

Effects from Soils Management

Implementing BMPs for soil-disturbing activities would minimize soil erosion and protect riparian habitats to a greater degree than the MFP Road Guidelines (BLM 1981a) or the Riparian Management Guidelines (BLM 1985e). This would require the BLM to maintain or increase PFC of riparian habitats.

Measures to protect landslide-prone areas and minimize potential for mass wasting would protect riparian habitat to the extent that it occurs in landslide-prone areas. Measures implemented under all alternatives are similar in regards to actions allowed within riparian habitats and landslide-prone areas, which may impact soils and vegetation.

Effects from Water Resources Management

Promoting activities to achieve DFCs in restoration watersheds would help increase the amount of PFC riparian habitat and indirectly benefit aquatic resources. ~~Thirty-two~~Twenty-eight watersheds would be managed as restoration watersheds and ~~1~~ three would be managed as~~ a~~ conservation watersheds, totaling 64,481 acres, which is 2 percent less than the prescription watersheds in Alternative A (66,077 acres).

Effects from Vegetation—Forests Management

Riparian vegetation would be protected from direct effects from timber harvest and other forest practices by placing 22,847 acres into RCA stream buffers according to the Aquatic and Riparian Management Strategy (**Appendix F** [see Volume II~~I~~]), 1,443 acres less than Alternative A. Although some timber extraction may still be allowed in buffer zones, it would be done only to enhance or preserve riparian conditions.

Effects from Vegetation—Weeds Management

Although there are no weed management actions specifically for riparian areas, actions to prevent the introduction of weeds or prevent the spread of existing ones would benefit habitat in riparian areas, similar to Alternative A. Measures to increase public awareness are increased under this alternative, as are measures to restore weed-affected areas and remove weed infestations. Weed potential in riparian areas would decrease under this alternative due to these increased measures.

Effects from Vegetation—Riparian and Wetlands Management

This alternative would place 22,847 acres into RCA stream buffers, which is 6 percent less than Alternative A. Most effects are described under Effects Common to All Alternatives. Overall efforts to restore degraded riparian resources or to decrease potential effects, including land use restrictions and active recontouring and reseeding, would be increased under this alternative and would lead to improved riparian health over current conditions. These efforts would be part of the BLM's strategy of moving sites toward PFC.

Effects from Wildlife and Special Status Wildlife Management

Actions to restore, protect, or maintain habitat for listed species would require maintaining adequate roost trees for bald eagles and cover for the yellow-billed cuckoo. Protecting both of these species would require maintaining adequate canopy structure and understory complexity, both of which are measures of PFC. Restoring unnecessary roads and trails would decrease habitat fragmentation and reduce disturbances that could increase weed potential.

Designing projects to preserve wildlife travel corridors would require preservation of adequate vegetation along riparian corridors, as these areas are frequently used for migration and travel by wildlife due to the density of vegetation found there.

Implementing grazing season of use would protect riparian habitat during sensitive periods in the lifecycle of aquatic species, indirectly leading to short-term effects on riparian vegetation. Development of new or continuation of existing wildlife HMPs would often have direct and indirect beneficial effects for riparian habitats and dependent wildlife.

Effects from Aquatic Resources, Fish, and Special Status Fish Management

Implementing specific standards and guidelines according to the Aquatic and Riparian Management Strategy (**Appendix F** [see Volume II~~I~~]) would allow only those activities that would minimize effects to riparian resources.

~~Thirty-two~~Twenty-eight watersheds would be managed as restoration watersheds and ~~1~~ three would be managed as~~ a~~ conservation watersheds (totaling 64,481 acres), which is 2 percent less than the prescription watersheds in Alternative A (66,077 acres). Development of new or continuation of existing aquatic HMPs would often have direct and indirect beneficial effects for riparian habitats and native fish species.

Effects from Special Status Plants Management

Effects would be the same as those described under Alternative A.

Effects from Wildland Fire Management

Effects would be similar to those described under Alternative A, although under this alternative effects may occur to riparian resources in the Craig Mountain ~~FMU~~FMA and portions of the Salmon ~~FMU~~FMA through evaluating and using wildfire for resource benefits.

Chemical, mechanical, or biological treatments on FRCC 2 or 3 lands may improve forest and rangeland health and would improve riparian health to the extent that such habitat is found in treated areas. Fuels treatments that emphasize biomass utilization would not affect riparian resources within RCA, since only actions that maintain or enhance such habitat would be allowed. Suspending livestock grazing in burned areas would decrease potential for damage to soils or vegetation made sensitive by being burned.

Effects from Visual Management

Effects under Alternative B would be the same as those described under Alternative A.

Effects from Forest Products Management

Potential impacts from forest products management are described under the Forest Products Management section of Effects Common to all Alternatives. As mentioned previously, a PSQ of 3,129 MBF on 40,598 acres is less than Alternative A (6,600 MBF on 35,757 acres), meaning that there is less potential for effects from logging activities under this alternative.

Protection of riparian areas during road construction would be provided by the buffer zones associated with the Road Construction Guidelines and the Aquatic and Riparian Management Strategy (**Appendix F** [see Volume II~~I~~]). The potential impacts based on buffer zone size are described under the Effects from Vegetation—Riparian and Wetlands Management section.

Effects from Livestock Grazing Management

Livestock grazing would be permitted on 1,880 aces of riparian areas (out of 105,619 acres) under Alternative B. The riparian/wetland acres would be 1.78 percent of the total acres and would be 11.65 percent less than offered for grazing under Alternative A. Therefore, potential effects are lower under this alternative than under Alternative A. Potential effects are listed under Effects Common to All Alternatives.

Effects from Minerals Management

The NSO stipulations would protect riparian habitats from surface-disturbing activities such as vegetation removal on 43,590 acres. Riparian habitats in river segments identified as suitable for inclusion in the NWSRS would be protected from minerals activities within 0.25-mile of the river.

Effects from Recreation Management

Under this alternative, similar to Alternatives C and D, 42,695 acres would be classified as Primitive or Semiprimitive Nonmotorized, decreasing the potential for disturbance of riparian zones in these areas relative to current management by approximately 20 percent.

Effects from Renewable Energy Management

Effects would be the same as those described under Alternative ~~B~~A.

Effects from Transportation and Travel Management

Potential for effects described under Effects Common to All Alternatives would decrease relative to current management since areas Open to cross-country OHV travel would be Closed or placed under restrictions. Limited travel areas would be increased to 125,729 acres and would be limited to designated routes, as opposed to existing routes in Alternative A. Potential for effects under this alternative would be lower than Alternative A.

Effects from Lands and Realty Management

Retention of public lands along the Salmon River would provide continued protection of riparian areas along the Salmon River from private land uses such as development or timber harvest.

Withdrawing public lands located on the Lower Salmon River would increase protection of riparian areas along the Salmon River from potential impacts associated with mining.

Consolidating right-of-way corridors would reduce potential loss of vegetation that is common to right-of-way construction and would reduce weed potential by minimizing right-of-way construction areas. This would reduce potential effects on riparian vegetation to the degree that rights-of-way cross riparian zones.

Effects from ACEC/RNA Management

In general, measures to improve conditions in ACEC/RNAs may improve conditions in riparian areas to the degree that riparian areas occur in ACEC/RNAs. Such measures include controlling nonnative vegetation, prohibiting soil or vegetation disturbance, and restricting grazing in some areas or at particular times, as described under Alternative A. Overall, effects on riparian vegetation are similar to those under the other alternatives. Developing and implementing a management strategy to support restoration of Cottonwood Flats would potentially result in better riparian cottonwood habitat than under current management. Listing the East Fork American River as an ACEC and allowing vegetation treatments to occur in ways that would afford maximum protection to the site would result in greater protection of riparian areas in this 570-acre parcel. In addition, by protective the Upper Lolo Creek as an ACEC and ensuring that new road construction is temporary, and making weed control a high priority would decrease the potential for effects. Assuming that classification as ACECs would protect resources in a given area to a greater degree than in other areas, this alternative would increase protection by ~~8,928~~10,553 acres (~~35~~ 41 percent) relative to Alternative A.

Alternative C

Effects from Geology Management

Effects would be the same as those described under Alternative B.

Effects from Soils Management

Effects would be the same as those described under Alternative B.

Effects from Water Resources Management

Effects would be similar to those described under Alternative B, except that a greater amount of protection and restoration would occur by managing 6 percent more watershed acres as conservation and restoration watersheds. This is 3 percent more watershed acres than prescription

watersheds in Alternative A and represents the greatest amount of watershed management of any of the alternatives. It also offers the most potential for restoration and protection of any alternative.

Effects from Vegetation—Forests Management

Effects would be similar to Alternative A, except that RCA stream buffers would be increased by 3,334 acres, decreasing the potential for effects.

Effects from Vegetation—Weeds Management

Effects would be the same as those described under Alternative B.

Effects from Vegetation—Rangelands Management

Effects would be similar to those described under Alternative B, except that 1,957 acres of riparian areas would be incorporated into allotments, the least of any alternative. This would lead to the lowest potential effect from livestock grazing.

Effects from Vegetation—Riparian and Wetlands Management

Effects would be similar to those described under Alternative B, except that 27,624 acres would be considered RCA stream buffers (21 percent more than Alternative B and 14 percent more than Alternative A). This is the most of any alternative; therefore, the potential for effects is lowest under this alternative.

Effects from Wildlife and Special Status Wildlife Management

Effects would be the same as those described under Alternative B.

Effects from Aquatic Resources, Fish, and Special Status Fish Management

Effects would be similar to those described under Alternative B, except that 6 percent more watershed acres managed as conservation and restoration watersheds under Alternative C. This would be 3 percent more watershed acres than prescription watersheds in Alternative A and would be the most of any alternative, resulting in the greatest protection and restoration potential of any alternative.

Effects from Special Status Plants Management

Effects would be the same as those described under Alternative ~~B~~A.

Effects from Wildland Fire Management

Effects would be similar to those described under Alternative B, except that every fire would be evaluated for its potential to assist in achieving resource goals, possibly increasing beneficial uses of this resource similar to Alternative A and to a greater extent than the other alternatives. Treated FRCC 2 and 3 (moderate to high risk) WUI areas would decrease by up to 20 percent under this alternative relative to Alternative B, potentially decreasing benefits to riparian vegetation from this resource use.

Effects from Visual Management

Effects would be similar to those described under Alternative B, except that the amount of land in VRM Classes I and II would increase to 73,699 acres, the most of any alternative, thereby reducing potential for disturbance in riparian areas more than any other alternative.

Effects from Forest Products Management

Effects would be similar to those described under Alternative B, except that PSQ would be reduced from 3,129 MBF to 3,101 MBF, and the commercial land base would be lowest of any alternative. Estimated PSQ would be 53 percent lower than under Alternative A. This alternative offers the lowest potential for effects from forest products management of any alternative.

Effects from Livestock Grazing Management

Livestock grazing would be permitted on 1,765 aces of riparian areas (out of 101,350 acres) under Alternative C. The riparian/wetland acres would be 1.74 percent of the total acres and would be 17.06 percent less than offered for grazing under Alternative A, as well as being less than under any other alternative. Therefore, potential grazing-related effects would be least under this alternative. Potential effects are listed under Effects Common to All Alternatives.

Effects from Minerals Management

Effects would be similar to those described under Alternative B, except that NSO restrictions on leasable minerals activities would increase to 68,854 acres, the most of any alternative. Therefore, potential mining ~~mineral~~ related effects would be least under this alternative.

Effects from Recreation Management

Effects would be the same as those described under Alternative B.

Effects from Renewable Energy Management

Effects would be the same as those described under Alternative B.

Effects from Transportation and Travel Management

Effects would be similar to those described under Alternative B, except that additional measures would be taken to reduce motor vehicle use in certain areas, potentially resulting in reduced effects on riparian resources.

Effects from Lands and Realty Management

Effects would be the same as those described under Alternative B.

Effects from ACEC/RNA Management

Effects would be similar to those described under Alternative A, except that ACECs would increase by 35,601 acres (135 percent), potentially increasing the amount of riparian areas protected under this designation. In addition, classifying the Craig Mountain ACEC for custodial timber management, increasing the area by 19,386 acres, excluding livestock grazing, ensuring that new road construction is temporary, and making weed control a high priority would decrease the potential for effects. ~~Similar effects would occur by protecting Upper Lolo Creek as an ACEC.~~

Alternative D

Effects from Geology Management

Effects would be the same as those described under Alternative B.

Effects from Soils Management

Effects would be the same as those described under Alternative B.

Effects from Water Resources Management

Effects would be similar to those described under Alternative B, except that the BLM would manage 52,118 acres as conservation and restoration watersheds, 19 percent fewer watershed acres than Alternative B and 21 percent fewer than prescription watersheds in Alternative A. This is the least amount of watershed management of any alternative and offers the least potential for restoration and protection.

Effects from Vegetation—Forests Management

Effects would be similar to Alternative A, except that RCA stream buffers would be decreased by 3,580 acres, increasing the potential for effects.

Effects from Vegetation—Weeds Management

Effects would be the same as those described under Alternative B.

Effects from Vegetation—Riparian and Wetlands Management

Effects would be similar to those described under Alternative B, except that 20,710 acres would be considered RCA stream buffers, which is 9 percent less than Alternative B and 15 percent less than Alternative A. This is the least of any action alternative; therefore, potential for effects is highest under this alternative.

Effects from Wildlife and Special Status Wildlife Management

Effects would be the same as those described under Alternative B.

Effects from Aquatic Resources, Fish, and Special Status Fish Management

Effects would be similar to those described under Alternative B, except that managing 52,118 acres as conservation and restoration watersheds would be the least of any alternative, resulting in the least riparian protection and restoration potential.

Effects from Special Status Plants Management

Effects would be the same as those described under Alternative B.

Effects from Wildland Fire Management

Effects would be similar to those described under Alternative B, except that only fires occurring in areas managed for custodial forest management or areas not authorized for livestock grazing would be evaluated for their potential to assist in achieving resource goals, which would greatly reduce the number of wildfires that could be used for riparian resource benefits.

Alternative D offers the highest annual treatment goal of any alternative, potentially increasing riparian areas treated by prescription fire, chemical or biological methods by up to 20 percent over Alternative B and 40 percent over Alternative C.

Effects from Visual Management

Effects would be similar to those described under Alternative B, except that the amount of area in VRM Classes I and II would decrease to 30,313 acres, the lowest of any alternative. Therefore, this alternative would increase potential for disturbance in riparian areas more than any other alternative.

Effects from Forest Products Management

Effects would be similar to those described under Alternative B, except that PSQ would be increased to 4,823 MBF (decreased from an estimated annual ASQ of 6,600 MBF, or 27 percent,

from Alternative A), and the commercial land base of 45,190 acres would be the highest of any alternative. Therefore, this alternative offers the highest potential for effects to riparian areas from forest products management. As with all alternatives, riparian buffers would shield riparian areas from effects of most forest products activities, as these are most likely to occur in upland areas.

Effects from Livestock Grazing Management

Livestock grazing would be permitted on 2,324 aces of riparian areas (out of 135,850 acres) under Alternative D. The riparian/wetland acres would be 1.71 percent of the total acres and would be 9.21 percent more than offered for grazing under Alternative A, and would be more than any other alternative. Therefore, potential for grazing-related effects is highest under this alternative. Potential effects are listed under Effects Common to All Alternatives.

Effects from Minerals Management

Effects would be similar to those described under Alternative B, except that NSO restrictions would decrease to 35,045 acres, the least restrictive of any action alternative (Alternatives B, C, and D), but more restrictive than Alternative A. Therefore, potential effects to riparian resources from mineral management would be the second highest under this alternative.

Effects from Recreation Management

Effects would be the same as those described under Alternative B.

Effects from Renewable Energy Management

Effects would be the same as those described under Alternative B.

Effects from Transportation and Travel Management

Under this alternative, 23,189 acres would be Open to cross-country travel, which is the most except under Alternative A, and OHV use would be limited on 102,542 acres, which is the least of any action alternative. Cross-country motorized vehicle travel could impact soils and vegetation in riparian habitats and increase weed infestations. Establishing these designations would create the highest potential for effects of any action alternative) However, potential for effects is lower than under Alternative A.

Effects from Lands and Realty Management

Effects would be the same as those described under Alternative B.

Effects from ACEC/RNA Management

Effects would be similar to those described under Alternative B. ACECs would increase slightly from current management, potentially increasing the amount of riparian areas protected under this designation. In addition, the potential for short-term disturbance of riparian vegetation or soils would increase relative to other alternatives by using livestock grazing to support achievement of goals and objectives identified for ACEC/RNAs, but would be offset by long-term benefits of achieving resource goals by use of this method.

~~*Effects from Public Safety—Abandoned Mines and Hazardous Materials Management*~~

~~Effects would be the same as those described under Alternative B.~~

Cumulative Effects

Past actions that are relevant to riparian resources in the cumulative impact area include land tenure changes, wildland fire and wildland fire use and suppression, fuel and vegetation treatments, salable minerals, population growth, urban development, recreational use, OHV use, stream and watershed restoration activities, regional planning efforts, weed management efforts, and grazing. The types of impacts that have occurred and would continue to occur include direct destruction of riparian resources, loss of plant diversity, changes to canopy structure, loss of soil integrity, reduced riparian function, enhanced weed control efforts, greater focus on restoration of affected areas, and greater focus on use of wildland fire for resource benefits.

Watershed restoration efforts throughout the planning area would result in improvements to riparian areas. Alternative C would include the greatest number and acres of restoration and conservation watersheds and would contribute most to this trend. Because long-term wildfire suppression has led to circumstances where stand-replacing wildfire can occur and severely affect riparian resources, regional fire planning on the part of various land-management agencies, along with implementation of individual fire plans, would directly influence riparian health in the cumulative impact area, with those plans that promote a return to a natural fire regime leading to highest riparian health. Increased population, particularly in WUI areas, makes the use of wildfire for resource benefits more difficult than in other, less-populated areas. Increased fuels treatments, although generally carried out in non-riparian areas, would indirectly affect riparian resources by reducing potentially stand-replacing wildfires. Alternative D would treat the most area, with Alternative C treating the least. Under all alternatives, grazing management would comply with the same standards in practice in other parts of the planning area. The differences in treatment areas and grazed areas between the alternatives amounts to at most several thousand acres, which is a small portion of the overall planning area, therefore effects to the overall planning area are minimal under any alternative.

Cumulative effects would be similar among the alternatives. Alternative A would contribute to more regional cumulative effects resulting from land tenure adjustments, open OHV use, and wildland fire suppression. In general, Alternatives B, C, and D would provide more management measures than Alternative A that would directly or indirectly reduce the potential for cumulative impacts. However, each of these alternatives also would accelerate fuel-reduction treatments using all available methods within five years and would have fewer restrictions on wildland fire use for resource benefit. These measures could contribute to cumulative impacts on riparian resources. The emphasis in Alternative C on actions that value resource conservation, protection, and minimal human intervention would have the least impact or risk of impacts to riparian resources and would contribute the least to cumulative impacts. Overall, the actions proposed under any of the alternatives would not contribute to effects on a planning-area wide scale.

4.2.9 Wildlife and Special Status Wildlife

Goal: Manage habitat to contribute to the conservation of special status species habitats and to maintain biological diversity of wildlife.

Summary

Actions that increase habitat disturbance potential and alter vegetation structure, composition, and distribution generally have the greatest impact on wildlife. These actions result from timber harvest,

road building, increased recreation use, livestock grazing, fire, mineral extraction, and construction of any type of infrastructure. Proposed management practices can mitigate many of the effects from these actions. Alternative C would best manage habitat to maintain biological diversity of wildlife, followed by Alternatives B, A, and then D.

Alternative A would not address all species that have been listed as threatened, endangered, species of concern, or sensitive species with USFWS, Idaho Department of Fish and Game, and Idaho BLM. Alternatives B, C, and D would provide updated list and status for special status species and management emphasis and added focus for protection, conservation, or restoration of special status species habitat.

The BLM has established procedures and policies that assess the effects of existing and proposed projects on BLM-managed lands. The BLM would be responsible for analyzing potential impacts to ensure that activities would not cause significant adverse effects on the habitats that support native fish and desirable nonnative fish species. The BLM would be responsible for analyzing potential impacts and for taking appropriate actions to ensure that special status/BLM Sensitive designation is no longer warranted.~~The BLM would be responsible for analyzing potential impacts to ensure that no significant adverse effects would occur to BLM sensitive species or habitats.~~ In addition, the BLM may consult with USFWS in accordance with ESA Section 7 on activities that may affect federally listed species. **Table 4-13** identifies the indicators that were used to analyze effects under each alternative.

Table 4-13
Comparison of Wildlife and Special Status Wildlife Indicators by Alternative

Indicator	Alternative A	Alternative B	Alternative C	Alternative D
What: Measures of composition, structure, diversity, and relative abundance of habitat components	Snag (dead standing trees) management on 60% of each timber harvest area	Snag management on 100% of each timber harvest area and buffers	Snag management on 100% of each timber harvest area and buffers	Snag management on 100% of each timber harvest area and buffers
	No DFC management	10% old forest DFC=24,789 acres	20% old forest DFC=28,087 acres	No DFC management
	Similar weed management across alternatives	Similar weed management across alternatives	Similar weed management across alternatives	Similar weed management across alternatives
Where: Measures of distribution, patterns, and habitat component connectivity	Least potential number and area of ACECs, rivers suitable for the NWSRS, wilderness areas	Moderate potential number and area of ACECs, rivers suitable for the NWSRS, wilderness areas	Greatest potential number and area of ACECs, rivers suitable for the NWSRS, wilderness areas	Less potential than Alternative B
Causal factors: Measures of processes and disturbances, geo-climatic capability, historical range of variability	Estimated 358 acres of forest harvest/treatment per year	Estimated 242 acres of forest harvest/treatment per year	Estimated 191 acres of forest harvest/treatment per year	Estimated 361 acres of forest harvest/treatment per year
	35,757 acres of commercial forest	40,598 acres of commercial forest	34,611 acres of commercial forest	45,190 acres of commercial forest

Table 4-13
Comparison of Wildlife and Special Status Wildlife Indicators by Alternative *(continued)*

Indicator	Alternative A	Alternative B	Alternative C	Alternative D
	1,530 to 4,800 acres of forest treated by prescribed fire or mechanical fuel reduction per year	1,182 to 3,545 acres of forest treated by prescribed fire or mechanical fuel reduction per year; Vegetation treatments would support achievement of natural ecosystem functions, which may include natural fire regimes, stand structure, and fuel reduction in the WUI	1,448 to 5,377 acres of forest treated by prescribed fire or mechanical fuel reduction per year; Vegetation treatments would support achievement of natural ecosystem functions, which may include natural fire regimes, stand structure, and fuel reduction in the WUI	2,870 to 7,597 acres of forest treated by prescribed fire or mechanical fuel reduction per year; Vegetation treatments would support achievement of natural ecosystem functions, which may include natural fire regimes, stand structure, and fuel reduction in the WUI
	12,704 acres VRM I	12,704 acres VRM I	26,945 acres VRM I	7,205 acres VRM I
	7,~~204~~ 200 AUMs	~~6,254~~6,263 AUMs	6,020 AUMs	8,54~~0~~9 AUMs
	14,381 acres Primitive ROS	6,200 acres Primitive ROS	6,200 acres Primitive ROS	6,200 acres Primitive ROS
	0 acres NSO (case-by-case basis)	43,590 acres NSO	68,854 acres NSO	35,045 acres NSO
	No DFC management	24,789 acres DFC management (timbered blocks over 1,000 acres)	28,087 acres DFC management (timbered blocks over 500 acres)	No DFC management
Identify acreages for "no net increase in open roads/trails for motorized use"	0	101,526 acres	75,772 acres; 38,733 acres for "strive for decrease"	0
Habitat quality and trends	122,735 acres available for grazing	105,619 acres available for grazing	101,414 acres available for grazing	135,850 acres available for grazing
Acres of RHCAs in prescription watersheds or RCAs in conservation and restoration watersheds (on BLM lands)	24,290 (RHCAs in prescription watersheds)	22,847 (RCAs in conservation and restoration watersheds)	27,624 (RCAs in conservation and restoration watersheds)	20,710 (RCAs in conservation and restoration watersheds)
Acres of Open travel areas	85,308	0	0	23,189
Acres Limited travel areas	40,437 (limited to existing routes)	125,729 (limited to designated routes)	125,729 (limited to designated routes)	102,542 (limited to designated routes)

Source: BLM 2004a

Methods of Analysis

Indicators

Indicators used to assess impacts are outlined in **Table 4-13**, Comparison of Wildlife and Special Status Wildlife Indicators by Alternative.

Methods and Assumptions

Wildlife health within the CFO is directly related to the overall ecosystem health, habitat abundance, habitat fragmentation, and wildlife security provided, and thus most resource management actions have at least an indirect effect on wildlife. Impact analysis on wildlife resources included an assessment of whether each action would result in the possible destruction, degradation, or modification of habitat, as well as impacts that could improve wildlife habitat. A large proportion of actions under all alternatives are mitigation measures for other actions and protective measures, so that many of the individual actions could improve wildlife habitats or the health of populations, depending on the success of the action when completed. The degree of impact attributed to any one management action or series of actions is influenced by the watershed, time and degree of action, existing vegetation, and precipitation. The indicators listed above were used to guide, frame, and measure impacts.

Impacts were identified with the use of best professional judgment and were assessed according to the following assumptions:

- Success of mitigation is dependent on specific protective measures, past results, and the assumption that proper implementation of such would take place;
- Implementation-level actions will be further assessed at an appropriate spatial and temporal scale and level of detail;
- Additional field inventories could be needed to support implementation-level decisions, which may be subject to further analysis under NEPA; and
- Implementation-level decisions that may affect species listed under ESA would be subject to appropriate ESA Section 7 consultation with USFWS.

Effects Common to All Alternatives

Effects from Soils Management

Under all alternatives wildlife habitat would be indirectly conserved via conservation measures to prevent erosion and other degradations to soil, which in turn diminishes impacts on vegetation and thus wildlife habitats. Preventing sedimentation in water courses also can improve the health of fish populations, which benefits fish-eating wildlife, such as bald eagle.

Effects from Water Resources Management

Effective watershed management, which minimizes erosion, maintains hydrologic flow, and maintains vegetative community health, would result in healthy and diverse plant communities, which in turn provide wildlife habitat, especially in riparian areas. Healthy watersheds improve fish habitat, which in turn provides foraging opportunities for fish-eating wildlife.

Effects from Vegetation—Forests Management

Vegetation treatments that alter tree species composition or stand structure for specific resource objectives or for commercial value would alter wildlife habitats immediately. This would improve

habitat for some species, especially those that select more early-seral or open forest habitats, and would degrade habitats for others, especially those that prefer denser and structurally diverse habitats. These treatments may return forests to a condition closer to historic composition or a desired condition in the long-term. Impacts would be highly dependent on (1) species, (2) habitat conditions before and after treatments, (3) type of treatment, (4) details of how each treatment is carried out, (5) adjacent habitat types, and (6) long-term management of each area after treatments.

Effects from Vegetation—Weeds Management

Spread of noxious and invasive weeds results in decreases in habitat quality, habitat diversity and forage for wildlife. Treatment actions would not be sufficient to control the spread of weeds into all wildlife habitats but would reduce these impacts in treated areas. Actions to prevent and control invasive and noxious weeds using integrated weed management techniques could reduce or at least slow down the rate of increase in the CFO and severity of damage to wildlife habitats across all alternatives. Reducing the quantity of invasive species, thereby decreasing plant competition, would allow native species vital to wildlife to increase (or at least slow down the rate of decrease). Although weed treatments would generally improve wildlife habitats in the long term, short-term disturbances to wildlife would occur. Weed treatment actions could remove forage and cover in areas dominated by weeds, resulting in short-term impacts on wildlife that are using weed infested areas. Short-term impacts would vary by type of application. All treatments, especially mechanical treatments, would cause some species to temporarily avoid treated areas. Some injury and mortality could occur from machinery, especially for small less mobile species. Herbicides would be applied with all applicable guidelines to prevent harm to wildlife, but some residual risk would still exist.

Effects from Vegetation—Riparian and Wetlands Management

Actions that would improve riparian and wetland PFC would in turn improve habitats for riparian- and wetland-dependent wildlife species, especially via increases in quantity and quality of riparian vegetation. Affected species could include bald eagle, yellow-billed cuckoo, harlequin duck, willow flycatcher, Coeur d'Alene salamander, Idaho giant salamander, western toad, several snail species, and other riparian-dependent wildlife.

Effects from Wildlife and Special Status Wildlife Management

Wildlife and special status wildlife management actions would generally improve wildlife habitats, with the exception of certain measures designed to improve habitat for one type of wildlife that could decrease habitat quality for another. Wildlife management emphasis would generally include multispecies benefits, and management emphasis would strive to achieve historic and natural habitat conditions. Actions related to general compliance with the ESA would be the same across alternatives. These include reviewing activities for impacts on listed species, consultation with USFWS as appropriate where listed species may be affected, coordination with USFWS on recovery efforts, and management under delisting (if applicable) and other requirements. Continuing bald eagle midwinter inventories for long-term trend information would continue to enhance appropriate opportunities for conservation and would contribute toward delisting the species by monitoring population size and distribution.

Effects from Aquatic Resources, Fish, and Special Status Fish Management

Generally any actions that increase fish populations can provide additional foraging opportunities for fish-eating wildlife, such as wading birds and bald eagles. Actions that result in improved health of aquatic systems can also result in improved aquatic invertebrate populations that are sources of

food for several species of waterfowl and American dipper (a song-bird that feeds on aquatic insects in streams). Any fish-related stream improvement actions that improve the quantity, quality, and structure of riparian vegetation indirectly increase the extent and improve the quality of riparian habitats for wildlife, such as yellow warbler, and BLM sensitive species, such as willow flycatcher.

Effects from Special Status Plants Management

Actions to conserve special status plant species generally would improve habitat and would protect wildlife species that occupy similar habitat types or that are affected by similar disturbances. Special status plant management objectives and management actions would strive to achieve good-quality habitats that support native plant populations, which support good-quality wildlife habitats. These actions include inventories, mapping, discretionary activity impact review, and consultation as appropriate with USFWS.

Effects from Wildland Fire Management

Fuel treatments would have similar impacts as forested vegetation treatments and may return sites to historic fuel loading and structure. Effects on wildlife would vary by the habitat needs of species. Fuel treatments would result in more open forested conditions improving habitat for species that select those types of habitats. Acreage of forest with dense multi-story cover would be reduced, decreasing available habitat for species that select those types of habitats. Effects would change over time. Short-term effects from any kind of vegetation treatment could temporarily displace wildlife. Habitats would be considerably changed immediately after treatments and then gradually evolve over time. Details of effects would vary considerably dependent on details of current conditions and treatments at a site-specific level. Wildland fire use in areas that have had fuel reductions would generally result in increased growth and vigor of forage plants and maintenance of open habitats.

Effects from Visual Resources Management

Impacts from visual resources on wildlife are indirect and come from actions under other areas of resource management that are authorized within each VRM class. Vegetation treatments, road construction, recreational facilities construction, and mining are actions that would change visual appearance and also would affect wildlife habitat and their associated species. Generally, VRM Classes III and IV would contain more alterations of wildlife habitat over time than VRM Classes I and II.

Effects from Forest Products Management

General types of impacts are similar to those under Effects from Vegetation—Forests Management. Discouraging livestock grazing in reforested areas until seedlings are at least three feet tall or five years old would reduce potential competition between ungulates and livestock for forage.

Effects from Livestock Grazing Management

Management of BLM lands to meet Idaho Standards for Rangeland Health and Guidelines for Livestock Grazing Management (BLM 1997a) (**Appendix A** [see Volume II~~I~~]) would minimize impacts from livestock grazing across alternatives. Potential impacts from livestock grazing include the following:

- Competition for forage, water, and space;
- Habitat alteration;
- Competition for grass and forbs for big game, such as elk, which is especially critical in winter;~~;~~

- Adverse impacts to bighorn sheep from domestic sheep and goat grazing because of potential for disease transmission;
- Degradations to stream banks from compression, sloughing, and removal of vegetation, resulting in erosion;
- Changes in plant species composition from overuse;
- Potential loss of shrubs in riparian areas, leading to a decrease in nesting riparian songbirds and bank stability;
- Appropriate levels of grazing, stimulating growth of some plant species and increasing succulents;
- Overgrazing, which decreases range condition;
- Weed control to reduce weed spread and resultant impact to native plant communities;
- Fences that create travel barriers, cause stress and energy loss, result in injury and death from entanglement, alter big game distribution, and create perches for predators;
- Fences for control of livestock to reduce impacts on vegetation, streams, and thus wildlife; ~~and~~
- Water developments that expand the spatial and temporal range of where both big game and livestock can exist, creating more pressure on vegetation and competition with each other~~.~~; and
- New water developments would allow increased use of an area by wildlife. New developments would provide previously unavailable watering sites for different wildlife species when livestock are not in the vicinity or conflicting with wildlife use of the area.

Effects from Minerals Management

Minerals management activities have the potential to impact wildlife everywhere except the Frank Church Wilderness, because mineral activities could occur everywhere but in the Wilderness. Minerals management impacts on wildlife generally occur from surface disturbance and thus loss and fragmentation of habitat, as well as disturbances from noise and movement from the exploration, construction, and operation of facilities and roads. Actions spell out where, how much, and what type of mineral exploration and extraction can occur. Generally, the tighter the restriction, the fewer impacts on wildlife.

Effects from Recreation Management

Impacts from recreation management actions can include loss or modification of habitat from construction of recreational facilities, including roads, which are addressed under Effects from Transportation and Travel Management. Other impacts are similar to the indirect impacts from transportation and travel management, such as increased human-wildlife interaction, which can cause animals to alter behaviors, home ranges, and habitat use and sometimes become physiologically stressed, especially in winter. Some bird species would abandon active nests if sufficiently disturbed.

Most BLM-managed lands (about 100,800 acres) would be open to snowmobiles, which can cause physiological stress in mammals from expending energy needed to stay warm with limited food supply. Limiting this type of travel to designated trails in the Craig Mountain WMA would reduce impacts on big game from snowmobiles in an area important to big game populations.

Effects from Renewable Energy Management

Potential impacts from renewable energy management are generally similar to those described under Effects from Minerals Management and Effects from Vegetation—Forests Management.

Effects from Transportation and Travel Management

Roads and trails can fragment habitats, reduce wildlife security areas, increase road kill, and alter home range and migration corridors of wildlife. On a broad general scale, roads decrease habitat quality and impair populations. The magnitude of impacts varies by species, habitat types, size and traffic volume of roads, and seasonal use. Species that require forest interior habitats, have large home ranges, follow distinct migration patterns, or are wary of humans are affected the most by roads. Roads, trails, and snowmobile access increase human-wildlife interactions. Vehicles can degrade wildlife habitats from surface disturbance and can displace and stress animals, which is especially important in winter. Motorized vehicle use and associated human uses that impact critical habitat niches for wildlife, such as den sites, nest sites, critical foraging areas, travel corridors, and security areas, are particularly vulnerable to wildlife disturbances and displacement.

Effects from Lands and Realty Management

Habitat fragmentation could be reduced via land acquisition and adjustment that reduces the checkerboard pattern of public lands ownership and increases the size of publicly owned blocks of land. Larger blocks of contiguous lands allow for consistent management of wildlife habitats without unregulated private land activities interspersed. Unfragmented lands are especially important to shy forest interior species. Degraded habitat on acquired lands could be improved. Public lands with low habitat value could also be exchanged for lands with better wildlife habitat or that are adjacent to unfragmented blocks.

Effects from ACEC/RNA Management

Generally special management areas such as ACECs and RNAs result in protection of wildlife from human activities and long-term improvement or at least maintenance of habitat quality because of numerous restrictions, such as OHV use, mineral exploration, and timber harvest. Several actions that protect resources within ACECs and RNAs would be the same across all alternatives, including the following:

- No new rights-of-way or road construction in Wapshilla Ridge ACEC/RNA;
- No livestock grazing in Captain John Creek ACEC/RNA;
- Management of the Long Gulch ACEC/RNA, in accordance with the updated MacFarlane's Four-o'clock Recovery Plan;
- Allowing no ground-disturbing activities and withdrawal from mineral entry in the Long Gulch ACEC/RNA;
- Filing for nonconsumptive water rights, permitting no new rights-of-way or road construction, and withdrawing from mineral entry at Lucile Caves ACEC/RNA;
- Management of the Skookumchuck ACEC/RNA, in accordance with the updated MacFarlane's Four-o'clock Recovery Plan, no grazing, and withdrawal from mineral entry; and
- In the Lower Lolo Creek ACEC, timber harvest activities on slopes over 50 percent would use yarding methods (such as aerial or high-lead systems) that minimize ground disturbance.

These management actions would have direct and indirect conservation impacts on wildlife, including several special status species that use these areas. The restrictions above, some of which are for sensitive and listed plants, would also reduce potential habitat degradations of wildlife habitats, including several BLM sensitive species, nongame species, upland game, bighorn sheep, elk, mule deer, mountain lion, and black bear at Captain John Creek, BLM sensitive snails at Lucile Caves, and several sensitive wildlife species at Lower Lolo Creek.

Effects from National Trails Management

Actions to protect resources along the National Trails could directly or indirectly affect wildlife and special status wildlife if these measures prevented disturbances of habitat or animals, such as restoring damaged areas around trails or a seasonal closure for a special status species.

Effects from Wild and Scenic Rivers Management

Under all alternatives, 29 miles of river segments found suitable, as well as 112 miles of the Salmon River that has been a study river since 1968, would be managed to preserve their outstandingly remarkable values. Wild and scenic river management can restrict activities that would alter the tentative classification, which could indirectly conserve wildlife habitat, especially for riparian species, in areas where actions would have been authorized without the classification. These impacts would vary according to the criteria for which each segment was found suitable. Special status species that are riparian-dependent and could be the most affected include harlequin duck, willow flycatcher, Coeur d'Alene salamander, Idaho giant salamander, and Columbia River tiger beetle.

Effects from Wilderness and Wilderness Study Areas Management

Continued management of BLM land would generally maintain existing conditions for wildlife in the following:

- 750-acre portion of the Frank Church/River of No Return Wilderness, in compliance with the Wilderness Act;
- The 5,571-acre Marshall Mountain WSA; and
- The 6,463-acre Snowhole Rapids WSA under Interim Management Policy for lands under wilderness review.

Bald eagles occur in the Snowhole Rapids WSA, and wolves could occur in the Frank Church/River of No Return Wilderness. Management under wilderness and WSA regulations would continue to provide indirect protection in addition to the ESA for these listed species.

Effects from Watchable Wildlife Viewing Sites Management

Actions to maintain or improve wildlife habitat could improve habitat for a variety of wildlife, including deer, elk, bighorn sheep, waterfowl, raptors, and river otter. This would be in conjunction with providing wildlife viewing opportunities in Lower Salmon River Canyon (87 miles), Middle Salmon River Canyon (80 miles), Snake River in Hells Canyon (68 miles), and Craig Mountain WMA (24,000 acres). Specific impacts would depend on the nature of individual habitat improvement measures made in these areas. Increased wildlife viewing can affect behavior in some wildlife species that may flush in response to human presence or avoid using areas frequented by humans. However, providing wildlife viewing opportunities helps build appreciation and knowledge of wildlife with the general public, which can result in increased indirect long-term support and funding wildlife programs.

Effects from Native American Tribal Uses Management

Consulting with tribes to identify culturally significant plants, animals, fish, and important habitats could improve habitat conditions for those species and habitats if these consultations result in changes in management that would improve habitats. ~~However, Tribes collecting or hunting special status species, as allowed under their treaty rights, could impact those species.~~

Effects from Public Safety—Abandoned Mines and Hazardous Materials Management

Generally, actions to remediate contaminated sites to safeguard human health would also affect wildlife habitats and populations, especially those that depend on riparian and wetland habitats. Reducing contaminants in the environment reduces the potential for animals to ingest them. It also reduces biomagnification because contaminants are concentrated as they pass up through the food chain. Removing contaminants from the environment through such actions as mitigating newly discovered hazards within 120 days and pursuing the reduction of hazards at abandoned mine sites would generally affect fish-eating species, such as osprey and belted kingfisher, as well as bats, which mostly forage on insects near water. Closing abandoned mines could affect bats. However, if the mines are closed in a manner to allow access to bats, then these bat populations would be preserved. Remediation and stabilization actions along creeks would promote the growth of riparian vegetation and reduce sediment loads and thus would gradually improve habitat for riparian-dependent wildlife species. Additional actions to more effectively manage hazardous sites and cleanups could indirectly improve habitat and the health of wildlife more under Alternatives B, C, and D than under Alternative A.

Alternative A

Effects from Soils Management

In addition to impacts noted under Effects Common to All Alternatives, under Alternative A the MFP Road Guidelines (BLM 1981a) and the Riparian Management Guidelines (BLM 1985e) would avoid and mitigate many surface disturbances and erosion, which could reduce impacts on quantity and quality of vegetation and thus habitats from other resource uses, especially those associated with roads and those located in riparian areas. Prioritizing existing roads for restoration, including obliteration, could increase quantity of wildlife habitat, reduce human disturbance on wildlife, and reduce habitat fragmentation, where roads are obliterated.

Effects from Water Resources Management

In addition to impacts noted under Effects Common to All Alternatives, under Alternative A wildlife habitat, especially riparian and wetland habitats would be conserved from water management actions, such as implementation of the MFP Road Guidelines (BLM 1981a), Riparian Management Guidelines (BLM 1985e), and PACFISH (BLM and Forest Service 1995). These actions directly and indirectly conserve riparian vegetation, which is especially critical wildlife habitat.

Effects from Vegetation—Forests Management

Under Alternative A treating dry ponderosa pine and dry conifer cover types and whitebark pine would reduce stand densities, which would result in impacts on wildlife described under Effects Common to All Alternatives. Improving old-growth forest structure may help prolong the life of old-growth stands and thus, in the long term, maintain or improve habitat for old-growth-dependent species, such as fisher.

Effects from Vegetation—Weeds Management

Actions to prevent and control invasive and noxious weeds using integrated weed management techniques consistent with the BLM's *Partners Against Weeds: An Action Plan for the Bureau of Land Management* (BLM 1996) could reduce or at least slow the rate of increase of the area and severity of damage to wildlife habitats, as described under Effects Common to All Alternatives, under Alternative A.

Effects from Vegetation—Rangelands Management

Alternative A identifies improvements in rangeland condition and riparian habitats, which would benefit wildlife. Alternative A identifies areas for development of HMPs, which could improve rangeland condition.

Effects from Vegetation—Riparian and Wetlands Management

Under Alternative A riparian management actions would continue to reduce the potential for degradations of riparian wildlife habitat. Implementing BMPs for riparian management units and the Riparian Management Guidelines (BLM 1985e) and PACFISH (BLM and Forest Service 1995) would avoid and mitigate many surface disturbances and erosion. This also would protect and enhance riparian vegetation, which could reduce impacts on riparian-dependent wildlife habitats from other resource uses, especially those associated with roads and those located in riparian areas.

Effects from Wildlife and Special Status Wildlife Management

In addition to impacts noted under Effects Common to All Alternatives, under Alternative A, following elk habitat coordinating guidelines would continue to maintain elk habitat conditions by guiding silvicultural practices that could affect elk habitat components.

Improving half the 3,840 acres of poor condition range to fair condition and half the 13,766 acres of fair condition range to good condition within 20 years could improve 8,803 acres of habitat for range and grassland wildlife species. These species include BLM sensitive species such, as ferruginous hawk, prairie falcon, and Brewer's sparrow. Managing lands identified for intensive wildlife management would continue to improve or maintain habitat for wildlife in these areas via HMPs and use restrictions.

Practicing snag management over 60 percent of any timber harvest area, with at least two large diameter and breast height snags per acre, plus additional snag recruitment actions, would help maintain cover, denning, nesting, and foraging microhabitat features for snag- and cavity-dependent forest wildlife species, such as woodpeckers.

Protection of active raptor nests with a 100-yard nondisturbance buffer would provide limited protection of these nests. This buffer size could be insufficient based on the species, topography, vegetation, site distance, and type of activity.

Effects from Aquatic Resources, Fish, and Special Status Fish Management

Under Alternative A, actions to improve aquatic, riparian, and fisheries habitats with implementation of management plans and use restrictions for sensitive areas would have indirect impacts on wildlife consistent with the impacts described under Effects Common to All Alternatives.

Effects from Special Status Plants Management

In addition to impacts noted under Effects Common to All Alternatives, under Alternative A the Long Gulch and Skookumchuck populations of MacFarlane's four-o'clock would be protected as ACEC/RNAs (completed). This is further described under Effects from ACEC/RNA Management.

Effects from Wildland Fire Management

Analysis of how wildland fire management actions would affect forested lands is described in Effects from Wildland Fire Management in Sections 4.2.5, Vegetation—Forests and 4.2.12, Wildland Fire Management. Predictions for forest conditions post-fire and treatments described in these sections form the basis of forest wildlife habitat. Impacts on species are variable and are described under Effects Common to All Alternatives.

Effects from Visual Resources Management

Alternative A, like Alternative B, would be intermediate between Alternatives C and D (**Table 4-13**, Comparison of Wildlife and Special Status Wildlife Indicators by Alternative) in terms of indirect impacts, as described under Effects Common to All Alternatives.

Effects from Forest Products Management

Alternative A designates 35,757 (35 percent) of the forested acres as commercial forest, 24,000 acres (less than 25 percent of the CFO) of which would be intensively managed with a focus on maximizing timber production on a sustained yield basis. Within this area, wildlife would not be a primary concern, and thus habitat quality would be lower than in other BLM-administered forested lands in the CFO. This is because less vegetative structural diversity and more human disturbances would exist, and fewer specific protections would apply. These losses of habitats and disturbances would generally affect late seral dependant wildlife more than early seral wildlife. Habitat conditions could improve for a few select species that thrive in early seral and disturbed habitats.

Effects from Livestock Grazing Management

Alternative A would generally be intermediate between Alternatives B and D in quantity of AUMs, allotments, and leased area (**Table 4-14**, Grazing ~~Statistics~~ Factors that Could Affect Wildlife). Improvements that have been completed under Alternative A, including 25.5 miles of fence, 30 spring developments, 7 catchments, 10 cattle guards, 2.7 miles of fence for stream protection, and 1,900 acres of noxious weed control, would have indirect impacts on wildlife, as described under Effects Common to All Alternatives. Allocation of 1,004 AUMs of competitive big game forage would reduce conflicts for forage with livestock from big game species, such as deer and elk. Also see **Table 4-50** in Section 4.3.2, Livestock Grazing.

Table 4-14
Grazing ~~Statistics~~ Factors that Could Affect Wildlife

Grazing Statistic	Alternative A	Alternative B	Alternative C	Alternative D
Permitted AUMs	7,~~204~~200	~~6,254~~6,263	6,020	8,54~~0~~9
Number of allotments	168	166	145	170
Area available for grazing (acres)	122,732	105,619	101,350	135,850
Big game competitive AUMs[1]	1,004	864	829	1,111

Source: BLM 2004a

[1]Only identifies competitive livestock/big game AUMs not allocated to livestock. Total available AUMs/forage for big game is significantly larger than indicated competitive amount.

Currently, the BLM CFO has four allotments that are leased for sheep grazing (**Table 4-15**). Domestic sheep or goat grazing is a concern because of associated risks for disease transmission from domestic sheep and goats to bighorn sheep. Using a risk rating process adapted from the Payette National Forest, a level of disease transmission risk was made, and ranged from low to high for the four BLM sheep allotments.

Table 4-15
BLM Sheep Allotments and Risk Analysis for Disease Transmission to Bighorn Sheep

Allotment Name Allotment No.	Total Acres	Class of Livestock AUMs[1]	Season of Use	Subbasin(s)	Level of Disease Transmission Risk from Domestic Sheep to Bighorn Sheep[2]	Bighorn Sheep Habitat
Partridge Cr. Allot. No. 36240	9,166 acres	Sheep 287 AUMs	4/11–7/15	Lower Salmon R.	High	Suitable Habitat
		Sheep 142 AUMs	10/15 – 11/30			
		Cattle 30 AUMs	5/1 – 10/15			
Marshall Mtn. Allot. No. 36284	4,719 acres	Sheep 166 AUMs	7/5 – 8/4	Middle Salmon R. S.Fk. Salmon R.	High	Suitable Habitat
Hard Cr. Allot. No. 36242	5,186 acres	Sheep 218 AUMs	6/15 – 7/15	Little Salmon R.	Low	Secondary Suitable Habitat
Big Cr. Allot. No. 36358	480 acres	Sheep 81 AUMs	6/1 – 10/31	Little Salmon R.	Low	Secondary or Incidental Use Habitat

[1]Conversion factor for AUM: 1 AUM = 1 cow and calf or 5 sheep and lambs (less than six months).
[2]Adapted from *Risk Analysis of Disease Transmission Between Domestic Sheep and Bighorn Sheep on the Payette National Forest* (Forest Service 2006). "Risk rating" was determined by rating given to nearest Payette National Forest Sheep Allotment and proximity of bighorn sheep habitat (Forest Service 2006). It is noted that these allotment specific ratings have not had an expert panel risk assessment, which was conducted for Payette National Forest sheep allotments.

Effects from Minerals Management

General effects are described under Effects Common to All Alternatives, above. Under Alternative A, 131,044 acres would continue to be open to leasable minerals activities subject to the standard lease terms and site-specific mitigation measures/stipulations, with 12,786 acres subject to nondiscretionary closures (same nondiscretionary closure acres for all alternatives). Approximately 131,044 acres would also be open to mineral (salable) materials disposal subject to the standard permit terms and site-specific mitigation measures/stipulations, with 12,034 acres subject to discretionary WSA closures and 750 acres subject to nondiscretionary closures. Approximately 121,961 acres would be open to locatable minerals with site-specific mitigation measures/stipulations developed during the BLM's review of a plan of operation. This would apply to all alternatives..

Effects from Recreation Management

In addition to the impacts noted under Effects Common to All Alternatives under Alternative A, the BLM would continue to manage public lands for a variety of recreational activities within all ROS settings, as shown in **Table 4-~~15~~16**.

Table 4-16
Recreation Opportunity Spectrum

ROS Class	Alternative A		Alternative B		Alternative C		Alternative D	
	Acres	%	Acres	%	Acres	%	Acres	%
Primitive	14,381	10.00	6,200	4.32	6,200	4.32	6,200	4.32
Semiprimitive	18,816	13.08	36,495	25.40	36,495	25.40	36,495	25.40
Semiprimitive motorized	26,206	18.22	23,593	16.42	23,593	16.42	23,593	16.42
Roaded, natural	55,988	38.93	54,867	38.19	54,867	38.19	54,867	38.19
Rural	0	0.00	22,478	15.65	22,478	15.65	22,478	15.65
Semiurban	27,349	19.02	0	0	0	0	0	0
Urban	40	0.03	40	0.03	40	0.03	40	0.03
Undesignated	1,046	0.73	0	0	0	0	0	0

Source: BLM 2004a

These percentages are indicative of the management emphasis for recreation activities on BLM-administered lands. A much smaller portion of the planning area is reserved for primitive experiences, when compared to opportunities for activities that include motorized uses. Generally wildlife and their habitats within the primitive class would be affected the least from recreation.

Impacts, as described under Effects Common to All Alternatives, would increase with each class up the ROS. More acres would remain in primitive ROS class under Alternative A than under the other alternatives, so that Alternative A could have the fewest impacts on wildlife from recreation (**Table 4-~~15~~16**, Recreation Opportunity Spectrum).

The BLM would continue to allow 44 commercial water-based outfitter permits issued with the Idaho Outfitters Guides Licensing Board on the Salmon and Clearwater Rivers. No permits would be issued for Lolo Creek, and permits for Craig Mountain would require concurrence of the Idaho Department of Fish and Game.

Effects from Transportation and Travel Management

In addition to the impacts noted under Effects Common to All Alternatives under Alternative A, Alternative A would provide areas Open to cross-country OHV use. Areas Open to motorized cross-country travel have the greatest potential to alter wildlife behaviors and do damage to habitats, as described under Effects Common to All Alternatives. Closing roads yearlong to all motorized vehicles on 108 miles of routes would reduce disturbances to wildlife near those routes. Locating designated areas and trails to minimize harassment of wildlife and especially listed species would further reduce potential conflicts with wildlife use.

Effects from Lands and Realty Management

In addition to the general impacts from lands and realty management described in Effects Common to All Alternatives under Alternative A, identifying hazards on public lands, if corrected, could locally reduce impacts on wildlife that could be harmed by these hazards, such as toxic materials that could be ingested. Keeping the public lands within 0.25-mile of the Salmon River withdrawn from mineral entry would prevent surface disturbances of wildlife habitat within 18,532 acres.

Effects from ACEC/RNA Management

Under Alternative A, impacts would be consistent with the general types of impacts on wildlife described under Effects Common to All Alternatives, where wildlife habitat would be protected by certain actions. These include actions that directly prohibit specific impacts on wildlife and their habitats and indirectly from conserving other natural resources, such as listed and BLM sensitive plants. Although these management actions would conserve wildlife resources, Alternative A would generally be less effective than Alternative B, C, or D where additional actions would be added to refine management of ACECs and RNAs, as well as adding new ACECs.

Alternative B

Effects from Soils Management

Implementation of BMPs (**Appendix B**, Best Management Practices [see Volume II~~I~~]) for soil-disturbing activities and application of reclamation measures to mitigate adverse impacts on soils and water add additional actions that could benefit wildlife and their habitats, including special status species, over Alternative A. The BMPs could prevent additional soil-disturbing activities that could encourage healthy vegetation communities, which are the foundation of wildlife habitats. Reclamation measures further restore wildlife habitats that have already been impacted. Alternative B, which includes a more thorough and protective list of BMPs and reclamation measures, would provide for more protection of wildlife and their habitats than Alternative A.

Effects from Water Resources Management

Implementation of BMPs (**Appendix B**, Best Management Practices [see Volume II~~I~~]), monitoring, and adaptive management add additional actions that could benefit wildlife and their habitats, including special status species, over Alternative A. The BMPs could prevent additional erosion that could lead to healthier vegetation communities, which are the foundation of wildlife habitats. Associated monitoring and adaptive management could increase the effectiveness of the BMPs. Alternative B, which includes a more thorough and protective list of BMPs and reclamation measures, would provide for more protection of wildlife and their habitats than Alternative A.

Effects from Vegetation—Forests Management

Blocks over 1,000 acres, which would be managed to improve forest health and vigor, account for 24,789 acres (24 percent of forest land) (17 percent of the CFO). These areas would be managed to meet DFC listed in **Appendix D**, Desired Future Conditions for Forest Vegetation/Wildlife Habitat (see Volume II~~I~~). Impacts on wildlife of managing for DFC would have some short-term impacts on wildlife from harvesting activities, including removal of potential cover, dens, nesting sites, and foraging opportunities from tree removal, and behavioral disturbances, including displacement associated with noise, movement, and vibrations. These activities, if successful, could transform forest stands into conditions closer to historical range of variability in native wildlife habitats, and they would represent an improvement in habitat quality for many species. As described under Effects Common to All Alternatives, forest treatment impacts on wildlife vary widely by species.

Managing species composition and canopy closure of large trees, giving preference to ponderosa pine and western larch, would, over more than 50 years, increase the amount of old-growth forest wildlife habitat. Identifying and recording old-growth stands and determining if they meet pre-fire suppression criteria could help prevent old-growth stands and their associated limited wildlife habitat from being lost in a severe fire. Performing site-specific analysis on forest vegetation proposals would allow for tailoring projects to maximize, within other constraints, the quality of wildlife habitat post-harvest/treatment by identifying and retaining specific microhabitat features, including nest sites, snags, dens, food sources, and migratory routes, as well as designing the composition and structure of the stand.

Harvesting timber in stands where there is high risk of extensive mortality, in order to maximize the economic return, would degrade wildlife habitats in the short-term due to loss of forested habitat and disturbance from harvest activities. Cavity-dependent and insectivorous species would be the most affected by the loss of potential snags and insects that may be present in dead and diseased trees. In the long term, live trees would be replaced more quickly, providing habitat for species requiring mature forest sooner.

Effects from Vegetation—Weeds Management

Types of impacts from weed management actions on wildlife are similar to those described under Effects Common to All Alternatives. Numerous additional specific actions under Alternative B would make weed management more effective than under Alternative A and thus would be more successful at slowing down the encroachment of weeds in native wildlife habitats.

Effects from Vegetation—Rangelands Management

Under Alternative B actions designed to promote the health of native vegetation communities and rehabilitate areas in nonnative vegetation would generally reduce degradations of wildlife habitat quality and improve it where rehabilitated by increasing quantity and quality of native plant communities that form habitats. Species that use canyon grassland habitat would be the most affected and include short-eared owl, vesper sparrow, mourning dove, and mule deer. The BLM sensitive species that use these habitat types include Brewer's sparrow, Woodhouse toad, and prairie falcon. Management actions and treatments that improve rangeland conditions would be emphasized in the Rattlesnake Ridge and Craig Mountain canyon grassland areas.

Effects from Vegetation—Riparian and Wetlands Management

Alternative B could be slightly less effective at conserving and restoring riparian wildlife habitats than Alternative A because Alternative B RCA stream buffers would total 22,847 acres, 6 percent less than the 24,290 acres of RHCAs under Alternative A.

Effects from Wildlife and Special Status Wildlife Management

Actions designed to conserve bald eagle could increase bald eagle use in the CFO and contribute toward species recovery, if successful, by increasing foraging opportunities, area of suitable nesting and roosting habitat, numbers of suitable nest trees, and protection of any active nests from disturbances.

Implementing applicable conservation and restoration measures identified in Canada Lynx Conservation Assessment and Strategy and the Recovery Plan for Canada lynx could increase the area of denning and foraging habitat on BLM-managed lands in the CFO and could contribute toward recovery.

Implementing applicable measures from the gray wolf recovery plan could increase populations of ungulates and alternate prey, suitable denning and rendezvous sites, and sufficient space with minimal human exposure. This could in turn increase the number of packs and individuals in central Idaho and contribute toward recovery. Maintaining and enhancing large stands of cottonwood would at least maintain the potential for yellow-billed cuckoo to occur in the CFO.

Actions to manage sensitive species and their habitats via inventories, database maintenance, guild-based habitat management, land tenure adjustments, conservation easements, restoration projects, and cooperative planning could improve, maintain, or reduce degradations to these species' habitats. Types of impacts would be specific to each species and the project-level implementation of these general guidelines. These actions, if successful, would reduce the possibility of CFO management contributing to a species being listed under the ESA in the future.

Striving to improve the ecological condition of native grassland plant communities, with an emphasis on bighorn sheep, elk, and deer winter range areas, could improve habitat conditions for species that use grasslands for part or all of their life. Improvement in big game winter range areas could increase the size of these herds by reducing winter mortality, and thus increasing success rates for these species.

Alternative B would be more successful at maintaining and improving snag-dependent wildlife habitat than Alternative A.

Actions to protect riparian areas from degradations and to achieve PFC would indirectly conserve and enhance riparian wildlife habitats as well. Increased riparian health would result in increased cover, nesting habitat, and food by increasing density, extent, and structural complexity of riparian vegetation. Improved bank stability and other conditions that reduce sedimentation, increase shading and instream structure, and improve water quality could lead to increases in fish density, which provides more foraging opportunities for fish-eating birds.

Protecting active raptor nests with a 100-yard nondisturbance buffer would provide limited protection of these nests. The possibility of a larger buffer being required to suit the specific situation would make raptor nest protection more effective under Alternative B than under Alternative A.

Actions to improve bighorn sheep habitat could result in an increase in population size in the long-term as well as an increase in hunting opportunities. Improvements to bighorn habitats would also improve habitat conditions for other canyon grassland species

General wildlife management actions to provide for overall species diversity, including providing water sources and developing management plans, reintroductions, and transplants, would generally contribute toward maintaining or improving biodiversity and quality of habitats in the CFO. Population health parameters could improve for some species due to management actions. At a minimum these management actions reduce impacts from other activities that could impair habitats and populations. Few management actions can have the same effect on all wildlife species. Actions that improve habitat for one group of wildlife may lessen the quality of habitat for another on any particular piece of land. Managing habitats for diversity at a landscape level balances out these issues.

Not authorizing any net increase in motorized vehicle use in priority management areas on 101,526 acres would prevent the increase of wildlife disturbance from vehicles.

Effects from Aquatic Resources, Fish, and Special Status Fish Management

Types of impacts on wildlife are similar to those described under Alternative A, but additional actions to conserve, enhance, and restore aquatic habitats could provide additional riparian wildlife habitat improvement and result in greater aquatic food sources for wildlife. Emphasis for restoration in 32 watersheds (64,481 acres) would have direct and indirect effects on wildlife habitats.

Effects from Special Status Plants Management

Actions designed to ensure that special status plant populations are stable or continue to improve could indirectly have similar impacts on wildlife that use the habitat types occupied by special status plants and conversely could decrease habitat quality for species that do not use each habitat type affected.

Effects from Wildland Fire Management

Types of impacts of wildland fire management on wildlife would be similar to those under Alternative A. Unplanned fire for wildland fire use would not be evaluated in the Craig Mountain ~~FMU~~FMA and a portion of the Salmon ~~FMU~~FMA (**Figure H-2**, Areas Available for Wildland Fire Use—Alternative B [see **Appendix H** in Volume II~~I~~]).

Treatment of up to 40 percent (approximately 33,760 acres) of CFO lands to reduce FRCC (moderate to high risk) WUI areas would represent less change in wildlife habitat than Alternative D (60 percent [approximately 50,650 acres]) and more than Alternative C (20 percent [approximately 16,883 acres]). Treatments in DFC areas outside of the WUI would strive to achieve historic fire regimes and vegetation-fuel-structure characteristics. Old growth/old forest stands would be managed to meet structural component targets in these areas, as described in DFC tables (**Appendix D**, Desired Future Conditions for Forest Vegetation/Wildlife Habitat [see Volume II~~I~~]).

Effects from Visual Resources Management

Indirect effects would be the same as those described under Alternative A.

Effects from Forest Products Management

Under Alternative B, 40,598 acres (40 percent of the forested acres) would be managed as commercial forest, and an estimated 242 acres would be treated annually (estimated 3,630 acres over the life of the RMP, which is almost 4 percent of the forested vegetation) (**Table 4-~~16~~17**, Commercial Forest Use Projections). Types of impacts are similar to those described under Alternative A.

Cavity-dependent wildlife species, such as woodpeckers, depend on snags for cover and reproduction. Population sizes of these species are limited by the availability of snags. Snag management would be followed for all timber sales based on forest type (**Table 4-~~17~~18**, Desired Range of Snags per Acre for Potential Vegetation Groups [PVG]) and would maintain or improve snag availability for the long term.

Table 4-17
Commercial Forest Use Projections

Commercial Forest Use Projections	Alternative A	Alternative B	Alternative C	Alternative D
Commercial forest land (acres)	35,757	40,598	34,611	45,190
Proportion of forested area (%)	35	40	34	44
Acres of forest management per year	358	242	191	361
Acres of forest management in a 15-year period[1]	Estimated 5,370	3,630	2,865	5,415
Predicted annual PSQ in MBF	6,600 (ASQ)	3,129	3,101	4,823

Source: BLM 2004a
[1] Based on the annual acres of forest management multiplied by 15 years.

Table 4-18
Desired Range of Snags per Acre for Potential Vegetation Groups

Diameter Group	PVG-1	PVG-2	PVG-3	PVG-4	PVG-5	PVG-6	PVG-7	PVG-8	PVG-9	PVG-11
10 to 20 inches	0.4-0.5	1.8-2.7	1.8-4.1	1.8-2.7	1.8-5.5	1.8-5.5	1.8-5.5	1.8-7.5	1.8-7.5	1.4-2.2
Greater than 20 inches	0.4-2.3	0.4-3.0	0.2-2.8	0.2-2.1	0.4-3.5	0.2-3.5	0.2-3.5	0.2-3.0	0.2-3.0	1.4-2.2
Total	0.8-2.8	2.2-5.7	2.0-6.9	2.0-4.8	2.2-9.0	2.0-9.0	2.0-9.0	2.0-10.5	2.0-10.5	2.8-4.4
Minimum Height	15 feet	30 feet	30 feet	30 feet	30 feet	30 feet	30 feet	30 feet	30 feet	15 feet

Source: BLM 2004a

Effects from Livestock Grazing Management

The impacts from livestock grazing management on wildlife are similar to those described under Alternative A. The Number of allotments and area of grazing would be intermediate between Alternatives A and C (**Table 4-14**, Grazing ~~Statistics~~ Factors that Could Affect Wildlife). Also see **Table 4-50** in Section 4.3.2, Livestock Grazing. Retiring three allotments could improve wildlife habitats within those allotments because any potential competition for forage would be alleviated and cover for wildlife may increase. Habitat for other species may not be improved. It needs to be noted that current conditions and trends for wildlife habitat would probably continue, because these allotments are not currently grazed by livestock. Construction of exclosures and ESA Section 7 consultation would reduce the potential for accidental take of listed plants from grazing. Modifying grazing authorizations to strive toward meeting unmet Idaho Standards for Rangeland Health (BLM 1997a) (**Appendix A** [see Volume II~~I~~]) would reduce degradations on rangeland wildlife habitats. It is difficult to control season of use and authorized AUMs on small tracts of fragmented BLM lands, which comprise a large majority of the allotments. Consequently, with exception of acres available for grazing, overall effects are expected to be similar for all alternatives. To promote the achievement of bighorn sheep management objectives, new domestic sheep or goat grazing would not be authorized where such grazing would result in risk of disease transmission to bighorn sheep. On existing sheep grazing allotments, coordination with grazing lessee's and appropriate state/federal agencies, and tribes would be taken to reduce or eliminate risks for domestic sheep

transmission of disease to bighorn sheep. Primary focus would occur on allotments with high risks for disease transmission to bighorn sheep (**Table 4-15**, BLM Sheep Allotments and Risk Analysis for Disease Transmission to Bighorn Sheep).

Effects from Minerals Management

General effects are described under Effects Common to All Alternatives, above. Under Alternative B, effects would be similar to those described under Alternative A, but would be further limited by additional areas with surface use restrictions (leasables and mineral materials), which include 43,590 acres subject to NSO stipulations to protect resources, including wildlife and special status wildlife, and 42,403 acres of public lands would be subject to CSU stipulations to protect visual quality and rivers suitable for the NWSRS. These stipulations mostly eliminate potential impacts on wildlife from mineral management within the NSO areas and would reduce them within the CSU stipulation areas.

Effects from Recreation Management

In addition to the impacts noted under Effects Common to All Alternatives, under this alternative the BLM would continue to manage the Elk City, Little Salmon River, John Day Creek, and Marshall Mountain areas as Extensive Recreation Management Areas. Lolo Creek and Craig Mountain would be designated as SRMAs, identifying recreation as the principal use of these lands. The Lolo Creek SRMA would emphasize backcountry, dispersed, and nonmotorized recreation opportunities, with an emphasis on whitewater boating and fishing. The Craig Mountain SRMA would provide opportunities in a natural setting for big game hunting, hiking, and biking, while promoting backcountry recreation experiences. Managing lands as SRMAs rather Extensive Recreation Management Areas could encourage additional use of these lands and thus increase the level of disturbances to wildlife, as described under Effects Common to All Alternatives. However, because these two SRMAs emphasize nonmotorized activities, the impacts would be less.

Similar to Alternative A, the BLM would continue to manage public lands for a variety of recreational activities within all ROS settings (**Table 4-~~15~~16**, Recreation Opportunity Spectrum). Under Alternative B, less than half of the acres affected under Alternative A would be managed as primitive, potentially opening over 8,000 acres to additional human disturbances that could affect wildlife, as described under Effects Common to All Alternatives.

Effects from Renewable Energy Management

Authorized renewable energy development could have some impacts on wildlife via alteration of habitats from removing vegetation from construction activities. Human disturbances from construction and operation of facilities, such as noise, movement, and vibrations, would alter wildlife behavioral use patterns in the vicinity of the project. Impacts would vary by species, type of development, topography, and habitat type. Removing vegetative treatment byproducts to use in generating plants would reduce the quantity of woody debris on the forest floor similar to removal for a forest or fuels management project. In turn, this would remove cover for wildlife species that use that type of habitat feature.

Effects from Transportation and Travel Management

In addition to impacts noted under Effects Common to All Alternatives, under Alternative B no acres would be Open to cross-country motorized vehicular traffic, thereby reducing impacts on wildlife more than Alternative A. Closing roads to all motorized vehicles yearlong on 100 miles of

routes would reduce disturbances to wildlife near those routes. Implementing the travel plan would ensure additional protections for wildlife, special status wildlife, and their habitats over Alternative A through patrols, enforcement, education, visitor contacts, monitoring, and use restriction signage.

Obliterating or decommissioning roads and trails could reduce habitat fragmentation in the long term.

Effects from Lands and Realty Management

Types of impacts from land tenure adjustments are described under Effects Common to All Alternatives. Improvements to wildlife habitat via land acquisition would be more likely under Alternative B because 113,728 acres in 12 management blocks have been identified with ranked resource values. Wildlife ranks as "high value" for 70,657 acres in 6 blocks. In addition, conservation easements would be used to protect resources, including wildlife.

Encouraging linear rights-of-way to be collocated would reduce the area of surface disturbance that could degrade wildlife habitat by vegetation removal and conversion and spread of noxious weeds. Wildlife and habitats would receive varying levels of protection and conservation from withdrawals and special designations that restrict potential land use conflicts.

Effects from ACEC/RNA Management

Under Alternative B ~~three~~ four new ACECs would be created: 5,759 acres on the Salmon River from White Bird Creek to French Creek, 570 acres on the East Fork American River, 1,625 acres on Upper Lolo Creek, and 6,356 acres on the American River. Adding another ACEC to the East Fork of the American River would further protect species along the river corridor, especially riparian-dependent wildlife, such as yellow warbler, bald eagle, and other riparian-dependent species.

Possible updates to the Clearwater River Islands Goose Nesting HMP could further enhance waterfowl habitat and nesting success rates in the Lower and Middle Cottonwood Islands ACEC/RNA. Possible updates of the Lucile Caves HMP could improve conservation efforts for BLM sensitive land snails.

Effects from National Trails Management

Effects would be the same as those described under Alternative A.

Effects from Wilderness and Wilderness Study Areas Management

Management of the wilderness area and WSAs under interim policy would have the same effect as under Alternative A. If Congress were to release the WSAs from wilderness consideration, management of these areas could offer slightly less protection for threatened and endangered species from other actions and human disturbance. These species would still receive required protection from the ESA.

Effects from Watchable Wildlife Viewing Sites Management

Impacts on wildlife and special status wildlife described under Alternative A would be continued and expanded under Alternative B with additional habitat improvements, viewing opportunities, and partnerships, which could improve more wildlife habitat and populations than under Alternative A.

Effects from Native American Tribal Uses Management

Consulting with tribes to identify culturally significant plants, animals, fish, and habitats, and then incorporating that information into monitoring protocols, could improve habitat conditions for those species and habitats, as well as for species with similar habitat requirements if management actions were adjusted to address the results of monitoring data.

Alternative C

Effects from Soils Management

Effects would be the same as those described under Alternative B.

Effects from Water Resources Management

Effects would be the same as those described under Alternative B.

Effects from Vegetation—Forests Management

Types of impacts from forest vegetation management would be similar to Alternative B. However, under Alternative C, the threshold of contiguous forest blocks would be reduced from 1,000 to 500 acres for management support of attaining DFC. Blocks would total 28,087 acres under Alternative C, a 3-percent increase from Alternative B. This could lead to attainment of more acres of wildlife habitats in DFC than under Alternative B.

Effects from Vegetation—Weeds Management

Effects would be the same as those described under Alternative B.

Effects from Vegetation—Rangelands Management

Effects would be similar to those described under Alternative B, with the addition of promoting native plant communities in one additional area, Salmon River canyon grasslands. Thus, Alternative C has the greatest potential to improve rangeland wildlife habitats.

Effects from Vegetation—Riparian and Wetlands Management

Alternative C would be slightly more effective at conserving and restoring riparian wildlife habitats than Alternative A because of greater sizes of the RCA stream buffers. Alternative C would have RCAs totaling 27,624 acres, 14 percent greater than RHCAs under Alternative A.

Effects from Wildlife and Special Status Wildlife Management

The impacts from wildlife and special status wildlife management are similar to Alternative B with the following exceptions:

- Under Alternative C, the addition of the Lower Salmon River in emphasis management areas for native grassland communities could increase the area of grassland wildlife habitat that is improved;
- Under Alternative C, the reduction of the threshold of contiguous forest size from 1,000 to 500 acres for management support of attaining DFC could lead to attaining more acres of wildlife habitats in DFC than under Alternative B;
- Riparian and wetland management actions would be more effective at improving riparian wildlife habitat because of larger RCA stream buffers (buffer widths are the largest for Alternative C compared to all other alternatives) and more watersheds and acreage identified for conservation or restoration (3 percent more than prescription watersheds under

Alternative A). Specifying use criteria for grazing allotments along fish-bearing streams could further conserve riparian areas; and

- More acres/areas identified for no net increase and/or emphasis for decrease in open routes for motorized use.

Effects from Aquatic Resources, Fish, and Special Status Fish Management

The impacts from aquatic resources management actions would be similar to those under Alternative B, with additional improvement to riparian wildlife habitats because of additional conservation and restoration watersheds (6 percent more than Alternative B and 3 percent more than prescription watersheds under Alternative A). Conservation and restoration measures identified for listed and BLM sensitive fish would have direct and indirect effects for riparian-dependent wildlife species.

Effects from Special Status Plants Management

Effects would be the same as those described under Alternative B.

Effects from Wildland Fire Management

Effects would be the similar to those described under Alternative B, except all unplanned fires would be evaluated for wildland fire use (**Figure H-1**, Areas Available for Wildland Fire Use—Alternatives A and C [see **Appendix H** in Volume II~~I~~]). Treatment of up to 20 percent of CFO lands (approximately 16,883 acres) to reduce FRCC (moderate to high risk) in WUI areas represents less change in wildlife habitat than Alternative B (40 percent [approximately 33,766 acres]) and Alternative D (60 percent [approximately 50,650 acres]). Habitat could improve for some species and not for others. With less fire management, there would be less opportunity for habitat improvements needing harvest per winter range HMPs.

Effects from Visual Resources Management

Indirect impacts on wildlife and special status wildlife from visual resources are the least among the four alternatives, as described under Alternative A (**Table 4-13**, Comparison of Wildlife and Special Status Wildlife Indicators by Alternative), because there would be the greatest number of acres in VRM Class I and II and the fewest in Class III.

Effects from Forest Products Management

Under Alternative C, types of impacts from forest products management are similar to those under Alternative B, except for fewer acres of forest harvest and treatment and larger RCA stream buffers for riparian areas within forested lands, as described under Vegetation—Riparian and Wetland. Habitat could improve for some species and not for others. With less fire management, they would be less opportunity for habitat improvements needing harvest per winter range HMPs.

Effects from Livestock Grazing Management

The types of impacts on wildlife from livestock grazing management are similar to those under Alternative B. However, there would be fewer AUMs, allotments, and grazed acres (**Table 4-14**, Grazing ~~Statistics~~ Factors that Could Affect Wildlife). Habitat could improve for some species and not for others. Also see **Table 4-50** in Section 4.3.2, Livestock Grazing. Reduced risks from transmission of disease from domestic sheep and goats to bighorn sheep may occur. Effects to bighorn sheep are similar to those described in Alternative B.

Effects from Minerals Management

Effects would be similar to those described under Alternative B, except 68,854 acres of the public lands open to leasing would be subject to NSO stipulation to protect resources, including wildlife and special status wildlife. Also, 59,122 acres of the public lands open to leasing would be subject to CSU stipulations to protect visual quality and rivers suitable for the NWSRS. These stipulations mostly eliminate potential impacts on wildlife from mineral management within the NSO areas and reduce them within the CSU stipulation areas. The increase in surface use stipulations would decrease potential impacts compared to Alternatives A and B. Alternative C specifies the largest acreages for lease stipulations and could, therefore, result in the least amount of impacts.

Effects from Recreation Management

Effects would be the same as those described under Alternative B.

Effects from Renewable Energy Management

Effects would be the same as those described under Alternative B.

Effects from Transportation and Travel Management

Effects would be similar to those described under Alternative B, except that managing for a decrease in motorized vehicle use on BLM-managed lands in 5 priority areas on 38,733 acres could decrease vehicle disturbances, habitat damage from OHVs, access to remote habitats, and fragmentation of habitats.

Effects from Lands and Realty Management

Effects would be the same as those described under Alternative B.

Effects from ACEC/RNA Management

Under Alternative C the Craig Mountain ACEC would be increased to 23,342 acres from the current 3,956 acres, an almost 5-fold increase. This would increase the number of protective measures in place for an area already managed for wildlife. Habitats would be further conserved by additional restrictions on roads and grazing, as well as a monitoring program. Forest habitats would be further conserved and/or restored by designating DFC for forest habitats, which would conserve and protect old forest characteristics. Upper Lolo Creek would be designated an ACEC. This 1,625-acre parcel would directly and indirectly conserve wildlife, especially riparian-dependent wildlife, by restricting timber harvest, withdrawal from minerals, road decommission, exotic plant management, riparian restoration, and forest management for DFC. Designation of the 576-acre Partridge/Elkhorn ACEC and the 590-acre Little Salmon River ACEC would protect wildlife, including BLM sensitive wildlife that use old-growth ponderosa pine, such as goshawk, by emphasizing management for large trees.

Effects from National Trails Management

Effects would be the same as those described under Alternative A.

Effects from Wilderness and Wilderness Study Areas Management

Effects would be the same as those described under Alternative B.

Effects from Watchable Wildlife Viewing Sites Management

Effects would be the same as those described under Alternative B.

Effects from Native American Tribal Uses Management
Effects would be the same as those described under Alternative B.

Alternative D

Effects from Soils Management
Effects would be the same as those described under Alternative B.

Effects from Water Resources Management
Effects would be the same as those described under Alternative B.

Effects from Vegetation—Forests Management
Effects would be similar to those described under Alternative B, except that, under Alternative D forest vegetation management could be less effective at conserving wildlife habitat than the other alternatives because there is no objective to manage for forest DFC and old forest characteristics.

Effects from Vegetation—Weeds Management
Effects would be the same as those described under Alternative B.

Effects from Vegetation—Rangelands Management
Rangeland management actions would be less protective of wildlife and special status wildlife habitats and would provide less potential to improve than under Alternatives A, B, and C because there would be no specific management emphasis actions to convert nonnative communities to native.

Effects from Vegetation—Riparian and Wetlands Management
Alternative D would be slightly less effective at conserving and restoring riparian wildlife habitats than Alternatives A, B, and C because of smaller sizes of the RCA stream buffers. Alternative D would have RCAs totaling 20,710 acres, 15 percent less than RHCAs under Alternative A, 9 percent less than RCAs under Alternative B, and 25 percent less than RCAs under Alternative C.

Effects from Wildlife and Special Status Wildlife Management
Effects would be similar to those described under Alternative B, with the following exceptions:

- Incorporating important sensitive species habitat components into activity and project design could conserve and in some cases improve sensitive species habitats. These improvements could contribute to preventing a future need for ESA listing;
- Riparian and wetland management actions could be less effective at improving riparian wildlife habitat because of smaller RCA stream buffers (15 percent, 9 percent, and 25 percent less acres than Alternatives A, B, and C, respectively), as described under Effects from Vegetation—Riparian and Wetland Management above;
- 21 percent, 19 percent, and 24 percent fewer priority (prescription, conservation, or restoration) watersheds than Alternatives A, B, and C, respectively; and
- No designated management areas with restrictions to not allow no net increase in open routes for motorizes vehicles, which is identified in Alternatives B and C.

Effects from Aquatic Resources, Fish, and Special Status Fish Management

Effects would be similar to those described under Alternative B, with less potential improvement to riparian wildlife habitats because of fewer conservation and restoration watersheds, 19 percent less than Alternative B and 21 percent less than prescription watersheds under Alternative A.

Effects from Special Status Plants Management

Effects would be the same as those described under Alternative B.

Effects from Wildland Fire Management

Effects would be similar to those described under Alternative B, except evaluation of unplanned fire for wildland fire use would not be done in commercial forest lands or grazing allotments (**Figure H-3**, Areas Available for Wildland Fire Use—Alternative D [see **Appendix H** in Volume II~~I~~]). Only fires that have been determined to not affect these resources would be allowed to burn. This could preclude potential wildlife habitat improvements .

Treatment of up to 60 percent of CFO lands (approximately 50,650 acres) to reduce FRCC (moderate to high risk) in WUI areas would represent more change in wildlife habitat than under Alternative B (40 percent [approximately 33,766 acres]) and Alternative C (20 percent [approximately 16,883 acres]). Habitat could improve for some species and not for others.

Effects from Visual Resources Management

Indirect impacts on wildlife and special status wildlife from visual resources are the greatest among the four alternatives, as described under Alternative A (**Table 4-13**, Comparison of Wildlife and Special Status Wildlife Indicators by Alternative), because there would be the fewest number of acres in VRM Class I and II and the greatest in Class III.

Effects from Forest Products Management

Effects would be similar to those described under Alternative B, except there would be more acres of forest harvest and treatment and smaller RCA stream buffers for riparian areas within forested lands, as described under Vegetation—Riparian and Wetlands.

Effects from Livestock Grazing Management

Effects would be similar to those described under Alternative B, but considerably more grazing would be permitted (**Table 4-14**, Grazing ~~Statistics~~ Factors that Could Affect Wildlife). Also see **Table 4-50** in Section 4.3.2, Livestock Grazing. Allotments that would be retired under Alternatives B and C would be increased under Alternative D, thus resulting in more potential for conflicts with wildlife management and potential degradations to wildlife habitat and populations as described under Effects Common to All Alternatives. Reduced risks from transmission of disease from domestic sheep and goats to bighorn sheep may occur. Effects to bighorn sheep are similar to those described in Alternative B.

Effects from Minerals Management

Under Alternative D, effects would be similar to those described under Alternative B, but would be less limited because of fewer areas with surface use restrictions (leasables and mineral materials), which include 35,045 acres subject to NSO stipulations to protect resources, including wildlife and special status wildlife, and 32,013 acres would be subject to CSU stipulations to protect visual quality and rivers suitable for the NWSRS. These stipulations mostly eliminate potential impacts on wildlife from mineral management within the NSO areas and reduce them within the CSU stipulation areas.

The increase in surface use stipulations could decrease potential impacts compared to current levels. Types of impacts would be the same as those described under Alternative A.

Effects from Recreation Management

Effects would be similar to those described under Alternative B throughout most BLM-managed lands. However, in the Craig Mountain WMA SRMA, access would be improved to promote rural, developed recreation instead of backcountry experience. This could result in more disturbances to wildlife and their habitats from the impacts of increased human presence and vehicles, as described under Effects Common to All Alternatives.

Effects from Renewable Energy Management

Effects would be the same as those described under Alternative B.

Effects from Transportation and Travel Management

Effects would be similar to those described under Alternative B, except that there would be a 23,189-acre Open area that would allow for more potential wildlife disturbance than under Alternatives B or C.

Effects from Lands and Realty Management

Effects would be the same as those described under Alternative B.

Effects from ACEC/RNA Management

Effects would be similar to those described under Alternative B. The only proposed difference is to allow livestock grazing to support achievement of goals on Wapshilla Ridge ACEC/RNA. Quantity and composition of vegetation may be altered by grazing, but if grazing is being used as a tool to achieve goals, the health of wildlife habitats likely would not be impaired.

Effects from National Trails Management

Effects would be the same as those described under Alternative B.

Effects from Wilderness and Wilderness Study Areas Management

Effects would be the same as those described under Alternative B.

Effects from Watchable Wildlife Viewing Sites Management

Effects would be the same as those described under Alternative B.

Effects from Native American Tribal Uses Management

Effects would be the same as those described under Alternative B.

Cumulative Effects

Most of the cumulative projects listed in Section 4.1.3, Cumulative Impacts, have or will affect wildlife. Population increases, timber activities, fire suppression, road construction, weeds, and mineral development have had the greatest effects. These actions and their interactions have resulted in the loss of and changes in habitat across northern Idaho, resulting in degraded quality of these habitats and the populations they support. The above actions directly and indirectly result in changes in vegetation species composition and structure. On public lands, these changes in vegetation have the greatest effect on wildlife as opposed to private lands where development results in the complete loss of habitats under the footprint of infrastructure. These changes include the following: old

single-story ponderosa pine forests have decreased; early seral forests have decreased; mid-age/mature stands of lodgepole and grand fir have increased; white pine blister rust has almost eliminated western white pine and whitebark pine; native canyon grasslands, primarily bluebunch wheatgrass and Idaho fescue, have declined due to weed invasion; agriculture has eliminated the majority of native Palouse grasslands; and vegetation and wildlife habitats are less diverse than historic conditions from past timber harvest practices, fire exclusion, roads, grazing, agriculture, weeds, and recreation. Improvements have included high populations of whitetail deer, wolves surpassing recovery goals, the first successful nesting pairs of bald eagles documented in the area, delisting of the peregrine falcon, high upland bird numbers, Idaho Department of Fish and Game habitat improvement projects, and conservation easements being implemented by Potlatch.

In the foreseeable future, implementing the RMP in combination with National Forest Plans and revisions would put numerous new mitigation, restoration, and conservation measures in place that would reduce the potential extent and severity of effects from other actions. Implementing several programs, such as RCA stream buffers, when combined with similar programs on Forest Service lands, would rehabilitate damaged lands such as riparian areas. Actions on BLM lands would have a noticeable effect at the local level, but because BLM lands are a small total area of scattered parcels, the Cottonwood RMP's contribution to cumulative effects on wildlife across northern Idaho is relatively small. The actions of the Forest Service, as well as state, private, and tribal lands, shape the conditions of much of northern Idaho.

Forested vegetation treatments and harvest, including prescribed fire in conjunction with similar actions on Forest Service, and some private, state and tribal lands, would, if successful, bring forested lands into DFC, a condition more similar to the historic range of variability for species composition and structure. However, logging would have short-term effects on wildlife from roads, noise, and presence of humans on all types of land ownership. Long-term effects would occur for species requiring the denser, more-complex structure of mature forests where converted to more open or early seral-stage stands. These species could decline to a historical level more in balance with the historical amount of mature forests. Species that select more open, single-canopy forest structures would experience an increase in available habitat from this type of forested vegetation treatments.

The same types of cumulative effects would occur under all alternatives. Generally, Alternative C would contribute the greatest potential for improvement in wildlife habitat in northern Idaho because of numerous management actions, mitigation measures, and restrictions designed to improve wildlife habitats. There would be less conversion of forested habitats to historical structures, so that habitat conditions for some species dependent on early seral stages and single story ponderosa pine, would be less improved than under Alternatives B and D. The least amount of change resulting from forest vegetation treatments would occur. Alternatives A and D would contribute less to any improvements in wildlife habitat conditions across northern Idaho because of more focus on commodities, especially under Alternative D. More acres of forest vegetation would be treated than under Alternative C, resulting in more effects on wildlife. Alternative B is intermediate between Alternatives C and D in most regards.

Most of the cumulative impact projects in Section 4.1.3, Cumulative Impacts, have had or will have effects on special status wildlife. Cumulative effects described above also apply to those wildlife species listed under the ESA or designated sensitive by the BLM. Actions and mitigation measures

to comply with the ESA and work towards recovery would make a small contribution to recovery of listed species in northern Idaho, because of the small quantity of BLM-managed lands. The Forest Service has by far the greatest control over the health of listed and sensitive species in northern Idaho because of the large amount of land in its ownership. Development on private lands in northern Idaho also would put additional pressure on special status species. Comparisons of effectiveness among the Cottonwood RMP alternatives would be the same as for non-special status wildlife.

4.2.10 Aquatic Resources, Fish, and Special Status Fish

Goal: Manage habitat to contribute to the conservation of special status and native fish species.

Summary

Healthy riparian areas are critical to aquatic systems that include invertebrate populations and fish, including special status fish species. Under Alternative A, aquatic resources management for the CFO includes designating streams for development of aquatic HMPs, Riparian Management Guidelines (BLM 1985e), PACFISH (BLM and Forest Service 1995), and Fisheries and Water Quality Objectives (BLM 1985d). Prioritized areas for achievement of fisheries and water quality objectives are identified as prescription watersheds for achievement of objectives. Under Alternatives B, C, and D, the Aquatic and Riparian Management Strategy (**Appendix F** [see Volume II~~I~~]) is somewhat similar to Alternative A for providing conservation and restoration measures for fisheries and water resources. The Aquatic and Riparian Management Strategy (**Appendix F**) provides more flexibility for adaptive management, which is also specific to the incorporation of the aquatic and riparian habitat component of ICBEMP into BLM land use plans.

Alternative A does not address all species that have been listed as threatened, endangered, species of concern, or sensitive species with USFWS, National Marine Fisheries Service, Idaho Department of Fish and Game, and Idaho BLM. Alternatives B, C, and D provide updated status for special status species and management emphasis and added focus for protection, conservation, or restoration of special status species habitat.

Because of the intermingled and fragmented land patterns and small BLM ownership within many watersheds, Chapter 2 identifies focus areas where achievement of fisheries objectives (e.g., DFCs) may be more achievable. This strategy focuses on public land ownership within a watershed and where similar management emphasis would also probably occur (e.g., BLM, Forest Service, Idaho Department of Fish and Game). Alternative A identifies prescription watersheds, and Alternatives B, C, and D identifies conservation/restoration watersheds, where focused fisheries management would occur.

Degradation of aquatic habitats and fisheries, including special status fish populations, could occur as a result of land management activities. Resource management such as forestry, minerals, travel, recreation development, and use and grazing can affect aquatic habitats. The potential for impact is dependent upon the success and adequacy of protective measures such as riparian buffer zones, mineral withdrawals, and adherence to the Idaho Standards for Rangeland Health and Guidelines for Livestock Grazing Management (BLM 1997a) (**Appendix A** [see Volume II~~I~~]). Alternative C would best manage habitat to contribute to the conservation of special status and native fish species,

followed by Alternatives B, A, and then D. **Table 4-~~18~~ 19** identifies the indicators that were used to analyze effects on aquatic resources, fish and special status fish under each alternative.

Table 4-19
Comparison of Aquatic Resources, Fish, and Special Status Fish Indicators by Alternative

Indicator	Alternative A	Alternative B	Alternative C	Alternative D
Changes to fish habitat condition in priority prescription, conservation, and restoration watersheds	Improved for 66,077 acres in 39 prescription watersheds (many are the same as restoration and conservation watersheds in Alternatives B, C, and D)	Improved for 64,481 acres in ~~32~~ 28 restoration watersheds and ~~1~~ 3 conservation watersheds	Improved for 68,359 acres in ~~40~~ 37 restoration watersheds and 3 conservation watersheds	Improved for 52,118 acres in ~~27~~ 24 restoration watersheds and ~~1~~ 3 conservation watersheds
Miles of streams in PFC flowing across BLM lands as an indicator of good fish habitat	537	537	537	537
Miles of fish-bearing streams within prescription, conservation, and restoration watersheds flowing across BLM lands	69	80	81	65
Miles of fish-bearing streams flowing across BLM lands	162	162	162	162

Source: BLM 2004a

Methods of Analysis

Indicators

Indicators are used to identify the level of impact. For aquatic resources, fish, and special status fish, the indicators used for impact analysis are identified in **Table 4-~~18~~19**, Comparison of Aquatic Resources, Fish, and Special Status Fish Indicators by Alternative.

Methods and Assumptions

Potential impacts on aquatic resources, fish, and special status fish from each alternative are based on interdisciplinary team knowledge of the resources and the planning area and information gathered from the public during the planning process. Impacts were identified using best professional judgment and were assessed according to the following assumptions:

- Healthy riparian areas are critical for properly functioning aquatic ecosystems. Improvements or protection of riparian habitats would indirectly improve or protect aquatic habitats and fisheries. Degradations to riparian habitats would indirectly degrade aquatic habitats and fisheries;
- Impacts described for fish populations and aquatic habitats would have similar effects on special status fish species where they occur;
- Emphasis and management opportunities for maintenance or improvement of fish habitat

conditions would occur in designated prescription, conservation, and restoration watersheds; and

- All BLM management actions would incorporate appropriate project design, BMPs, and mitigation to not result in any adverse long-term trends for water quality and aquatic habitats at a sixth-code HUC.

Effects Common to All Alternatives

Effects from Water Resources Management

Properly functioning floodplains are important for functioning aquatic ecosystems. Protecting floodplains would indirectly protect aquatic habitats and fisheries. The BLM would not impair long-term achievement of state or tribal water quality standards. It is the responsibility of the BLM through implementation of the Clean Water Act to protect and restore the quality of public water under its jurisdiction to the extent feasible. The development and implementation of water quality restoration plans (or, in some specific instances, sufficiently stringent management measures) would provide the specific action by which the BLM would meet TMDL requirements on lands under their jurisdiction.

Effects from Vegetation—Forests Management

Forest management includes activities such as commercial timber harvest, vegetation treatments, and road construction. These activities can affect aquatic resources. Potential impacts associated with forest management include:

- *Increased sedimentation.* For various forestry practices, the relative contribution of sediment appears to be moderate from clear-cutting (i.e., higher than from selective cutting or patch-cutting), moderately high from skid trails, and moderate from site preparation. By far, excess sediment generation is greatest from logging roads, particularly if built near streams (Waters 1995). Increased sedimentation in streams can affect fish populations in a variety of manners, including direct mortality, reduction in suitable spawning gravels, suffocation and mortality of eggs, and displacement of individual fish. Increased sedimentation resulting from forest vegetation treatments could occur even if the treatments occur outside the buffer zones.
- *Altered stream flow regimes.* Water yield increase resulting from excessive vegetation removal could result in scouring of stream channel bottoms and decreasing fish habitat and food sources (BLM 1981a). Scouring is dependent on the percent of total overstory forest canopy removed at a watershed level and does not occur at a result of localized vegetation removal. Consequently, the potential for scouring to occur would be relatively low.
- *Changes in water temperature.* Increases in water temperature can occur in areas where streamside vegetation is removed or altered flow regimes exist, increasing the amount of sunlight reaching the water or reducing summer base flow conditions. The default buffer zones on fish-bearing water bodies identified would vary between Alternative A and Alternatives B, C and D. The buffer zones would prevent vegetation treatments from occurring in these areas unless treatment would benefit the riparian plant community structure and riparian goals. As water temperature increases, the amount of available dissolved oxygen for fish and aquatic invertebrates decreases.

- *Logging debris accumulation.* Logging debris and jams in moderate amounts may provide increased and improved aquatic habitats. Large quantities of debris may form check dams that fill with silt, causing loss of food-producing rubble and gravel. Large quantities may also form migration barriers (BLM 1981a). The default buffer zones would generally prevent streams from changes in the amount of large woody debris recruitment for streams.

Effects from Vegetation—Weeds Management

Herbicide treatments of noxious weeds could degrade water quality in water bodies through the introduction of minimal amounts of herbicides, which are considered of low to moderate risk to aquatic organisms. Careful management and monitoring of applications would minimize the potential for these impacts. Potential for these impacts would be the same for all four alternatives.

Depending on existing riparian ecological condition and potential for weed infestations, large noxious weed infestations could provide inferior riparian habitat than populations of native riparian species, which could affect aquatic habitats. Noxious weed control measures would help prevent these conditions. Invasive plants can create or exacerbate conditions that reduce water quality. Directly or indirectly, invasive plants can affect stream bank stability, sediment, turbidity, shade and stream temperature, dissolved oxygen, and pH (Forest Service 2005a). Reduction of total acres impacted by invasive plants would positively affect water quality and therefore aquatic resources.

Effects from Aquatic Resources, Fish, and Special Status Fish Management

Alternative A would provide similar protection for aquatic and riparian areas as the Aquatic and Riparian Management Strategy (**Appendix F** [see Volume II~~I~~]) measures to be implemented under Alternatives B, C, and D. Alternative differences would exist for watersheds designated as prescription watersheds (Alternative A) or as conservation or restoration watersheds (Alternatives B, C, and D). The PACFISH (BLM and Forest Service 1995), Riparian Management Guidelines (BLM 1985e), and Fisheries and Water Quality Objectives (BLM 1985d) could be more restrictive for some actions than the Aquatic and Riparian Management Strategy identified for Alternative B, C, and D (**Appendix F**). Alternative A has larger default buffers for lakes and large rivers than the other alternatives. Default buffers on all other types of fish-bearing water bodies within RHCAs and RCA stream buffers would be the same across all alternatives. These buffer zones would serve to protect aquatic habitats from impacts associated with other resource uses such as forest products and minerals, as described in the Effects Common to All Alternatives section. Alternatives B, C, and D are more specific for implementation of conservation and restoration actions for special status fish.

Effects from Special Status Plants Management

Management measures that protect sensitive riparian plant species would indirectly protect aquatic habitats by maintaining healthy riparian areas where sensitive plant species occur.

Effects from Wildland Fire Management

The use of non-fire fuel management strategies such as timber harvest could impact aquatic habitats and fish. Potential impacts are described under Effects from Vegetation—Forests Management. The use of protective riparian buffer zones would lessen the severity of impacts on aquatic habitats in riparian areas from fuels management compared to fire. The potential degradation of aquatic habitats resulting from a high-severity fire could include burning of riparian habitats, increased landslide potential, increased sedimentation, and scouring. Fuel management strategies could reduce these impacts in areas where high-severity fires could occur. Factors in wildland fire management

that could affect aquatic resources, fish, and special status fish are related to the size of area where vegetation is removed and its proximity to fish-bearing waterbodies.

Effects from Visual Resources Management

VRM Classes I and II contain restrictions that limit the amount of timber harvest or mineral resource extraction that may occur within these areas. VRM Classes III and IV contain few restrictions limiting land uses. The increased restrictions associated with VRM Classes I and II could indirectly protect fish populations and aquatic and riparian habitats from impacts associated with other land uses.

Effects from Forest Products Management

General potential impacts, described under Effects from Vegetation—Forests Management, are more likely to be realized under Alternatives B and D than under Alternative A.

Effects from Livestock Grazing Management

The quality of riparian areas influences the productivity of stream fisheries. Livestock grazing can affect the riparian environment by changing, reducing, or eliminating vegetation, and by actually eliminating riparian areas through channel widening, channel aggrading, or lowering of the water table (Platts 1991). In the CFO, assessments per the Idaho Standards for Rangeland Health and Guidelines for Livestock Grazing Management (BLM 1997a) (**Appendix A** [see Volume II~~I~~]) have shown that current grazing levels are compatible with aquatic resources as assessed in Standard 1 (watersheds), Standard 2 (riparian areas and wetlands), and Standard 3 (stream channel and floodplains). In all alternatives, the Idaho Standards for Rangeland Health and Guidelines for Livestock Grazing Management would be implemented, and allotments where grazing occurs in occupied habitat and adjacent to occupied habitat would be monitored and management changes implemented to assure grazing use is compatible with the maintenance of listed fish species habitat. Federal listing of salmon, steelhead, and bull trout, and subsequent ESA Section 7 consultation with USFWS, would reduce potential for BLM impacts to listed fish and aquatic habitats under all alternatives.

Effects from Minerals Management

In instances where conservation measures are not successful, or the identified buffers are inadequate, the actions associated with mining could impact fish populations and aquatic habitats. The potential impacts on fish and aquatic habitats from mining activities include but are not limited to:

- *Increased sedimentation on fish-bearing streams.* Excess sediment generation can be the direct result of surface disturbances for mineral extraction, drilling, and facilities construction and also for road construction, maintenance, and use. Increased sedimentation in streams can affect fish populations in a variety of ways, including direct mortality, reduction in suitable spawning gravels, suffocation and mortality of eggs, and displacement of individual fish. Increased sedimentation resulting from mining could occur even if the mining activities are outside the buffer zones.
- *Introducing hazardous materials to fish-bearing rivers, streams, and lakes.* Hazardous materials from mining activities and from equipment use and maintenance could be released into fish-bearing water bodies. Associated with locatable minerals extraction are mine tailings, which can introduce heavy metals. Similarly, the extraction of fluid materials can result in oil or

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