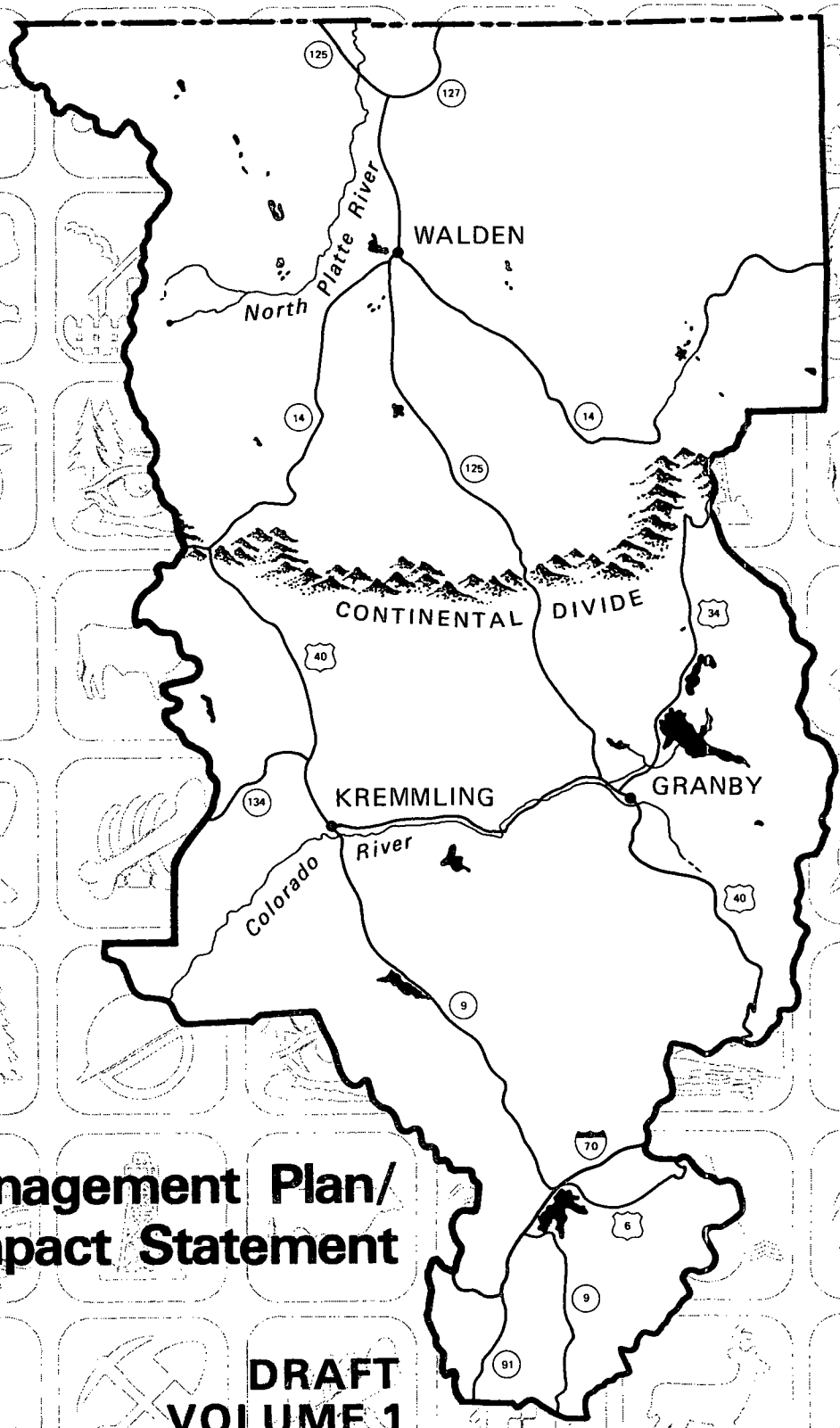
KREMMLING RESOURCE AREA



Resource Management Plan/ Environmental Impact Statement

DRAFT VOLUME 1

U.S. DEPARTMENT OF THE INTERIOR
Bureau of Land Management • Colorado

IN REPLY REFER T

United States Department of the Interior

BUREAU OF LAND MANAGEMENT
CRAIG DISTRICT OFFICE
455 EMERSON STREET
P.O. BOX 248
CRAIG, COLORADO 81625

NOTICE

Enclosed for your review and comment is the draft Resource Management Plan (RMP) and Environmental Impact Statement (EIS) for the Kremmling Resource Area. Resource management planning is an attempt to integrate all resources into a single unified program of management after considering a reasonable range of alternatives. The proposed RMP and draft EIS represent considerable effort on the part of Bureau of Land Management personnel as well as a variety of publics. Your review and comments are needed at this time to insure that your concerns have been considered.

Your comments are invited on the alternatives presented and on the adequacy of the impact analysis. Please direct your written comments to the Area Manager, Kremmling Resource Area, Bureau of Land Management, P.O. Box 68, Kremmling, CO 80459. Written comments should be received by close of business on May 25, 1983. Oral comments will be accepted at the public hearings. Open houses have also been scheduled prior to the hearings to give you the opportunity to ask BLM personnel questions or to find out more about the RMP/EIS in general. Oral comments for the official record will not be taken at the open houses, only at the hearings.

OPEN HOUSES

BLM Office East US 40 Kremmling, Colorado	Tuesday, March 15, 1983 2 PM to 6 PM
SCS Building Walden, Colorado	Wednesday, March 16, 1983 2 PM to 6 PM
Holiday Inn West Colfax at Indiana Golden, Colorado	Thursday, March 17, 1983 2 PM to 6 PM

PUBLIC HEARINGS

Grand County Courthouse District Courtroom Hot Sulphur Springs, Colorado	Tuesday, April 12, 1983 7 PM
SCS Building Walden, Colorado	Wednesday, April 13, 1983 7 PM
Holiday Inn West Colfax at Indiana Golden, Colorado	Thrusday, April 14, 1983 2 PM and 7 PM

CONSERVE AMERICA'S ENERGY

Sincerely,

Lee Carie

Lee Carie
District Manager

Save Energy and You Serve America!

DRAFT RESOURCE MANAGEMENT PLAN AND ENVIRONMENTAL IMPACT STATEMENT ON THE KREMMLING RESOURCE AREA

Prepared by
BUREAU OF LAND MANAGEMENT
U. S. DEPARTMENT OF THE INTERIOR

DISTRICT MANAGER
CRAIG DISTRICT OFFICE

I concur:

STATE DIRECTOR
COLORADO STATE OFFICE

RESOURCE MANAGEMENT PLAN/

ENVIRONMENTAL IMPACT STATEMENT

for the

KREMMLING RESOURCE AREA, COLORADO

Draft (X) Final ( )

The United States Department of the Interior, Bureau of Land Management

1. *Type of Action:* Administrative (X) Legislative ( )

2. *Abstract:* This draft resource management plan and environmental impact statement describes and analyzes seven alternatives for managing the public lands and resources in the Kremmling Resource Area. They are: (1) Continuation of Present Management, (2) Preferred Alternative (BLM's favored option), (3) Energy and Minerals Alternative, (4) Economic Benefit Alternative, (5) Renewable Resources Alternative, (6) Recreation Alternative, and (7) Natural Environment Alternative.

3. *Comments have been requested from the following:* See Chapter 5, Consultation and Coordination

4. *For further information, contact:*

Harold Belisle, Area Manager

Bureau of Land Management

Kremmling Resource Area

P.O. Box 68

Kremmling, Colorado 80459

Telephone: (303) 724-3437

5. Comments on the draft statement must be received no later than:

May 25, 1983

DISTRIBUTION LIST

COMMENTS ON THE ENVIRONMENTAL IMPACT STATEMENT ARE REQUESTED FROM THE FOLLOWING AGENCIES AND INTEREST GROUPS:

Federal Agencies

Department of Agriculture
- Forest Service
- Soil Conservation Service

Department of Energy

Environmental Protection Agency

Department of the Interior
- Bureau of Reclamation
- Fish and Wildlife Service
- Geological Survey
- National Park Service
- Office of Surface Mining

Colorado State Agencies

Colorado Division of Planning - State Clearing House (Distributes to State Agencies)
Colorado State University Extension Service

Local Government

Northwest Colorado Council of Governments
County Commissioners and Planning Departments of Eagle, Grand, Jackson, Summit and Larimer Counties
Cities and Towns of Granby, Grand Lake, Kremmling, Hot Sulphur Springs and Walden

Other Organizations

Advisory Council on Historic Preservation
American Petroleum Institute
Audubon Society
Club 20
Colorado Association of 4-Wheel Drive Clubs
Colorado Cattlemen's Association
Colorado Farm Bureau
Colorado Mining Association
Colorado Open Space Council
Colorado River Outfitters Association
Colorado River Water Conservation District
Colorado Wilderness Network
Colorado Wool Growers Association
Independent Petroleum Association of Mountain States
League of Women Voters
Mile Hi Jeep Club
National Audobon Society
Natural Resources Defense Council
Nature Conservancy
North Park Stockgrowers Association
Rocky Mountain Oil and Gas Association
Sierra Club
St. Vrain Valley 4-Wheelers
Utah Wilderness Association
Western River Guides Association

Numerous Organizations and individuals expressing interest have been sent copies of this Environmental Impact Statement and are invited to comment.

TABLE OF CONTENTS

VOLUME 1 - DRAFT ENVIRONMENTAL IMPACT STATEMENT

SUMMARY 1

CHAPTER 1: PURPOSE AND NEED 9
- Introduction 11
- General Location of the Resource Area 12
- The Planning Process 12
- Issues 15
- Planning Criteria 17

CHAPTER 2: AFFECTED ENVIRONMENT 23
- Topography 25
- Climate 28
- Air Quality 30
- Geology 32
- Soils 34
- Water Resources 36
- Vegetation 38
- Wildlife and Domestic Livestock 42
- Visual Resources 45
- Recreation 46
- Wilderness 50
- Cultural Resources 53
- Economics 57
- Social Analysis 64

CHAPTER 3: ALTERNATIVES INCLUDING THE PREFERRED RESOURCE MANAGEMENT PLAN 69
- Summary 71
- Introduction 71
- Formulation of Alternatives 72
- Alternatives Considered But Not Analyzed in Detail 72
- Alternatives Considered and Analyzed in Detail 73
- Management Prescription Categories 73
- Continuation of Present Management (No Action) Alternative 81
- Preferred Alternative 114
- Energy and Minerals Alternative 120
- Economic Benefit Alternative 125
- Renewable Resources Alternative 131
- Recreation Alternative 136
- Natural Environment Alternative 141
- Comparison of Alternatives 147

CHAPTER 4: ENVIRONMENTAL CONSEQUENCES 153
- Air Quality 155
- Locatable Minerals 156
- Coal 157
- Oil and Gas 158
- Paleontology 159
- Soils 160
- Water Resources 162
- Vegetation 165
- Wildlife and T&E Plant and Animal Species 168
- Visual Resources 172
- Recreation 174
- Wilderness 176
- Cultural Resources 178
- Economics 182
- Social Analysis 190
- Impact Summary Table 196

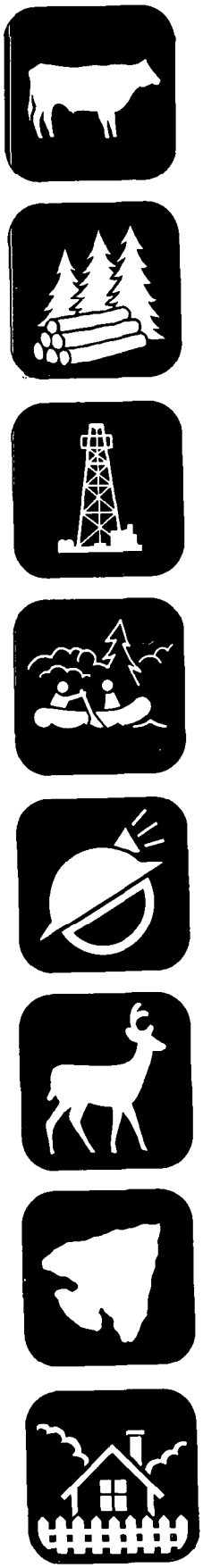
CHAPTER 5: CONSULTATION AND COORDINATION 199
- Public Participation 201
- Consultation and Coordination 201
- List of Preparers 203

APPENDICES 207
1. Vegetation Manipulations 209
2. Range Forage Allocation 210
3. Wilderness Study Policy and Planning Criteria 231
4. Proposed Off-Road Vehicle (ORV) Designations 233
5. Recreation Opportunity Spectrum (ROS) Classes 235

GLOSSARY 237

BIBLIOGRAPHY 242

VOLUME 2 - MAP ADDENDUM



SUMMARY

SUMMARY

Seven multiple use alternatives for the management of public lands in the Kremmling Resource Area have been developed and analyzed through the Bureau's planning regulations issued under authority of the Federal Land Policy and Management Act of 1976, as outlined in Chapter 1. The alternatives respond to the major issues identified early in the planning process.

Each alternative is a master plan that would provide a framework within which future, more site-specific decisions woulds be made, such as directing the management intensity of various resources, developing activity plans (e.g., grazing allotment management plans and transportation plans) or issuing rights-of-way, leases or permits.

The seven alternatives considered, in summary, are:

1. CONTINUATION OF PRESENT MANAGEMENT (NO ACTION)

This alternative allows for the management and flow of outputs from the public lands and resources in the Kremmling Resource Area at their present levels. Some changes, however, would be required in the amount of forage allocated to livestock, as well as in the status of the Troublesome Wilderness Study Area (WSA), in order to comply with specific provisions of the Federal Land Policy and Management Act.

All Federal lands in the resource area would remain open to entry under the provisions of the Mining Laws of 1872, except those lands presently under protective withdrawal. Surface protection would be addressed in accordance with the provisions of the Surface Management Regulations (43 CFR 3809). All Federal lands would remain open to oil and gas leasing and development, except for 640 acres in North Sand Hills, which would be closed to leasing. Surface use restrictions would be addressed in the existing Umbrella Environmental Analysis for Oil and Gas Leasing.

Coal leasing on Federal lands would be limited to emergency leases to continue existing mining operations. Water resources would be protected through limits placed on surface disturbing activities.

Available livestock forage consumption would be reduced approximately 13 percent, from a current licensed use of 45,648 AUMs to 39,726 AUMs. Current management intensity would remain the same, with only 4 out of the 311 allotments being intensively managed (4 percent of the public lands). Approximately 50,000 acres of productive forest lands would be managed for the production of forest products. An annual harvest of approximately 5 million board feet of timber would be allowed. Public lands would be managed to provide sufficient habitat to maintain wildlife populations at their 1980 levels. Approximately 64,500 AUMs would be available for wildlife on 326,800 acres of public land. Threatened and endangered species' habitat would be protected from surface disturbing activities.

Maintenance of visual character in "sensitive" Class II areas would be emphasized. The upper Colorado River and the North Sand Hills would continue to be managed as special recreation management areas, the upper Colorado for floatboating and related activities, and the North Sand Hills for ORV use on the open sand dunes, while protecting important cultural resource and the dune environment. The Troublesome Wilderness Study Area would be recommended as not suitable for wilderness designation.

Inventoring and protecting cultural resources from surface disturbing activities would continue. Lands and realty actions would be addressed on a case-by-case basis. No specific tracts of public land would be identified for disposal. No further designations restricting off-road vehicle use would be made for the public lands.

2. PREFERRED ALTERNATIVE

The Preferred Alternative would emphasize the management, production, and use of renewable resources on the majority of the public lands in the Kremmling Resource Area. Opportunities to provide sufficient suitable local lands would be emphasized to allow for the continuation and possible expansion of the coal industry in Jackson County. Scattered tracts of public lands would be prioritized for disposal in the Grand Lake and Granby-Fraser areas to support their recreational and tourism-based economies.

Multiple-use management would be directed toward providing a flow of renewable resources from the public lands on a sustained yield basis. In addition, management would be directed to the expansion of local and regional economies in areas where Bureau actions could influence orderly economic growth.

The goods and resources provided by the public lands would help meet local, regional and national needs, including the national goal of energy self-sufficiency.

This alternative represents the Bureau's favored management approach. The management of locatable minerals, oil and gas, visual resources, wilderness, and cultural resources would continue as described in the Continuation of Present Management Alternative.

Approximately 45,000 acres of Federal lands would be identified as priority areas for future coal leasing for the continuation and expansion of the coal industry in Jackson County. Water quality would be maintained and protected through restrictions on surface disturbing activities. Sensitive watersheds would be improved through intensive management practices initiated by other resource programs, such as range or forest management. A reduction of 13 percent would also occur in available livestock forage consumption, with 76 grazing allotments, or 51 percent of the grazing lands, having allotment management plans for the purpose of improving overall forage conditions.

Approximately 40,000 acres of productive forest lands that are economically accessible would be intensively managed for the production of forest products. An annual harvest of approximately 4.5 million board feet of timber would be allowed. Public lands would be managed to provide sufficient habitat to maintain wildlife populations at levels determined by the Colorado Division of Wildlife's Strategic Plan where conflicts with livestock did not exist. Approximately 86,000 AUMs of forage would be available for wildlife on 326,800 acres of public land.

One site containing habitat for the endangered plant scorpion weed (*Phacelia formosula*) would be designated as an ACEC. Remaining threatened and endangered species habitats would be protected from surface disturbing activities through use of stipulations. The upper Colorado River and the North Sand Hills would be designated as special recreation management areas, with management continuing as described in the Continuation of Present Management Alternative. The remaining public lands would be managed for dispersed types of recreation.

Criteria would guide the placement of major rights-of-way on public lands and be used to determine which types of public lands would be made available for disposal. Approximately 17,000 acres would be suitable for disposal by various methods; including the Bureau's Asset Management Program.

All public lands would be designated as either open (90 percent) or limited (10 percent) to off-road vehicle use.

3. ENERGY AND MINERALS ALTERNATIVE

This alternative would emphasize the exploration for and development and transportation of energy, energy minerals, and critical mineral resources on Federal lands within the Kremmling Resource Area. Multiple-use management would be directed toward providing timely Bureau actions and support necessary to help meet national needs for energy, critical minerals, and energy self-sufficiency.

The management of livestock grazing, forest products, wildlife (except available habitat managed would be 225,000 acres), threatened and endangered species, visual resources, wilderness, and cultural resources would continue as described in the Continuation of Present Management Alternative.

Locatable minerals and oil and gas resources would remain available to the degree identified in the Continuation of Present Management Alternative. However, exploration and development of these resources would be favored. Conflicts with competing uses would be resolved, emphasizing the mineral and oil and gas needs. Surface use restrictions would be limited to the minimum necessary to protect or maintain the affected environment. Approximately 60,000 acres of Federal lands would be identified as priority areas for future coal leasing for the continuation and expansion of the coal industry in Jackson County.

Emphasis would be placed on protecting and maintaining water quality. Intensive watershed management practices would be employed to improve watershed conditions on sensitive watersheds. The upper Colorado River and the North Sand Hills would be designated as special recreation management areas, with management continuing as described in the Continuation of Present Management Alternative. The Troublesome WSA would also be designated as SRMA to be managed for primitive and backcountry recreation opportunities.

Criteria would guide the placement of major rights-of-way on public lands and would be the least restrictive in this alternative. Criteria would also guide the determination of public lands suitable for disposal. Approximately 9,200 acres of public lands would be suitable for disposal by various methods, including the Bureau's Asset Management Program.

All public lands would be designated as either open (95 percent) or limited (5 percent) to off-road vehicle use.

4. ECONOMIC BENEFIT ALTERNATIVE

This alternative would emphasize providing economic benefits to the local and regional economy. Multiple use management would be directed toward the production of goods and services on the public lands within the Kremmling Resource Area to meet expected local and regional demands. Those resources whose use and development best contributed to the employment and income of local residents and that benefited both local and regional economies would be emphasized. Economic diversification would be encouraged and opportunities for local and regional economic expansion would be provided.

The management of locatable minerals, oil and gas, forest products, wildlife (except available habitat managed would be 225,000 acres), threatened and endangered species, visual resources, wilderness, and cultural resources would continue as described in the Continuation of Present Management Alternative. The maximum amount of Federal lands, approximately 107,000 acres, would be identified as priority areas for future coal leasing for the continuation and expansion of the coal industry in Jackson County.

Water quality would be maintained and protected through restrictions in surface disturbing activities. The condition of sensitive watershed would be improved through intensive management practices initiated by other resource programs, such as range or forestry.

A reduction of 13 percent would occur in available livestock forage consumption, with 63 grazing allotments, or 45 percent of the resource area's grazing lands, having allotment management plans designed to improve overall forage conditions.

The upper Colorado River and North Sand Hills would be designated special recreation management areas, with management continuing as described in the Continuation of Present Management Alternative. Four areas would be designated SRMAs at a later date, when intensive management would be required to maintain, protect, or enhance projected long-term demands for recreational opportunities. Remaining public lands would be managed for dispersed types of recreation.

Criteria would guide the placement of major rights-of-way on public lands and be used to determine which types of public lands would be made available for disposal. Approximately 17,000 acres would be suitable for disposal by various methods, including the Bureau's Asset Management Program.

All public lands would be designated as either open (90 percent) or limited (10 percent) to off-road vehicle use.

5. RENEWABLE RESOURCE ALTERNATIVE

This alternative would emphasize the multiple use management of renewable resources to meet local, regional, and national needs. The renewable resources which traditionally support the local economy would be favored. Although all renewable resources are favored, nonrenewable resource uses would be continued to sustain existing industry's demands.

The management of locatable minerals, oil and gas, visual resources and wilderness and cultural resources would continue as described in the Continuation of Present Management Alternative. Approximately 13,000 acres of Federal lands would be identified as priority areas for future coal leasing for the continuation of the coal industry in Jackson County.

Water quality would be maintained and protected through restrictions on surface disturbing activities. The conditions of sensitive watersheds would be improved through intensive management practices initiated by other resource programs, such as range or forest management.

A reduction of 13 percent would occur in available livestock forage consumption, with 81 grazing allotments, or 55 percent of the grazing lands, having allotment management plans for the purpose of improving overall forage conditions.

Approximately 40,000 acres of productive forest land that is economically accessible would be intensively managed for the production of forest products. An annual harvest of approximately 4.5 million board feet of timber would be allowed.

Public lands would be managed to provide sufficient habitat to maintain wildlife populations at levels determined by the Colorado Division of Wildlife's Stragetic Plan when conflicts with livestock did not exist. Approximately 86,000 AUMs of forage would be available for wildlife on 326,800 acres of public lands.

One site containing habitat for the endangered plant scorpion weed (*Phacelia formosula*) would be designated as an ACEC. Remaining threatened and endangered species' habitats would be protected from surface disturbing activities through use of stipulations.

The upper Colorado River would be designated as a special recreation management area, with management continuing as described in the Continuation of Present Management Alternative. The remaining public lands would be managed for dispersed types of recreation.

The North Sand Hills would be designated as an ACEC to protect existing cultural and natural values.

Criteria would guide the placement of major rights-of-way on public lands and be used to determine which types of public lands would be made available for disposal. Approximately 9,500 acres would be suitable for disposal by various methods, including the Bureau's Asset Management Program.

All public lands would be designated as either open (90 percent) or limited (10 percent) to off-road vehicle use.

6. RECREATION ALTERNATIVE

The Recreation Alternative would emphasize providing for and managing recreation opportunities on public lands to meet both existing levels of use and projected long-term demand. Areas with opportunities that are presently highly sought after, or with that potential, would be intensively managed or protected to maintain present recreation opportunities. The remainder of public lands would be managed to ensure their continuing availability for a variety of dispersed recreation activities in relatively unregulated settings.

A growing regional population having more free time and seeking recreation opportunities closer to home will increase the use pressure on the region's public land recreation base. The BLM administered public lands in the Kremmling Resource Area are the object of growing interest and demand as other public lands in the region become overcrowded. Although provisions for recreation opportunities would be emphasized in certain areas, multiple use goals, sustained yield objectives, and all mandatory environmental protection requirements would be met.

The management of locatable minerals, threatened and endangered species, visual resources, and wilderness would continue as described in the Continuation of Present Management Alternative.

Approximately 13,000 acres of Federal lands would be identified as priority areas for future coal leasing for the continuation of the coal industry in Jackson County. Oil and gas leasing would continue as described in the Continuation of Present Management Alternative, except that temporary surface use restrictions would be developed to protect the visual, wildlife, and recreation resources that are emphasized in this alternative.

Water quality would be maintained and protected through restrictions on surface disturbing activities. The conditions of sensitive watersheds would be improved through intensive management practices initiated by other resource programs, such as range or forest management.

A reduction of 14 percent would occur in available livestock forage consumption, with 81 grazing allotments, or 55 percent of the grazing lands, having allotment management plans to improve overall forage conditions.

Approximately 40,000 acres of productive forest lands that are economically accessible would be intensively managed for the production of forest products. An annual harvest of approximately 4.3 million board feet of timber would be allowed.

Public lands would be managed to provide sufficient habitat to maintain wildlife populations at optimum levels are determined by the Colorado Division of Wildlife's Strategic Plan. Approximately 107,500 AUMs of forage would be available for wildlife on 326,800 acres of public lands.

The upper Colorado River and the North Sand Hills would be designated as special recreation management areas (SRMAs) with management continuing as described in the Continuation of Present Management Alternative. In addition, Independence Mountain, Dice Hill, the Strawberry area, the Troublesome WSA, and the Black Mountain-Drowsy Water Complex would be designated SRMAs to protect and maintain present recreation opportunities in their areas.

In addition to inventorying and protecting cultural resources, emphasis would be placed on managing suitable sites for educational and public information purposes.

Criteria would guide the placement of major rights-of-way on public lands and be used to determine which types of public lands would be made available for disposal. Approximately 15,000 acres would be suitable for disposal by various methods, including the Bureau's Asset Management Program.

All public lands would be designated as either open (90 percent) or limited (10 percent) to off-road vehicles use.

7. NATURAL ENVIRONMENT ALTERNATIVE

The Natural Environment Alternative emphasize the protection, maintenance and enhancement of the current natural environment within the Kremmling Resource Area. This management alternative would maintain and reinforce the natural environment. The enjoyment and use of the natural environment for present and future generations, both locally and nationally, would be emphasized. Exist-

ing multiple use/sustained yield activities, as well as nonrenwable resource uses, would maintain existing industries.

The management of locatable minerals woud continue as described in the Continuation of Present Management Alternative. Approximately 13,000 acres of Federal lands would be identified as priority areas for future coal leasing for the continuation of the coal industry in Jackson County. Oil and gas leasing would continue as described in the Continuation of Present Management Alternative, except that temporary surface use restrictions would be developed to protect the visual, wildlife, and wilderness values that are emphasized in this alternative.

Water quality would be maintained and protected through restrictions on surface disturbing activities. The condition of sensitive watersheds would be improved through intensive watershed management practices.

A reduction of 14 percent would occur in available livestock forage consumption, with 81 grazing allotments, or 55 percent of the grazing lands, having allotment management plans for the purpose of improving overall forage conditions.

Approximately 40,000 acres of productive forest land that is economically accessible would be intensively managed for the production of forest products. An annual harvest of approximately 4.0 million board feet of timber would be allowed.

Public lands would be managed to provide sufficient habitat to maintain wildlife populations at optimum levels as determined by the Colorado Division of Wildlife's Strategic Plan. Approximately 107,500 AUMs of forage would be available for wildlife on 326,800 acres of public lands. One site along the North Platte River containing habitat for the endangered plant scorpion weed (*Phacelia formosula*) would be designated as a Natural Area. Remaining threatened and endangered species habitats would be protected from surface disturbing activities.

Maintenance and protection of the visual quality of *all* class II visual areas would be emphasized. The upper Colorado River would be designated as a special recreation management area, as described in Continuation of Present Management Alternative. The North Sand Hills would be managed as an outstanding Natural Area, with ORV use being prohibited. The remaining public lands would be managed for dispersed types of recreation. The Troublesome WSA would be recommended as suitable for wilderness designation.

Cultural resources would be intensively managed, including inventory, maintenance, protection, and enhancement of important sites. Emphasis would also be placed on managing suitable sites for research, education, and public information purposes.

Criteria would guide the placement of major rights-of-way on public lands, as well as which types of public lands would be made available for disposal. Only about 600 acres would be suitable for disposal by various methods, including the Bureau's Asset Management Program.

All public lands would be designated as either open (88 percent), limited (10 percent), or closed (2 percent) to off-road vehicle use.

CHAPTER 1

PURPOSE AND NEED

CHAPTER 1
PURPOSE AND NEED

Introduction

The Kremmling Resource Management Plan (RMP) will provide a framework for future management of the public lands and resources in the Kremmling Resource Area. This framework for future management will be established by determining which resources will be given management emphasis in the various parts, or priority areas, of the resource area. Each priority area would allow for other resources to be developed or protected to the maximum extent consistent with the resource emphasized in that area. Resource development would be managed within the principles of multiple use and sustained yield.

Dividing the resource area into different priority areas makes it possible to know what to expect for any resource in any given area. A developer of oil and gas, for example, will know where oil and gas development will be favored (have the least restrictions) and where more restrictions will be required if that resource is developed. Utility companies can look at the RMP map and determine where a right-of-way will encounter the fewest restrictions. Areas where range or wildlife improvements can occur with the least threat of later conflict with other resource development will be known.

By inviting the general public resource users and local, state, and other Federal agencies to participate in this planning process, BLM has assured that everyone has been provided the opportunity to have a say in how the Kremmling Resource Area should be managed over the next decade.

Without this plan, there would be no current master plan to guide Bureau management or to tell others how this area will be managed. In addition, any proposed development or protection of resources in the resource area would have to be examined on a case-by-case basis, with each action being weighed against all the other possible uses for the area and its effect on all other resources. This piecemeal approach would not provide a comprehensive or cumulative analysis of the effects of taking these various actions.

The Kremmling Resource Management Plan is being prepared in accordance with the Bureau of Land Management's Planning Regulations, Title 43, Code of Federal Regulations, Part 1600, issued under the authority of sections 201 and 202 of the the Federal Land Policy and Management Act of 1976. The environmental impact statement (EIS) is being prepared according to the Council On Environmental Quality's Regulations for implementing the National Environmental Policy Act of 1969, Title 40, Code of Federal Regulations, Part 1500.

In addition to meeting the need for a master plan for the Kremmling Resource Area, this resource management plan also meets several specific objectives. It identifies the areas within North Park which are suitable for further consideration for coal development. Identification of lands suitable for further consideration for coal leasing is determined according to Title 43, Code of Federal Regulations, Part 3400. This RMP also evaluates the Preference Right Lease Application C-0125854 for environmental impacts.

A suit was filed in 1973 in Federal Court alleging that the Bureau of Land Management's programmatic grazing EIS did not comply with the National Environmental Policy Act. As a result of the settlement of this suit, BLM agreed to prepare grazing EISs according to an agreed-upon schedule. The RMP will meet this objective.

The RMP includes the study of the Troublesome Wilderness Study Area (WSA) as required by the Federal Land Policy and Management Act of 1976. Through evaluations of the alternatives in this RMP, the value of the Troublesome WSA for wilderness use or for other uses will be evaluated and the consequences analyzed. The RMP will make the preliminary recommendation as to whether the Troublesome WSA is suitable or nonsuitable for designation as wilderness. A mineral survey will be conducted by the Geological Survey and Bureau of Mines if the area is recommended as suitable.

Congress has the sole authority for designating any Federal land as wilderness. Congress takes the recommendations submitted by the President, along with other information it may have obtained through its own sources, and, after debate and counsel, either approves or rejects legislation that formally designates areas as wilderness.

Finally, the RMP will also identify lands which will be made available for sale or exchange to consolidate ownership for improved management and to meet other important public objectives, such as the Asset Management Program.

General Location of the Resource Area

145,000 Acres
blic Land in
rand County

The Kremmling RMP encompasses an area of 1,222,880 acres located in north-central Colorado. Included are Jackson and Grand Counties and portions of Eagle, Larimer, and Summit Counties. The area is bordered on the north by the State of Wyoming; on the west by the Routt National Forest; on the south by the Grand Junction BLM District, White River National Forest, and Arapaho National Forest; and on the east by the Roosevelt and Arapaho National Forests and Rocky Mountain National Park. Of the 1,222,880 acres, 33 percent (398,275 acres) is public land administered by BLM, 57 percent is privately owned, 9 percent is state land, and 1 percent is administered by other Federal agencies.

Figure 1-1 shows the location of the Kremmling Resource Area. In addition, a color map of the resource area at a scale of 1/2 inch-to-the-mile is included in the map addendum of this document.

The Planning Process

The planning process is designed to enable BLM to accommodate the uses the public wants to make of public lands while complying with the laws and policies established by the Congress and the executive branch of the Federal government. The RMP process includes nine basic steps and emphasizes the role of public participation at several key stages.

The nine planning steps are as follows:

1. Identification of Issues: In this first step, BLM asks the public, "What's important to you in this planning area?" For the Kremmling RMP, a series of public meetings were held in February and March 1980. In addition, representatives of state and local governments, various user and interest groups, and other Federal agencies, including the U.S. Forest Service, were contacted in March 1980. As a result of these public meetings and contacts and input from BLM staff specialists, planning issues were identified. These were later consolidated into the issues which are presented later in this chapter.

2. Development of Planning Criteria: Criteria are developed to set standards and guidelines for planning and ensure that the RMP is tailored to the previously identified issues. The draft version of the Kremmling RMP planning criteria, along with the planning issues, was distributed to the public in 1980 in the form of a newsletter, *Update*. Approximately 500 copies were distributed or mailed to individuals, elected officials, interest groups, and other agencies.

3. Inventory Data Collection: Based on the issues and planning criteria previously developed, BLM specialists inventory the resources in the planning area, seeing how they are used and what condition they are in. Additional inventory work for the Kremmling RMP was completed in late 1981. Vegetation, wildlife, cultural resources, stream, and recreation inventories were among those conducted. The information thus gathered represents the raw data base used to develop the information and analyses presented in Chapters 2, 3, and 4. The vegetation production data displayed and used in this RMP/EIS was collected during the 1980 field season using the range condition inventory methods prescriped by the Soil Conservation Service. This data was needed to help determine areas suitable for continued rangeland, wildlife, and watershed management and to provide the basis for developing multiple-use management programs and management alternatives. The vegetation production data has also been used to identify and analyze impacts and mitigation of the proposed action and alternatives. Reviewers of this EIS, however, should recognize the limitations of vegetation inventory data. While this data is adequate for purposes of planning and analysis, it must be supported by the results of monitoring studies before making forage allocation decisions.

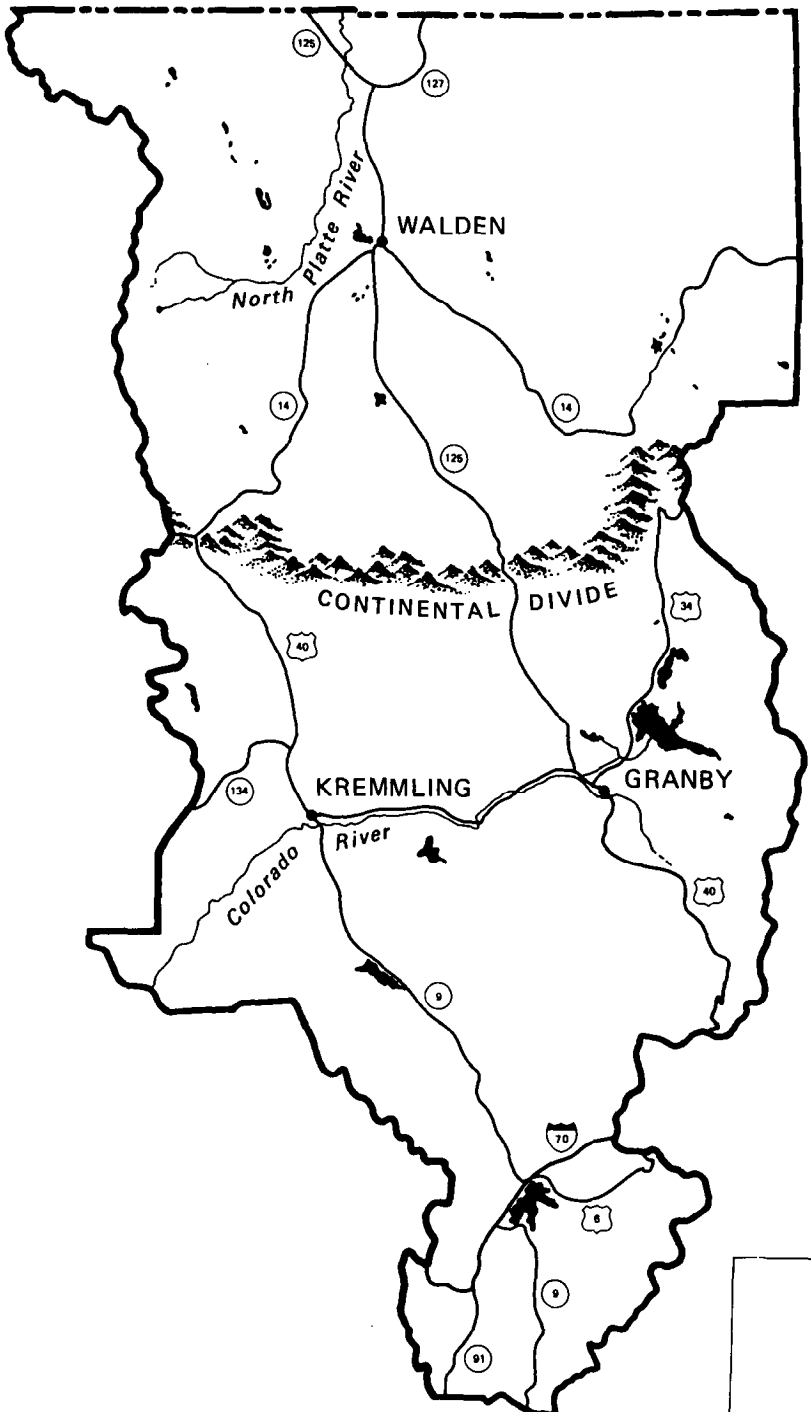
4. Analysis of the Management Situation: In this step, BLM sifts through the inventory data to define the existing situation, assess public demand for the various resources, and predict the ability of these resources to meet future demands on a sustained yield basis. Upon completing these steps, various opportunities are set forth to meet anticipated public demands and resolve potential resource conflicts (for example, identification of lands suitable for coal leasing or grazing lands in need of management to improve their productivity).

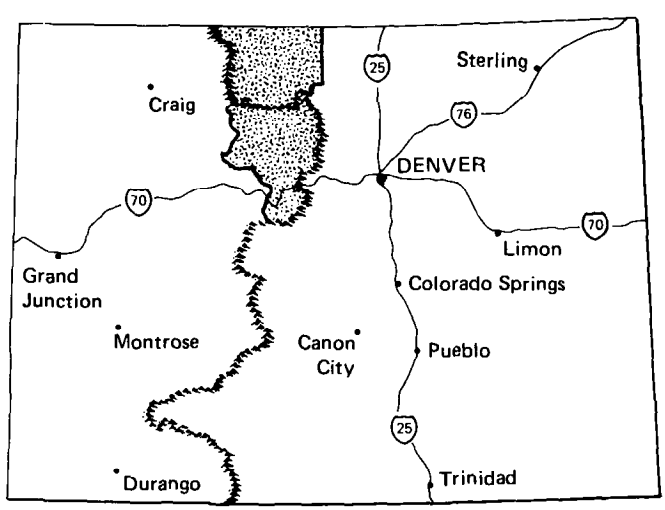
5. Formulation of Alternatives: At this point, BLM formulates a range of options for managing resources. These options range from economic production to environmental protection, thus giving the public lands manager the widest possible range of realistic alternatives to choose from. Alternatives are described in Chapter 3.

6. Estimation of Effects of Alternatives: BLM estimates and describes the physical, biological, economic, and social impacts of each alternative. This environmental analysis is found in Chapter 4.

7. Selection of Preferred Alternative(s): Here the public lands manager reviews the alternatives

KREMMLING RESOURCE AREA





COLORADO

Figure 1 - 1.

and their predicted effects and then chooses or develops a preferred alternative. This alternative is then analyzed in turn. The preferred alternative is described in Chapter 3, while its effects are delineated in Chapter 4.

At this point, the draft plan and draft environmental impact statement (EIS), which constitute this document, are completed and released for public review and comment. This may result in new information being presented, problems being pointed out in the BLM preferred alternative, or other alternatives being suggested.

8. Selection of Resource Management Plan: The public lands manager evaluates comments received and selects and recommends a proposed resource management plan to the BLM State Director. If this plan is not within the range of alternatives in the draft RMP and EIS and the environmental impacts are significantly different, a new draft RMP and EIS must be prepared. After review and concurrence, the State Director publishes and files the RMP and EIS.

9. Monitoring and Evaluation: Once the plan is approved by the State Director, it is implemented. BLM requests funding to carry it out and lists specific jobs needed for implementation. BLM also schedules reviews of the RMP at least every five years to see if it is still workable as time goes on. If change is required, the RMP may be amended or revised.

Issues

The issues which were identified as described in the above section on the planning process are listed here by category.

Locatable Minerals

Withdrawal of public lands to restrict mineral exploration and development

Coal

Availability of Federal coal for lease in the Kremmling Resource Area. Specific areas of interest are the McCallum, Coalmont, and Sheep Mountain areas, all of which are in Jackson County.

Oil and Gas

Oil and gas exploration and development

Mineral Materials

Availability of mineral materials such as sand and gravel

Presence of split ownership such as Federal minerals/private surface or Federal surface/state minerals

Flexibility of postmining reclamation requirements

Paleontological Resources

Identification, protection, and interpretation of the paleontological resources on public lands

Water Resources, Soil, and Air Quality

Soil erosion on disturbed areas, such as roads, off-road vehicle (ORV) areas, clearcuts, and areas of mining activity

Maintenance of the high quality air conditions in the resource area

Quality of both surface and groundwater

Salinity in the Colorado River

Maintenance of minimum streamflows

Management of wetland areas

Livestock Grazing

Availability and condition of range improvements

Competition for, and loss of, livestock forage on public lands

Stability of the livestock industry in the resource area

Potential conflicts involving common-use grazing allotments

Forest Products

Continuation of forest management practices, including harvest, improvement of existing timber stands, and rapid regeneration of logged or burned forested areas

Loss of productive forest lands because of wilderness designation

Maintenance of an even flow of forest products

Availability of firewood cutting and gathering areas

Wildlife

Protection of critical big game winter ranges

Balancing of wildlife numbers, particularly big game numbers, with available forage and habitat

Improvement of big game critical winter ranges

Protection of important fisheries habitats

Availability of access to fishing streams on public lands in the resource area, especially to the Colorado River

Protection of threatened and endangered plants and animals

Visual Resources

Mainteance of landscape character, scenic areas, and views

Recreation

Control of off-road vehicle (ORV) use in environmentally sensitive areas on public lands. Designation of areas as either open, closed, or restricted to ORV use

Management of recreation on the Upper Colorado River

The presence of vandalism, littering, and trespass on the public lands and adjacent private lands by segments of the recreating public

Designation of areas of unique geological, scenic, educational, or natural character as areas of critical environmental concern (ACECs), research natural areas (RNAs), or outstanding natural areas (ONAs).

Wilderness

Suitability of the Upper Troublesome Wilderness Study Area (WSA) for wilderness designation.

Cultural Resources

Identification and protection of cultural resource sites

Management of unique sites on public lands

Lands and Realty

Availability of public lands for sale or exchange in order to consolidate ownership for improved management

Availability of public lands for urban use or expansion, public purposes, and rights-of-way

Identification of utility corridors (major linear rights-of-way)

Support Needs (Transportation and Access)

Acquisition of public access to large blocks of public land for multiple resource use and management.

Maintenance of BLM roads

General Issues

Application of the principles of multiple use to decisions made in the RMP

Coordination of the RMP with existing plans and planning efforts of local and state governments and other state and Federal agencies

Analysis of social and economic impacts and energy conservation in the RMP

Potential for greater demands and impacts to occur on public lands and resources in the Kremmling Resource Area because of the energy shortage and proximity of the area to eastern slope population centers

Concerns Outside the RMP

Numerous concerns were identified that cannot be appropriately addressed by the RMP. These are, however, valid issues that will be resolved inhouse by BLM management or administrative actions. These concerns are:

1. Keeping the public better informed of Bureau activities

2. Delegating more authority to Bureau field managers to enable them to respond to the public more quickly.

3. Ensuring the availability of adequate staffing or funding to respond in a timely manner to public service and demand items, such as rights-of-way, leases, permits, and licenses

4. Addressing the problem of red tape and duplication of requirements within agencies

5. Considering establishment of a part-time Bureau office facility in east Grand County and a full-time office in Walden

6. Minimizing the number of government sponsored public meetings by having agencies hold joint meetings whenever possible

The list of issues presented above is only a summary of the most important issues. A complete listing of issues is available at the Kremmling Resource Area Office.

Planning Criteria

The issues listed above were reworded into questions and the Bureau has established "sideboards" within which it intends to answer these questions through the planning process. These sideboards, or planning criteria, are summarized below for each of the planning questions. Planning criteria may be legal, policy, or regulatory constraints that direct or limit the Bureau's ability to resolve the issues, or they may be constraints imposed as a result of public input or coordination with state and local governments.

In any case, the planning criteria listed below by resource activity have been used to guide the inventory and to establish limits for the proposed levels of resource use or production under the various alternatives. They were also used in selecting the Preferred Alternative and will be used in making the resource management decisions that will result in the final resource management plan.

Locatable Minerals, Oil and Gas, and Mineral Materials

1. *What Federal minerals should be developed through leasing, location, sale, and free use?*

a. Identify areas where economically significant deposits of oil, gas, uranium, sand, gravel, and other minerals exist.

b. Identify withdrawn areas no longer being used for the purposes of the withdrawal which could be used for mineral development.

c. Give priority to meeting the material needs of local governments and agencies.

d. Give priority to leasing oil and gas in known geologic structures and adjacent areas.

e. Limit the general sale of mineral materials if they are readily available from commercial suppliers.

f. Require reclamation that meets Federal and state requirements.

g. Compare the public value of leasing minerals against the use of lands for other purposes and the value of other resources which might be lost.

2. *What areas should be withdrawn from mineral development or have temporary restrictions placed on development?*

a. Identify areas where valuable resources must be protected from the effects of mineral development.

b. Determine those areas which could be developed or explored with appropriate restrictions.

Coal

1. *What Federal coal lands within the Kremmling Resource Area are suitable for coal development?*

a. Identify areas with high to moderate potential for coal development based on resource and demand information and industry interest.

b. Evaluate preference right lease applications (PRLAs) and existing leases for their suitability for surface mining.

c. Compare the public value of leasing lands for coal mining against the use of the lands for other purposes and the value of other resources which might be lost.

d. Apply the 20 unsuitability criteria to insure environmental compatibility as required by the Federal coal management program.

e. Obtain surface owner consultation for surface mining.

f. Provide for enough coal leasing to stabilize existing industry in the area.

Paleontological Resources

1. *What should be done to protect and manage paleontological resources?*

a. Through a literature search, identify geologic formations which have potential for containing significant paleontological resources.

b. Protect significant paleontological resources through site avoidance or salvage.

c. Provide interpretation and enhancement of paleontological sites of significant scientific or educational value through management as an ACEC, RNA, or ONA.

Water Resources, Soil, and Air Quality

1. *Where are the waters that need quality maintenance or improvement and how should BLM manage these waters?*

a. Classify the waters in the resource area according to their quality.

b. Develop management practices which will protect and maintain existing water quality.

c. Identify methods to improve the quality of waters not meeting minimum legal standards.

d. Protect water rights and maintain minimum stream flows.

e. Comply with approved 208 plans and Colorado State Water Quality Standards.

2. *Where are the areas of active and potential soil erosion and what can be done to prevent erosion in these areas?*

a. Determine types, potential productivity, and capability of soils in the Kremmling Resource Area.

b. Meet Federal and state regulations on water and air quality.

c. Apply management techniques to control erosion and improve the land's resistance to erosion, especially in areas of fragile soil, riparian zones, floodplains, municipal watersheds, steep slopes, and threatened and endangered species habitat.

3. *How can air quality in the Kremmling Resource Area be maintained or improved?*

a. Ensure that BLM activities comply with all state and Federal air quality standards and regulations.

b. Assure that management practices do not adversely affect air quality.

c. Take positive steps to mitigate impacts on air quality and to monitor air quality in areas of intensive use.

Livestock Grazing

1. *How should BLM allocate forage to provide for the needs of the livestock industry?*

a. Inventory, monitor, and classify the rangelands according to their management and forage potential.

b. Allocate forage for livestock, wildlife, watershed protection, scenic quality, threatened and endangered species, and other multiple use considerations.

c. Determine management practices which would provide general grazing management and a range improvement program.

d. Develop a method to gradually reduce grazing on rangelands determined to be overstocked.

2. *What should be done to provide needed range improvement projects for grazing allotments?*

a. Categorize allotments by their needs for range improvements and the potential effectiveness of improvements.

b. Provide maintenance for cost-effective improvements, especially those which would result in immediate benefits to the range.

c. Provide new range improvements that will efficiently increase range productivity, such as water developments, fencing, and vegetation manipulations.

Forest Products

1. *What forest lands should be intensively managed for commercial forest products?*

a. Classify lands according to their timber production potential.

b. Assess the level and kind of forest management practices needed.

c. Weigh the value of forest resources against all other resources, such as mining, wildlife, and scenic quality.

d. Determine market conditions and the degree of local dependence on forest products.

e. Develop efficient plans for the harvest, long-term management, and protection of forest lands.

f. Participate in cooperative planning with other forest owners and managers.

2. *What public forest lands should be considered for restocking with trees?*

a. Classify lands according to their restocking potential and establish priorities based on growth potential.

b. Integrate restocking plans with the larger forest management plans.

3. *Which lands are best suited for improved firewood availability to the general public and commercial cutters?*

a. Limit firewood gathering to specific areas to enhance good management.

b. Select areas with abundant slash and logging debris.

c. Consider the effects of firewood gathering on wildlife and other resources.

Wildlife

1. *How should the public lands be managed to provide for the needs of wildlife?*

a. Classify lands according to their value as threatened and endangered species habitat, critical wildlife habitat, and important seasonal habitat.

b. Determine areas of greatest conflict between wildlife and other land uses.

c. In consultation with the Colorado Division of Wildlife, develop effective management practices, including water development, habitat development, and habitat protection.

d. Allocate forage based on the carrying capacity of the range.

2. *Where are the riparian and floodplain areas and what should be done to manage or protect them?*

a. Identify riparian and floodplain areas in the Kremmling Resource Area.

b. Implement a management system to protect, maintain, and enhance all wetland-riparian-floodplain areas administered by BLM.

c. Protect high value streams, riparian zones, and wetlands habitats when fisheries, wildlife, and water quality can be preserved or restored.

Visual Resources

1. *How can BLM maintain the scenic quality of the Kremmling Resource Area?*

a. Follow visual resource management class guidelines when planning multiple use activity locations for public lands.

b. Reduce visual impacts of activities by evaluating landscape character and repeating landscape elements to fit projects into the landscape or to relocate projects to a different landscape type or position to reduce the contrast and disturbance that will be created.

Recreation and Wilderness

1. *What areas should be recommended for designation as wilderness or designated as areas of critical environmental concern (ACECs)?*

a. Inventory the public lands for areas which might be designated as ACECs.

b. Preserve relatively undisturbed examples of native plants, species of special concern, special habitats, aquatic systems, and geologic features.

c. Integrate appropriate ACECs into the Colorado Natural Areas program.

d. Determine suitability of wilderness study areas (WSAs) for wilderness designation and recommend those of appropriate quality to Congress for such designation.

e. Manage the Troublesome WSA under interim management guidelines.

2. *What should BLM do to provide better management on the upper Colorado River?*

a. Consider intensive management of recreation on the upper Colorado River by developing sites and access, regulating use, and providing information and assistance.

b. Consider the collection of a graduated commercial fee to recover some of the expense of intensive management.

c. Protect outstanding environmental areas, including critical floodplains and free-flowing river segments.

d. Ensure management is consistent with Colorado boating regulations and other use authorization procedures.

3. *What should be done to provide more recreational opportunities on the public lands?*

a. Identify dispersed recreational opportunities in the Kremmling Resource Area.

b. Identify areas suitable for recreation development, especially undeveloped areas already being heavily used, areas adjacent to existing travel corridors, and areas that will serve the needs of visitors from throughout the state and nation.

c. Limit development actions to areas which can sustain recreational use without environmental damage and which can realistically be efficiently developed and managed. Ensure these areas are necessary to providing recreation sought by the public and that this recreation is not readily available elsewhere.

d. Limit development to activities which do not duplicate existing services or opportunities and which do not generally have a profit potential for the private sector.

e. Emphasize interpretive programs and resource use programs other than facility use programs.

f. Encourage state, local, private, and other Federal agencies to provide recreational developments through easements or outright land acquisition.

g. Make some access to natural and recreational areas available for all citizens, regardless of age, health, or financial status, when such access is sought by the public.

4. *How should BLM reduce the impacts caused by recreation?*

a. Identify areas being impacted.

b. Protect areas by providing intensive site management where necessary and regulating use if nonregulatory measures fail.

c. Favor management, design, and cooperation over direct regulatory measures to protect resources.

5. *How should BLM provide proper management for off-road vehicle (ORV) use?*

a. Identify areas that are suitable for open, closed, or restricted ORV use.

b. Limit or restrict ORV use in environmentally sensitive areas where it is a management concern.

c. Ensure ORV designation and management are consistent with U.S. Forest Service designations and Colorado off-road recreational vehicle statutes.

Cultural Resources

1. *What should BLM do to provide proper protection and management of cultural resources?*

a. Locate cultural resources by conducting appropriate literature searches and inventories.

b. Protect or avoid sites of importance.

c. Enhance and interpret sites of important scientific or educational value for the public.

Lands and Realty

1. *Which lands should be disposed of or acquired to improve management of the public lands?*

a. Identify lands which are difficult or uneconomic to manage or which will most prudently serve important public objectives by their disposal or sale.

b. Identify lands which could be exchanged to best serve the public interest.

c. Identify lands which could be transferred to other agencies for more efficient or appropriate management.

d. Identify private lands which, if acquired, would consolidate the public lands and thereby improve their management.

2. *Which public lands are suitable for leasing?*

a. Identify lands suitable for leasing for recreation or other public purposes.

b. Identify lands appropriate for leasing to serve the needs of the economy, community expansion, or the production of food, fiber, and minerals.

3. *What public lands would be suitable for the siting of rights-of-way?*

a. Identify tracts or corridors of public lands which, if used as a right-of-way, would have greater public value than if used for other purposes.

b. Limit the granting of rights-of-way in unsuitable areas, such as floodplains, geologic hazard areas, wilderness study areas, etc.

4. *What lands need to have surface and mineral ownership consolidated?*

a. Determine areas of split mineral ownerships where management conflicts exist.

b. Identify areas with significant coal resources which can be consolidated by exchange of Federal and state mineral rights.

c. Identify lands with no mineral potential where mineral rights could be sold to a private surface owner, especially where industrial, residential, commercial, or recreational developments exist or are proposed.

d. Identify mineral estates which cannot be sold because they contain valuable mineral deposits.

Support Needs (Transportation and Access)

1. *What areas of public land need administrative or public access within the Kremmling Resource Area?*

a. Identify large blocks of public land having intensive use

b. Determine timber sale areas

c. Identify areas of high BLM investment or management

d. Locate areas with high outdoor recreation potential

e. Determine other areas needing only restrictive or administrative access

2. *What is needed to develop a sound transportation systen for the Kremmling Resource Area?*

a. Classify the value of roads according to type and level of use.

b. Identify road and trail maintenance responsibilities.

c. Close and rehabilitate unneeded roads for resource protection and public safety.

d. Assure the maintenance and improvement of roads to meet their use classification.

e. Identify proposed roads needed for management of lands.

CHAPTER 2

AFFECTED ENVIRONMENT

CHAPTER 2
AFFECTED ENVIRONMENT

This chapter describes the physical, biological, and human components of the Kremmling Resource Area. Emphasis is given to critical or limiting factors that would be affected by BLM management actions. BLM's current management of these components is described in the Continuation of Present Management Alternative in Chapter 3.

The information presented in this chapter is summarized from more detailed information available in the Kremmling Resource Area Office and elsewhere.

TOPOGRAPHY

The Kremmling Resource Area comprises three distinct topographic regions situated in the northern reaches of the Rocky Mountains of Colorado. These regions are called North Park, Middle Park, and the Laramie River Valley.

North Park is a topographic depression called an intermountain basin or park. North Park is typical of intermountain basins, having a relatively flat interior surrounded by mountains (see Figures 2-1 and 2-2). North Park is situated on the east side of the Continental Divide and is the headwater for the North Platte River.

The lowest point in the park is 7,770 feet above sea level on the North Platte River as it enters Wyoming. The average elevation for the basin floor ranges between 8,000 to 8,500 feet. Most of the public lands in North Park are at elevations below 9,500 feet and are located primarily in the central portion of the basin.

Middle Park differs from North Park and traditional basins in that its interior is mountainous (see Figure 2-3). Middle Park is situated on the west side of the Continental Divide and forms the headwaters for the Colorado River. The lowest point on the Colorado River in the resource area is 6,650 feet near McCoy, Colorado. Most of the public lands in Middle Park are also located in the central portions of the park at elevations between 7,000 and 9,500 feet.

The Laramie River region is located east of North Park on the other side of the Medicine Bow Range. This region is a high mountain valley characterized by rolling foothills. The elevation in this part of the resource area varies from 7,700 on the Laramie River at the Wyoming/Colorado border to 9,500 feet on Bull Mountain.

Some topographic features of interest or prominence occurring within the Kremmling Resource Area are:

1. Gore Canyon - deep canyon cut by the Colorado River, located southwest of Kremmling, Colorado.
2. Little Gore Canyon - deep canyon cut by the Colorado River located near Radium, Colorado.
3. Red Gorge - deep canyon cut by the Colorado River, located near State Bridge, Colorado.
4. Byers Canyon - deep canyon cut by the Colorado River, located west of Hot Sulphur Springs, Colorado.
5. Fraser Canyon - deep canyon cut by the Fraser River, located near Tabernash, Colorado.
6. Kremmling Cliffs - shale bluffs overlooking the town of Kremmling.
7. Wolford and Little Wolford Mountain - prominent land feature overlooking Kremmling, Colorado River, and eastern Middle Park. Wolford Mountain has been considered for designation as a National Natural Landmark by the National Park Service.
8. Whiteley Peak - prominent peak located adjacent to U.S. Highway 40 near Muddy Pass north of Kremmling.
9. Sheep Mt. - prominent peak located west of Walden, near Lake John.

In general the topography of the resource area poses no major management problems. Steep slopes limit uses and development in certain areas. Slopes over 40 percent restrict timber harvesting and cause road construction problems. Slopes over 50 percent constrain livestock grazing in certain areas.

Specific areas where steep topography restricts certain uses or development are:

1. Upper Troublesome - north of Kremmling, Colorado, steep slopes into Rabbit Ears Creek and Troublesome Creek.
2. Radium Area - steep drainage of Colorado River and its tributaries near Radium, Colorado.
3. Drowsy Waters-McQueary Creek - located north of Colorado River west of Granby - steep benches and drainage.
4. Strawberry Area - located east of Tabernash, steep tributaries of the Fraser River
5. Sheep Mt. - steep ridge located west of Walden.
6. Laramie River - steep valleys of tributaries of Laramie River, steep benches adjacent to the river and steep slopes on side of Bull Mt.

Resource Area Boundary

Figure 2 - 1. Topography of the Kremmling Resource Area

Figure 2 - 2. Typical View of North Park

Figure 2 - 3. Typical View of Middle Park

CLIMATE

The resource area's climate is characterized by long, cold winters and short, cool summers with low to moderate precipitation. The precipitation varies throughout the area but is closely correlated to the elevation. The park floor areas receive the least precipitation, with the quantity increasing as elevation increases. The prevailing winds are westerly but are greatly affected by local topography. The growing season is short but varies widely in the area. Fluctuations of temperature and precipitation form year to year are often quite dramatic.

Temperature

Seasonal temperature ranges in the area are drastic. Summer temperatures may reach the upper 90's (F), while winter temperatures may go below -50°F. The elevation also affects the temperature. During the summer, higher elevation land may be 10 or more degrees cooler than the valleys or park floors. Winter inversions can cause the valleys to be much cooler than the surrounding higher areas. Daily fluctuations can be dramatic, especially during the early summer and early fall months. Daily temperatures may go from the 80's during the afternoon to near or below freezing (32°F) at night. The cold winter temperatures may limit the field season and recreation activities. However, the cool summer temperatures make hiking, camping, hunting, and fishing very popular activities in the area.

Growing Season

The growing season ranges from an average of 6 days at Fraser to 89 days at Bond. (Bond no longer has a reporting station and the length of growing season was taken from old records, but the average should still be valid.) These ranges are for a 32°F freeze level. The length of the growing season at various freeze levels for Walden, Kremmling, and Fraser is shown on Table 2-1.

TABLE 2-1 -- Growing Season in Walden, Kremmling, and Fraser, Colorado

Temp. (°F)	Mean Date of Last Spring Freeze	Mean Date of First Fall Freeze	Mean Freeze-Free Days
		Walden	
32	Jul 5	Aug 7	33
28	Jul 16	Aug 22	67
24	May 29	Sep 6	100
20	May 14	Sep 11	120
16	May 4	Sep 26	145
		Kremmling	
32	July 5	Aug 23	50
28	Jun 17	Sep 4	78
24	Jun 9	Sep 6	90
20	May 16	Sep 24	131
16	Apr 27	Oct 4	160
		Fraser	
32	July 17	July 23	6
28	Jul 9	Aug 3	25
24	Jun 18	Aug 19	61
20	Jun 1	Sep 1	92
16	May 9	Sep 13	127

Source: Benci & McKee 1977.

The short growing season severely limits the type of vegetation, amount of annual growth, and length of the field season for vegetation inventories. Species selection for revegetation of disturbed areas is limited to those plants that can withstand both the short growing season and low precipitation.

Precipitation

The area receives low to moderate amounts of precipitation. The amount is closely related to the elevation, with the precipitation increasing as the elevation increases. This rate of increase ranges from 5 to 15 inches per 1,000-foot rise in elevation for the area.

There is also a seasonal variation that is correlated to elevation. The lower park floor areas receive about equal precipitation from May to October and November to April, while the higher elevations receive more during the November to April period.

Local topography can also affect the amount of precipitation due to rain shadows or channeling of storms. Kremmling and Walden are located in a rain shadow. These rain shadows are caused by precipitation falling on the west (windward) sides and summits of nearby mountain ranges. As the storm moves across the east side there is little precipitation remaining. The Grand Lake area is a good example of the channeling effect that topography can have. Grand Lake reporting station 1 NW

receives about 6 inches more precipitation than Grand Lake 6 SSW even though they are only about seven miles apart.

Summer precipitation is usually produced by convective thunderstorm activity. These storms seldom cause heavy rainfall or hail (see Table 2-2).

TABLE 2-2 -- Precipitation in the Kremmling Resource Area

Station	Annual Precip.	Average Monthly Maximum	Average Monthly Minimum	Days with Precip.			Days With Hail
				>.2"	>.5"	>1.0"	
Spicer 2NE	13.9"	1.5"Aug	0.9"Feb	47	4	< 1	5.8
Walden	9.6"	1.2"Aug	0.4"Feb	33	3	< 1	.5
Kremmling	11.3"	1.5" Aug	0.5" Feb	41	3	< 1	.7
Grand Lake 1NW	20.2"	2.4" Aug)Feb	1.0" Oct	66	7	< 1	--
Grand Lake 6SSW	14.2")Apr	1.8" Aug	0.8")Nov	45	3	< 1	--
Fraser	19.6")Sep	1.8")Aug	1.2" Oct	63	6	1	--
Bond *	12.1"	1.7" Sep	0.5)Feb	38	4	1	--

Source: Colorado Climatologist Report 77-1 except (*) Siemer 1977.

The 100-year return period is an indicator of the chance of a severe storm occurring. The 100-year return period 24-hour precipitation is 2.4 inches for Walden and 2.6 inches for Kremmling (McKee, personal communication). These amounts are very low and indicate that heavy rain storms are rare in the area. The summer thunderstorms that occur seldom have much lightning and dry lightning storms are uncommon, so the fire hazard from lightning strikes is low.

Winter precipitation comes in the form of snow. The snow is normally a very light, dry powder type with a low moisture content. The SCS runs snow courses at numerous locations in and around the area to determine snow depth and water content (see Table 2-3).

TABLE 2-3 -- Snowfall in the Kremmling Resource Area

Drainage	Station	Elev.	Feb. 1		March 1		April 1		May 1	
			SD	WC	SD	WC	SD	WC	SD	WC
North Platte	Columbine Lodge	9165'	53	14.5	64	19.9	65	23.2	50	20.7
Colorado	Gore Pass	8900'	27	6.5	32	8.5	34	10.1	22	7.7
Colorado	Granby	8700'	23	4.9	26	6.6	26	7.3	13	4.4
Colorado	Grand Lake	8600'	27	5.2	32	7.1	32	8.3	17	5.0
Laramie	McIntyre	9100'	29	7.9	36	9.3	39	11.2	32	10.4
North Platte	Northgate	8500'	18	4.0	23	5.4	23	6.2	13	4.1
North Platte	Parkview	9200'	27	6.0	31	7.6	34	9.1	22	6.8
Laramie	Roach	9400'	43	11.5	52	15.0	61	18.2	61	19.5
Colorado	Willow Cr. Pass	9500'	32	7.8	38	10.2	42	12.2	31	10.8

SD = Snow Depth (inches)
WC = Water Content (inches)
Source: USDA - SCS 1977

The snowpack in the high elevations usually begins to develop by October and does not begin to melt until late April, with melting continuing through late June. The annual snowfall in some areas may exceed 50 feet (uncompacted) during the winter. The snow is compacted by settling and blowing.

Deep snow restricts animal movement and vehicular travel in many areas. Land used for grazing of livestock is often snow covered during the

winter, so animals must be moved down to lower elevation areas, such as hay meadows, and fed hay to survive through the winter. Wildlife, especially deer and elk, must also move down to areas where their browse is not covered by snow. The field season and activities of land managers are also restricted by snow. Snow does provide for various forms of recreation, such as downhill and crosscountry skiing, snowmobiling, and snowshoeing.

The snowpack provides a major water source for domestic, industrial, and agricultural use. Most cities and towns rely on rivers or streams to supply their municipal water needs. Some of the run-off from the melting of the snowpack is diverted to communities east of the Continental Divide. Ranchers in the area use the run-off for irrigating their hay meadows.

Low precipitation years occur fairly regularly. All vegetative growth can be severely affected by a lack of adequate moisture during the critical growth period in May and June. This can affect livestock grazing areas, wildlife browsing areas, hay meadow output, tree growth, and regeneration and revegetation success. Domestic water supplies can be reduced, resulting in restrictions on water use by households and industry. The Colorado River is used for river rafting by numerous commercial outfitters; low water decreases the length of the floating season and the quality of the float trip.

Air Movement

The prevailing winds in the area are westerly, although local topography can affect surface wind patterns. The winds are generally strongest in the spring.

The North Park area is known for its nearly continuous, year-round winds. The velocity is highest in late winter and early spring and can cause ground blizzard conditions. Winds in the North Park area are usually light to moderate during the rest of the year.

The Middle Park area is more affected by topography and its channeling of the surface winds. The velocities are usually highest in the spring. The range of average monthly wind speeds at Grand Lake 6 SSW is from 2.9 to 4.6 mph and at Green Mountain Dam from 1.3 to 3.8 mph (Siemer 1977).

Another form of air movement common to the area is the "air tide". Air tides occur on calm days and nights and are caused by the heating of the earth's surface. During the day the surface is warmed, causing a layer of air near the surface to warm and move upslope or upvalley as this warmed air rises. During the evening the flow reverses as the surface cools, causing the air layer to cool and flow downslope or downvalley.

Valley inversions are caused by cold, dense air settling into these low-lying areas during the nighttime air tide movement. Inversions occur throughout the year but are most common and severe during the winter months. Inversions occur most frequently at Fraser, as the short growing season and cold temperatures indicate. Kremmling, Granby, Hot Sulphur Springs, and Walden also have inversions regularly during the winter. No data has been collected on these local inversions, but in other areas where they occur, the depth averages about 1,000 feet. The size of the valley and its shape affect the depth of the inversion. During the summer the inversions disperse in the later morning, but during the winter they may remain for several days and possibly a week or more.

Other Climatic Factors

Relative humidity is closely correlated to precipitation. Since the precipitation for the area is generally low, relative humidity is also low. During the summer months the relative humidity may be as low as 10 percent, though the average is about 25 to 35 percent during the afternoon and slightly higher in the evening and early morning. The relative humidity is about 40 percent during the rest of the year.

Evaporation data for the area is available for Grand Lake and Green Mountain Dam (13 miles south of Kremmling). The Grand Lake area has a mean evaporation of approximately 37 inches from May to October and the Green Mountain Dam about 33 inches (U.S. Dept. of Commerce). The evaporation rates are much higher than the amount of precipitation the areas receive, indicating possible plant moisture stress problems during dry years.

Solar radiation data for the area does not exist at the present time. McKee et al. (1980) say that the summer cloudiness throughout the state is quite consistent and estimate that about 2300 BTUs per square foot per day reach the surface of North Park. The potential for solar energy use in the area is not yet known due to the lack of data.

AIR QUALITY

The air quality of the area is very good. There are no known or suspected amounts of pollutants

in excess of Federal or state standards. The visibility within the area is also very good.

The resource area is located within Air Quality Control Region (AQCR) Number 12 of the State of Colorado. According to Environmental Protection Agency (EPA) designations, the air quality of AQCR Number 12 is as follows:

TSP (Total Suspended Particulates): Better than national standards

Sulfur dioxide: Better than national standards

Oxygen (including ozone): Cannot be classified, or better than national standards

Carbon monoxide: Cannot be classified, or better than national standards Source: 40 CFR 81.306

Air quality data for the area is very limited. There are no known existing air quality monitoring sites in the area and, therefore, the information in this section is based on generalizations and some local observations.

Air Quality Boundaries

There are four areas adjacent to the resource area that require exceptional air quality standards. Each of these areas was identified in the Clean Air Act Amendments (CAAA) of 1977 as a Mandatory Class I Federal Area. These areas are shown in Table 2-4, along with their administering agency and acreage.

TABLE 2-4 -- Class I Air Quality Areas

Name	Agency	Acres
Eagles Nest Wilderness Area	U.S. Forest Service	133,910
Mount Zirkel Wilderness Area	U.S. Forest Service	72,472
Rawah Wilderness Area	U.S. Forst Service	26,674
Rocky Mountain National Park	National Park Service	263,138

Source: 40 CFR 81.406

There are two newer wilderness areas and two additions to existing wilderness areas that have not been designated as Class I areas but possibly will be when the Clean Air Act is amended again. These areas are shown in Table 2-5 with their approximate acreages.

TABLE 2-5 -- Potential Class I Air Quality Areas

New Wilderness Areas	*(acres)*
Indian Peaks Wilderness Area	72,000
Never Summer Range Wilderness Area	15,000

TABLE 2-5 -- Potential Class I Air Quality Areas—Continued

Additions	
Mt. Zirkel Wilderness Area	68,500
Rawah Wilderness Area	44,000

All are administered by the U.S. Forest Service.

The Class I designation allows for only a small increase in the amount of TSPs and sulfur dioxide in the air. Class II areas are allowed larger increases in TSPs and sulfur dioxide and Class III an even larger increase over Class II levels.

Those areas designated Class I are areas where visibility is considered an important value. Since the prevailing winds are from the west, the develop ment of the area could be restricted to facilities that would not affect the air quality or visibility of Class I areas to the east of the resource area. The areas on the east that could be affected include Rocky Mountain National Park and the Rawah, Indian Peaks, and Never Summer Range Wilderness Areas.

Sources of Pollutants

There are several sources of TSPs located in the area. Teepee burners at sawmills in Walden, Kremmling, Granby, and Fraser and open burning at a small sawmill in Kremmling are used to dispose of wood product wastes. This burning creates smoke and particulate matter in the local areas and, to some extent, downwind. Due to the current popularity of wood burning stoves and fire places, additional smoke and particulates are produced in the towns during the winter months. During the fall and early winter the U.S. Forest Service and BLM burn slash piles and conduct broadcast burning of slash on timber sale areas in and around the resource area. This slash burning is conducted during good smoke dispersal conditions only.

The amount of TSPs emitted by the burning of wood in the area is not known. The effect the TSPs have on the air quality of the area is also not known but is not expected to be in excess of allowable standards except during some inversion periods. The smoke does create a visibility problem in the local areas during inversion periods.

Inversions

The inversions that occur in the lower areas can trap pollutants and particulates and could pose a

possible health hazard. The inversions are most common and most severe during the winter months. This is also the time when the most smoke and particulates are present from burning wood. The inversions trap the smoke and particulates as well as any other pollutants (such as exhaust emissions) that are present. The concentrations of pollutants are the highest when the inversion ceiling is lowest because there is a smaller volume of air to contain the pollutants. These inversions may limit the type of development within the area to those facilities that would not produce pollutants that would pose a health hazard during inversions.

GEOLOGY

The Kremmling Resource Area is located in the Middle Rocky Mountain region. It consists of mountainous terrain (9,000-12,000 feet) surrounding two lower level basin areas (North and Middle Parks). Only these areas are of concern in this document. No surrounding areas (primarily National Forest) have been considered.

This section identifies the structures (geologic features) and stratigraphy (rock units) that are important sources of mineral values and geological hazards. Of additional importance is the geologic history of the area for the location of valuable paleontological (fossil) resources. The information gathered is based exclusively on a search of available literature. Maps showing the surface geology, mineral, and paleontologic resources may be examined in the Kremmling Resource Area Office.

Geologic History

The geology of the Kremmling Resource Area is represented by a cross section of all the time periods since the original cooling of the earth's crust. Mountain building activity occurred during the Permian and Cretaceous time periods. The later episode resulted in the uplifting of the present Rocky Mountains. The mountain building activities resulted in the formation of the large, northward trending open syncline between the Park Range on the west and the Medicine Bow and Front Ranges on the east. The syncline is separated into two topographic basins (North and Middle Parks, see Figure 2-1) by the eastward trending Rabbit Ears Range (Tweto 1957). Folding and faulting during Tertiary time were the direct result of volcanic activity in the mountain ranges (Izett 1966).

In summation, the Cretaceous uplift of the Rocky Mountains, Tertiary volcanism and subsequent glaciation (Pleistocene), and natural erosion have resulted in the topography and geologic structure as we see it today (Tweto 1976, 1978).

Mineral Resources

Coal

Valuable mineral deposits are very evident in the North Park region. The McCallum Known Recoverable Coal Resource Area (KRCRA) encompasses a large portion of North Park. Coal production is from the Coalmont Formation. Active mining can be seen east of Walden and past mining is in evidence near Coalmont.

Oil and Gas

Along the McCallum Anticline in North Park, valuable deposits of oil and gas are presently being produced. Primary production is from the Dakota Sandstone, which is found north of Walden, Colorado (Newton 1957).

Uranium

Considerable exploration for uranium has been done in recent years in the Middle Park area. Exploration is concentrated in the Morrison, North Park, and Troublesome Formations. These formations are exposed or near the surface in much of Middle Park (Carr 1977; Izett, Barclay, and Venable 1973).

Other Minerals

Gold, silver, copper, and fluorite discoveries and production have been intermittent since the late 1880s. Very low metals production levels exist today. The two recorded fluorspar mines are not presently in operation (Colorado Div. of Mines 1970-1973).

TABLE 2-6 -- Mineral Resource Values

Resource Value	Rock Formation	Rock Unit Type	Time Period	Rock Age (Years)	Mineral Potential
				(Millions)	
Coal	Pierre Shale	Fine grained, gray mud	Cretaceous	70-100	Low
	Coalmont	Coal separated by white sandstones, and shales	Tertiary (Paleocene)	50-70	High: presently in production along McCallum Anticline
Oil and Gas	Dakota	Highly resistant sandstone	Cretaceous	125-135	High: presently in production along McCallum Anticline
Uranium, Radium, Vanadium	Morrison	Variable colored shales and sandstone	Jurassic	135-180	Moderate-high: Some initial exploration in process.
	North Park and Troublesome	Sandstones, siltstone, and conglomerates with few volcanic ash layers	Tertiary (Miocene)	10-30	Low-moderate
Metals: Gold, Silver, Copper	Undifferentiated	Igneous: granites, gneisses, and schists	Precambrian	Over 570	Low-moderate (gold), Low (silver, copper)
	Undifferentiated	Sand and gravels	Quaternary (Pleistocene)	0-3	Low-moderate (gold)
Other Minerals: Fluorite, Gypsum, Sand and Gravel	Undifferentiated	Igneous granites	Precambrian	Over 570	Low-moderate
	Chugwater	Red and gray sandstones and shales	Triassic	200-225	Low
	Undifferentiated	Sand and Gravels	Quaternary	0-3	Low-high: some larger areas are presently being used

Sand and Gravel

Sand and gravel is consistently being used for construction and road maintenance. Most of this production comes from glacial deposits scattered throughout the Kremmling Resource Area (Carr 1977; Bartell 1974).

Geothermal

There are four known areas of a geothermal nature occurring in the resource area: (1) a three-mile square area on the west side of North Park (Hail 1975), (2) an area three miles west of Delaney Butte, (3) Hot Sulphur Springs (Izett 1968), and (4) Sulphur Gulch. The potential for geothermal development in these areas is unknown, since only preliminary exploration has been done.

Paleontology

Table 2-7 outlines fossil locations and fossil classifications for the resource area. The formations of significance are primarily those having vertebrate fossils (North Park, Troublesome, and Morrison Formations). Significant fossil finds are the only fossils that are legally protected (Antiquities Act of 1906 - P.L. 59-209; 34 Stat. 225; 16 USC 432, 433).

TABLE 2-7 -- Paleontological Resources

Fossil Type	Fossil Names	Rock Formation	Rock Type	Time Period	Millions of years	Fossil Classification
Vertebrates						
1. Skeletal parts, jaws, and skulls	Merychippus, Brachychrus, Ustatochoerus, Eucaster, Pliauchenia	North Park Fm. and Troublesome Fm.	Sandstone, siltstone and conglomerate with a few volcanic ash layers	Tertiary (Miocene)	10-30	1b
2. Fossil teeth	Titanothera	White River Fm.	Light colored soft tuffaceous siltstone and claystone	Tertiary (Oligocene)	30-45	111
3. Dinosaur bone fragments	Saurischian	Morrison Fm.	Variable colored shales and sandstone	Jurassic	135-180	1a
4. Bone fragments	Unknown	Chinle Fm.	Calcareous siltstone, sandstone and mudstone	Triassic	180-200	11
Invertebrates						
1. Marine Inv. fragments	Baculites, Inoceramus, Ammonite	Pierre Shale	Dark gray marine shale with a few fine grained sandstone	Cretaceous	70-85	11
2. Marine Inv. fragments	Ostrea, Inoceramus, Baculites	Niobrara Limestone	Calcareous shale with a basal limestone	Cretaceous	85-100	11
3. Marine Shells	Inaceramus Ammonite	Benton Shale	Dark bentonite shale	Cretaceous	100-200	11
4. Marine shell and fish scales	Inoceramus, Fish-unknown	Dakota Sandstone	Light colored sandstone or quartzite	Cretaceous	120-135	11
5. Marine shell	Ostra codes, Pelecypods, Gastropods	Morrison Fm.	Variable colored shales and sandstones	Jurassic	135-180	11
6. Burrow casts	Sp-unknown	Chinle Fm.	Calcareous siltstone, sandstone and mudstone	Triassic	180-200	11
7. Marine Inv. fragments	Corals, Brachiopods, Foraminifera	State Bridge and Minturn Fms.	Variable colored sandstone and siltstone, coral reefs found in Minturn Fm.	Pennsylvanian/Permian	225-310	11
Plants						
1. Leaves and pollen	Platanus, Viburnum, Amporopsis	Middle Park Fm.	Sandstone, conglomerate and mudstone with abundant volcanic detritus	Tertiary (Eocene)	45-60	11

TABLE 2-7 -- Paleontological Resources—Continued

Fossil Type	Fossil Names	Rock Formation	Rock Type	Time Period	Millions of years	Fossil Classification
2. Pollen	Sp. unknown	Coalmont Fm.	Sandstone, conglomerate and certanaceous shale-coal beds	Tertiary (Paleocene)	60-70	111
3. Carbonized remains	Sp.-unknown	Dakota	Light colored sandstone or quartzite	Cretaceous	120-135	11

Source: Newton 1957, Tweto 1957

Specific vertebrate fossils which are potentially significant are the mammal skeletons of the North Park and Troublesome Formations and the dinosaurs (Saurischian) of the Morrison Formation. The only known significant invertebrate fossil location is an ammonite bed of the Pierre Shale or Benton Shale. This site is located approximately seven miles north of Kremmling and has potential for management as an area of critical environmental concern (ACEC), research natural area (RNA), or outstanding natural area (ONA).

Geologic Hazards

Landslides

The type of terrain conducive to landslides is a combination of moderately coherent masses of material and a relatively steep incline. Major landslides occur in the portions of the Troublesome and Middle Park Formations containing soft tuffaceous (ash) rocks rich in clay. Less frequent slides occur within the Morrison, Dakota, and Niobrara Formations and the Benton and Pierre Shales. Areas susceptible to landslides are evidenced by a rippling surface on a valley slope or hillside.

Landslides can be triggered by seismic disturbances (earthquakes), heavy precipitation or adjacent water seepage, and the undercutting of ordinarily stable slopes by both natural erosion or the works of man (Colton et al. 1975a, b).

Areas in the resource area which are susceptible to landslides are the Granby Anticline, the Hot Sulphur Springs area, and steeply inclined sediments along the Park Range.

Swelling Clays

Swelling clays produce stress forces of a magnitude that can seriously affect the structural integrity of bridges, pipelines, buildings, and other developments. Swelling clays are known in the Benton and Pierre Shales and portions of the Troublesome Formation.

Subsidence

Subsidence is common where man has removed large volumes of fluid or masses of subsurface material. These factors exist on lands over and near active oil and gas fields and in coal mining (primarily deep shaft) areas near Coalmont and east of Walden.

Seismicity and Faults

Seismicity and faults are considered a minor risk in Colorado. This rating results from no major earthquakes or fault movement being observed in the last 100 years.

SOILS

The soils of the Kremmling Resource Area are cold, with a mean soil temperature less than 47°F (8°C). Because of low temperatures, the chemical reactions which release plant nutrients from minerals take place slowly. The rate of biologic activity is also limited by temperature, which results in a slow rate of biologic decomposition, seed germination, and root growth. These factors combine to give the soils low fertility.

Soils in the resource area generally do not receive moisture during the growing season. Therefore, the ability of the soil to store moisture from winter precipitation is critical to site productivity. Fine textured soils (greater percentages of silt and clay) store more moisture than coarse textured soils.

The most productive soils in the resource area are those in valley bottoms and at higher elevations. The valley bottoms receive additional moisture because they concentrate runoff from adjacent uplands and because water will percolate laterally into the subsoil from stream channels. Most valley bottoms support grass hay production.

Areas at higher elevations receive a greater amount of precipitation during the growing season. These areas support commercial and noncommer-

cial forests. Areas between the hay meadows in the valleys and the forested areas are rangeland, which are generally less productive. Rangeland with the least productive potential occurs on steep slopes which are exposed to high winds and intense sunlight.

For planning purposes, the soil surveys of Larimer, Jackson, Grand, and Summit Counties and the Aspen-Gypsum area can be used. These soil surveys were prepared by the Soil Conservation Service and are available at the Bureau of Land Management offices in Kremmling and Craig, Colorado. The Larimer County, Jackson County, and Summit County surveys have been published. The remainder are in manuscript and subject to revision. It should be noted that site-specific soil investigations may be required for the proper location and design of improvements requiring soil disturbance.

Over 117 soil series have been identified in the Kremmling Resource Area. A detailed description of these is available at the Kremmling Resource Area Office.

Erosion

In order to preserve site productivity, erosion rates must be balanced with the rate of soil formation. If this is not done, maintenance of sustained yield is not possible.

During the range condition inventory conducted in the summer of 1980, erosion condition was assessed. A soil surface factor (SSF) was determined for each site write-up area in which a transect was taken. This SSF is based on visual evidence of soil movement. It does not assess erosion hazard. Erosion condition reflects the intensity of past land use as well as soil and vegetation factors. An area in stable erosion condition has not been abused, but may have high erosion hazard. Erosion hazard is an estimate based on soil properties of how a site will react if the site is disturbed.

The SSF is a subjective rating of present erosion condition. It is used to flag problem areas. When the SSF is less than 40, the site is considered to be stable or to have slight erosion taking place (soil loss is within soil loss tolerance). In areas where SSFs were greater than 40, further analysis was conducted, using the Universal Soil Loss Equation (USLE). The value obtained from USLE was then compared to the soil loss tolerance. The soil loss tolerance is a value determined by the Soil Conservation Service for the soil. It is based on soil depth and given in terms of tons per acre per year.

When the calculated erosion rate was less than the soil loss tolerance, the site was described as having moderate erosion not presently affecting site productivity. When the calculated erosion rate was greater than the soil loss tolerance, the site was described as having severe erosion affecting site productivity. These areas are shown in Table 2-8.

Table 2-8 -- Erosion Condition

Land Status	Stable or Slight	Moderate Erosion	Severe Erosion
Ac. Public Land.	271,600	13,700	19,700
Ac. Other Land	172,100	10,600	4,800

Generally, SSF's are less than 40 on timbered sites and irrigated meadows. Some areas in rangeland have SSF's of less than 40 as well; these are generally located on level to gently sloping landforms. Areas with SSFs greater than 40 are generally located in rangeland where slopes are steep. Along Route 40 west of Kremmling, Colorado, an area with SSF greater than 40 can be seen. This erosion is a result of human acitivity on an unstable soil. Not all areas with poor erosion condition result from the impact of human activity. For example, the badlands northeast of Cowdry, Colorado, are geologic in origin.

Overuse of the land can cause SSF's to be greater than 40. It may take many years for the evidence of this overuse to be erased.

Alluvial Valley Floors

Alluvial valley floors are areas where streams have deposited sediment over long periods of time. This has created areas that are particularly well suited for flood and subirrigated agricultural activities, given the fact that some deposits act as reservoirs for water. The water holding capacity of the soil can be high, with deposits being as much as 20 feet deep.

In the Kremmling Resource Area almost all perennial streams are associated with alluvial valley floors. These are important to agriculture because almost all hay produced in the resource area is grown on them. This hay is very important to ranching operations because it provides the forage needed to maintain herds over the winter. Alluvial valley floors that are significant to agriculture where the mineral estate is in Federal ownership in the McCallum Known Recoverable Coal Resource Area have been identified through application of the coal unsuitability criteria.

In the Surface Mining Control and Reclamation Act of 1977, Congress specifically states that alluvial valley floors in the arid and semiarid west are to be protected from surface disturbance associated with surface mining. All surface disturbing activity which may affect alluvial valley floors must be carefully considered so that the present level of agricultural production will be protected.

WATER RESOURCES

The water resources in the resource area consist of the streams forming the headwaters of the North Platte and Colorado Rivers as well as many springs and several large reservoirs. Heavy snowfall results in a high spring runoff in May and June. The streams reach a base flow by August or September and remain at this level through the winter.

A baseline survey was conducted in 1980 to determine basic water quality parameters and water quantity. Field data from these surveys is filed in the Kremmling Resource Area Office. With few exceptions, the overall water quality in the resource area is good. However, since this data was verified based on a one-time field check, there may be seasonal problems that are not apparent.

Surface Water Resource

The headwaters of the Colorado River drain Middle Park. The Colorado River watershed has an area of 2,654 square miles in the resource area and ranges in elevation from 6,700 to 13,000 feet above sea level. Only 10 percent (266 square miles) of the watershed area is under BLM management.

Most of the streams in Middle Park originate in the surrounding mountains. They have very high gradients, falling several hundred feet per mile until they reach the 8,000 foot elevation mark. At this point the gradients are less steep and the streams start to meander. As the streams flow out of the mountains, they pass through relatively insoluble geologic formations, resulting in soft water. For example, Crystal Creek is located at a high elevation and has the lowest readings for calcium, magnesium, sodium, bicarbonate, and conductivity in Middle Park.

The Colorado River and its tributaries in the resource area are affected by eight transmountain diversions. There are several large reservoirs in the resource area that are involved with these diversions. Dillon Reservoir, located on the Blue River, provides domestic water supplies to Denver. Shadow Mountain, Granby, and Willow Creek Reservoirs and Grand Lake are part of the Colorado-Big Thompson Project. This project diverts water from the Colorado River and Willow Creek to the South Platte basin for domestic and agricultural use. The Williams Fork and Green Mountain Reservoirs provide water to the Colorado River to replace water taken out by the Big Thompson Project. The Windy Gap Reservoir has been approved and construction began in 1981. This reservoir will provide additional water to the Big Thompson system.

Approximately 40 percent of the streamflow that would otherwise flow past Kremmling is diverted into the South Platte watershed. The average annual discharge past the USGS gauging station on the Colorado River west of Kremmling is 613,320 acre feet per year (AF/yr) after diversions. Approximately 417,850 AF/yr are diverted to the east slope of the continental divide. Upon completion of the Windy Gap Project, an additional 50,000 AF/yr will be diverted from the Colorado River.

The primary uses for the water remaining in the Colorado Basin are agricultural, e.g., hay meadow irrigation and livestock water. Domestic water supplies for Granby and Hot Sulfur Springs are derived from the Colorado River. Recreation is a major water use; rafting on the Colorado River, fishing on the streams and lakes, and boating on the larger reservoirs are popular activities.

The North Platte River watershed covers North Park. The North Platte flows north out of Colorado as part of the Missouri River basin. Included in the North Platte basin is the Laramie River watershed. The Laramie River is separated from the headwaters of the North Platte by the Medicine Bow Mountain Range. Elevations in the watershed range from 8,000 to 13,000 feet.

Streams in the North Platte basin have a very steep gradient, falling several hundred feet per mile until they reach the open portion of the park, where the gradient is lower and the streams spread out in wide alluvial valleys. The geology of the mountains is similar to Middle Park and yields soft water. Geologic formations in the lower elevation area of North Park are more soluble and contribute more minerals to the water.

The major water uses in the North Platte basin are agricultural. Water for livestock and irrigation for hay meadows are provided.

The Michigan River provides the domestic water supply for the town of Walden. Water uses also include recreation. There are several high quality fishing streams and reservoirs in the North Platte watershed.

The average discharge for the North Platte near the Wyoming border is 312,300 AF/yr and for the Laramie River near Glendevey is 53,030 AF/yr. The North Platte and Laramie Rivers have a combined watershed area of 2,030 square miles in the resource area. Only 16.7 percent (339 square miles) of the surface area is managed by the BLM. There are seven transbasin diversions into the Cache La Poudre River that average 19,110 AF/yr. The water diverted is used for agricultural purposes, primarily irrigation, and as domestic water for cities, including Fort Collins and Greeley.

Surface Water Quality

Colorado Basin

The overall surface water quality in the Colorado River watershed is good. There are a few exceptions, such as the Muddy Creek drainage, which has several tributaries that flow through geologic formations that contain soluble sodium and sulfate compounds. This increases the surface water salinity. The Colorado River Salinity Control Act of 1974 requires BLM to assist in reducing salinity input to the Colorado. In addition to the Muddy Creek drainage, there are several springs, including Sulfur Gulch Spring and Sulfur Dump Spring, that have high sodium and sulfate levels. In some cases these springs feed streams that flow into the Colorado River. In other cases they merely serve to bring the salts to the surface.

Selected water samples were analyzed for five metals: lead, molybdenum, arsenic, mercury, and selenium. In all surface waters sampled, levels of these metals were within EPA and state allowable levels.

Water pollution is not a large-scale problem in Middle Park. The only point sources of pollution along the Colorado and its tributaries are municipal waste plants. Nonpoint source pollution is common in the form of agricultural runoff. This type of pollution contributes relatively large amounts of nitrogen and suspended sediments to the surface waters. Springs were sampled as part of the surface water sites during the 1980 inventory. With the exception of a few that are highly saline, the springs had good water quality.

North Platte Basin

The surface water quality in the North Platte basin is good. The geologic formations of North Park are less soluble than the formations in Middle Park. Therefore, the high values (extremes) for North Park (Platte River basin) are lower than the high values in Middle Park (Colorado River basin). With a few exceptions, the springs in North Park also have good water quality. The water meets or exceeds EPA standards, except for mercury in some springs. There are several naturally occurring forms of mercury, with some types being more toxic than others.

Because mercury can accumulate in animal tissues, the EPA standards are low. A level of less than 0.001 milligram/liter (mg/l) in livestock water is considered acceptable (EPA 1976). No streams in North Park had levels above 0.001 mg/l; however, seven springs had values that ranged from 0.002 mg/l to 0.007 mg/l. These springs could have an adverse effect on livestock using them if this level of mercury was constant.

The pollution that occurs in the North Platte basin is similar to that found in the Colorado River basin. Agricultural runoff is the major component. In addition, some of the operating oil wells in Jackson County produce oily water which must be stored and falls under wastewater effluent regulations.

Floodplains

Floodplains in the Colorado River basin are not very wide because most of the streams flow through steep, narrow valleys. In addition, four of the five major drainages are regulated by one or more dams, which reduces the probability of flooding. Muddy Creek, which is not controlled by a dam, is subject to spring flooding. The major streams and rivers in the North Platte basin are not regulated by any dams. These streams are subject to spring flooding, but because of the wide alluvial valleys through which they flow, little damage is done. Table 2-9 shows the 100-year frequency flood level for five North Park streams.

Table 2-9 -- 100-year Frequency Flood Levels for Five North Park Streams

Stream Name	Feet Above Point of Zero Flow
Little Grizzly Creek	4.2
Grizzly Creek	5.6
Canadian River	5.4
Michigan River	5.4
North Platte River	7.9

Flood levels were determined using data from USGS publications and a *Manual for Estimating Flood Characteristics of Natural Flow Streams in Colorado* by McCain and Jarret.

National Resource Waters

National resource waters are those that fall into the high quality classification as determined by the Colorado Department of Health Water Quality Control Commission. None of the streams in the resource area falls into this classification. Several streams within the national forests and in Rocky Mountain National Park do meet this standard.

Municipal Watersheds

The towns of Granby, Fraser, Tabernash, and Winter Park obtain their water from the Fraser River. Hot Sulfur Springs obtains water from the Colorado River. The town of Kremmling obtains its domestic water supply from Sheep Creek west of town. Within these municipal watershed are public lands. These watersheds are affected by the management of public lands. The town of Walden in North Park obtains its domestic water supply from the Michigan River. Portions of the Michigan River watershed fall into the known recoverable coal resource area (KRCRA).

Groundwater Resources

The geology and groundwater hydrology of North and Middle Parks is very complex. Unlike the eastern portion of Colorado, there are no large, well defined aquifers that yield large volumes of groundwater. Most of the groundwater is found either in alluvial aquifers, as might be found along the North Platte or Colorado Rivers, or in isolated pockets of porous sedimentary rocks. These latter sources are not considered aquifers because of their limited extent, great depth of burial, or probability of being drained (Voegeli 1965).

Aquifers and groundwater sources are recharged primarily by infiltration from streams and percolation of precipitation (Voegeli 1965). Both North and Middle Parks have essentially closed groundwater basins. Very little ground water moves out of the basins. Groundwater quality and quantity is adequate for both domestic and livestock use. It is infrequently used for irrigation.

Groundwater Sources

Most of Middle Park is underlain with rock that is capable of yielding only small amounts of water. The alluvium is the principal source of groundwater, yielding supplies adequate for domestic and livestock use. Most of the formations are nearly impermeable to water, which reduces the amount of groundwater. In some areas, however, these formations are faulted and fractured so that some groundwater is stored. Sedimentary rocks of the Tertiary system yield good water when the primary constituents of the formation are sandstone, sand, gravel, or boulders (Voegeli 1965).

As with Middle Park, the alluvium is the principal groundwater source in North Park. In addition, glacial deposits and sandstone areas in the North Park and Coalmont formations yield adequate water for domestic and livestock use. The Coalmont formation and alluvial deposits are the most dependable sources of groundwater.

Groundwater Quality

The groundwater quality of the Colorado and North Platte River basins is good. As with the surface waters, selected wells were sampled for lead, molybdenum, arsenic, mercury, and selenium. In Middle Park, only one well had a reading that exceeded state standards for lead. This well had a lead level of 0.2 mg/l; the state standard is 0.04 mg/l. If future checks reveal a continuing high level of lead from this well, it may be necessary to restrict its use as a water source.

Eight wells sampled in North Park had mercury levels ranging from 0.002 mg/l to 0.008 mg/l. This exceeds the EPA recommendation of 1 mg/l of mercury in livestock water. If future samples continue to show high levels of mercury, it may be necessary to restrict these wells as water sources for livestock.

VEGETATION

Vegetation Classification and Inventory

The vegetation in the Kremmling Resource Area can be divided into four land site classifications: croplands, wetlands, rangelands, and forest lands. All of these are well represented throughout the two major geographic regions in the resource area, Middle Park and North Park (including the Laramie River drainage.)

The land site classifications may be further divided into 13 distinct vegetation types, 4 of which ac-

count for more than 90 percent of the total vegetative cover in the resource area. These four types include sagebrush (58 percent coverage), irrigated meadow (14 percent), lodgepole pine (13 percent), and quaking aspen (7 percent).

During the summer of 1980 a range condition inventory was conducted in the resource area in which all 13 vegetative types were extensively surveyed. This inventory, allowed for the more specific mapping of vegetation types into various range sites. Table 2-10 shows the 13 vegetation types in the area.

TABLE 2-10 -- Vegetation in the Kremmling Resource Area

Vegetation Types	Total Acreage	% of Total North Park	% of Total Middle Park	% of Resource Area
CROPLANDS				
Irrigated Meadow	173,460	18	9	14
WETLANDS				
Riparian	11,000	1	1	1
RANGELANDS				
Sagebrush	710,243	58	59	58
Mountain Shrub	15,680	2	1	1
Salt Shrub	10,159	< 1	< 1	1
Native Grasslands	31,440	3	2	3
FOREST LANDS				
Major Forest Types				
Lodgepole Pine	158,974	8	19	13
Aspen	83,180	10	3	7
Pinyon-juniper	16,400	< 1	3	1
Other Forest Types				
Spruce/Fir	6,623	< 1	1	< 1
Douglas Fir	4,833	< 1	1	< 1
Ponderosa Pine	330	< 1	< 1	< 1
Limber Pine	130	< 1	< 1	< 1
Total North Park:	687,382	--	--	--
Total Middle Park:	535,000	--	--	--
Total Resource Area:	1,222,382	--	--	--

During the course of the inventory approximately 452,200 acres of vegetation were mapped and surveyed. A total of 243 plant species were identified and characterized (46 trees and shrubs, 57 grass species, and 140 forbs.) All of these vegetation species were evaluated in each range site as to their age, growth form, condition, annual production, and availability to primary grazers (domestic livestock and wildlife). This information has been computer catalogued and is available for review at the Kremmling Resource Area Office.

Forest inventory information has been obtained primarily from aerial photo interpretation in conjunction with varying intensity levels of on-the-ground forest surveys on BLM lands. Inventories of very low intensity were begun in 1973 and more intensive inventories are being conducted at this writing. Specific data generated from these inventories, such as forest stand evaluation through site indexing, is available at the Kremmling Resource Area Office.

Other sources were also consulted in cataloguing vegetation information in concert with the inventory (Terwilligan and Smith 1978; Colorado Division of Wildlife 1978; Colorado State University).

Vegetation Distribution and Historic Use

There is a consistent trend in the distribution of the four major vegetation communities throughout North Park and Middle Park. The lower elevation basins are dominated by steppe vegetation, consisting primarily of rolling sagebrush hills and alluvial terraces formerly converted from sagebrush to irrigated meadow. At the higher elevations, this steppe vegetation gives way to expansive forested areas dominated by lodgepole pine.

This elevational trend, which contrasts the more xeric vegetation of the lower regions with the aspen-coniferous forests of the higher country, varies significantly throughout the parks with respect to slope exposure. For example, sagebrush communities may often be found at higher elevations on the drier, southern exposures, and aspen-coniferous forest may be found scattered throughout lower elevations on the moisture-rich, northern exposures.

In addition to slope exposure, other natural elements, such as a short growing season, a varied complex of soil types, and the occurrence of wildfires, have strongly influenced the development of these vegetation communities. Substantial modification to these communities has also been induced by man in the form of extensive timber harvesting and the introduction of livestock grazing within the last 100 years. In the case of livestock grazing, heavy, repeated use has diminished or eradicated several plant species from their preferred habitat.

Discussion of Vegetation Types

The following is a description, of the 13 vegetation types found within the resource area.

Croplands

Irrigated Meadow. Approximately 14 percent of the land in the resource area consists of irrigated river bottoms, terraces, and benches which have largely been converted from sagebrush to hay pasture. The major forage crops produced on these primarily private wetlands are the stable hay grasses which provide critical winter feed for livestock. Included among these grass species, in

order of importance, are Timothy, smooth brome, American sloughgrass, meadow foxtail and red top. Grass-like plants such as the sedges and rushes are also found in these meadows, often on the wetter, boggy sites.

Wetlands

Riparian. The riparian vegetation type is commonly found throughout the resource area in association with river bottoms, irrigated meadows, and upland stream courses. It is a specialized form of wetland, usually existing as fringed strips of vegetation lining a perennial or intermittent stream system. However, riparian vegetation may also inhabit broader sites, such as poorly drained salt marshes, open grasslands, or even steep, rocky canyons consisting of sparse vegetation.

The most extensive areas of riparian vegetation occur along the floodplains and river valleys of North Park, Middle Park, and the Laramie River drainage. These, as well as many upland riparian areas, consist of groves of narrowleaf cottonwood trees or often dense, continuous stands of willows. Associated understory species are wild rose, currant, bluegrass, wheatgrass, bromes, rushes, sedges, and a vast component of annual forbs. Such species are well adapted to the frequent flooding and high water tables evident during the peak spring runoff.

Although the riparian vegetation types account for only about 1 percent of the total land coverage, they are one of the most important ecological components of the local environment. They provide water and shade for domestic livestock, valuable nesting areas for raptors and other birds, and food and cover for many species of wildlife. Perhaps the most significant attributes of riparian communities are that they form an often complex biotic network with the streams along which they are found. This riparian/stream interaction is necessary to maintain acceptable water quality and suitable habitat for fish and other aquatic organisms.

Rangelands

Sagebrush. Sagebrush communities comprise nearly 60 percent of the total land coverage in the resource area. However, their distribution appears to be largely restricted to the more arid, well drained regions throughout the parks. Collectively, they constitute the most characteristic vegetation of the drier valley, terrace, bench, and foothill terrain, which ranges between 7,000 and 10,000 feet in elevation.

The most common species of sagebrush in the resource area is big sagebrush, a species of which there are three nearly indistinguishable varieties. According to studies conducted in North Park by Colorado State University, the most common variety of big sagebrush is *Artemisia tridentata vaseyana*, which accounts for nearly 90 percent of all the sagebrush type (Terwilliger & Smith 1978). This variety of sagebrush may assume a number of stature types or growth forms, depending on the environmental conditions of slope, aspect, soil conditions, and wind exposure. Consequently, the overstory may vary from very open to completely closed stands.

Other sagebrush species found throughout the resource area include alkali sagebrush found almost exclusively on clay plan soils, silver sagebrush on wet sites, and the half shrubs of fringed sagewort and wormwood sagebrush. It is important to note that there is little mixing of these species except for narrow transitional zones between types.

Perhaps the most important factors influencing the range and watershed conditions within the sagebrush types are the composition, development, and density of understory plants. Depending on the range site capability, the understory vegetation varies greatly throughout the sage types. Understories generally consist of low-growing shrubs, perennial grasses, and numerous species of short-lived annual forbs. Several of the more important low-growing shrubs, which are found in association as secondary dominants or understory species, are antelope bitterbrush, rabbitbrush, snowberry, and winter fat. Most common among the key grass species are the bluegrasses, wheatgrasses, Indian rice grass, pine needle grass, June grass, and fescues.

Production of the grasses and other palatable plants within the sagebrush type is generally dependable with average amounts of precipitation and proper use. However, during a year of unseasonably low precipitation, key grass and forb species often fail to produce adequate leafy forage, and seed production may fall off dramatically. Lack of seasonal moisture is one of the single most important management problems in the sagebrush types.

Mountain Shrub. The mountain shrub communities constitute only about 1 percent of the total vegetative cover in the resource area. Despite their thinly scattered distribution, they are one of the most vital rangeland types in terms of their nutrient and cover value for wildlife and livestock.

The most common areas where mountain shrub types are found are on northern exposures in snow pockets and along drainages where moisture is not a limiting factor. These areas are frequently located

about midslope and may be associated with rough or steep topography.

The brush coverage within the stands is generally dispersed and open, often patchy in appearance. This condition provides a marked contrast with surrounding sagebrush and aspen types. The primary dominant shrub species within the majority of the mountain shrub stands are serviceberry and true mountain mahogany. Other shrubs scattered throughout these communities may include mountain snowberry, gooseberry, antelope bitterbrush, sagebrush, and rabbitbrush.

Salt Shrub. The salt shrub communities comprise approximately I percent of the resource area and are scattered throughout the lower elevation drainage basins of North and Middle Park. These areas are characterized by heavy, poorly drained soils that accumulate salt on the surface. Such soil conditions tend to bind surface and subsurface water, making it largely unavailable to plant species. Subsequently, salt shrub communities are usually sparse, containing a poorly developed plant understory of only a few salt tolerant grass and forb species.

Among the dominant plant species of the salt shrub communities is black greasewood, a spiny shrub which may be found forming pure stands or peripherally intermixed with the less salt tolerant sagebrush. Some of the salt flat communities are dominated by a mat-forming saltbush. Primary understory species include inland salt grass, western wheatgrass, and bottlebrush squirreltail.

The primary management problem associated with the salt flat shrub communities is that they often may contain standing water or surface salt, which makes them attractive to livestock during the warm season months. Heavy grazing use is prevalent in these areas, often culminating in surface erosion and the eventual formation of gullies.

Native Grasslands. The open range grasslands of the resource area consist of two elevationally distinct types, the low foothill grasslands and the more extensive high mountain meadows. The former is generally found in association with windswept, exposed sagebrush foothills along the lower stream valleys, mesas, and terraces. It is locally confined to the drier areas of rolling to steep topography, which are often characterized by poorly developed soils that may often contain a veneer of slide rock. The vegetative cover of grass species on these sites is generally low and, more frequently than not, composed of perennial increaser or invader-type grass species, such as Indian ricegrass, bottlebrush squirrel tail, Junegrass, and muttongrass.

In contrast to these sparse foothill grass types, the high mountain meadows support a diverse and well developed flora of grasses. Sustained by a predominantly gently rolling topography and rich moisture regime, these open mountain parks generate a more continuous landscape than their lower elevation counterparts. Large bunchgrasses give these sites a lush grassland aspect. Several of these major meadow grass species include Thurber fescue, blue wildrye, needlegrass, and nodding brome.

Forest

The three major forest types in the resource area are lodgepole pine, aspen, and pinyon-juniper. Together, they constitute approximately 21 percent of the total vegetation cover in the resource area and are among the most intensively managed.

Lodgepole Pine. The lodgepole pine is the major coniferous species within the resource area and is found throughout most of the mountainous slopes between 8,000 and 10,000 feet. It is not only the most extensive timber type, constituting approximately 60 percent of the forest types, but is also the most important commercial forest type. Because of its economic and aesthetic values, the lodgepole pine forest is one of the most intensively managed vegetation types.

Understory vegetation in the lodgepole pine type is usually sparse and has little forage value for livestock or wildlife. Included among the most prominent understory species are russet buffaloberry, kinnikinnick, grouse whortleberry, oregon grape, and sedge.

In addition to lodgepole pine there are four other coniferous forest types that occur generally in scattered pockets throughout the resource area. Each of these types account for less than 1 percent of the total vegetation cover and, therefore, are not intensively managed. They include:

- Spruce-Fir type - Englemann spruce and subalpine fir.
- Douglas Fir type.
- Ponderosa Pine type.
- Limber Pine type.

Aspen. Stands of quaking aspen are found on mountain slopes at nearly all elevations. Aspen communities constitute nearly all of the hardwood trees and account for about 7 percent of the total vegetation cover in the resource area.

Aspen can be found growing under a wide range of conditions. It is found as isolated pure stands in the sagebrush in the transition zone between sagebrush and conifer, as islands within conifer stands, as a cover crop for conifers, in mixed stands with

large conifers, and along stream courses or wet areas. Cattle and wildlife are known to seek out the highly palatable brome, rye, wheatgrasses, and leguminous forbs found in the abundant understory community.

Aspen stands have largely been maintained and preserved for their scenic, recreational, wildlife, and grazing values. However, if a paper industry became established within the area, commercial demand for aspen may occur.

Pinyon-juniper. Due to a local difference in the temperature regime, the pinyon-juniper vegetation type is almost exclusively confined to the drier, warmer foothills in the southwest part of the resource area, between the mountainous exclosures of Gore Canyon and the river town of State Bridge. The steep and rocky terrain of this area provides a suitable habitat for pinyon pine and two species of juniper, Utah juniper and Rocky Mountain juniper.

The primary use of these pinyon-juniper woodlands has been in support of spring-summer-fall livestock and wildlife grazing. Although much of this type is inaccessible to livestock, those portions that are accessible generally contain an understory composition of shrubs and bunchgrasses which have a fair to high preference by livestock and big game.

From a commercial standpoint, pinyon-juniper trees have little value other than for firewood and fence posts. Additionally, the pinyon-juniper woodlands represent less than 1 percent of the total vegetative cover in the resource area.

Poisonous Plants

Poisonous plants are prevalent throughout the resource area, although few areas contain concentrations of poisonous species large enough to seriously threaten livestock or wildlife.

A comprehensive list of the poisonous plant species known to occur within the resource area has been prepared and is available in the Kremmling Resource Area Office. This list was derived from the Plant Information Network of Colorado State University.

Threatened, Endangered, and Sensitive Plants

There are few known locations for federally listed threatened or endangered plant species in the resource area. However, *Phacelia formosula* (scorpion plant), a member of the waterleaf family, has been formally adopted as an endangered species by the U.S. Fish and Wildlife Service in the September 2, 1982, Federal Register, Vol. 47 No. 170. The scorpion plant is an annual, or possibly a biennial, that grows to be 6 to 10 inches tall. The violet flowers are arranged in clusters on stalks that look like a scorpion's tail. These scorpioid flower clusters are about 2 inches in length. This endangered species has presently been identified in two locations in North Park, although similar habitat exists for the species elsewhere throughout the park. The *Phacelia's* known habitat is a sandstone area open to direct sunlight. Associated plant species are Indian ricegrass, stickleaf, nodding buckwheat, and wild rose. These species are outlined in further detail in Table 2-11.

TABLE 2-11 -- Threatened, Endangered, or Rare Plants That May Occur in the Kremmling Resource Area

Plant Name	Status	Habitat	Associated Species
1. *Phacelia formosula*, Osterhout	Proposed Endangered Federal Register, Sept. 1982, Vol. 47, No. 170	Sandstone bluff open to direct sunlight	*Eriogonum cernuum, Mentzelia nuda, Rosa, Penstemon, Lithosperum*, and *Chrysothamnus*
2. *Astragalus osterhoutii*, M. E. Jones	USFWS Category 2 Federal Register Notice of Review Dec. 1980 Vol. 45, No. 242	Barren knolls, in gulches of denuded clayhills, gullied bluffs, stiff alkaline claysoils, and Niobrara shale	None
3. *Penstemon harringtonii*, Penland	USFWS Category 2 Federal Register Notice of Review Dec. 1980 Vol. 45, No. 242	Sagebrush community, open dry flats, and rocky knolls	*Mertensia, Artemisia, Phlox, Castilleja, Agropyron, Oryzopsis*, and *Tesquerella*
4. *Artemisia argilosa* Beetle	USFWS Category 2 Federal Register Notice of Review, December 1980 Vol. 45, No. 242	Disturbed dry soils and coal powder	*Artemisia tridentata, Artemisia cana, Sarcobatus vermiculatus*, and *Chrysothamnus*
5. *Penstemon laricifolius* ssp. *exilifolius* (A. Nels.) Keck	Sensitive, rare	Open ground in direct sunlight	None
6. *Neoparrya megarhiza* (A. Nels.) Weber	Sensitive, rare	Mixed Desert shrub, of dark grey shale	*Oryzopsis*, and *Eurotia*

WILDLIFE AND DOMESTIC LIVESTOCK

The Kremmling Resource Area provides habitat for approximately 310 species of animals, including

220 birds, 60 mammals, 20 fish, 7 amphibians, 1 reptile, and 3 domestic herbivores.

The 310 species of animals are widely distributed over approximately 1,222,000 acres of aquatic and terrestrial habitats. Nearly all the public lands within the resource area are used for livestock grazing by local ranchers who operate from private lands within the area. Currently, there are 145 ranch operation that use the public lands to graze approximately 30,000 cattle, 70 horses, and 200 sheep.

The Kremmling Resource Area is composed of 13 distinct habitat types (vegetation types) and numerous land forms that range in elevation from 6,700 feet to 10,700 feet above sea level. (See the Vegetation and Topography sections of this chapter for a detailed discussion of the vegetation and topographic features.)

Source of Information and Inventory Methods

Population estimates for big game, sage grouse, and waterfowl were obtained from the Colorado Division of Wildlife. Additional data for this report was taken from the results of the inventory conducted in the resource area during the 1980 field season. During this inventory, field crews also conducted a modified version of the Bureau's Integrated Habitat Inventory and Classification System (IHICS). The IHICS requires a listing of wildlife species occurrence by habitat site. Habitat sites are IHICS mapping units based on the dominant vegetation and land form of a given site. Wildlife species observed in the field during the inventory effort were listed by occurrence on range site area rather than by habitat site. A range site area is the basic land mapping unit for the inventory and is based on soils, dominant and co-dominant vegetation present and condition. Special habitat features, an integral part of the IHICS, were recorded during the inventory.

Other data used in this report was taken from an accumulation of general field inventory results compiled over the past several years and from numerous specific field studies. The more specific studies include the Middle Park Mule Deer Ecology Study, the Bald Eagle Winter Habitat Inventory, and the various facets of the extensive North Park Sage Grouse Study, to name a few.

Large Wild Mammals

Mule deer, pronghorn antelope, and Rocky Mountain elk are the most common large mammals found in the Kremmling Resource Area. Mule deer and elk occupy higher elevations, usually forested habitat, during summer and then migrate to lower elevation sagebrush dominant ridges and slopes to winter. BLM administered public lands provide the vast majority of winter range available to deer and elk in the resource area. The Colorado Division of Wildlife estimates the deer population to be 3,000 in North Park and 10,000 in Middle Park (including the lower Colorado River drainage); the elk population is estimated at 3,600 in North Park and 5,000 in Middle Park.

Breeding populations of pronghorn antelope are currently limited to North Park (including the Laramie River drainage). Antelope were historically residents of Middle Park but were extirpated by market hunters during the early 1900s. A few antelope appear in Middle Park each summer, probably immigrants from North Park, and the current population is estimated by the Division of Wildlife at 10. The North Park antelope population is estimated at 750. Antelope use the sagebrush dominant ridges and valleys within these ranges and usually occupy public lands in North Park on a yearlong basis.

Birds

Upland game birds common to the resource area include blue grouse and sage grouse. Blue grouse are widely distributed throughout the higher elevation woodlands and mountain meadows. Because blue grouse are extremely difficult to accurately census, population estimates are unavailable at this time. Sage grouse occupy the lower elevation sagebrush-dominant rangelands throughout the resource area. Sage grouse depend almost entirely on the sagebrush ecosystem for successful breeding, nesting, and winter survival. The North Park sage grouse population has been extensively studied for the past 10 years and the current population is estimated to be 20,000. Population estimates are unavailable for the remainder of the resource area.

The numerous streams, rivers, reservoirs, ponds, and associated riparian vegetation provide excellent habitat for a wide variety of waterfowl and shorebirds. Puddle ducks, including mallards, pintails, gadwalls, greenwinged teal and American widgeon, are common throughout the aquatic habitats in the resource area. North Park is particularly important because its waterfowl production is the second highest of any area in Colorado. Only the San Luis Valley produces more ducks annually than does North Park. Waterfowl production occurs throughout the resource area, but no other area approaches North Park in magnitude. The breeding season population of ducks in North Park is estimated at 17,000 to 20,000 breeding pairs. Popula-

tion estimates for the remainder of the resource area are unavailable at this time.

Shorebirds are common in association with the numerous water bodies. Greater sandhill cranes, classified as a state endangered species, are known to nest in the southwest quadrat of North Park. Some public lands in this area have been identified by the Division of Wildlife as essential habitat for the greater sandhill cranes. Killdeers, American avocets, willets, and Wilson's phalaropes are among the more common shorebirds found in the resource area.

Raptors (birds of prey) are abundant. Prairie falcons, red-tailed hawks, marsh hawks, and golden eagles are the more common raptors breeding and nesting in the area. Precipitous rock formations, large trees, and mountain meadows provide suitable nesting habitat for these species. The numerous songbirds and small mammal populations provide the prey base available to these raptors. Woodland nesting species such as goshawks, Coopers hawks, and sharp-shinned hawks are common in the forested areas.

Bald eagles and peregrine falcons, both classified as endangered species by the U.S. Fish and Wildlife Service, are known to occur. Bald eagles are fairly common winter residents along the Colorado River and several major tributaries in Middle Park. Migrant bald eagles are observed annually in North Park and occasionally in the Laramie River drainage. Peregrine falcons are observed in migration in Middle Park and North Park; however, no established use has been recorded, even though apparent suitable habitat exists. Essential or critical habitats for bald eagles and peregrine falcons have not been designated in the resource area.

Songbirds and Small Mammals

Songbirds and small mammals are abundant in the resource area. Little or no data other than occurrence exists for the majority of these species, even though they are important components of the various ecosystems. These species are important as food sources for larger birds and mammals and, equally important, may be used as environmental quality indicators.

Amphibians and Reptiles

A mere handful of amphibians and one reptile, the garter snake, occur in the resource area. The extreme cold temperatures and arid climate are not conducive to cold blooded animal survival. These species are apparently widespread in distribution but few in numbers.

Fish

The Kremmling Resource Area contains an important fishery resource in both streams and lakes. The fishery resource can be divided into two areas: streams and rivers that contain naturally reproducing populations of game fish, and lakes and reservoirs that contain some naturally reproducing populations which are supplemented with fish stocked by the Colorado Division of Wildlife (CDOW).

The predominant fish species in the small tributary streams in the resource area is the brook trout. The major game fish in the Colorado River is the rainbow trout. In addition to rainbows, some brown, brook, and cutthroat trout occur in lesser numbers. All of the fish have naturally reproducing populations in the Colorado River. CDOW stocks some cutthroat and rainbow trout in the Colorado River below Kremmling and near Hot Sulphur Springs. The rivers in the lower elevations of North Park are dominated by brown trout and contain some brook and rainbow trout.

Middle Park contains several large reservoirs that provide important recreational fisheries. Rainbow trout and Kokanee salmon are the two major fish species that occur in the reservoirs. Other game fish found in the reservoirs include lake, brown, cutthroat, and brook trout. Most of these game fish populations are maintained by CDOW stocking programs. Northern pike have been stocked in the Williams Fork Reservoir and are doing well. There are some indications that they have successfully reproduced in the reservoir.

Several lakes in North Park contain valuable fisheries. Lake John has a good population of brown, rainbow, and cutthroat trout. The Delaney Lakes contain excellent brown and rainbow trout populations. In addition to these reservoirs, there are several other lakes in North Park that contain stocked populations of rainbow trout.

There are no known populations of federally listed threatened or endangered fish in the Kremmling Resource Area. The Johnny darter is on the Colorado state list of threatened fish. Some small populations of Johnny darters may exist in the major North Park rivers. There may be populations of Johnny darters in Lake Granby and the Upper Colorado River as a result of "bait bucket" introductions.

Several species of roughfish also inhabit the reservoirs and streams in North and Middle Parks.

Species such as creek chubs, fathead minnows, and Johnny darters that are not native to the Colorado drainage have been introduced there by bait fishermen releasing leftover live bait. This has been stopped now that the use of live minnows for bait is illegal above 7,000 feet in elevation. These roughfish serve as a food base for the larger predaceous trout and for northern pike.

Important Habitat Features

Critical winter ranges for elk, mule deer, and pronghorn antelope are essential to the survival of these species in the Kremmling Resource Area. Critical winter ranges are located on sagebrush dominant ridges and south-facing slopes at lower elevations throughout the resource area. Habitats for species that depend on specific or historic sites for breeding and associated courtship activities are also critical. Sage grouse strutting grounds are a specific example of these important habitats. Strutting grounds are distributed throughout the sagebrush vegetation type, usually located on ridges with low-growing vegetation. Loss of nesting habitats that have been used historically and are limited in number and distribution for certain raptors, such as prairie falcons and golden eagles, may have serious negative impacts on these species. Detailed locations of these and other important habitat features are available in the Kremmling Resource Area Office.

Water is an essential habitat component for all animals, and, because of the arid climate of the resource area, it is limited in availability. Land use practices that could degrade the quality or reduce the quantity of water available would adversely impact all animals inhabiting the resource area.

VISUAL RESOURCES

The Kremmling Resource Area has a diverse landscape. It is dominated by two mountain parks, North and Middle Parks. These parks are broad depressions in the mountains where trees are absent or scattered across open, rolling terrain. Both ancient geologic activity and climatic conditions have alternately built up and weathered down the landscape, creating canyons, isolated peaks, rocky outcrops, rounded hillsides, flat valleys, and waterways. These diverse features, together with vegetation and surrounding mountains, combine to form the landscape of North and Middle Park (see Figure 2-1).

The majority of the public lands in the resource area provide the foreground and middleground landscapes to scenic mountain vistas. Developments on these lands have affected the vistas seen when driving through the area.

When traveling through North Park, the views seen are predominantly of open, rolling hills covered with grasses and sagebrush. Interest is created by the mountains surrounding the park. These, as well as the foothills bordering the park, create scenic vistas. The foothills are open sagebrush on the southern exposure and pine and aspen forest on the north exposure. The relief and vegetation adds variety along the park edges.

Throughout the center of the park, the sagebrush hillsides are broken up by water features and ridges. Creeks and rivers wind through the hills, displaying riparian vegetation communities as well as flowing water. Four lakes located in the northwest end of the park give this area additional variety and interest. The ridges that run across the park are composed of rock outcrops and open sage grasslands. The rock outcrops and higher relief break the line of the rolling, rounded hills.

Other features in North Park are the result of man's activities. A few small towns have developed in the park, the largest being Walden. The other towns in North Park are smaller and consist of a few buildings and a gas station. Some additional effects of man's activities are the oil and gas fields east of Walden, the coal strip mines east of Walden, the 345 kV powerlines cutting across the landscape, and the railroad line traversing the north end of the park. From the major traffic routes these activities can be seen but do not dominate the landscape. The visitor still can see the countryside, get a feeling of remoteness, and enjoy the mountain vistas.

Middle Park has more diversity in landscape features than North Park. When traveling through the area, one observes a landscape that is constantly changing. Here, too, open rolling sagebrush hills are seen but do not dominate all views. In the northwest, the rolling hills are interrupted by isolated mountain peaks that have rocky south faces and forested north faces.

The central part of the area is bisected by the Colorado River. The river winds through the park in an east/west direction and is alternately enclosed by cottonwood trees, open to riparian grasses, or dominated by dark, steep-walled canyons (Gore to the west and Byers to the east). As the river flows out of Gore Canyon, it winds through hills composed of reddish-orange, rocky soil strata. These hills are covered with pinyon-juniper and provide a diversity of color and texture along the riverway.

The other canyon, Byers, is intersected by the main highway so many travelers see the steep, dark, vertical canyon walls.

East of Byers Canyon the countryside becomes even more diverse. The Colorado River, as it winds out of the canyon, cuts through a large, rocky ridge and several rocky hills. The river is enclosed by large cottonwood trees that add color and texture to the landscape. The highway has been built along the river, so views from the highway are dominated by forested waterways backdropped by rocky ridges. The very eastern edge is predominately a forested landscape.

The man-made features in Middle Park are mainly the result of tourism. The largest towns are Granby on the east side and Kremmling on the west. Other, smaller communities have grown up along the eastern edge, including a ski town, dude ranches, and second home developments. Many houses have been built in the forested areas and serve mainly as recreational homes. The northeast edge also has recreational homes and facilities. This area is next to Grand Lake and Rocky Mountain National Park.

The diversity and landscape character of both North and Middle Park is an important resource because the landscape is seen by many people. Travelers passing between Cheyenne or Denver and northwest Colorado or Salt Lake must travel through the parks. Many vacationers also travel through the parks enroute to popular recreation areas. To most of these travelers the scenery or visual resource is an important part of their trip.

RECREATION

The boundaries of the Kremmling Resource Area contain an abundance of outdoor recreation opportunities. Major attractions include Rocky Mountain National Park, Arapaho National Recreation Area, several national forest wilderness areas, several major reservoirs, and the upper Colorado River. With the exception of the upper Colorado River and North Sand Hills, the major recreation features are located on lands managed by agencies other than BLM. Recreation on government administered lands within the resource area, regardless of agency administration, is becoming more important because these lands are close to the Denver metropolitan area and other front range communities. Virtually every type of outdoor recreation opportunity associated with the Rocky Mountains is available in the region.

The BLM managed lands, while not containing the major recreation attractions (except the upper Colorado River and North Sand Hills), do play a significant supplemental role in the regional recreation setting. In North Park, the BLM lands comprise a majority of the basin and are mostly rolling, open sage country useful for dispersed recreation. In Middle Park, the BLM lands are usually adjacent to national forest, except around Kremmling and along the Colorado River, and provide both access and "spill over" room for the more heavily used areas. In addition, BLM lands add another dimension to recreation opportunities available on other public lands by providing for opportunities in generally unrestricted settings for activities such as rockhounding, ORV use, and certain forms of wildlife viewing and hunting. Table 2-12 shows the increasing visitor use on the various types of public land in the region.

TABLE 2-12 -- REGIONAL RECREATION SETTING

RECREATION VISITOR USE[3]/VISITOR DAYS [1]

Area	1978	1979	1980
Arapaho National Recreation Area	282,012	277,600	336,800
Arapaho-Roosevelt National Forest[2]	669,100	915,800	1,168,700
Routt National Forest[2,4]	107,204	155,600	181,600
Colorado State Forest	86,892	77,079	68,494
Kremmling Resource Area (BLM) Upper Colorado River (Pumphouse to State Bridge)	23,100	27,114	29,623
Dispersed Use	43,173	47,970	53,300
TOTALS	1,211,481	1,501,168	1,838,517

SOURCE: U.S. Forest Service Visitor Use Data, Colorado Division of Parks and Outdoor Recreation.

[1]Visitor Day - The presence of one or more persons on an area of land or water for the purpose of engaging in one or more recreation activities during continuous, intermittent, or simultaneous periods of time aggregating twelve hours.

[2]Figures are for ranger districts or portions thereof included within the Kremmling Resource Area boundaries, excluding the Dillon Ranger District of the Arapaho National Forest.

[3]Includes use at developed sites and dispersed sites.

[4]Includes data for the Middle Park Ranger District of the Arapaho National Forest administered by the Routt National Forest.

In response to increasing use and demands for recreational opportunities on the public lands in the Kremmling Resource Area, BLM has started to intensively manage a few key areas. Areas are managed under one of two classifications: special and extensive.

Special recreation management areas (SRMAs), require intensive management to achieve recreation objectives and provide specific recreation opportunities. BLM recreation investments are concentrat-

ed in these areas. There are two de facto special recreation management areas in the resource area: the upper Colorado River and the North Sand Hills.

Extensive recreation management areas are areas where significant recreation opportunities and problems are limited and intensive recreation management is generally not required. Limited management actions (access, visitor information, signs, etc.) are usually adequate. The bulk of the public lands in the resource area are presently in this category. Figure 2-4 shows the location of recreation management areas as they presently exist. Table 2-13 displays the estimated visitor use.

TABLE 2-13 -- ESTIMATED VISITOR USE ON BLM ADMINISTERED PUBLIC LANDS

Recreation Management Area	County	1980 Estimated Visitor Days[2]	Approx. Acreage	Primary Recreation Activities	ROS[14] Classes (Settings)
Upper Colorado River SRMA[3] (pumphouse to State Bridge)	Grand/ Eagle.	29,623	4,870	Floatboating, Fishing, Camping, Picnicking.	RN
North Sand Hills SRMA[3]	Jackson.	6,000	1,400	ORV, Camping.	SPM
Middle Park ERMA[3]	Grand/ Eagle.	40,300	161,000	Dispersed use (see below).	See below
Use Areas [1]					
Sunset Fishing Access	Grand..	1,300	120	Fishing.....	R
Troublesome	Grand..	3,500	11,760	Hunting, Fishing, Hiking.	SPN,SPM,RN
Resource Conservation	Grand..	5,000	5,040	ORVs, Shooting for pleasure.	RN,SPM
Black Mountain	Grand..	2,000	1,960	Hunting, Firewood gathering.	SPM
Kinney Creek	Grand..	5,000	3,360	Hunting, Firewood gathering, Camping.	SPM,RN
Smith Mesa/ Corral Creek	Grand..	8,000	4,760	Hunting, ORVs, Firewood gathering, Sightseeing.	SPM,RN
Drowsy Water	Grand..	3,000	8,860	Hunting, ORVs, Horseback riding, Jeep tours, Fishing.	SPM
Strawberry	Grand..	3,000	6,020	Hunting, Firewood gathering, Cross country skiing.	SPM,RN
Dice Hill	Grand..	8,000	5,200	Hunting, Camping, Sightseeing, Firewood gathering.	RN,SPM
Yarmony Mountain	Eagle...	1,500	6,580	Hunting, ORVs.	SPM,RN
North Park ERMA[3]	Jackson.	7,000	193,661	Dispersed use (see below).	
Use Areas [11]					
Independence Mountain	Jackson.	4,000	18,620	Hunting, ORVs, Historical observation.	RN,SPM
McCallum Oil Field	Jackson.	1,500	7,720	ORVs, Hunting.	RN
Buffalo Peak	Jackson.	1,500	1,600	Hunting, Firewood gathering.	RN,SPM
Laramie River ERMA[3]	Larimer.	.....	26,303	Hunting.....	SPM,RN
TOTAL	.....	82,923			

[1]Areas that receive measurable use. The recreation use on the remainder of the public lands is too dispersed and minimal to estimate.

[2]LEstimates are based upon traffic counter information and personal observations of BLM personnel. For the upper Colorado River, actual use information is available. See Table 2-12 for definition of visitor day.

[3]SRMA = Special Recreation Management Area. ERMA = Extensive Recreation Management Area.

[4]Recreation Opportunity Spectrum Classes (see appendix for definitions). R = Rural; RN = Roaded Natural; SPM = Semi-primitive motorized; SPN = Semi-primitive nonmotorized; P = Primitive.

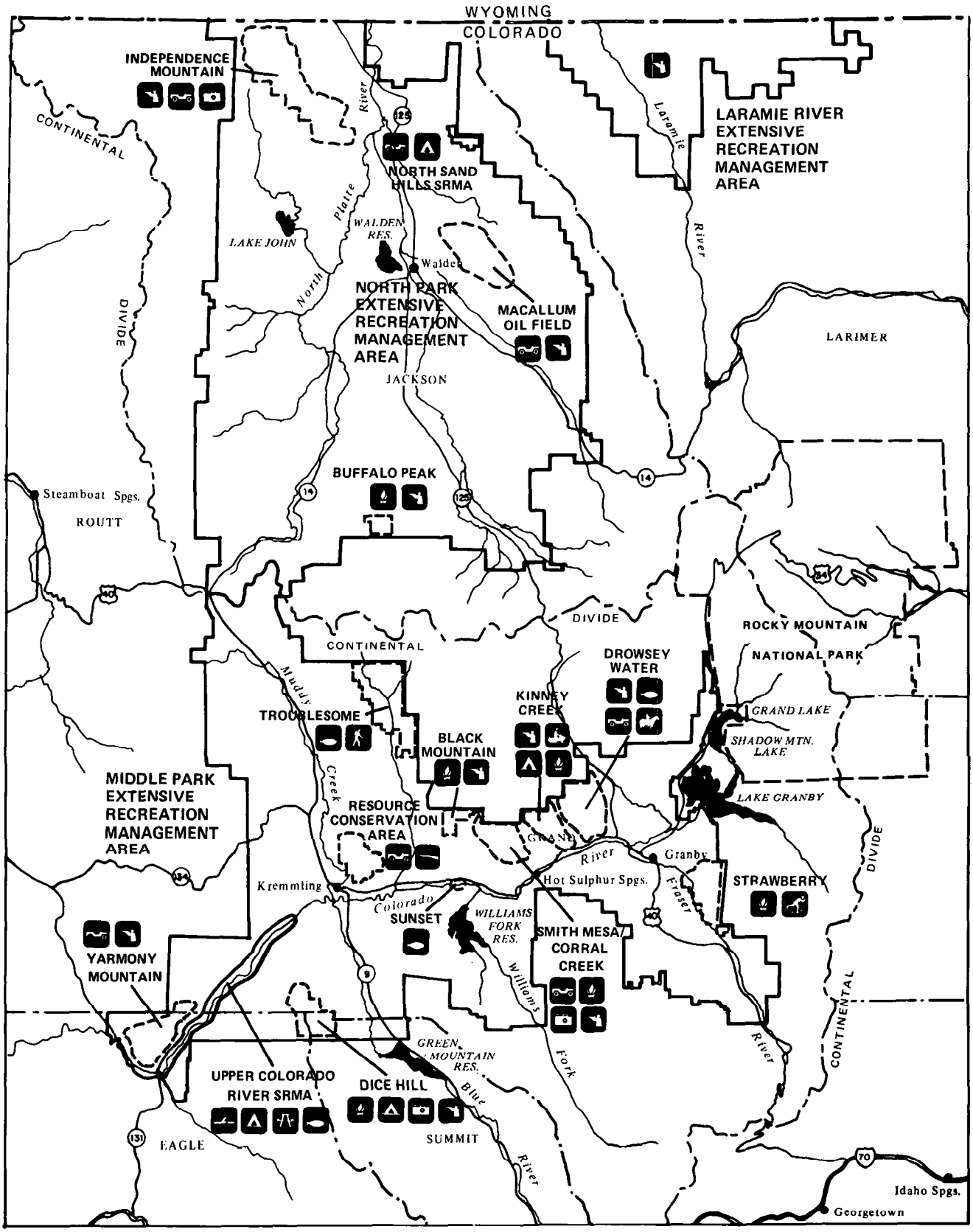


Figure 2-4 EXISTING RECREATION MANAGEMENT AREAS

—— Extensive Recreation Management Area Boundaries (ERMA)

- - - Primary Use Areas within the ERMA

—— Special Recreation Management Area Boundaries (SRMA)

SPECIAL ACTIVITY SYMBOLS

- Floatboating
- Fishing
- Camping
- Off-Road Vehicles
- Hunting
- Hiking
- Shooting for Pleasure
- Sightseeing
- Horseback Riding
- Cross-Country Skiing
- Firewood Gathering
- Picnicking
- Snowmobiling

Figure 2 - 5. Walden, Colorado

Figure 2 - 6. Kremmling, Colorado

In order to identify recreation opportunities available on public lands and to properly plan for the long-term maintenance of these opportunities, BLM and the Forest Service have adopted a system called Recreation Opportunity Planning.

The premise of recreation opportunity planning is two-fold. One aspect is that people care not only about the recreation activities they can enjoy but also about the types of settings in which they occur. The other is that these settings help define a range or spectrum of recreation opportunities.

The reason settings are important is that they more precisely define the nature of recreation activities. Combined with the activities themselves, they affect people's recreation experiences. Both the types of activities and the settings in which they occur determine that type and amount of satisfaction people will derive from a recreation outing. For example, camping in a campground is totally different from backcountry camping. A greater sense of security and personal safety is provided in campgrounds. However, backcountry camping provides a greater opportunity for adventure and getting away from people.

For this RMP the different settings available on the public lands were identified. The variety of settings results from differences in physical resource character, the amount of social interaction between people within the area, and managerial controls imposed on both the resource and the people using it.

The Kremmling Resource Area has been mapped for both the activities and the settings in which they occur. Figure 2-4 shows some of the more dominant existing activity. Activity and setting opportunity information is also summarized on Table 2-13. The identification of these classes was coordinated with the U.S. Forest Service for adjoining national forests. Further information on the process is available at the Kremmling Resource Area Office.

Settings relate directly both to the types of recreation opportunities available and to other resource management actions. Of the total public land acreage in the Kremmling Resource Area (388,839 acres), the following percentages occur in each of the six setting classes on the Recreation Opportunity Spectrum:

Primitive -- None
Semiprimitive Nonmotorized -- 1 percent
Semiprimitive Motorized -- 25 percent
Roaded Natural -- 73 percent
Rural -- 1 percent
Modern Urban -- None

These classes are defined in Appendix 5.

WILDERNESS

BLM Wilderness Review Process

In Section 603 of the Federal Land Policy and Management Act (FLPMA) of 1976, BLM was directed to review all wilderness areas of 5,000 acres or more for their wilderness potential. Those areas having wilderness characteristics as defined in the Wilderness Act of 1964 were to be studied to determine their suitability or nonsuitablility for preservation as wilderness. In order to determine which areas are suitable, BLM established a three-stage process, which was initiated in late 1978.

The first stage, inventory, was divided into two major steps: initial and intensive. The initial inventory, completed in 1979, identified three units in the Kremmling Resource Area that met the minimum size requirements, were roadless, and were, generally, natural in appearance. These units were Troublesome (CO-010-155), north of Kremmling; Drowsy Water (CO-010-168), northwest of Granby; and Yarmony Mountain (CO-010-178), north of State Bridge. The intensive inventory conducted during 1980 determined that only the Troublesome unit met all the criteria required for further wilderness consideration; this unit was identified as a wilderness study area (WSA). The summary of the intensive inventory evaluation on all three units and the analysis of public comment is contained in the BLM document, *Final Wilderness Areas*, November 1980.

The second stage, study, involves the process of determining which WSAs will be recommended as suitable for wilderness designation and which will be recommended as nonsuitable. These determinations, made through BLM's land use planning system, consider all values, resources, and uses of the public lands. The resource management plan represents this phase of the process. The planning criteria and quality standards on which these determinations are based are described in Appendix 3.

The third step, reporting, consists of actually forwarding these suitability recommendations through the Secretary of the Interior and the President to the Congress. Mineral surveys required by law, environmental statements, and other data are also submitted with these recommendations.

The information presented below is a summary of the information contained in the intensive inventory documentation. The supporting information is available for review in the Kremmling Resource Area Office and the Colorado State Office in Denver

CHAPTER 2

Size and General Status

Approximately 8,250 acres of contiguous public land are contained within the Troublesome WSA. A private inholding of 625 acres is located in the southern portion of the area. The access route to this private land is not included within the WSA. The Federal government owns the subsurface rights for all the public lands within the area as well as those for the private inholding. The Arapaho National Forest adjoins the area on the north and east, with a mixture of state and private lands on the south and west.

There are no known mining claims in the WSA.

Most of the WSA is leased for oil and gas. Theses were issued after passage of FLPMA. All pre-FLPMA leases have expired.

Two public water reserves, one 40 acres and the other 80 acres, are located in the unit. (A public water reserve is a withdrawal to protect water sources on public lands. The withdrawal segregates the area from mining location under the Mining Law of 1872 and from land disposal actions.) No easements or rights-of-way are within the WSA boundaries. The entire area is under grazing lease (two allotments).

Naturalness

The Troublesome WSA represents a rugged, mountainous terrain varying in elevation from 8,000 to 10,800 feet. The rock slide and rock outcropping areas contribute to this ruggedness. Most of the unit is forested with lodgepole pine, spruce, fir, and aspen. Vegetation variety is enhanced by the riparian habitat along the streams and the fungi-lichen ecotone on the rock outcroppings. The Troublesome and Rabbit Ears Creek drainages pass through the area, forming a "V" in the northern portion. The headwaters of both streams are located in Arapaho National Forest.

The area is substantially natural in appearance and has retained its ecological naturalness as well. No significant activities of man have occurred in the area to disrupt natural processes. Minor imprints of man include an irrigation ditch on the extreme lower end of Troublesome Creek, two small stock ponds, and a short drift fence made of natural materials. These range improvements are all small in scale, do not represent significant surface disturbances, and do not contrast to any great degree with the surrounding landscape.

Opportunities for Solitude

The Troublesome WSA has outstanding opportunities for solitude due to the following factors: sufficient size, topographic variation, and forest and riparian vegetation. The size of the unit provides ample opportunity for visitors to disperse themselves while in the unit. The drainages of Rabbit Ears and Troublesome Creeks, their side drainages, and intervening ridges would screen visitors from each other and provide opportunities to become isolated. These opportunities are enhanced by the dense forest and riparian vegetation. Visitors are also afforded long-range views from the higher points in the northern portion, thus enhancing a feeling of vastness. Overall, this unit provides numerous opportunities for solitude.

Activities taking place (e.g., operation of chainsaws and generators) on the private inholding would affect the opportunities for solitude on the lands immediately adjacent to the inholding; however, the vast majority of the unit is topographically screened from this area. Grazing is the primary current use. Because this activity is dispersed throughout the area, it does not significantly detract from the opportunities for solitude. In addition, grazing is an allowable use in designated wilderness areas. Ranching is the predominant use of the adjoining lands. The WSA is separated from these uses by ridges, which enhance, the geographic isolation of the area.

Opportunities for Primitive, Unconfined Recreation

Outstanding opportunities for primitive and unconfined recreation are present due to the following characteristics: (1) a variety of game and nongame wildlife, (2) opportunities for hiking, backpacking, horseback riding, cross-country skiing, and snowshoeing, (3) the availability of stream and riparian habitat for fishing and wildlife viewing, (4) a variety of geologic features for viewing and nontechnical climbing, and (5) opportunities for scenic viewing. Recreation use would tend to be concentrated in the Troublesome and Rabbit Ears Creeks drainages. The private inholding would impede travel along Troublesome Creek in the southern portion of the unit and would tend to further concentrate use in the northern portion of the unit. It is possible to avoid the private property by traveling along the western boundary. Visitors entering the area from the north, west, or east could travel unimpeded by the inholding.

Special Features

The area is within a three- to five-hour drive (depending on location of access) of the Denver metropolitan area. U.S. Highway 40, which passes within nine miles of the unit, serves as a major tourist route for northern Colorado. The visual resource inventory has identified the area as having class "A" scenery due to the forest vegetation, topographic variety, and lack of any significant man-made improvements on the landscape. No unique or significant ecological, geological, or other features of scientific, educational, scenic, or historic values have been identified.

Regional Setting

There are several existing and proposed wilderness areas in the region as well as several wilderness study areas (See Table 2-14).

TABLE 2-14 -- REGIONAL SETTING -- WILDERNESS

DESIGNATED NATIONAL FOREST WILDERNESS AREAS[1]

Wilderness Area	National Forest	County	Ecosystem[2]	Acreage
Mt. Zirkel	Routt	Routt/ Jackson.	Western Spruce Fir Forest/ Alpine, Meadow and Barren.	140,972
Rawah	Roosevelt	Larimer	[3]	76,394
Never Summer.	Arapaho/ Routt.	Grand/ Jackson.	[3]	14,100
Indian Peaks.	Arapaho/ Roosevelt.	Grand/ Boulder.	[3]	70,000
Cache La Poudre.	Roosevelt	Larimer	Western Spruce Fir Forest/ Pine Douglas Fir Forest.	9,400
Comanche Peak.	Roosevelt	Larimer	[3]	67,500
Neota	Roosevelt	Larimer	[3]	9,900
Eagles Nest	Arapaho/ White River.	Summit/ Eagle.	[3]	133,915
Flat Tops	White River/ Routt.	Rio Blanco/ Garfield/ Eagle.	Western Spruce Fir Forest.	235,230
			TOTAL	737,411

TABLE 2-14 -- REGIONAL SETTING -- WILDERNESS—Continued

DESIGNATED NATIONAL FOREST WILDERNESS AREAS[1]

Wilderness Area	National Forest	County	Ecosystem[2]	Acreage
NATIONAL FOREST WILDERNESS STUDY AREAS				
Vasquez Peak.	Arapaho	Grand	[3]	12,800
NATIONAL FOREST FURTHER PLANNING AREAS				
Service Creek.	Routt	Routt	Western Spruce Fir Forest.	39,860
Williams Fork.	Arapaho	Grand/ Summit.	[3]	74,770
			TOTAL	114,630
PROPOSED NATIONAL PARK WILDERNESS AREA				
Rocky Mountain National Park.		Larimer/ Boulder/ Grand.	Pine Douglas Fir Forest/ Western Spruce Fir Forest/ Alpine Meadows and Barren.	239,835
BLM WILDERNESS STUDY AREAS				
Castle Peak		Eagle	Sagebrush Steepe.	11,940
Bull Gulch		Eagle	Sagebrush Steepe.	15,000
Hack Lake		Eagle/ Garfield.	Western Spruce Fir Forest.	3,360
			TOTAL	20,300

[1]As of December 1980.
[2]Bailey - Kuchler Ecosystems of the U.S. All areas are in Rocky Mtn. Forest province.
[3]Same as Mt. Zirkel.

The Forest Service Roadless Area Review and Evaluation II (RARE II) identified a 98,890 acre roadless area for the national forest lands adjacent to the Troublesome WSA. The RARE II process was completed prior to the identification of potential WSAs by BLM. The RARE II roadless area, Arapaho Creek (Area No. 109), was not recommended for wilderness due primarily to mineral values (oil and gas) and the potential for timber development. The area has been allocated to nonwilderness uses. Further information on the RARE II evaluation

is available from the Routt National Forest Supervisor's Office in Steamboat Springs.

The Forest Service is presently preparing a management plan for the Routt National Forest which administratively includes that portion of the Arapaho National Forest adjacent to the Troublesome WSA. The forest plan is scheduled for completion in late 1982 and will consider nonwilderness uses for the national forest lands adjacent to the BLM WSA. The wilderness potential of these national forest lands cannot be reconsidered until the next generation of land management plans.

All the areas listed on Table 2-14 are within a five-hour drive of the Denver metropolitan area. In addition, there are several existing wilderness areas (e.g., Hunter-Fryingpan, Mt. Evans, Maroon Bells, Collegiate Peaks) south of the region shown in Table 2-14, but within a day's driving time (five hours) of Front Range communities.

Existing Rights and Off-Site Impacts

With the exception of potential mineral development under the 1872 Mining Law or on oil and gas leases issued prior to October 21, 1976, there are no existing rights or special uses in the WSA that would impair BLM's ability to manage the WSA in perpetuity. The BLM minerals inventory, which included consultation with industry, did not identify any significant potential for mineral development (including oil and gas) in the areas.

Two livestock grazing allotments fall within the boundaries of the WSA. The two allotments combined have a preference demand of 730 AUMs of livestock forage, with a designated grazing season of July 1 to October 15. Existing management facilities include two stock watering reservoirs and approximately one-half mile of allotment boundary fence. Existing livestock grazing and supporting facilities continue to be maintained in this area.

Nonwilderness uses on adjoining lands, especially the national forest lands upstream from the WSA, could impact the wilderness values that presently exist in the WSA. However, these nonwilderness uses are subject to environmental laws, such as the Clean Water and Clean Air Acts, which would mitigate any degradation of downstream wilderness values should the area be designated wilderness.

Ecosystem Representation

As shown on Table 2-14, all existing and potential wilderness areas in the region, including the Troublesome WSA, are in the Rocky Mountain Forest Province (Ecoregions of the U.S., R.G. Bailey, Forest Service 1976). In terms of the potential natural vegetation (PNV), the areas in the region are a mixture of western spruce-fir forest and alpine meadows and barren (PNV, A.W. Kuchler, University of Kansas 1966). The Troublesome WSA is located entirely within the western lodgepole pine, spruce-fir forest zone.

CULTURAL RESOURCES

Prehistoric

The earliest signs of people in the Kremmling Resource Area date from about 10,000 years ago. Although occupation of the area in prehistoric times probably occurred only in the summer, this seasonal use has been continuous since people first began to populate central North America. This great span of time has been divided into five periods: Paleo-Indian, Plains Archaic, Late Prehistoric, Protohistoric, and Historic (see Table 2-15).

TABLE 2-15 -- Kremmling Resource Area Chronology[1]

A. Paleo-Indian[2]	
1. Llano	10,000 - 9,000 B.C.
(No documented sites in KRA)	
2. Folsum	9,000 - 7,000 B.C.
(No documented sites; reports of several unsubstantial finds in KRA)	
3. Plano	ca 7,000 - 5,000 B.C.
(Earliest documented evidence of human occupation in KRA)	
C. Plains Archaic	
1. Early	ca 5,000 - 3,000 B.C.
2. Middle	3,000 - 1,000 B.C.
3. Late	1,000 B.C. - A.D. 500
C Late Prehistoric	ca. A.D. 500-1800 [2]
D. Protohistoric	
1. Indian-European Contact	ca. A.D. 1820
2. Ute Indian Removal	A.D. 1881
E. Historic	ca. A.D. 1820 - Present

[1] (Lischka et al. 1980)
[2](Frison 1978)

Although Kremmling is in an area that anthropologists call the Northwest Plains, the ancient and protohistoric people came from three different cultural traditions: Great Basin, Plateau, and Plains. From whatever cultural tradition or time period they came, their use of the area was much the same. Seasonal hunting and gathering by small nomadic bands was the persistent, basic way of life until European culture overwhelmed the area.

The ancient climate was at first cold and harsh, then much warmer than it is today. After some years the climate became harsh again, then warm, gradually evolving into our modern climate of long cold winters, short wet springs, and even shorter summer growing seasons. The prehistoric people adapted to this environment by staying away from

the area in the winter and entering it in small groups during the summer. These bands followed seasonal animal migrations into rich grazing lands during the warmer periods when other plant foods were also most abundant. The fleeting nature of game and useful plants called for small, close-knit bands of people to give mobility, organization, and security.

The physical remains of these ancient peoples make up cultural resource sites (Table 2-16). Tool making sites, campsites, quarrys, and kill sites are the most common.

TABLE 2-16 -- Cultural Resources Site Types

Site Types	Characteristics	Cultural Complex
Lithic scatter (also open lithic scatter, chippings, chipping station)	Area containing waste products and/or tools associated with stone tool manufacture	All (Paleo-Indian, Archaic, Prehistoric, and Protohistoric)
Campsite (habitation, open camp, camp, burnt spots, fire spots, hearths)	Area containing substantial features indicating more extensive and/or long useage. Includes lithic scatters and/or evidences of fires (charcoal, fire-cracked rocks or artifacts, burnt bone), and/or evidence of plant resource use (grinding tools, ground stone).	All
Quarry (chippings, tool stone site, manufacturing/procurement area)	Area containing a natural source of rocks for tool manufacture. Unmodified rock, waste, and tools in various stages of manufacture are present.	All
Kill Site (trap, drive, jump)	An area containing the remains of one or more animals, in association with stone and/or bone tools.	All, but particularly Llano and Plano of Paleo-Indian.
Burial (burial platform, burial tree, burial ground)	Area containing the remains of human beings	Protohistoric
Stone circle (stone ring, tipi ring, tipi)	Circular, spaced arrangement of rocks, with varying diameters	Protohistoric
Wickiup (tipi, tipi poles)	Arrangement of poles or branches of pinyon, juniper, or other trees or brush against a living tree or piled upon each other.	Protohistoric
Rock alignment (rock/stone walls, fort, fortification)	Rock alignments or walls of varying height or construction, usually of dry-laid stone masonry.	Protohistoric
Trail (path, pass)	Routes used by early peoples. Physical evidence may or may not be present.	All. Most evident for Archaic through Protohistoric.
Rock Shelter (petrograph)* 1)pictograph 2) petroglyph	Area protected by overhanging or enclosed rock formation, usually with dripline, that has been used by pre-/protohistoric peoples. Sometimes rock alignments with dry or wet masonry is present.	Plano, Archaic. Possibly Prehistoric, Protohistoric
Granary (cist, corn crib)*	Mud-mortared sandstone slab structures (about 1.5 x 1.5 x 1.5m). Often built into sandstone ledges. Sometimes mud-lined and capped by stone slabs. Used for food storage.	Archaic
Rock alignment* (walls, fortifications)	Rock alignment or wall of wet-laid masonry consruction (use of mortar or mud).	Archaic, Protohistoric?
Trails	Identified Routes followed by early explorers or by many emigrants. Physical evidence may or may not be present.	Historic
Forts	Military establishments for the protection of persons or property. Also gathering and exchange points prior to the establishment of towns.	Historic
Toll and/or wagon roads	Roadbed, bridges, and stations associated with early commercial or private transportation of goods or people.	Historic
Stage stations	Wayfarers' resting places and fresh harness animal transfer points.	Historic
Hotel	Building in which wayfarers or vacationers were (are) temporarily housed. Transients' temporary quarters for which rent is paid.	Historic
Resort	Structure or group of structures whose primary function is recreation.	Historic
Bridge	Structure used by a road or railroad to cross a watercourse, depression, or obstacle.	Historic
Homestead	One or more structures of varied size, shape, and materials used to shelter isolated Euro-American families claiming land under various homestead laws.	Historic
Ranch	Cluster of structures of single and multiple uses associated with a livestock-based family economic operation.	Historic
Railroad	Roadbed, tracks, trestles, bridges, depots, and rolling stock associated with early (and continued) industrial transportation of goods and people.	Historic
Town	Aggregation of structures sheltering domestic, business, educational, social, political, and religious activities. Individual structures may be single or multiple use, but population is multifamily.	Historic
Unique Structure	Any structure whose merit is associated with a particular person or event.	Historic
Site	The location where a historic event occurred but no tangible evidence remains of the action itself.	Historic
Architectural site	A structure whose merit is its manner or style of construction.	Historic
School	A structure built for educational purposes, but whose historical function is as a community center in the absence of nearby towns.	Historic
Mine	An outcropping of valuble mineral resource and the structures or residue associated with the removal activity.	Historic
Mill	Structure(s) associated with mineral refining activity.	Historic
Reclamation projects	Structures associated with irrigation, water, and soil retention, or flood control. Usually, these are engineering features.	Historic.

*CR sites not presently documented in KRA. Location of these types would constitute major scientific finds.

Paleo-Indian

The earliest people known on the Northwestern Plains were the Paleo-Indians, who date from before 6,000 B.C. Their time is divided into three cultural stages: Llano, Folsom, and Plano.

The Paleo-Indians hunted mammoths and extinct species of bison. Grinding stones found in nearby Wyoming are evidence that they ate seeds and grain.

They were hunter-gatherers whose campsites indicate short periods of occupation by only a few individuals. Site locations are usually in park floor basins of the area. There are no documented sites of the Llano or Folsom, but Folsom points have been reported in both North and Middle Parks.

The Plano people used a wide variety of stone spear points. Several documented sites have been found in the area.

Plains Archaic

The Plains Archaic period (6000 B.C. - A.D. 500) is divided into the Early, Middle, and Late stages which were characterized by a change to smaller weapons for hunting modern animals such as the modern bison, and a greater dependence on plant resources. Barricades and traps were built to drive game into killing areas, implying a more complex social organization and larger groups. Campsites have been found in the mountains, intermontane basins, foothills, and plains. The Early Plains Archaic is best represented in the Indian Peaks region near Rocky Mountain National Park.

The Middle Plains Archaic in the Northwestern Plains is delineated by the McKean Complex, with distinct spear and lance points. Stone circle sites made their first appearance in the Middle and Late stages, with a wide variation in size and location. Their functions are largely a matter of conjecture, as most stone circles lack other cultural material. Most of the stone circle sites here indicate use as anchors for lodge coverings, though some are too small for use as living areas. Possible functions could include ceremonial uses, but this has not been substantiated locally.

The Late Plains Archaic is primarily characterized by the appearance of corner-notched projectile points, also evident here.

Late Prehistoric

The last prehistoric period in this area is the Late Prehistoric (A.D. 500-1800), which was characterized by the use of the bow and arrow for both large and smaller game. Bison hunting continued, with impoundments as well as jumps and traps being used. Pottery has been documented in the area.

Protohistoric

The Protohistoric Period (ca. A.D. 1820 - 1880) consists of historically known native peoples. The Utes, Arapaho, Cheyenne, Shoshone, Crow, Sioux, and Blackfoot were known in the area, although the Utes were the principal occupants.

The Utes had lived a Western Archaic lifestyle in the Great Basin to the west. They gathered in larger groups for game drives and traveled to the mountains during the summers and south to the plateaus in the fall, living in small brush lodges and wickiups. The introduction of the horse around 1640 A.D. greatly altered their social organization, settlement, and subsistence patterns.

Group size became larger, with their range of movement and dependence on plant resources increasing. Contact with the Plains tribes led to use of tipis and other Plains customs. Firearms, tradebeads, and metal arrow heads were also acquired at this time.

During their movement through the Parks and on the Plains, the Utes encountered Euro-Americans in the early 1800's. Early contacts between Utes and these trappers resulted in mutual indifference (Lischka et al. 1979; Burney et al. 1978).

Historic

The early history of Middle and North Parks is one of exploitation by fur trappers from the 1820's through the 1830's who left no known physical remains. Similarly, explorers like John C. Fremont in 1844 and Ferdinand V. Hayden in 1876 left no physical traces, but they did assemble valuable journals describing their findings.

Hot Sulphur Springs became the first permanent European settlement in 1860. The springs and town still remain. To get settlers and miners into the area, roads were built over Rollins Pass and Berthoud Pass. The original wagon roads can still be seen. Mining in North Park first occurred in 1870 with the Independence Mountain gold placers. In 1875 a small boom occurred at Lulu City, Gaskill, and Grand Lake. The ruins of Lulu City and Gaskill are presently in Rocky Mountain National Park, while Grand Lake is currently a tourist town.

The Ute Indians used the parks for hunting grounds. There were minor incidents, such as a "battle" at Independence Mountain in the early 1870s. In 1881, as a result of the Meeker massacre of 1879, the Utes were removed to Utah and the parks were opened to settlers for homesteading.

North and Middle Parks were settled by farmers and ranchers during the 1870s and 1880s. Middle Park's agriculture was confined to the river bottoms, while North Park's hay and horses became world famous. Ranching is still very important in North and Middle Park. Many of the original settler's operations are still run by the descendents of the pioneer families.

North and Middle Parks were not fully developed due to an inadequate transportation system. In 1904, the Denver, Northwestern, and Pacific Railroad (the Moffat Road) reached Middle Park. This is the present Denver and Rio Grande Western's line to Craig and Glenwood Springs. The original Rollins Pass route of the Moffat Road is in the National Register of Historic Places. It was replaced in 1928 when the Moffat Tunnel was completed. North Park also got a railroad in 1912 when the Laramie, Hahn's Peak, and Pacific was completed to Coalmont, enabling North Park's small coal export industry. This railroad is the present-day Union Pacific line from Laramie to Walden. The Coalmont section has been abandoned.

One of the by-products of the railroads was a timber industry. By the early 1900s, eastern Middle Park was heavily dependent upon the timber business. Mills were erected at towns such as Monarch (now under Lake Granby). Many mills still operate in the park.

The 1920s saw a slow but stable economy in North and Middle Parks. The newly completed Fall River Road through Rocky Mountain National Park brought an influx of tourists to Grand Lake. This period is represented by National Register sites such as the Kauffman House in Grand Lake and the Hozwarth Historic District.

The other major event during the 1920s and 1930s in the area was the continuation of major transmountain water diversion projects made possible by increases in Federal government's public works funds.

Physical remains of these projects can be seen in ditches, tunnels, and reservoirs. Green Mountain, Shadow Mountain, Williams Fork, and Lake Granby are all part of these diversion efforts.

From 1940 to the present, Middle Park has seen steady growth, particularly on the eastern side. The development of Winter Park as a ski resort in 1939 helped greatly. The western side tended to languish until the late 1960s, when AMAX built its Henderson Mill near Ute Pass. This caused an influx of workers to Kremmling, Hot Sulphur Springs, and Granby. North Park experienced an oil boom in the 1920s which has continued to the present. Coal mining collapsed in the 1940s, but ranching continues to be the park's mainstay. Population increases have been minimal in North Park, but substantial in Middle Park since 1960 (see Table 2-17).

TABLE 2-17 -- Population

	1960	1970	1980	Percent Change	
				1960-70	1970-80
Grand County	3557	4107	7475	15	82
Granby Division	2340	2902	5325	24	83
Fraser-Winter Park	N/A	509	950	N/A	87
Granby	503	554	963	10	74
Grand Lake	170	189	382	11	102
Hot Sulphur Springs	237	220	405	- 7	84
Outside communities	N/A	1430	2625	N/A	84
Kremmling Division	1217	1205	2150	- 1	78
Kremmling	576	764	1296	33	70
Outside community	641	441	854	- 31	94
Jackson County	1758	1811	1863	3	3
Walden	809	907	947	12	4
Outside community	949	904	916	- 5	1
Total resource area	5315	5918	9338	11	58
State of Colorado	1753925	2207259	2888834	26	31
United States	179323175	203212926	226504825	13	11

N/A: Not available. Winter Park population was not tabulated separately in 1960.
Source: Bureau of the Census, various years. *Census of the Population,* Department of Commerce, Washington, D.C.

ECONOMICS

Resource Area Definition

Because much social and economic data is not available for geographic units smaller than a county, it is necessary to define the resource area in terms of whole counties. Therefore, the Kremmling Resource Area, for social and economic analysis, consists of Grand and Jackson Counties. Where BLM-controlled resources are located outside of those two counties -- in adjacent portions of Eagle, Larimer, and Summit Counties -- the resources are included in the analysis, but their use is treated as affecting only the two-county area.

Grand County is divided by the Bureau of the Census into the Granby and Kremmling Divisions, which correspond to the areas termed eastern and western Grand County in the text. Jackson County is treated as a single unit.

Current Economic and Social Characterics

Tourism, mineral production and processing, timber, and agriculture compose the resource area's economic base. Other types of local economic activity serve to support these export-oriented industries (export meaning that most of their product is sold to customers outside the resource area) and the local population. Estimates of 1979 exports by industry are given in Table 2-18.

TABLE 2-18 -- Exports[1] from the Resource Area by Industry in 1979

(thousand dollars)

Agriculture	$7,487
Mining	263,631
Manufacturing, including lumber	5,555
Tourism [2]	28,619
Other	772
Total	306,064

[1] Exports means sales to any place outside the resource area.
[2]Tourism includes retail trade and services other than medical.
Source: BLM estimates.

BLM's actions can affect all four export sectors, but its major effects are on agriculture and timber. Its involvement in the growth sectors is currently small. Therefore, barring major changes in policy or significant resource discoveries, the impacts of its actions are likely to be minor.

Population

The resource area has experienced a rapid rate of population growth since 1970, in contrast to a relatively slow increase during the previous decade (Table 2-17). The rate at which people have moved into the resource area from 1970 to 1980 has been almost double that at which they have moved into the state. However, as might be expected, most of the growth has occurred in Grand County, particularly on the eastern side of the county.

Economic developments readily explain the way population is distributed. Almost 90 percent of the growth since 1970 has occurred in two areas -- the strip from Winter Park to Granby and the Kremmling Division (western Grand County). In the latter case, the bulk of the growth has concentrated in or adjacent to the town of Kremmling. Northern and south-central Grand County and the whole of Jackson County, in contrast, have gained relatively few people.

Recreation, including recreation homes, accounts for the largest part of the increase, which is in the eastern Grand County strip. Population growth in the Kremmling area has been stimulated mostly by the Henderson Mill. Other recent developments, such as coal mining near Walden, have brought in far fewer new residents. The traditional elements of the economy -- ranching and the timber industry -- have had little effect, or a negative one, on population levels and distribution.

Employment and Income

In the last few years, substantial growth has occurred in the total labor force and in employment in the resource area (Table 2-19). However, almost all of the growth has taken place in Grand County, while Jackson County has shown a net decline. From 1975 to 1979 the resource area's rate of increase has trailed that of the state as a whole, largely because of rapid development in the Front Range area.

TABLE 2-19 -- Labor Force, Employment and Unemployment Rate

	1975	1976	1977	1978	1979	Average Annual Percent Growth
Labor Force						
Grand County	4026	4546	4353	4591	5036	6.0
Jackson County	898	758	800	843	848	-1.0
Resource area	4924	5304	5153	5434	5884	4.7
State of Colorado	1,162,083	1,199,454	1,258,262	1,337,481	1,412,070	5.0
Total Employment						
Grand County	3887	4382	4217	4505	4940	6.4
Jackson County	865	729	766	814	816	-1.0
Resource area	4752	5111	4983	5319	5756	5.0
State of Colorado	1,101,096	1,140,485	1,199,718	1,288,005	1,366,666	5.6
Unemployment rate						
Grand County	3.5	3.6	3.1	1.9	1.9	--
Jackson County	3.7	3.8	4.2	3.4	3.8	--
Resource area	3.5	3.6	3.3	2.1	2.2	--
State of Colorado	5.2	4.9	4.7	3.7	3.2	--

Source: Colorado Division of Employment and Training, Labor Market Information. Branch, various issues. Colorado Manpower Review. Denver, Colo. Colorado Division of Employment and Training.

The unemployment rate has declined in the resource area and remains well below that of the state. Again, however, the entire decline has occurred in Grand County.

Employment figures for the individual industry groups illustrate recent trends in the area's economy and explain the discrepancy in growth between the two counties (Table 2-20). Personal income figures have shown nearly the same trends as employment (Table 2-21). The principal exceptions are agricultural income, which fluctuates markedly from year to year, and earnings in manufacturing, which are believed to have increased because of higher rates of pay at the Henderson Mill despite a drop in employment.

TABLE 2-20-- Employment by Sector

	Wage and Salary Employment					Percent of Total				
	1975	1976	1977	1978	1979	1975	1976	1977	1978	1979
Grand County										
Agriculture	$90	$86	$94	$101	$W	3.5	2.9	3.4	3.4	N/A
Mining	17	12	30	14	W	0.6	0.4	1.1	0.5	N/A
Construction	615	618	208	188	290	24.0	20.9	7.5	6.3	8.8
Manufacturing	45	138	154	159	176	1.8	4.7	5.5	5.3	5.3
Transportation, communication, utilities	104	98	97	107	102	4.0	3.3	3.5	3.6	3.1
Trade	442	502	567	684	782	17.2	17.0	20.4	22.7	23.7
Finance, insurance, real estate	105	98	124	153	180	4.1	3.3	4.5	5.1	5.4
Services[1]	607	824	939	1030	1107	23.6	27.9	33.8	34.3	33.5
Government	542	579	569	571	578	21.1	19.6	20.5	19.0	17.5
Total	2,567	2,955	2,782	3,007	3,305	100.0	100.0	100.0	100.0	100.0
Jackson County										
Agriculture	139	137	W	159	135	20.2	23.4	N/A	23.3	20.3

TABLE 2-20-- Employment by Sector—Continued

	Wage and Salary Employment					Percent of Total				
	1975	1976	1977	1978	1979	1975	1976	1977	1978	1979
Mining	39	44	68	94	125	5.7	7.5	10.7	13.8	18.8
Construction	10	10	W	18	W	1.4	1.7	N/A	2.6	N/A
Manufacturing	207	116	W	W	110	30.1	19.8	N/A	N/A	16.5
Transportation, communication, utilities	29	27	30	28	25	4.2	4.6	4.7	4.1	3.8
Trade	75	76	106[2]	W	W	10.9	13.0	16.7	N/A	N/A
Finance, insurance, real estate	15	14	17	18	18	2.2	2.4	2.7	2.6	2.7
Services[1]	39	28	23	W	17	5.7	4.8	3.6	N/A	2.6
Government	135	133	127	134	143	19.6	22.7	20.0	19.8	21.3
Total	688	585	636	682	666	100.0	100.0	100.0	100.0	100.0
Total Resource Area										
Agriculture	229	223	W	260	W	7.0	6.3	N/A	6.8	N/A
Mining	56	56	98	108	W	1.7	1.6	2.8	2.9	N/A
Construction	625	628	W	206	W	19.2	17.7	N/A	5.5	N/A
Manufacturing	252	254	W	W	286	7.7	7.2	N/A	N/A	7.2
Transportation, Communication, Utilities	133	125	127	135	127	4.1	3.5	3.7	3.6	3.2
Trade	517	578	673	W	W	15.9	16.3	19.2	N/A	N/A
Finance, Insurance, real estate	120	112	141	171	198	3.7	3.2	4.1	4.6	5.0
Services[1]	646	852	962	W	1,124	19.8	24.1	27.7	N/A	28.3
Government	677	712	696	705	720	20.8	20.1	21.6	20.5	18.1
Total	3,255	3,540	3,418	3,689	3,971	100.0	100.0	100.0	100.0	100.0
State of Colorado										
Agriculture	21,382	21,363	23,775	25,004	22,119	2.0	1.9	2.1	2.0	1.7
Mining	19,424	20,756	23,734	27,349	30,616	1.8	1.9	2.1	2.2	2.4
Construction	53,246	55,153	61,735	72,518	79,289	5.0	5.0	5.3	5.9	6.1
Manufacturing	136,031	142,396	152,551	167,397	181,184	12.9	13.0	13.2	13.6	13.9
Transportation, communication, utilities	59,345	60,035	62,573	68,841	74,437	5.6	5.5	5.4	5.6	5.7
Trade	236,362	252,485	265,595	281,098	299,047	22.4	23.0	23.0	22.8	23.0
Finance, Insurance, Real Estate	56,992	59,102	63,021	69,846	76,131	5.4	5.4	5.5	5.7	5.8
Services	198,998	207,753	221,953	240,481	255,406	18.8	18.9	19.2	19.5	19.6
Government	273,838	279,729	279,828	281,191	284,423	25.9	25.4	24.2	22.8	21.8
Total	1,055,618	1,098,772	1,154,765	1,233,725	1,302,652	100.0	100.0	100.0	100.0	100.0

Note: Percent of total detail may not add to 100 percent because of rounding.
[1]Includes unclassified.
[2]Retail trade only.
W: Withheld to avoid disclosing confidential information.
N/A: Not Available.
Source: Bureau of Economic Analysis, various years. Regional Economic Information System. U.S. Department of Commerce, Washington, D.C.

TABLE 2-21 -- Income by Sector

(Thousand Dollars)

	Personal Income					Percent of Total				
	1975	1976	1977	1978	1979	1975	1976	1977	1978	1979
Grand County										
Agriculture	$166	–$328	$292	$1,351	$W	0.6	– 0.9	1.0	3.9	N/A
Mining	619	267	522	332	W	2.1	0.8	1.7	0.9	N/A
Construction	11,700	13,109	3,568	2,771	5,169	39.5	37.2	11.8	7.9	11.5
Manufacturing	654	1,811	2,023	2,416	2,826	2.2	5.1	6.7	6.9	6.3

TABLE 2-21 -- Income by Sector—Continued

(Thousand Dollars)

	Personal Income					Percent of Total				
	1975	1976	1977	1978	1979	1975	1976	1977	1978	1979
Transportation, Communication, Utilities	1,876	2,016	2,277	2,577	2,904	6.3	5.7	7.6	7.4	6.5
Trade	4,169	4,592	5,091	6,191	7,589	14.1	13.0	16.9	17.7	16.9
Finance, Insurance, Real Estate	781	1,156	2,084	2,672	3,097	2.6	3.3	6.9	7.6	6.9
Services	4,885	7,088	8,506	10,449	11,633	16.5	20.1	28.2	29.9	25.9
Government	4,751	5,505	5,786	6,233	6,707	16.0	15.6	19.2	17.8	14.9
Total	29,601	35,216	30,149	34,992	44,893	100.0	100.0	100.0	100.0	100.0
Jackson County										
Agriculture	−1,056	868	W	4,140	−2,284	21.3	12.6	N/A	33.4	−31.2
Mining	1,080	1,673	1,821	2,842	3,836	21.8	24.3	25.3	22.9	52.3
Construction	219	268	249	451	242	4.4	3.9	3.5	3.6	3.3
Manufacturing	2,176	1,385	W	W	1,685	44.0	20.1	N/A	N/A	23.0
Transportation, Communication, Utilities	321	358	474	471	521	6.5	5.2	6.6	3.8	7.1
Trade	686	729	914	950	1,046	13.9	10.6	12.7	7.7	14.3
Finance, Insurance, Real Estate	180	190	198	221	252	3.6	2.8	2.7	1.8	3.4
Services	301	260	331	W	357	6.1	3.8	4.6	N/A	4.9
Government	1,042	1,161	1,243	1,449	1,675	21.0	16.8	17.3	11.7	22.9
Total	4,949	6,892	7,202	12,387	7,330	100.0	100.0	100.0	100.0	100.0
Total Resource Area										
Agriculture	−890	540	W	5,491	W	−2.6	1.3	N/A	11.6	N/A
Mining	1,699	1,940	2,343	3,174	W	4.9	4.6	6.3	6.7	N/A
Construction	11,919	13,377	3,817	3,222	5,411	34.5	31.8	10.2	6.8	10.4
Manufacturing	2,830	3,196	W	W	4,511	8.2	7.6	N/A	N/A	8.6
Transportation, Communication, Utilities	2,197	2,374	2,751	3,048	3,425	6.4	5.6	7.4	6.4	6.6
Trade	4,855	5,321	6,005	7,141	8,635	14.0	12.6	16.1	15.1	16.5
Finance, Insurance, Real Estate	961	1,346	2,282	2,893	3,349	2.8	3.2	6.1	6.1	6.4
Services	5,186	7,348	8,837	W	11,990	15.0	17.4	23.7	N/A	23.0
Government	5,793	6,666	7,029	7,682	8,382	16.8	15.8	18.8	16.2	16.0
Total	34,550	42,108	37,351	47,379	52,223	100.0	100.0	100.0	100.0	100.0
State of Colorado										
Agriculture	561,451	331,779	347,372	516,533	586,055	4.7	2.5	2.4	3.0	2.9
Mining	359,636	436,649	521,651	687,291	832,404	3.0	3.3	3.5	4.0	4.2
Construction	827,042	924,023	1,079,200	1,330,312	1,565,865	6.9	7.1	7.3	7.7	7.8
Manufacturing	1,830,693	2,066,754	2,403,978	2,835,930	3,341,825	15.3	15.8	16.3	16.4	16.7
Transportation, Communication, Utilities	925,687	1,051,255	1,204,047	1,445,049	1,688,324	7.7	8.0	8.2	8.3	8.4
Trade	2,144,302	2,397,011	2,626,618	3,015,638	3,527,459	17.9	18.3	17.8	17.4	17.6
Finance, Insurance, Real Estate	625,774	741,886	909,314	1,099,530	1,288,741	5.2	5.7	6.2	6.3	6.4
Services	2,006,010	2,196,462	2,490,737	2,960,515	3,472,165	16.8	16.8	16.9	17.1	17.3
Government	2,667,687	2,921,689	3,143,208	3,432,791	3,727,232	22.3	22.4	21.3	19.8	18.6
Total	11,948,282	13,067,508	14,726,125	17,323,589	20,030,070	100.0	100.0	100.0	100.0	100.0

Note: Percent of total detail may not add to 100 percent because of rounding.
W: Withheld to avoid disclosing confidential information.
N/A: Not available.
Source: Bureau of Economic Analysis, various years. Regional Ecnomic Information System. U.S. Department of Commerce, Washington, D.C.

Average personal income figures present a very mixed pattern in the resource area (Table 2-22), with several different trends obviously being present.

Local pay rates in most industries are not moving appreciably closer to state averages. The exceptions to this trend (transportation-communication-utilities in both counties, finance-insurance-real estate in Grand County, and government in Jackson County) involve cases of rapid growth, large firms, and a few high incomes in a small sector. Most local incomes seem likely to remain below state averages except in cases where new companies enter the area paying at nonlocal rates or where industries experience rapid growth.

TABLE 2-22 -- Average Personal Income by Industry

	1975	1976	1977	1978	1979	1978-79 as Percent of 1975-76
Grand County						
Agriculture	$1,844	-$3.814	$3,106	$13,376	$N/A	N/A
Mining	36,412	22,250	17,400	23,714	N/A	N/A
Construction	19,024	21,212	17,154	14,739	17,824	81
Manufacturing	14,533	13,123	13,136	15,195	16,057	113
Trans., comm., utilities	18,038	20,571	23,474	24,084	28,471	136
Trade	9,432	9,147	8,979	9,051	9,705	101
Finance, ins., real est.	7,438	7,969	16,806	17,464	17,206	225
Services	8,048	8,602	9,059	10,145	10,509	124
Government	8,766	9,508	10,169	10,916	11,604	123
All Industries	11,531	11,917	10,837	11,637	13,583	108
Jackson County						
Agriculture	- 7,597	6,336	N/A	26,038	- 16,919	N/A
Mining	27,692	38,023	26,779	30,234	10,688	93
Construction	21,900	26,800	N/A	25,056	N/A	N/A
Manufacturing	10,512	11,940	N/A	N/A	15,318	N/A
Trans., comm., utilities	11,069	13,259	15,800	16,821	20,840	155
Trade	9,147	9,592	8,623	N/A	N/A	N/A
Finance, ins., real est.	12,000	13,571	11,647	12,278	14,000	103
Services	7,718	9,286	14,391	N/A	21,000	N/A
Government	7,719	8,729	9,787	10,813	11,796	137
All Industries	7,193	11,781	11,324	18,163	11,006	154
State of Colorado						
Agriculture	26,258	15,531	14,611	20,658	26,496	113
Mining	18,515	21,037	21,979	25,130	27,189	132
Construction	15,532	16,754	17,481	18,345	19,749	118
Manufacturing	13,458	14,514	15,759	16,941	18,444	126
Trans., comm., utilities	15,598	17,511	19,242	20,991	22,681	132

TABLE 2-22 -- Average Personal Income by Industry—Continued

	1975	1976	1977	1978	1979	1978-79 as Percent of 1975-76
Trade	9,072	9,494	9,890	10,728	11,796	121
Finance, ins., real est.	10,980	12,553	14,429	15,742	16,928	139
Services	10,081	10,572	11,222	12,311	13,595	125
Government	9,742	10,445	11,233	12,208	13,105	125
All Industries	11,319	11,893	12,752	14,042	15,376	127
Per Capita Income						
Grand County	5,364	6,448	6,555	7,333	8,725	
Jackson County	3,861	5,123	5,640	7,981	6,112	
State of Colorado	6,006	6,526	7,204	8,102	9,114	

N/A: Not available.
Sources: Tables 2-20 and 2-21; Bureau of Economic Analysis, April, 1981. Regional Economic Information System. U.S. Department of Commerce, Washington, D.C.

Local Government Finance

Local sources provide most of the revenues of counties, towns, and school districts in the resource area. As shown in Table 2-23, Grand and Jackson Counties obtain from 50 to 60 percent of their funds locally, while the communities are about 90 percent dependent on their own sources. Local revenues make up 70 to 90 percent of the school districts' budgets. Therefore, BLM actions in the resource area have the potential to impact local government finances significantly.

Rough measures of the adequacy of local funding sources are provided by assessed valuation per capita and retail sales per capita figures, which are included in Table 2-23. The figures show that both counties, all three school districts, and the towns of Fraser/Winter Park and Grand Lake should have sufficient tax bases for their needs. Fraser/Winter Park, Granby, and Grand Lake also have large volumes of retail sales because of their role as resort centers. The other communities lack these advantages and must operate from more limited local resources.

TABLE 2-23 -- Local Government Financial Data

	Counties		Communities						School Districts		
	Grand	Jackson	Fraser-Winter Park	Granby	Grand Lake	Hot Sulphur Springs	Kremmling	Walden	East Grand	West Grand	North Park
Total Revenue:											
Local	68%	58%	99%	93%	[b]93%	91%	92%	93%	77%	87%	70%
State	24	13	([a])	5	[b]2	6	5	5	17	9	25
Federal	8	29	1	2	6	3	3	2	6	4	5
Per Capita Assessed Valuation	$14,625	$9,713	[c]$9.675	$4,796	[c]$12,412	$4,863	$3,154	$1,789	$10,248	$25,261	$9,713
Total Mill Levy	12.74	14.07	16.60	18.09	13.66	18.60	10.06	19.00	28.80	16.64	29.98
Per Capita Retail Sales	$9,555	$15,031	([d])	$21,843	([d])	$1,421	$7,278	[e]$8,197			
Sales Tax Rate	0	2%	([f])	2%	3%	2%	2%	([g])			
Bonded Indebtedness (000)											
General Obligation	$0	$0	$1,615	$765	$0	$73	$450	$39	$8,958	$6,590	$606
Revenue	0	0	141	30	189	151	728	250			

Notes: Community data include enterprise fund and special districts providing water and sanitary service and fire protection.

[a]Less than one-half percent.

[b]1978 data. Percentages for 1979 are distorted by unusually large tap fee revenues.

[c]Based on communities only, because poulation figures are not available for surrounding developments.

[d]Per capita retail sales cannot be determined because population figures are not available for surrounding developments.

[e]Difference between town and county retail sales results from mining sales classed as retail sales and shopping facilities outside Walden city limits.

[f]2% in Fraser, 4% in Winter Park.

[g]Walden Receives county sales taxes collected within the city limits.

Sources: Division of Property Taxation, various years; *Annual Report* Colorado Department of Local Affairs, Denver, Colorado. Division of Local Government, various years; *Local Government Financial Compendium* Colorado Department of Local Affairs, Denver, Colorado. Colorado Department of Revenue, various years; *Annual Report* Denver, Colorado. Colorado State Auditor; Files. Data from local governments.

Probably the most significant impact on local government finances from BLM actions would come from increased capital improvement needs caused by population growth. Conversely, reduced population would increase the burden of any existing debt on remaining residents. It should be noted that rapid population growth can quickly require capital spending in excess of the resources of most local governments, in which case their only recourse is to seek financial assistance from state and Federal programs.

Community Facilities and Services

There is only one hospital in the resource area, the Kremmling Memorial Hospital at Kremmling. Use of the hospital is still below its 19-bed capacity, and no expansion is currently planned. However, if population continues to grow rapidly in eastern Grand County, which has ready access to no other hospital, this facility is likely to be inadequate to serve local needs in the near future. Jackson County residents use either this hospital or one in Laramie, Wyoming, and these services appear to satisfy their needs at the present slow population growth rate.

Eastern Grand County presents unique problems because of both the rapid rate of growth and the proportion of development that is outside established communities. Services are provided by four fire protection districts and about eight water and/or sanitation districts, plus the towns themselves. Adequacy of present capacity thus varies considerably within short distances. Systems said to be ap-

proaching capacity or in need of improvements include Fraser Sanitation, Winter Park Water and Sanitation, Granby Water, and Hot Sulphur Springs Water; others appear to be adequate at present. Additional facilities will be required, however, if growth continues at present rates. Expansion of facilities will be made more difficult and expensive by the need to serve previously undeveloped areas. Some consolidation of present small systems would seem desirable.

Kremmling and Walden appear to have fewer problems. An expansion of Walden's water system is getting under way. Other facilities seem to have sufficient capacity for the near future.

With the completion of a new high school, East Grand School District will have ample classroom capacity for the present. However, continuing rapid growth could completely utilize that capacity within a few years. West Grand School District is approaching capacity at the elementary school but has adequate room for the upper grades. Capacity is sufficient at all levels in the North Park School District and should remain so in the near future at the present population growth rate.

As discussed in Chapter 1, this plan is designed to meet specific requirements for both livestock grazing and wilderness. Economic information related to these two programs is presented here.

Livestock Grazing

A total of 145 ranch operators hold grazing privileges on BLM lands in the resource area. Table 2-24 shows economic data on those ranches. The operators currently hold active preference rights for a total of 45,648 animal unit months (AUMs) of grazing annually. Their average actual use has been about 39,000 AUMs.

TABLE 2-24 -- ESTIMATED RANCH OPERATOR DATA 1981

Ranch Class	Head Sizes		Number of Ranches	Allotments - Actual Use			Gross Sales		Net Income[1]	
	Cattle	Sheep		BLM AUMs	Private AUMs	Total AUMS	Per Ranch	All Ranches	Per Ranch	All Ranches
1	1-149		43	3,703	3,713	7,416	$23,389	$1,006,000	$15,819	$680,000
2	150-449		61	15,461	23,193	38,654	53,311	3,252,000	4,406	269,000
3	450-749		16	515	6,359	11,514	101,024	1,616,000	24,694	395,000
4	750-1,999		17	10,614	22,649	33,263	232,340	3,950,000	15,453	263,000
5	2,000 or more		5	3,540	14,045	17,585	691,967	3,460,000	254,572	1,273,000
8	1,400 or more	1,750 or more.	3	464	321	785	739,734	2,219,000	263,783	791,000
TOTAL			145	38,937	70,280	109,217		15,503,000		1,773,000

Estimated secondary business sales generated by ranching	$26,817,000
Estimated resource area total business sales	$352,877,000
Resource area total employment	4,122
Estimated resource area population	9,660
Estimated assessed valuation, all ranches	$10,420,000
Estimated resource area property tax revenue	$8,996,000

[1]Net income is defined as gross sales less operating expenses and depreciation.

A word about the analytical method is needed. Colorado State University (CSU) developed a series of ranch economic models based on a survey of ranches throughout Colorado (Bartlett, Taylor, and McKean 1979). The ranch models were grouped by regions of the state and by number and type of livestock. Ranch class numbers in Table 2-24 correspond to six of the eight models for Northwest Colorado (no operators fell into the other two classes). The models provide average gross sales and net income figures for each model, and the sales and income amounts in the table are calculated from the models. Thus, the figures do not show the actual financial records of the operators but are averages that are believed to be representative of actual conditions. Estimated changes in gross sales and net income that would result from changes in Federal AUMs by model are included in the CSU study, and those factors are used to project the effects of the alternatives on ranch sales and income.

Spending of ranch revenues for business expenses and personal consumption generates additional sales in the local economy. Based on an input-output study of the Kremmling region (McKean and Weber 1981), it is estimated that the $17.3 million in total sales and net income contrib-

utes about $26 million in secondary business to the area. This high amount results both from the spending of a large portion of ranch sales revenue with local businesses and from the local respending of that revenue by the businesses. However, compared to total local sales and other income sources of $595 million in 1979 (from the input-output study, adjusted to 1979 dollars), the combined primary and secondary sales generated by the operators ($43.3 million) amounts to 7 percent of the local economy.

Ranches make up part of the tax base for local government. Total 1981 agricultural assessed value in Grand and Jackson Counties was $10.8 million. Ranches holding BLM grazing privileges use an estimated 831,000 AUMs annually (including those from private and other government lands as well as BLM), which is 96 percent of the estimated 866,000 AUMs used in the entire resource area. Assuming that ratio to hold for ranch properties as well, the 145 ranches using BLM grazing would have a total assessed value of about $10.4 million. Although mill levies vary by county and location, it can be estimated that the ranches paid total property taxes in the neighborhood of $660,000, which is 7 percent of the estimated $9.0 million collected in the two counties.

Wilderness

Western Grand County would be affected economically by designation of the Troublesome WSA as wilderness. Kremmling is the only community that would be so affected.

Livestock grazing, which is the only current economic activity on the WSA, would be unchanged by wilderness designation. Although petroleum and natural gas resources potentially are present, the feasibility of commercial recovery is rated low, and no estimate is made of production values foregone. Therefore, only the recreation-oriented portions of the retail trade and services industries would be affected if the WSA was designated as wilderness.

SOCIAL ANALYSIS

For social analysis, the Kremmling Resource Area will consider Jackson and Grand Counties, omitting small portions of Larimer, Eagle, and Summit Counties.

The present social environments of the region cannot be understood without consideration of its history, geography, topography, climate, and location relative to the eastern slope population centers. There are three separate areas described below.

Jackson County, with the single incorporated town of Walden, is set in North Park, a high cold valley separated from the rest of Colorado by high mountain passes and opening to Wyoming on the north (see Figure 2-5). Ranching, lumbering, and mining are its main economic bases. A mountainous section of Larimer County lying across the Medicine Bow Range in this region orients to Wyoming and is virtually unpopulated.

Grand County consists of an east-west natural division of Middle Park, separated by Byers Canyon. Kremmling is the only population center in the western portion, a rugged ranching valley somewhat lower than North Park in elevation (see Figure 2-6). It is separated from northwest Colorado by high passes, but opens southward through Blue River Valley. Portions of Eagle and Summit Counties are found in this section.

Eastern Grand County has a T-formation of small towns: Hot Sulphur Springs on the west; Grand Lake on the north; and Tabernash, Fraser, and Winter Park on the south, with Granby as the central hub. Eastern Grand County accesses eastern, southern, and northern Colorado only by high passes. Trail Ridge Road from Grand Lake is closed except for a few months in summer. (The two natural divisions of Middle Park correspond also to the Census Bureau Kremmling and Granby divisions.)

The social data used here is largely from observation and informal interviews with a handful of leaders from each of the communities, together with figures furnished by them and from other county and state statistical reports.

Present Social Attitudes and Intergroup Relations

Valid data on attitudes directly pertinent to specific management alternatives in BLM's Kremmling RMP is not available, except as noted in various resource sections of the Continuation of Present Management Alternative (see Chapter 3). The following discussion thus attempts to describe those aspects of the general social setting which BLM decisions might reasonably be expected to affect.

Except for the Winter Park area, where upper class spillover from the Denver region occurs, there is little social class consciousness in the three social regions. The stratification system accords highest status in general to successful oldtimer

ranching families. Energy workers, though often making higher incomes, are often considered more transient. Life styles largely reflect historical values of close-knit informality and closed-group self sufficiency.

Social controls are primarily informal even within such formal structures as schools and police departments. Little serious crime problem exists, though minor crime such as vandalism is increasing, especially in eastern Grand County. Residents describe themselves as "conservative", but there is evidence of much variety of views.

Some social convergence is occurring as towns join councils of government to share interests and concerns. Better roads, post-World War II population growth, and prosperity have brought eastern slope residents into the area for recreation and second homes. Family ranching is giving way to absentee-owner ranching. Policies for management of the predominantly public lands of the whole area, including national forests, have shifted toward multiple-use planning and conservation.

A community forced to be self-sufficient by its isolation from the outside world forms a "closed society". Its members must often be independent of others in the physical sense (as when a blizzard strikes a ranch family whose nearest neighbors are several miles away). More important, however, is that families are dependent upon this community alone for satisfaction of social and emotional needs, and for other help in times of necessity (illness, death, marriage, barn-raising, and entertainment). Thus, intra-group dependency as well as personal self-sufficiency are characteristic of such small isolated communities.

Communities of this type were typical of the American frontier, and, except for east Grand County, Jackson and Grand Counties are still close to their Frontier history. Both the sense of group closeness and the spirit of individualism still exist in the values and mores of the long-term residents. These survivals enhance and uniquely flavor a set of otherwise fairly typical American attitudes: resistance to "government", general lack of social class consciousness, distrust of change, pride in the "self-made self", mores regarding manliness (such as in drinking habits), and rugged womanhood. Neighborliness and mutual help are still valued but less practiced.

North and Middle Parks, except for a small handful of Chicanos and Indians, are without ethnic or racial minorities. Conflicts are quite minor.

Kremmling

Kremmling seems to have the fewest generalized conflicts and a social structure (especially voluntary associations) sufficient for social cohesiveness and the performance of most needed community services. Change and growth have occurred (the AMAX Henderson Mill, for instance) but in spite of an annual growth rate of 5.9 percent between 1970 and 1980, relatively smooth social-structural adjustments have taken place. Some newcomers are omitted from the main social structure because no special effort is made to include them, but no systematic exclusion exists. Occasional minor conflicts occur between pass-through travelers, hunters, etc., and the local residents. Community spirit seems positive and shared loyalties center around school activities. In general, the outlying ranchers are well integrated into the social structure of the town.

North Park

North Park more closely resembles its own past; its cohesiveness is from persistence of historical values rather than from social-structural strength. Social structures appear to be in the process of becoming more formalized as the community changes. The police department, for instance, solves some police problems through formal methods but still retains informality in much of its operation.

The small size of Walden and its isolation from other towns means that the number of persons having a specific interest in any given topic (such as stamps or rock collecting or great books) tends to be too small for these persons to organize into interest groups such as clubs. Therefore, some social and social-psychological needs remain unmet for some citizens. Some identifiable groups apparently participate only marginally in the community (the poor, some occupational groups, some newcomers).

The still-persistent individualistic stance of earlier times slows development of broader social ties. Some minor conflicts exist in the Walden area among occupational groups such as miners, lumber workers, etc. Lifelong residents are somewhat distrustful of newcomers, especially young transient oil rig workers. A small population base with considerable intermarriage over the years has produced an elaborate extended kinship system in the area. Thus some problems take the form of "family squabbles" rather than "intergroup conflicts". Anti-government feeling runs stronger in North Park than in the other two regions.

Eastern Grand County

Eastern Grand County ranching never was of primary importance, and, except for Hot Sulphur Springs, the "pioneer spirit" has been replaced largely by tourist business, especially in the past few years.

The several communities are integrated socially and economically in many ways. Hot Sulphur Springs is the county seat providing countywide social services and law enforcement. The Winter Park ski area uses many low-paid seasonal workers, mostly young persons. Scarcity of reasonably priced housing in Winter Park forces many to find living quarters in the other communities, while a lack of employment opportunities in the area generally draws some commuting workers from the other communities to Winter Park. Granby is the commercial and utilities center for all of east Grand County. All junior and senior high students are bused to Granby.

The towns are too small to support many social organizations. Churches and clubs therefore tend to be shared across communities.

These elements produce a regional economic and social integration; they also discourage the development of specific community social bonds. The influx of thousands of recreation transients in summer and winter, the spillover of cultural demands and influences (including drugs) from the eastern slope, visible extremes of wealth, and conflicts over proper use of public lands by different recreational interests also minimize small-town "atmosphere". Hot Sulphur Springs has gradually declined as Granby has become the regional center, while Grand Lake in winter turns more nearly into a small neighborhood society (though efforts are underway to attract more winter recreationists). The other towns are business/tourist oriented, accepting social change easily, apparently not much disturbed by limited community social life.

Most serious (though still minor) intergroup conflicts are between those who think enjoyment of the wild areas ought to be by "foot power" and those who prefer motor vehicles. In addition, dissatisfaction was expressed by several residents of other communities that Winter Park is trying to put off lower cost housing, supportive services, industry, etc., onto other towns, though it is not clear that such an intent actually exists.

Formal Social Structures and Services

All the incorporated towns in the region have local government structures consisting of a mayor and an elected six-person town council, a six or seven-person planning board, and a handful of paid town employees headed by the town clerk.

County commissioners, county zoning boards, and county-based services are located in the two county seats, Walden and Hot Sulphur Springs. Social welfare services in Jackson County are provided by one part-time social worker. Grand County social services are centered in Hot Sulphur Springs with several full-time social welfare specialists, each of whom covers the county in his/her own professional category.

Colorado West Regional Mental Health Center in Glenwood Springs has an office in Granby serving both Jackson and Grand Counties. Services are available regularly three days a week in Kremmling and two days a week in Walden, full time in Granby, and on demand anywhere else in either county. Neither county has an alcohol detox center -- the nearest are in Craig or Denver.

Kremmling's hospital serves both counties. The whole region participates in the Denver-based helicopter Flight-for-Life program. Only Kremmling and Granby have near adequate medical personnel. Granby and Kremmling have Senior Citizen programs, including plans for senior housing. Granby's program serves all of East Grand County. Table 2-25 portrays medical services for the resource area.

TABLE 2-25 -- Medical Services - Kremmling Resource Area

January, 1981

Town	Doctors/ Type	Hospital/Distance	Capacity	Occupancy Rate	Nursing Home	Detox Center	Comment
Walden	1 G.P.	No-62 mi. (Kremmling)	--	--	No	No	Ambulance Service to Laramie, Kremmling, Ft. Collins, Denver. Participant, Helicopter Flight-for-Life program (Denver).

TABLE 2-25 -- Medical Services - Kremmling Resource Area—Continued

January, 1981

Town	Doctors/ Type	Hospital/Distance	Capacity	Occupancy Rate	Nursing Home	Detox Center	Comment
Kremmling	5 G.P./Spec. 1 Dentist	Yes	19 beds	51%	No*	No (AA Chapter)	*In dire need hospital has permitted person to remain in hospital no charge. All services except critical emergencies Women's Aux. provides extra services as needed. $225,000 remodeling of old building for offices in progress. 75 employees (40 professional).
Hot Sulphur Springs	No	No-17 mi. to Kremmling	--	--	No	No	
Granby	6 G.P./Spec. 1 Dentist	No-27 mi. to Kremmling (2 clinics)	--	--	No	No (AA Chapter)	
Grand Lake	No	No-40 mi to Kremmling	--	--	No	No	
Fraser	No	No-42 mi. to Kremmling East slope possible	--	--	No	No	
Winter Park	5 G.P./Spec. (winter seas.) 1 Dentist	No-47 mi to Kremmling East slope possible (2 clinics)	--	--	No	No	

North Park District in Walden provides public education for all Jackson County. Grand County has two school districts. Kremmling has three schools for the West Grand School District. In East Grand District, new elementary schools have been opened in Fraser and Grand Lake. Junior and senior high students attend in Granby. School enrollments are below capacity over the entire area, and most buildings are new or newly remodeled, containing all essential special use facilities. Counseling, career guidance, remedial assistance, and enrichment programs are adequate; achievement scores exceed the national average, but fewer than the usual proportion of average high school graduates go on to college.

Teacher turnover is not excessive. Discipline problems are virtually nonexistent in the schools, though teen drinking is a problem to some degree in most towns, according to some local officials.

Both Grand and Jackson Counties have agricultural extension programs and active 4-H club projects. College extension courses are offered in Kremmling, Walden, and Granby. Walden and Hot Sulphur Springs provide small historic museums; small libraries are found in all the towns.

Kremmling, Walden, and Granby have 3-man police departments, Grand Lake has a town marshall and deputy, and the other incorporated towns have contract arrangements with the county sheriff's department for police protection.

Crime rates in both counties have been on the rise but types of problems differ. Kremmling's problems are often associated with hunting season pass-throughs, including small thefts. Walden's increase is largely due to a crackdown on disorderly conduct of oil rig and other transient workers. Eastern Grand County has problems typically connected with summer tourism, winter concentration of well-to-do young skiers, and the spillover from the Denver area of deviant urban mores, such as drug abuse, with some of these influencing local youth.

Fire protection in both counties is by volunteer fire departments. Towns and ranching hinterlands share in law enforcement and fire protection. Cooperative arrangements with the Forest Service and BLM exist for sharing both manpower and equipment as needed for firefighting.

Regular cultural events (concert series and Steamboat Repertory performances) are held in Kremmling. East Grand has summer theater in Grand Lake and Winter Park. These and other towns have other regular community events such as rodeos (Kremmling and Walden), snowmobile and crosscountry ski events (Grand Lake, Winter Park), and school athletic contests (Kremmling, Walden, and Granby).

Voluntary Associations

Generally, in the smallest communities almost all services and controls are at the personal level. Growth tends to lead to increasing bureaucratiza-

tion of social structures, thus changing many social relationships from personal to impersonal. The "density of acquaintanceship" (Freudenburg 1980) is reduced as more strangers move in; informal social control mechanisms, such as gossip, neighborhood supervision of children, etc., become formalized into police departments and social welfare offices.

As noted earlier, in the smallest communities persons sharing specialized interests may be too few to support organizational structures. Friendship clusters and private philanthropy tend to be the principal vehicles for filling social needs. In small towns some social services and many social-psychological needs are fulfilled through a structure of voluntary associations -- those organized interest groups to which persons belong by their own choice, such as hobby clubs, men's clubs, etc. If very small communities are geographically close, voluntary associations may include members from several towns.

Three distinguishable types of such community structures exist in the Kremmling Resource Area. Kremmling is large enough to support numerous voluntary associations, which fill most gaps in the formal services structure and also provide opportunities for fulfilling a variety of citizen social-psychological needs. Walden is both smaller and more isolated than Kremmling. Its voluntary association structure is less complete, leaving gaps in community services and producing a lack of social-psychological fulfillment for some citizens. Individual family and friendship groups are of correspondingly greater importance there.

The eastern half of Grand County, as already noted, contains a number of quite small towns, close together, interrelated both economically and for social services delivery. Strictly local loyalties seem rather weak, but the whole area shares memberships in some voluntary associations and in church memberships. Friendship groupings probably also occur across communities to some extent. There is an expressed commitment by many to the beauty and commercial development of the entire area.

CHAPTER 3

ALTERNATIVES INCLUDING THE PREFERRED RESOURCE MANAGEMENT PLAN

CHAPTER 3
ALTERNATIVES INCLUDING THE PREFERRED RESOURCE MANAGEMENT PLAN

SUMMARY

Chapter 3 describes the seven alternative multiple use land management plans in detail as well as the process that was followed to develop them. Alternatives considered, but not fully described and analyzed, are also mentioned.

The seven alternatives considered were:

Continuation Of Present Management (No Action)

This alternative allows for the management and flow of outputs from the public lands and resources in the Kremmling Resource Area at their present levels. Some changes would be necessary in the amount of forage allocated to livestock, based on the recent inventory, as well as in the wilderness study area (WSA) designation of the Troublesome WSA in order to comply with provisions of the Federal Land Policy and Management Act (FLPMA). The Troublesome WSA would not be recommended for wilderness designation.

Preferred

This alternative is considered by the Bureau to be the one that responds best to the issues in a multiple use framework. It would emphasize the management, production, and use of the renewable resources on a majority of the public lands in the resource area. In addition, sufficient suitable coal lands would be made available for the continuation and possible expansion of the coal industry in Jackson County. Isolated tracts of public lands would be made available for disposal as needed to support the recreation and tourism based economies in eastern Grand County.

Energy And Minerals

This alternative emphasizes the exploration, development, and transportation of energy and other critical mineral resources on Federal lands within the resource area.

Economic Benefit

This alternative emphasizes the management and production of all public lands resources that would benefit local and regional economies.

Renewable Resources

This alternative emphasizes the management, production, and use of the renewable resources on public lands in the resource area.

Recreation

This alternative emphasizes providing for and managing recreational opportunities and ensuring the availability of public lands to meet recreational needs.

Natural Environment

This alternative emphasizes the protection and enhancement of the natural environment within the resource area.

INTRODUCTION

The Bureau's planning regulations require that "several complete, reasonable resource management alternatives shall be prepared for the resource area. One shall be for no action, which means continuation of present levels or systems of resource use. The alternatives reflect the variety of issues and guidance applicable to the resource area". (43 CFR 1616.5).

The National Environmental Policy Act (NEPA) regulations (40 CFR 1502.14) further require decisionmakers to "rigorously explore and objectively evaluate all reasonable alternatives; and for alternatives which were eliminated from detailed study, briefly discuss the reasons for their having been eliminated".

All of the alternatives developed for the management of the Kremmling Resource Area are:

1. Multiple use alternatives that are realistic and implementable.

2. Developed in accordance with FLPMA and NEPA regulations; Bureau planning regulations; principles of multiple use and sustained yield; and other applicable laws, regulations, and minimum standards.

3. Subject to existing valid rights (mining claims, rights-of-way leases, etc.).

4. Structured so as not to eliminate any Bureau programs or activities that respond to an economic or social dependency.

5. Designed so as not to totally exploit any resource or totally eliminate any resource program or activity.

6. Responsive to the issues that were identified. Each alternative addresses or resolves issues or groups of issues.

7. Designed to provide BLM managers a framework within which to make multiple use decisions or develop more site-specific activity plans or actions.

FORMULATION OF ALTERNATIVES

A series of steps was used to formulate the multiple use alternatives for the Kremmling Resource Area. These steps started early in the planning process and included:

1. **Issue Identification** - The general public, local and state governments, other Federal agencies, and user groups all identified issues relating to management of the public lands (Refer to Chapter 1).

2. **Analysis of Issues** - The issues were analyzed and grouped. From these issues, planning questions were developed. The answers to these questions became the components of the alternatives necessary to resolve the issues (Refer to Chapter 1).

3. **Analysis of Resource Data and the Current Management Situation** - Available inventory data was analyzed to determine quality, quantity, location, condition, and trend of the resources based on present management.

4. **Capability Analysis** - A range of realistic management opportunities or potentials were identified for each resource, based on its capabilities.

5. **Priority Use Mapping** - The priority management areas for each resource were identified on maps.

6. **Identification of Alternatives** - Goals for alternative land use plans were identified. Each alternative was intended to resolve a group of issues in a multiple use context.

7. **Alternative Formulation** - A logical mix of resource management opportunities and priority use areas was developed for each alternative in a theme that best achieved the goal of that alternative. Priority use areas are areas where a specific resource or use is to be given management emphasis.

ALTERNATIVES CONSIDERED BUT NOT ANALYZED IN DETAIL

Some alternatives were considered but eliminated from detailed analysis. The alternatives and the reasons for their elimination are identified in the following narratives.

Minimum Management and Output Alternative

This alternative would provide for little or no management of the public lands and resources. The goal would be to provide only sufficient management necessary to protect human life, public health and safety, and the environment. Hazard reduction, fire suppression, insect or disease control, limited road maintenance, and cooperative management with adjacent landowners or local governments are some of the management actions that would occur.

No livestock grazing, outputs of forest products or minerals, land disposal, recreational developments, or wildlife habitat improvements would be provided for under this alternative. Incidental outputs, such as wildlife use and dispersed recreation, would continue.

This alternative was eliminated from detailed study because it is not a realistic, implementable alternative. It is contrary to the principles of multiple use and sustained yield and does not meet the requirements of the Federal Land Policy and Management Act of 1976. Ultimately, it would lead to deterioration of the productivity of public lands and resources.

A "No Livestock Grazing" Alternative is not analyzed in the body of this document. However, a fully detailed analysis has been developed and is available as a separate document for review at the Kremmling Resource Area Office.

It would also cause significant economic and social hardships to segments of the public who are

dependent on a continuous flow of goods and services from the public lands.

Maximum Output Alternative

Several alternatives were identified that would provide for the maximum output of a resource based on the physical or biological capability of that resource. No consideration was given to the needs of other resources. Maximum production alternatives were identified for coal, livestock, wildlife, and forest products.

Coal. All known Federal coal would be leased in the resource area. Approximately 200 to 275 million short tons of coal could be mined through a combination of surface and underground mining methods.

Livestock. All the existing available and usable range forage on public lands in the resource area would be allocated solely for livestock grazing. Approximately 63,500 AUMs would be available for livestock production (50,225 AUMs suitable for cattle and 13,275 AUMs for sheep).

Applying intensive range management to the grazing lands would eventually result in approximately 115,000 AUMs of forage available for livestock production.

Wildlife. All existing available and usable forage on public lands in the resource area would be allocated to wildlife species, including deer, elk, and antelope. Approximately 428,000 AUMs of forage would be available for an estimated population of 9,500 antelope, 32,000 elk, and 37,000 deer.

Forest Products. All productive forest lands in the resource area (96,000 acres) would be included in the calculation of the allowable cut. This would result in an annual harvest of 7.2 million board feet of timber.

Applying intensive forest management practices to all productive forest lands would eventually result in an annual harvest of 13.4 million board feet.

The maximum output alternatives were eliminated from detailed study because they are not realistic or implementable alternatives. They are inconsistent with the principles of multiple use and sustained yield and do not meet the requirements of the Federal Land Policy and Management Act of 1976. They address only a single use or issue. Loss of future management options or other resource values and the loss of a continuous flow of a variety of goods and services from the public lands would result in unacceptable levels of adverse environmental impacts.

ALTERNATIVES CONSIDERED AND ANALYZED IN DETAIL

Seven alternative multiple use land management plans were identified and are presented in this chapter. Impacts are analyzed in Chapter 4.

Each of the seven alternatives identifies:

1. Priority areas, which are areas where a specific resource or use will be given management emphasis. These areas are displayed on each alternative map (Refer to Map Addendum).
2. Compatibility, which relates to the limits or restrictions that must be placed on resources or uses in order to avoid conflict within the priority areas.
3. The types of uses or activities that would be excluded within priority areas.
4. The management intensity that would be applied to each resource (intensive or limited management).
5. The types of management practices that would be associated with implementing each management intensity.
6. The lands suitable or unsuitable for development or use.
7. The types of support actions that would be needed to implement each alternative.

Activities or uses not specifically addressed in the RMP, such as small-scale projects (right-of-way applications for rural telephone lines, communications sites, free use permits, etc.), would be authorized if they met legal requirements and were compatible with the management emphasis of a given area. Where necessary, appropriate limits or restrictions would be required to ensure compatibility.

The seven alternatives considered, along with the recommendations made in them, do not contradict the terms, conditions, or decisions of any known officially approved or adopted resource plans or related programs, policies, laws, or regulations of any local, regional, state, or Federal agency or government.

MANAGEMENT PRESCRIPTION CATEGORIES

Management categories have been developed for most of the resource programs within the Kremmling Resource Area. These categories will be

applied to each of the seven alternatives presented later in this chapter. They will be fully described here and only referenced in each alternative. For example, either intensive or limited management is prescribed for forest products under each alternative. To fully comprehend these terms, the reader will need to refer back to this section.

The categories describe the intensity of management to be applied to different resources. They also identify types of management practices likely to be associated with each management intensity.

Livestock Grazing

Intensive Management

Alternatives calling for intensive management of grazing allotments would result in all the grazing allotments in the Kremmling Resource Area being managed according to one of the three levels described below. Level two allotments would have highest priority for implementation, followed by level one and then level three.

Level One

Objective: To maintain or improve forage production in grazing allotments that are currently in satisfactory condition.

The following allotment criteria would be applied:

1. Estimated carrying capacity allocated for livestock is the same or more than current active licensed use as indicated by the range condition inventory/monitoring studies data. No significant areas within a grazing allotment are receiving greater than 60 percent utilization on the key forage species.

2. The allotment is producing 75 percent or more of its potential for livestock forage and the allotment has a potential of less than 20 acres/AUM.

3. No major conflicts exist between livestock and wildlife for available forage or the use of critical riparian zones.

4. Allotments are comprised of greater than 1,000 acres of public land and public lands account for more than 40 percent of the total allotment AUMs.

5. Opportunities may exist for positive economic return from public investments.

Management actions would include the following:

1. Maintaining or increasing livestock stocking rates and adjusting seasons of use, based on the range condition inventory and monitoring studies

2. Implementing comprehensive use-supervision and monitoring studies on those allotments that warrant an increase in stocking rates; conducting minimum intensity use-supervision and monitoring on remaining allotments. Comprehensive monitoring studies would include the collection of actual use, utilization and climatic data in the short term in order to supplement inventory data. Trend studies would be added as management plans were developed. Minimum intensity use supervision and monitoring would include compliance checks to ensure adherence to annual grazing authorizations.

3. Consulting with all grazing permittees/lessees concerning adjustments in allocation and management decisions affecting their allotments

4. Investing in cost-effective range improvements (primarily through private investment) as needs arose to further improve forage condition. Specifically, additional water developments may aid in improving the allotment situation by lengthening the season of use, spreading usage more evenly over the range, and opening up more range to grazing. Additional fencing may be required in order to provide for better distribution of grazing. Interior pasture fencing would allow for opportunities to defer or rest portions of an allotment seasonally. Other management facilities, such as corrals and holding pens, may be authorized where the need arises for the containment and/or shipping of livestock.

Opportunities may also exist for the authorization of vegetation manipulation in areas where optimum herbaceous forage production is inhibited by undesirable brush species. Manipulations would be designed on range sites that have a medium or high potential for forage production and that would meet the following additional criteria:

a. Grazing distribution and use of an allotment would be enhanced.

b. Treated areas could be isolated and rested for a minimum of two spring growing seasons following the manipulation.

c. Wildlife habitat values would be enhanced.

The types of vegetation manipulations that would be considered include chemical control, prescribed burning, and mechancial control. A description of each of these methods and the

criteria under which they would be used is given in Appendix 1.

Additionally, artificial seeding may be required following a vegetation manipulation when insufficient desirable forage plants remain or to supplement needed early spring or late fall pasture. Such areas would receive proper seedbed preparation, followed by the drilling or broadcasting of selected seed.

These range improvements would conform to specific development plans designed to provide the framework for meeting multiple-use objectives.

Level Two

Objective: To improve the forage production and condition in grazing allotments that are currently in unsatisfactory condition. Improve allotment condition to meet Management Level One standards.

The following allotment criteria would be applied:

1. Allotments have the potential for medium to high vegetation productivity, but are currently producing at less than 75 percent of potential (present forage condition rated unsatisfactory).

2. Present grazing practices are inadequate and/or nonproductive.

3. Conflicts exist between livestock and wildlife demands for available forage and/or habitat.

4. Allotments have more than 1,000 acres of public land and public lands account for more than 40 percent of the total allotment AUMs.

5. Opportunities exist for positive economic return from public investments.

Management actions would include the following:

1. Ranking allotments to receive priority management, beginning with those that have wildlife/livestock forage or habitat conflicts and watershed and water quality problems associated with livestock grazing use.

2. Adjusting stocking rates to proper allocation levels in accordance with the range condition inventory/monitoring studies data.

3. Designing grazing systems, providing minimum rest requirements, and/or adjusting season of use for all allotments. Grazing allotments may also be combined for management purposes. Additionally, other agency lands (state, U.S. Forest Service) would be considered for incorporation into consolidated allotment management plans (AMPs).

4. Conducting comprehensive use supervision and monitoring to assess the effectiveness of prescribed grazing systems and/or to refine and update the range condition inventory data. Comprehensive monitoring studies would include the collection of actual use utilization, and climatic data in the short term to supplement inventory data. Trend studies would be added as management plans were developed.

5. Consulting with all permittees/lessees concerning adjustments in allocation and management decisions affecting their allotments.

6. Investing in cost-effective range improvements (primarily through public investment) to implement grazing systems and meet the objectives of this management level as well as the specific objectives of AMPs.

Stock water developments would be authorized as a basis for implementing grazing systems; additional water sources could be turned on and off to regulate cattle distribution and use within pastures. This would allow previously developed water facilities to receive less concentrated use and would enhance grazing uniformity within pastures/allotments.

Interior fencing would be authorized to develop pastures for implementation of grazing systems that would provide alternate period of rest for each area of an allotment. Other management facilities, such as corrals and holding pens, would be authorized where critical need arose for the containment and shipping of livestock.

Vegetation manipulations (mechanical, spraying, and burning) would be authorized, along with reseeding, in areas that are currently producing significantly under their potential forage production. These manipulations would be designed on range sites that have a medium to high potential for forage production and that would meet the criteria for vegetation manipulations as described for Management Level One and in Appendix 1.

7. Allocating additional forage made available through intensive management practices first to satisfy grazing preferences (restore any suspended nonuse) and second to allow for increases above preference on a case-by-case basis.

Level Three

Objective: To maintain the existing allotment situation and provide for intensive management opportunities as needs arise for operators/other land use agencies.

The following allotment criteria would be applied:

1. Allotments have a low vegetation production potential and are producing near their potential (greater than 20 acres/AUM).

2. Forage/habitat conflicts between livestock and wildlife are limited or not considered significant.

3. Allotments are comprised of less than 1,000 acres of public lands, or public lands account for less than 40 percent of the total allotment AUMs. There is no potential for separating blocks of 1,000 acres (or less) for the purpose of consolidated management as a unit or with other blocks of public range.

4. Opportunities for positive economic return on public investment do not exist or are constrained by technological or economic factors. Opportunities for private investment may exist.

5. The public lands in an allotment have been designated for disposal, have been leased for surface coal mining, or will be designated for development and expansion to support the existing coal industry.

Management actions would include the following:

1. Adjusting stocking rates and/or season of use where necessary on allotments where the range condition inventory and monitoring studies have been completed. Where the inventory has not been conducted, stocking rates and season of use would remain as currently authorized.

2. Consulting with all grazing permittees/lessees concerning adjustments in allocation and management decisions affecting their allotments.

3. Emphasizing development of long-term agreements with the Soil Conservation Service in order to incorporate public lands into a comprehensive ranch management plan.

4. Authorizing range improvements (primarily through private investment) in order to meet the requirements of comprehensive ranch management plans. Vegetation manipulations may be authorized as a management tool where opportunities exist for improving range condition.

5. Conducting minimum intensity use-supervision and monitoring.

All of the grazing allotments in the Kremmling Resource Area have been placed in one of the three management levels described above. However, as situations, events, or conditions change, allotments may be placed in a different management level to better correspond to their needs.

Unallotted public land, or lands excluded from livestock grazing, would include:

1. Lands withdrawn from grazing for scientific studies (wildlife/livestock exclosures, etc.)

2. Lands not licensed because of cooperative agreements with other agencies emphasizing other land uses

Forest Products

Intensive Management

Forest lands growing commercial tree species (lodgepole pine, Douglas fir, or Englemann spruce) on productive growing sites (producing 20 cubic feet of wood fiber per acre per year) on lands not withdrawn for other resource needs would be intensively managed to produce a variety of forest products on a sustained yield basis. Intensive management would include the following practices:

1. Giving emphasis to improving vigor and productivity by converting decadent forest stands into younger growth. The oldest stands would be harvested first and no harvest would be allowed on stands younger than 90 years except for thinning. Mature and overmature stands would usually be clearcut in parcels of less than 40 acres. After harvest, the remaining slash would be cleaned up with machines or, more rarely, by fire to ensure the natural renewal of seedings within five years.

2. Cutting forest stands, in some instances, by using the shelterwood method. Each 10 years, a third of a mature stand would be removed and would be replaced by the establishment of reproduction under the partial shelter of the remaining mature trees. The final cut would remove the remaining seed trees. The 40-acre limitation on clearcuts would not apply to shelterwood harvests, which could be of any size.

3. Allowing commercial thinning in stands between 50 to 80 years of age.

4. Prescribing precommercial thinnings for stands 20 to 30 years of age.

5. Initiating artificial regeneration if adequate stocking were not achieved within five years of final harvest or site preparation.

6. Implementing immediate salvage or accelerated harvests after catastrophic events such as fire, windstorm, or insect epidemics.

7. Giving a high priority to intensive management areas for fire protection and insect and disease control.

Limited Management

Forested lands growing woodland or noncommercial tree species (pinyon-juniper, Ponderosa pine, sub-alpine fir, or aspen), nonproductive growing sites (producing less than 20 cubic feet of wood fiber per acre per year), or sites withdrawn from planned harvest for other resource needs or because they are economically inaccessible would not be intensively managed. Custodial management of these areas would be emphasized for the maintenance and protection of the forest environment. Timber harvest would be permissible, but would not be a goal of management under sustained yield principles. Harvesting, primarily salvage, would be mostly for posts, firewood, etc. Fires, insects, and disease would be controlled but would be a lower priority than for the intensively managed areas. No intensive forest management practices, such as thinnings or artifical regeneration, would be planned.

Aquatic Wildlife

Intensive Management

Streams to be intensively managed to improve the existing fisheries resource would meet the following criteria:

1. A significant portion of the stream is on public lands and Bureau initiated management would have a measurable effect on improving the fisheries.

2. Sufficient flows exist in the stream to support game fish populations.

3. Stream conditions need improvement and would respond to management.

4. A water right protecting instream flow has been filed by the Colorado Water Conservation Board under S.B. 97.

Types of management practices that could be employed to improve the fisheries would include:

1. Placing gabions to stabilize streambanks

2. Placing riprap to protect banks from erosion

3. Revegetating streambanks to stabilize them

4. Constructing fences to restrict livestock from damaging riparian areas

5. Constructing pools to provide fish habitat at low flows

6. Removing debris that restricts flow or fish migration

7. Working with other agencies or landowners on a cooperative basis to improve aquatic habitat

8. Providing protection by imposing restrictions on surface disturbing activities (See Limited Management Restriction)

Limited Management

Limited management would be conducted on the streams not meeting intensive management criteria.

Management to protect fisheries would be through restrictions placed on uses or activities that might reduce the fisheries resource. Types of restrictions would include:

1. Leaving buffer strips of vegetation between streams and areas of surface disturbance, such as clearcuts, roads, or surface mining.

2. Building sediment gathering structures to prevent sediment from entering streams from surface disturbing activities.

3. Locating roads out of riparian or wetland areas. Roads crossing streams would be positioned so as to cause minimal damage to riparian, stream, or wetland habitat and to provide for unobstructed migration of fish.

4. Restricting livestock from using riparian areas.

5. Preventing debris or toxic materials from entering streams.

6. Improving riparian habitats.

Terrestrial Wildlife

Intensive Management

Important terrestrial wildlife habitats considered for intensive management would include:

1. Essential habitats required by species such as deer, elk, bald eagles, antelope, and sage grouse for winter survival

2. Defined courtship and breeding areas for upland game birds and nongame species, such as songbirds and birds of prey

3. Migration routes

4. Nesting, fawning, and calving areas

5. Other limiting habitats, such as riparian zones

Intensive management practices could include the following actions:

1. Avoiding near surface disturbing activities (ORV's, etc.), critical habitats.

2. Providing a buffer area between disturbing activities and important habitat when that habitat is in use.

3. Designing vegetation manipulations of important habitats so they are beneficial to wildlife.

4. Ensuring rapid revegetation of plant species beneficial to wildlife after surface disturbing activities.

5. Replacing habitats lost to long-term disturbances, such as coal mining.

6. Protecting critical riparian habitats from livestock grazing by fencing and/or management systems.

7. Cooperating with the Colorado Division of Wildlife to manage public lands not leased for livestock grazing in T1S, R82W, and T2S, R82W as big game winter range. These public lands should not be leased for livestock grazing due to potential livestock/big game forage competition problems.

8. Designing livestock grazing systems that would improve forage production for game and nongame species.

Limited Management

The noncritical habitats, such as yearlong or summer ranges, would require limited management. Types of actions or practices would include:

1. Restricting types and extent of vegetation manipulation

2. Ensuring rapid revegetation with species beneficial to wildlife after surface disturbing activities

3. Designing timber sales to increase open areas in dense forest habitat

4. Designing livestock grazing systems that would improve forage production for both game and nongame species

5. Constructing or developing watering facilities for joint use by livestock and wildlife

Water Resources

Intensive Management

Streams not meeting state standards and/or having unstable channels could either be improved to meet minimum standards or have their channel stability improved to good condition, provided the streams met the following criteria:

1. Twenty percent or more of the watershed is in a moderate to severe erosion class (sensitive watersheds).

2. The land pattern is such that watershed improvement projects initiated by BLM would have a noticeable effect on improving the water quality.

3. The pollution source is on public land.

4. Fish and wildlife would benefit from channel stability.

For streams that did not meet the state standards and above criteria, the Bureau would cooperate with other agencies or adjacent landowners to improve the water quality.

Management practices employed for water quality improvement would include:

1. Monitoring water quality or stream bank stability

2. Improving vegetation cover on watersheds by developing grazing systems for livestock that would provide an increase in plant density and stabilize the soil

3. Initiating streambank stabilization projects

4. Restricting the use of riparian areas by livestock to protect riparian habitat and to promote streambank stability

5. Constructing check dams on intermittent stream drainages to reduce sediment load caused by upland erosion

Restrictions would be imposed on other activities or uses of the public lands, including the following:

1. Excluding surface disturbing activities from sensitive watersheds where they were contributing to, or had the potential for contributing to, degradation of water quality

2. Providing buffer strips between streams and surface disturbing activities, such as mining, road building, clearcutting trees, etc.

3. Ensuring rapid revegetation of disturbed areas

4. Utilizing water course structural engineering practices (gully plugs, gabion structures, dams, riprap, etc.)

5. Limiting ORV usage in sensitive watersheds

6. Controlling erosion or runoff on disturbed sites

7. Limiting vegetation manipulations or treatments in sensitive watersheds to spraying, aerial seeding, or designed grazing systems

8. Placing timing restrictions on surface disturbing activities to avoid spring thaw and runoff seasons

9. Constructing snow management structures for watershed improvement

10. Complying with all Federal, state, and local water quality regulations

Limited Management

Limited management would be applied to maintain existing water quality. Measures that could be employed are:

1. Excluding surface disturbing activities from sensitive watersheds, where resulting erosion would degrade water quality

2. Providing buffer strips between streams and surface disturbing activities, such as mining, road building, clearcutting trees, etc.

3. Ensuring rapid revegetation of disturbed areas

4. Controlling erosion or runoff from disturbed sites

5. Limiting vegetation manipulations or treatments of sensitive watersheds to spraying, aerial seeding, or designed grazing systems

6. Placing timing restrictions on surface disturbing activities so as to avoid the spring thaw and runoff seasons.

Visual Resources

Limited Management

Protection of visual quality would be achieved through mitigating measures designed to reduce the degree of contrast with the surrounding landscape. Types of mitigating measures may include:

1. Relocating a project

2. Redesigning a project

3. Screening or buffering

4. Using nonreflective paints or materials

5. Ensuring rapid restoration and revegetation of surface disturbance areas

Recreation

Intensive Management

Special recreation management areas (SRMAs) would be established where intensive management would be required to maintain, protect, or enhance recreation opportunities. Areas would be established if they met, or had the potential for meeting, one or more of the following criteria:

1. An area has recreation opportunities not readily available elsewhere that would be denied to the public unless proper management was applied.

2. Significant user conflicts exist.

3. Visitor safety problems exist.

4. Potential for recreation resource damage exists.

5. Adequate water resources exist and are protected by water right filings made by BLM.

Management emphasis would be directed to accommodating both existing and projected long-term use levels, providing resource protection, promoting visitor safety and information, and reducing conflicts among uses and users. Actions that would be taken to provide recreation opportunities in these areas include:

1. Developing management prescriptions for each SRMA.

2. Designing, constructing, and maintaining improvements necessary to meet management objectives for an area. These could include sanitary facilities, campsites, parking areas, launching areas, etc., necessary for visitor use and safety, site protection, and/or site stabilization.

3. Placing restrictions on recreation users where significant conflicts exist, such as restricting areas to specific types of recreation use.

4. Providing user information through signs, brochures, and maps.

5. Supervising use and monitoring regularily.

6. Placing restrictions on other conflicting resource uses that may degrade recreational opportunities or improvements, or compromise visitor health and safety. This may include

avoidance, timing restrictions, buffering, etc. A no surface occupancy stipulation would be placed on all oil and gas leases issued on developed recreation sites, primary river use sites along the upper Colorado River, the North Sand Hills, and major dispersed sites, such as hunter camps. No new material sales (e.g., gravel) would be allowed within SRMAs. Livestock grazing would be excluded from developed recreation sites.

7. Appraising developed recreation sites for their mineral potential and withdrawing them from mineral entry if necessary to protect the public investment in facilities.

Limited Management

Public lands not included in special recreation management areas would be managed for dispersed recreational uses, such as hunting, hiking, and sightseeing. These would be areas where significant recreation issues or management concerns are limited and intensive management or protective measures would not be required in the long term to ensure providing of the recreation opportunities.

Management emphasis would be directed to those actions necessary in making dispersed recreation opportunities available on a continuing basis. Actions to be taken would include:

1. Providing limited visitor information through signing of access points, public land boundaries, and hazardous or restricted areas

2. Acquiring public access to public lands with significant recreation opportunities where access does not presently exist

3. Providing minimal maintenance of undeveloped sites, e.g., litter collection from hunter camps

4. Carrying out limited use supervision or monitoring

Cultural Resources

Intensive Management

Cultural sites on, or eligible for inclusion to, the National Register of Historic Places would be intensively managed. Management actions may include:

1. Implementing site enhancement, which includes rehabilitation, reconstruction, etc.

2. Developing interpretive facilities

3. Initiating a protective withdrawal of National Register of Historic Places sites to exclude any future uses of the site

4. Pursuing further research data recovery and interpretation

Limited Management

Limited management could occur on any significant cultural site. Management actions or protective measures could include:

1. Inventorying areas containing cultural resources potentially significant for scientific and/or interpretive purposes.

2. Inventorying all areas before beginning surface disturbing activities. Inventory intensity would be based on potential impacts.

3. Determining the eligibility of cultural resources for nomination to the National Register of Historic Places; priority would be given to those in potential danger or with potential to yield important information.

4. Protecting cultural sites on, or eligible for inclusion on, the National Register of Historic Places. Management measures may include:

   a. Avoidance of sites by disturbing activities

   b. Data recovery of cultural resources where avoidance is impractical or impossible

Paleontological Resources

Limited Management

Geologic formations likely to contain significant paleontological resources would have limited management applied to them to protect these resources.

Management actions could include:

1. Inventorying likely sites prior to surface disturbance

2. Monitoring surface disturbance activities

3. Avoiding fossils when discovered

4. Salvaging fossils where avoidance was impractical

CHAPTER 3

CONTINUATION OF PRESENT MANAGEMENT (NO ACTION) ALTERNATIVE

The Continuation of Present Management Alternative proposes to continue the Bureau's existing management of the various resources on public lands in the Kremmling Resource Area. As this document is both the draft resource management plan and environmental impact statement, the discussion of this alternative goes into considerable detail to describe existing management practices and demand and dependency, both locally and regionally, on the various public land resources. This information provides the baseline upon which the other alternatives were developed and against which they can be compared.

In this alternative the management and flow of outputs from the public lands and resources in the Kremmling Resource Area would continue at essentially their present levels, with certain exceptions. A recommendation on the suitability or nonsuitability of the Troublesome WSA for wilderness designation must be made in this plan. A continuation of interim management for the protection of wilderness values is not allowable under FLPMA. Also, the Bureau is required by law to make adjustments in range forage allocations if the need for adjustments is identified in a complete range inventory such as the one completed for the Kremmling Resource Area in 1980. The required changes in existing management are reflected in this alternative.

MINERALS AND PALEONTOLOGY

Introduction

The management of public domain minerals is separated into three categories: leasable, locatable, and salable. Leasable minerals include such products as coal, oil, and gas. Leasing in areas that are known to contain such minerals is accomplished through a competitive bidding system. Leasing areas that have an unknown potential are disposed of by *noncompetitive sales.*

Locatable minerals are those minerals that fall under the jurisdiction of the General Mining Law of 1872, as well as subsequent hardrock mining laws. These minerals include gold, silver, copper, molybdenum, uranium, and fluorspar. Locatable mineral areas may be staked and filed by a claimant. This procedure gives the claimant exclusive rights to the exploitation of the minerals within the claim boundaries. Management by BLM consists of recording the claims, as well as implementing the surface management regulations (Surface Management of Public Lands Under U.S. Mining Laws - FR 78902: 11/26/80). These regulations primarily provide for reclamation of surface disturbances of public lands following completion of the mining operation.

Salable minerals include common varieties of sand, stone, gravel, cinders, pumice, pumicite, and clay that may be acquired under the Materials Act of 1947, as amended. The primary salable minerals in the Kremmling Resource Area are sand and gravel used for road base and building construction.

The management of paleontologic (fossil) resources of scientific value on public lands is the responsibility of BLM. The present, inventory consists only of a literature search. No areas have been identified for paleontologic values. Should locations be discovered in the future, every effort will be made to protect these.

Coal

The coal resources in the Kremmling Resource Area are located mostly in the North Park basin. Much of North Park has been designated by the U.S. Geological Survey (USGS) as a known recoverable coal resource area (KRCRA). This area is referred to as the McCallum KRCRA.

Four known minable coal zones are exposed in the McCallum area. They are all within the Coalmont Formation. These zones are the Sudduth and Capron Coal zones and two additional unnamed coal zones. Sudduth coal is now being strip-mined at the Marr, Canadian, and Flatiron mines. These mines are on the east flank of the South McCallum Anticline. The Sudduth coal bed ranges in thickness from 4 to 58 feet. The coal is sub-bituminous (Btu/16=8,520 to 11,280 as-received), low in sulfur content (0.2 to 0.3 percent), and variable in ash content (2.1 to 19.2 percent). The Capron coal ranges from lignite to sub-bituminous (Btu/16=4,500 to 10,669 as-received) (USDI/U.S. Geological Survey 1977).

The lands described as the McCallum KRCRA contain approximately 226,000 acres. Of the total KRCRA acreage, approximately 68,990 are surface acres managed by BLM, while 109,510 are mineral estate acreage under the Bureau's jurisdiction (see Table 3-1). Estimations derived from information contained in the USGS CRO/CDP (Coal Resource Occurrence/Coal Development Potential) reports indicates a coal reserve in the McCallum KRCRA of approximately 275 million short tons (90.7 surface/184.2 subsurface)(USGS 1979).

TABLE 3-1 -- LAND STATUS SUMMARY

(Known Recoverable Coal Resource Area)

Surface/Subsurface Ownership	Acres
Federal/Federal	68,990
Private/Federal	36,880
State/Federal	2,240
Arapaho National Forest/Federal	1,400
	109,510
Federal/Miscellaneous	2,110
	111,620
Private/Private	114,395
Total Known Recoverable Coal Resource Area	226,015

There are six coal leases in the McCallum KRCRA; these leases encompass approximately 4,330 acres and are located principally in the Walden area. In addition to the existing leases, there is one preference right lease application (PRLA) for 440 acres near Coalmont. This PRLA will be processed through this planning effort.

The economic conditions for production of coal are less than ideal in the area. Even though the demand in the Midwest for western low-sulfur coal has increased steadily in recent years and the North Park Basin area has increased coal production, the production in this area accounts for only about 4 percent of the total production for the State of Colorado (Colorado Division of Mines files). The demand for coal is expected to experience a continued but moderate increase in the foreseeable future.

Presently, there are six existing coal leases in the North Park area. To date, only three of these leases are actively under development. The three undeveloped leases are located in the Coalmont area. Future development of these leases (and the nearby PRLA C-0125854) is uncertain.

The Union Pacific Railroad, which extends between Walden and Laramie, Wyoming, is the primary limiting factor for coal development in Jackson County. The eastern ranges prohibit easy access to coal markets by routing transportation to the north. Even though the price of coal has risen from $9.87/ton in 1974 to $19.54/ton in 1979, the increased cost of transportation can make North Park coal unprofitable to produce.

There are three strip mines in operation in North Park: the Marr and Canadian on public lands and the Flatiron on private. Production at these mines has increased steadily since the initial operation in 1974 and is expected to stabilize at approximately 2 million tons per year, 39 percent above the 1979 production. This coal production accounts for approximately 66 percent of Jackson County mineral production income (USDI/U.S. Geological Survey 1981).

The Marr and Canadian mines employ approximately 114 persons. These workers and their families account for approximately 18 percent of the population of Jackson County (Colorado Division of Mines 1979).

Coal Unsuitability Criteria and Surface Owner Consultation

BLM is required to review Federal lands to determine which lands are unsuitable for all or certain stipulated methods of coal mining. Bureau procedures for assessing unsuitability are defined in the planning regulations (43 CFR 1601.6-6) and coal regulations (43 CFR 3461).

The 20 criteria addressing unsuitability for the surface mining of coal were applied to the McCallum KRCRA, including existing Federal coal leases. The complete assessment report is available in the Kremmling Resource Area Office.

A final decision on the application of unsuitability criteria will not be made on existing, nonproducing coal leases until the mine plan review stage. Only a preliminary application of the criteria has been made in this document for lands with existing leases. After applying the 20 unsuitability criteria, the Bureau found that 7,190 acres were unsuitable for surface mining (see Table 3-2).

TABLE 3-2 -- SUMMARY OF UNSUITABILITY

Criterion Number	Title	Exception Application	Acres Unsuitable
1	Federal Land Systems	No	1,200
2	Rights-of-Way	Yes	Unknown
3	Buffer Zones	Yes	Unknown
4	Wilderness	No	0
5	Scenic Federal Lands	No	0
6	Scientific Study Areas	No	0
7	Cultural Resources	No	0
8	Natural Areas	No	0
9	Federally Endangered Species.	No	1,990
10	State Endangered Species.	No	1,200
11	Eagle Nest Sites	No	440
12	Eagle Concentration Areas.	No	0
13	Falcon Nest Sites	No	[1]280
14	Migratory Birds	No	[2]1,920
15	State Resident Fish and Wildlife.	No	0
16	Floodplains	No	0
17	Municipal Watersheds	No	0
18	National Resource Waters.	No	0

TABLE 3-2 -- SUMMARY OF UNSUITABILITY—Continued

Criterion Number	Title	Exception Application	Acres Unsuitable
19	Alluvial Valley Floors	No	[4]2,280
20	State Proposed Criteria	No	0
	Surface Owner Consultation.	N/A	0
	Total Unsuitable Acres		[3]7,380
	Unsuitable Acres as a % of Total Federal Lands in McCallum Coal Area.		6.7%

[1]120 acres of this Criterion were also included as part of the acreage in Criterion 11.
[2]Same acreages as the total of Criteria 10, 11, and 14, less 120 acres identified in footnote 1.
[3]Total acres with no duplication of acreages.
[4]Ten acres of this Criterion were also included as part of the acreage in Criterion 9.

Surface owners in the McCallum area were consulted for their preferences for or against surface mining on their lands where the Federal government holds the mineral estate.

The responses were as follows:

	Number of Responses	Percent of Responses
Against Leasing	14	32
In Favor of Leasing	30	68
Not A Qualified Surface Owner	8	N/A
	52	100

The responses indicating opposition to surface mining expressed varying concerns. Of most concern was the anticipated conflict between maintaining a viable livestock operation and allowing surface mining. Other concerns were expressed over water quality, maintenance of the natural setting, and other general environmental factors.

Those opposed to surface mining of federally owned coal were scattered throughout the coal area. No specific area, community, or logical mining unit contained a significant number of opposed landowners. Therefore, all suitable areas in the McCallum Coal Area would be considered for future surface coal mining. No areas would be considered unsuitable solely because of surface owner opposition. Miners would have to obtain the consent of surface owners before mining could take place, however.

Oil and Gas

Oil and gas under Federal management are leasable minerals. When the commodity falls within a known geologic structure (KGS), it is disposed of by leasing through a competitive bidding system. Areas outside of KGSs are disposed of by noncompetitive leasing.

Interest in the North Park area as a potential oil producing basin remains high for several reasons: the frequent oil and gas shows, the presence of KGSs, and the presence of attractive potential reservoir sections of the Muddy, Dakota, Lakota, and Jurassic sandstones. It is estimated that between 80 and 90 percent of the Kremmling Resource Area is presently under oil and gas lease.

Several areas in Middle Park are considered prospectively valuable since they are underlain by potential source and reservoir rocks (USDI/U.S. Geological Survey 1981). Although several holes have been drilled (most are fairly shallow), to date no known discoveries have occurred. Further consideration in this RMP of oil and gas will concentrate on the five main known fields in the North Park basin. These five fields are:

1. North McCallum: Sections 7, 18, T9N, R78W; Sections 1-4, 9-14, T9N, R79W; Sections 33-35, T10N, R79W.

2. South McCallum: Sections 7, 8, 16-18, 20-22, 26-28, 34, 35, T9N, R78W; Sections 3, 10, T8N, R78W.

3. Canadian River: Sections 2, 3, 10, 121, T9N, R78W.

4. Battleship: Sections 22, 23, T10N, R79W.

5. Lone Pine: Section 28, T9N, R81W.

Table 3-3 shows production figures on these fields.

TABLE 3-3 -- OIL AND GAS FIELDS OF NORTH PARK

Field	No. of Prod. Wells	1979 Production		Cumulative Prod. to 1/1/80	
		Oil (BBLS)	Gas (MCF)	Oil (BBLS)	Gas (MCF)
Battleship	5	21,090	0	2,743,730	0
Canadian	8	3,002	175,078	440,111	6,53, 221
Lone Pine	12	90,010	32,328	1,275,173	444,101
McCallum	50	155,457	2,327,935	7,197,647	498,348,305
McCallum (South)	8	4,075	91,473	728,810	154,912,204
TOTALS	83	273,634	2,626,814	12,385,471	660,557,831

(State of Colorado 1979)

All five fields are anticlinal structures. The first four are located north and east of the Walden area. The Lone Pine Field is located approximately 12 miles due west of Walden.

Surface and mineral ownerships vary. The Canadian and Lone Pine Fields are, for the most part, privately owned. The remaining fields are predominantly public lands. Approximately 62 percent of the production is derived from public land.

As can be seen from Table 3-4, active production in the North Park area was reinitiated in the early 1970's and appeared to peak in the mid-1970's. Much of the gas production (CO_2) is presently being used for reinjection into oil wells for additional production. At present, no pipeline transportation exists for delivering out of the area. Since present fields are relatively small, production represents only about one percent of the statewide total. No transportation system for out-of-the-area use is anticipated in the near future.

TABLE 3-4 -- NORTH PARK: OIL AND GAS PRODUCTION

(Colorado Oil and Gas Conservation Commission - Various Years)

Year	Number Producing Wells	Oil (BBL)	Gas (MCF)	% Colorado Production	
				Oil	Gas
1974	64	493,984	4,871,849	1.3	3.3
1975	66	452,029	4,322,638	1.2	2.5
1976	68	389,476	4,058,356	1.0	2.2
1977	68	338,367	3,454,897	0.9	1.8
1978	.....	332,339	2,541,952	0.9	1.3
1979	92	301,686	2,669,237	0.9	1.4

Production of oil and gas can be expected to conflict with other minerals production within the five KGSs. Of particular interest are those areas which fall within the KRCRAs (see coal section). The primary areas of concern in the affected KGSs are:

1. North McCallum: Most of Sections 3, 4, 9-11, 13, 14, T9N, R79W; portions of Sections 1, 2, 12, T9N, R79W; Sections 33-35, T10N, R79W, Sections 7, 18, T9N, R78W.

2. South McCallum: Portions of Sections 7, 8, 16, 18, 20-22, 26, 28, 34, 35, T9N, R78W, Section 10, T8N, R78W.

3. Battleship: All of the KGS.

Uranium

Uranium found on public land is considered a locatable mineral and thus is subject to exploration under the General Mining Law of 1872. Management by BLM has consisted for the most part of recordation of the mining claims and issuance of rights-of-way for various drilling operations. The management of uranium resources is now subject to the Surface Management Regulations (43 CFR 3809), which provide for the management and reclamation of all lands subject to the General Mining Law.

No uranium is presently being produced from lands managed by BLM in the Kremmling Resource Area. Four or five exploration operations per year have been conducted in recent times. The source of uranium in the Kremmling Resource Area is the Morrison and Troublesome Formations found in the Middle Park basin (Malan 1957). With exploration still incomplete, the total value and area of the resource is unknown. In addition, the demand for uranium products is at a low point. Therefore, even though exploration continues, these operations are speculative and future demand is uncertain.

Other Mineral Values

Molybdenum

No molybdenum is being mined in the Kremmling Resource Area. However, the Henderson Mine's milling operations are found in the southwestern

area of Middle Park. This product accounts for over 80 percent of the mineral economic values in the resource area. Production at the Henderson Mine (Clear Creek County) has dramatically increased in recent years. Productive capacity at the mine increased from 8,000 tons per day in 1978 to 24,000 tons per day in 1979. An eventual goal of 35,000 tons per day by 1983 is anticipated (USDI/Bureau of Mines 1979).

As of 1979, approximately 592 persons were employed at the Henderson Mill (Colorado Division of Mines 1979). This figure includes approximately 100 construction workers. A total of 284 Henderson operation (mine and mill) employees reside in the Grand County area (personal communication). These workers and their families account for approximately 4 percent of the population of Grand County. Because of its location and the fact that this mineral is a locatable mineral subject to the mining laws, it is not a manageable mineral for BLM.

Fluorspar

Intermittent mining and production of fluorspar minerals has occurred in the Northgate area of North Park. However, no production from this area has been recorded since 1973. At that time, production was valued at $3.8 million (Colorado Division of Mines 1973).

Pearl District Area

Northwest of Northgate on State Route 125 is Independence Mountain, a haven for hobby prospectors because placer gold deposits are found among the many Precambrian rocks. At present there are an estimated 350 claims in and around Independence Mountain. There are a few mines in the vicinity of Pearl (copper deposit) which appear promising. However, these deposits have not generated a great deal of interest from the mineral industry. The majority of interest in this area is from hobby prospectors.

Mineral Materials

Mineral materials include sand and gravel, limestone, and building stone. Of primary importance are sand and gravel. The best sources of sand and gravel are found along primary rivers and streams, such as the Colorado River and Troublesome Creek (Middle Park) and the North Platte, Michigan, Illinois, and Canadian Rivers and Arapahoe Creek (North Park). Presently, sufficient quantities exist and are being disposed of to meet present as well as foreseeable future demands.

The local demand has risen 7 percent annually over the past 10 years. This modest growth is expected to continue. The removal of mineral materials has little or no social impact.

The major portion (87 percent) of total sales for the resource area occur as private sales in the Grand County area (Colorado Division of Mines 1979). Production from public lands in Jackson and Grand Counties accounts for just under 12 percent of the counties total sand and gravel sales.

The demand for sand and gravel from public lands is almost exclusively for free-use by state and local highway and road departments. The free-use demand by state and local governments is much higher in North Park (Jackson County) area than in Middle Park. Table 3-5 shows production and disposal figures for Jackson and Grand Counties from 1976 through 1979.

TABLE 3-5 -- BLM - SAND AND GRAVEL DISPOSAL [1]

Year	Production (yd^3)	County	
		Jackson	Grand
1976	125,600	125,000	600
1977	129,000	129,000	0
1978	23,300	0	23,300
1979	150,000	150,000	0

[1]USDI - Bureau of Land Management - files

Paleontologic Resources

The management of paleontologic resources has only recently become a focus for BLM. The manageable paleontologic values in the Kremmling Resource Area consist predominantly of dinosaur specimens in the Morrison and Troublesome Formations and marine invertebrates such as ammonites in the Pierre Shale.

Until recently, BLM has done little to preserve local fossil finds. However, recent public interest has arisen over protecting significant fossil locations. A literature search was conducted in 1980 to identify rock units having potential paleontologic value. A classification system for paleontologic values has recently been developed for use in BLM management. From Here to the end of paleontologic resources is part left out

An overlay identifying all rock formations and the classification rating may be examined in the Kremmling Resource Area Office. Presently, no fossil locations have been field inventoried for identification and posting as fossil sites, although one possibly significant ammonite bed has been identified approximately 7 miles north of Kremmling.

Demand and Dependency

Economic demand and dependency has been discussed previously in this section as it pertains to each resource (coal, oil and gas, etc.). In North Park, public attitudes generally favor regulated, orderly mineral development. To the extent that mineral exploitation removes range acreage from livestock use and mining attracts a work force culturally different and/or transient, adjustments to social structure and interaction patterns occur and conflicts arise.

Troublesome Wilderness Study Area

Leasable Minerals

Evidence of coal resources in the Troublesome Wilderness Study Area (WSA) were not found because the majority of the tract is underlain with volcanic rocks (mostly tuffaceous) of late Tertiary age. Beneath this, the structure and character is that of the Middle Park Formation, a strata largely equivalent to the Coalmont Formation of North Park. The only known evidence of coal to have occurred anywhere near the area is in Sections 4 and 5 of T3N, T80W, known as the Hartman Coal Mine. The mine, which extracted coal from the Middle Park Formation, operated between 1931 to 1935. It was then abandoned due to a lack of funds and the presence of soft shale, which caused unfavorable roof conditions.

Several areas considered prospectively valuable for oil and gas are located in Middle Park. No actual discoveries have been reported. Other leasable minerals are not known to exist within the Troublesome WSA.

Locatable Minerals

The WSA has no reported radioactive occurrences, although there have been occurrences north of Sheep Mountain. Some uranium ore production has come from the Hot Sulphur Springs Area (State of Colorado 1960). Favorable indications for possible economic uranium occurrences exist in the Dakota Sandstone and Middle Park Formations. No other locatable minerals are known to exist in this area or in association with equivalent geologic formations found in the area.

Salable Minerals

Primary rivers and streams are the best source for recovering sand and gravel. Troublesome Creek is one area in the WSA where sand and gravel could be recovered, but it is isolated from areas where the need exists. More readily accessible areas are available.

WATER RESOURCES

Present Management

The present management of water resources in the Kremmling Resource Area is limited to maintaining water quality at existing levels. For the most part, this consists of applying stipulations to activities on public lands which might pollute or lower water quality.

Some assistance is given to other resource activities in feasibility studies and project design for the development of water facilities. Management also requires an analysis of impacts on major Federal actions potentially affecting the water resource.

Surface Water

The current program is primarily an inventory of surface waters, which has included a baseline study of water quality on public lands. Information is available from the U.S. Geological Survey or at the Kremmling Resource Area Office. Flow data has been gathered as a part of the baseline inventory.

A stream channel stability form developed by the U.S. Forest Service was used to measure the hydrologic stability of perennial stream channels.

Table 3-6 shows the miles of stream in each of the four ratings. An excellent rating means that a stream channel would change very little after a flood. A flood would have a significant impact on a stream with a poor rating.

TABLE 3-6 -- STREAM CHANNEL STABILITY RATINGS[1]

	Miles	Percent of Total
Excellent	0	0
Good	67	45
Fair	62.4	42
Poor	20.6	13

[1]Data on specific streams is on file in the Kremmling Resource Area Office

Monitoring of developed springs consists primarily of checking condition and maintenance needs at least once every five years. The undeveloped springs on public land were inventoried in 1980; a summary of the information gathered is available at the Kremmling Resource Area Office.

Groundwater

Groundwater resources are protected by mitigations for actions that would affect them. The primary impact comes from coal mining in North Park.

Groundwater has been developed and is used by the range and wildlife programs as water sources.

Water Rights

The Bureau has filed applications for numerous water sources in North Park and Middle Park. Reserved water right claims for 82 springs in North Park and 51 springs in Middle Park were filed as part of the general state adjudication of 1972. In addition, application for 13 wells was made by the Bureau as a part of that adjudication. Since 1972, many new springs have been identified, and other new water sources have been developed. In accordance with state law, the Bureau has filed for reserved rights for springs and for appropriation water rights for wells between 1972 and 1982.

Public water reserves are springs and water holes that were reserved by the U.S. Government by executive order in 1926 for livestock water and water supplies. The purpose was to prevent anyone from monopolizing large tracts of arid grazing land by controlling water sources. The Bureau is trying to obtain appropriative rights on these water sources.

Water Management Regulations

There are several regulations that affect water management. At the local level, the Northwest Colorado Council of Governments has completed their 208 Water Management Plan. This could mandate some water quality controls for the public lands but the plan is presently under a court injunction. The state of Colorado has classified the state's waters and set standards. Bureau management practices may not degrade water quality below these standards. By adhering to the State's standards, the Bureau would also meet the requirements of the Federal Water Pollution Control Act, the Colorado River Basin Salinity Control Act, and the Clean Water Act.

Demand and Dependency

There are two conflicting demands on the surface water resources in Middle Park. Local demand for irrigation and domestic water competes with municipal and agricultural interests on the eastern slope of the Rockies. Approximately 40 percent of the total surface runoff that originates above State Bridge is diverted to the Eastern Slope. As energy development continues to grow, western Colorado will demand more of this water supply.

Both east and west slope interests depend on the Colorado River basin. The Middle Park ranching community depends completely on this water for hay production. Expanding recreational and residential developments in the east end of Grand County depend on it for domestic use. In the same way, increasing populations on the East Slope create ever increasing demands for domestic water supplies. Agricultural water interests on the Eastern Slope are accorded a lower priority than municipal needs.

Water demand in North Park centers on ranching. There are very few transbasin diversions from the North Platte watershed and conflicts between North Park and Eastern Plains cities are not as pronounced as in Middle Park. However, North Park's ranching community is dependent on the North Platte drainage for its continued existence.

The social values associated with water resources in the Kremmling Resource Area involve retaining the natural beauty and purity of the region while continuing the present recreational and ranching uses of water. Any management decision that would threaten the quality of the area, including water quality, would almost certainly meet opposition.

Troublesome Wilderness Study Area (WSA)

There are five perennial streams in the Troublesome WSA. All five streams have excellent water quality, as there has been little disturbance in the upper watershed. Two ditches divert water from Rabbit Ears and Troublesome Creeks for hay meadow irrigation. There is currently no specific management of these streams. The demand for water from the Troublesome WSA is confined to adjacent landowners' need for irrigation water. These landowners depend on getting good quality water from the Troublesome drainage for hay meadow irrigation.

LIVESTOCK GRAZING

General Description

Livestock grazing has been an important use of the public lands in the Kremmling Resource Area since the introduction of domestic livestock in the 1870s (see Figure 3-2).

Presently, the resource area supports a domestic livestock grazing program on 356,260 acres, or 93 percent of the public lands within the resource area. Currently, these public ranges license 45,648 animal unit months (AUMs) of forage.

The majority of the permitted public lands (95 percent) are grazed by cattle, which use 99 percent of the AUMs available. Sheep and horse grazing account for only one percent of the total authorized

use and occur on only 5 percent of the public lands.

There are no known wild horses or burros within the resource area.

Current Management

Grazing Allotments

There are 162 term permits or leases on 311 allotments within the resource area. Seven of these allotments are common use areas, while the remainder are licensed for individual operator use.

At present, four allotments are intensively managed under allotment management plans (AMPs) that cover approximately four percent of the public lands (14,120 acres) and account for six percent of the total AUMs.

The remaining 307 allotments are less intensively managed and are licensed in accordance with the constraints of individual term permits and leases. The AUMs authorized on the term permits and leases were determined largely through a livestock forage production inventory conducted in 1953.

The outdated nature of this inventory makes its value questionable for present use. However, during the summer of 1980, an extensive range condition inventory was conducted to provide specific data on the condition, annual production, and availability of forage found within the resource area.

In addition, a comprehensive monitoring program was initiated in 1981. The monitoring studies include actual use, utilization, and climate data and are conducted on a annual basis. The data collected is used to check, refine, and improve upon the range condition inventory data.

Summaries of range production data are shown in Appendix 2, which portrays the appropriate allocation of forage among the various users. Initial stocking rate information generated from the range condition inventory indicates that available livestock forage would be established at a level of 39,726 AUMs, a decrease of approximately 13 percent from the current licensed use of 45,648 AUMs.

A grazing administration map depicting the location of allotments and a listing of permittees and lessees has been prepared, along with a Range Management Allotment Status Report. Both are available for review at the Kremmling Resource Area Office.

Season of Use

The majority of public lands are licensed for grazing use during various periods between May and October. This use, particularly in the spring, was established primarily to accommodate the needs of livestock operations. Spring use occurs on the lower benches and terraces and is designed to coincide with the end of calving. All calving is done on private hay meadows, and the cows are removed from the meadows to the public lands shortly after calving has ended. This allows ranchers to begin early flood irrigation to raise hay for winter feeding.

This current cycle of continual spring use of public ranges has afforded the ranchers a convenient place to pasture their cows during the irrigation season. However, this type of use on a continual basis has contributed to a loss in the vigor and reproductive capability of some key forage plants.

Range Forage Condition

During the 1980 field season, forage condition was evaluated on 225 out of the 311 of the grazing allotments in the resource area. Eighty-six grazing allotments were not inventoried because they consist primarily of small, scattered tracts of public land. Table 3-7 presents a summary of the forage condition readings for the allotments and total acres inventoried.

TABLE 3-7 -- RANGE FORAGE CONDITION

	Range Forage Condition[1]	
	Satisfactory	Unsatisfactory
No. of Allotments	37	188
Percent of Allotments	17%	83%
Acres	70,339	233,196
Percent of Acres	23%	77%

Note: 86 allotments, or 52,725 acres, were not inventoried.
[1]Range Forage Condition is based on the amount of forage (lbs/acre) presently produced on an allotment in relation to its potential forage production (lbs/acre). -- Unsatisfactory indicates currently less than 75% of potential; satisfactory indicates currently greater than 75% of potential.

As shown in Table 3-7, approximately 17 percent of the allotments inventoried are in satisfactory condition. The satisfactory condition of these allotments may be largely attributed to either proper stocking rates, adjusted seasons of use that allow for periodic or continuous spring rest, or both of the factors combined.

In contrast, approximately 83 percent of the allotments inventoried are in unsatisfactory condition. The unsatisfactory condition of these allotments is the result of overstocking, lack of spring rest, or lack of management facilities such as adequate stock waters or crossfencing. The condition of these allotments is expected to decrease even further under present management. Extimated long-term forage production would be 38,184 AUMs, down an additional four percent from the established level of 39,726 AUMs.

Distribution and Range Utilization

As a general rule, livestock distribution and utilization patterns may be directly correlated to the availability of water and existing topography. On nearly all allotments within the area, heaviest grazing occurs on gentle terrain with good access to water. In contrast, steep terrain and areas farther than one mile from water are less frequently used by livestock. Therefore, uniform grazing of an allotment depends on the ease of cattle movement over the land and uniform distribution of water.

Grazing patterns in the resource area indicate that the lower benches and terraces yield the most even grazing patterns due to their flat or gently rolling topography and generally well distributed water points. However, some problems occur even on these ranges. Heavy livestock grazing occurs along streams and intermittent riparian drainages. Livestock congregate in these areas of lush vegetation and plentiful water and tend to exhaust them, leaving the rest of the allotment undergrazed even though other stock water may be available.

In the higher elevation allotments, livestock are generally confined to narrow draws or mountain meadows because of the inaccessability of steep slopes and dense forests.

Range Improvements

Water Developments

Water quality and quantity in the Kremmling Resource Area are generally adequate. However, in some areas, distribution is unsatisfactory. Streams, creeks, and springs provide ample water for livestock along their courses, and groundwater supplies appear to be adequate where tapped. Allotments that do not contain year-round surface water flows depend upon reservoirs and wells to supply livestock with water. Those allotments that are totally dependent on reservoir sites are often inadequately watered because they rely heavily on snow melt in the spring, with livestock having to be removed as the water supply dwindles. This limits the time during which these areas are suitable for grazing.

Current management of water development is geared to maintaining existing springs and wells and constructing pipelines to adjacent ranges. These pipelines provide a reliable source of water throughout the grazing season as well as enhancing livestock distribution.

Vegetation Manipulations

Vegetation manipulations have consisted primarily of a combination of brush beatings, plowings, sprayings, and seedings. The majority of the brush control projects were performed in the 1960s and have met with varying degrees of success. Many of the projects still in existence have no available comparison data to determine success. In such cases, personal observation indicates increased forage production, which is the general objective of the projects.

Vegetation manipulations have not been used in recent years within the Kremmling Resource Area. However, they are considered to be a viable management tool.

Fencing

The majority of fences in the resource area were constructed in the 1950's and 60's to establish permanent allotment boundaries. As a result, most allotments have adequate perimeter fences. However, some boundary fences are still needed, particularly in the higher elevation forested allotments.

Although fencing around the perimeter of an allotment warrants first priority, subsequent interior fencing is generally needed for range production efficiency. Interior fencing has been infrequent and limited predominantly to allotments managed under AMPs.

Existing management has been geared toward maintenance of existing fences, with very little new fence construction due to budget and policy constraints. Fencing practices are considered to be a very important to any range management program.

A comprehensive listing of the location and type of all range improvement projects found within the resource area has been compiled and is available at the Kremmling Resource Area Office.

Current Land Use Conflicts

There are a number of land uses that are reducing available forage. Among the most prominent are mineral exploration and development programs, primarily in North Park. Presently, grazing allotments are being impacted by the McCallum oil field and two active coal strip mines.

Energy exploration (particularly for oil and gas and uranium) is affecting the range resource to a lesser degree over the short term. However, long-term cumulative losses in forage production are evident, particularly due to new road construction and drill pad preparation.

In addition to development, other land uses, such as off-road vehicle use and transmission line construction activities, continue to reduce livestock forage. Off-road vehicle use, which produces long-term effects, is heaviest in those grazing allotments within a 10-mile radius of the towns of Kremmling

and Walden. The RCA Allotment north of Kremmling has been significantly impacted by off-road vehicles.

Major right-of-way projects such as transmission lines and water diversion pipelines are expected to reduce range forage for a relatively short time (three to four years) until reclamation is completed.

Other Land Use Plans

Currently, there are no other land use plans that specifically deal with the livestock grazing program on BLM administered lands within the Kremmling Resource Area. However, there is a need to develop intergency cooperative agreements with other Federal and state agencies, particularly as activity plans are prepared. Agreements could be formed to collectively accomplish range management objectives on a significant number of allotments.

Demand and Dependency

The main agricultural product of the Kremmling Resource Area is livestock. Eighty percent of the agricultural receipts come from this source, while the remaining 20 percent come from hay. As shown in Table 3-8, hay is apparently being sold as a cash crop more often than in the past. Sales receipts from livestock have increased 13 percent annually since 1974, despite reduced inventories. Inflation and sales generated from the reduction of herds probably account for this increase.

TABLE 3-8 -- KREMMLING RESOURCE AREA AGRICULTURE TRENDS

	No. of Years	Annual Percentage Growth		
		Production	Value per Ton	Marketed Earnings
Hay				
Resource Area[2]	6	−2	0	6
Colorado[3]	6	1	2	5
United States[3]	3	3	0	4
Livestock and Products	**Inventory Cattle**	**Inventory Sheep**	**Total Earnings**	
Resource Area [1,2]	10	−2	−6	13
Colorado [1,2]	10	−2	−6	14
United States	6	.....	.....	7
			1978	**1979**
Resource Area agricultural exports (000)[4]			$5,953	$7,487

[1]Various years *Colorado Agricultural Statistics*, Denver: Colorado Department of Agriculture, Colorado Crop and Livestock Reporting Service.

[2]Various years *Regional Economic Information System*, Washington: U.S. Department of Commerce, Bureau of Economic Analysis.

[3]Data files from the U.S. Departmentof Agriculture, Crop and Livestock Reporting Service, Denver, Colorado.

[4]Input-output economics model, Colorado State University, Fort Collins, Colorado.

These figures are consistent with statewide figures for the same period and greater than those for the nation as a whole. Cattle inventories have dropped an average of two percent every year for the period of 1971 to 1980, and sheep inventories have dropped an average of six percent. According to an input-output economics model developed by Colorado State University, $7,437,000 of agricultural products were exported in 1979. There were about 220 people employed in agriculture in the area in 1979 (BEA various years).

As seen in Table 3-9, 75 percent of BLM operators use the public lands for ten percent or less of the forage required by their range operation. This in itself would indicate a very low dependency on BLM forage by most of the operators. However, since most of the operations require this forage at a critical time of the year, i.e., the spring, 74 percent of the operators are critically or substantially dependent upon BLM permits (Table 3-10). Spring forage is at a premium because ranchers must start irrigating their private meadows for winter hay supply and get young calves to drier, more open range early to reduce the chance of disease. Since U.S. Forest Service land is usually not available for grazing until late spring or summer, most of the land needed for spring grazing is administered by BLM.

TABLE 3-9 -- PERCENT OF GRAZING OBTAINED FROM BLM LANDS BY OPERATORS HOLDING BLM PERMITS[1]

Percent of Forage Obtained from BLM	Percent of Operators	No. of Operators
0-10	75%	109
11-20	16%	23
21-30	6%	9
31-40	3%	4
41-50	0%	0
51-60	0%	0
61-70	0%	0
71-80	0%	0
81-90	0%	0
91-100	0%	0
TOTAL	100%	[1]145

NOTE: The number of operators is different than the number of permits and leases. One operator may have several permits or leases.

[1]BLM data and estimates, U.S. Department of Interior, Bureau of Land Management, Kremmling, Colorado.

TABLE 3-10 -- DEPENDENCE ON BLM GRAZING PERMITS/LEASES[1,3]

Dependence[2,3]	No. of Operators	Percent of Total
Critical	44	30
Sustantial	64	44
Low	37	26
TOTAL	145	100

[1]BLM data and estimate, U.S. Department of Interior, Bureau of Land Management, Kremmling, Colorado

[2]*Critical* means that BLM forage is judged to be an essential element for the survival of the ranching operation.

Substantial means that BLM forage use may or may not be an essential survival element.

Low means that BLM forage use is judged not to be essential to the survival of the ranching operation.

[3]In developing this table, the following three criteria were used:

1. Proportion of forage acquired on public land
2. Season that forage is acquired
3. Size of operation and thus ease of acquiring alternate sources of forage.

Each allotment was then given a numerical rating based on the sum of points given from each criterion. The higher the number of points given from that criterion, the more critical that criterion was to the operator. Criterion Number 1 was given the heaviest emphasis. A range of points was then used to classify each operator at high, low, or medium in his criticality of dependecy. After this classification, each operator's record was looked at again to see if some factor not considered in the rating system could change the operator's classification. For more information on how this table was developed, consult the Kremmling Resource Area Office.

Twenty percent of the cattle produced in the resource area are produced on ranches that are critically dependent on BLM. Thirty-five percent are produced on ranches that are substantially dependent.

In terms of economic trend, ranch units have undergone changes in their number, size, and dependency on BLM forage. The number of ranches has increased in Grand and Jackson Counties (these contain most of the public lands in the area) since 1974, but their size has decreased, along with the total amount of land used for ranching (Table 3-11). At the same time, the number of BLM permits and leases has remained fairly constant at around 162 (BLM 1981). This probably means that smaller operations are holding grazing permits and leases.

TABLE 3-11 -- KREMMLING AGRICULTURE CENSUS FIGURES[1]

Unit	1964	1967	1974	1978
No. of Ranches				
Grand County	125[2]	115[2]	128	135
Jackson County	78[2]	82[2]	92	103
Acre Land in Ranches				
Grand County	301,195[2]	341,703[2]	305,976	314,764

TABLE 3-11 -- KREMMLING AGRICULTURE CENSUS FIGURES[1]—Continued

Unit	1964	1967	1974	1978
Jackson County	341,700[2]	296,300[2]	470,485	437,829
Acre Avg. Size of Ranches				
Grand County	2,410	2,971	2,390	2,332
Jackson County	4,381	3,613	5,114	4,251

[1]Various years *Census of Agriculture*, Washington: U.S. Department of Commerce, Bureau of Census figures.

[2]Original figures adjusted to account for change of definition of form, based on ratio computed from 1974 appendix of 1978 ag. census figures.

All other dependency criteria being equal, a smaller ranch operation will usually be more dependent on its BLM permit or lease than a larger one because it has less flexibility in acquiring alternate forage. Because of this, some of the ranchers holding BLM permits in the Kremmling Resource Area are probably more dependent on the BLM for their ranch operation than they were 10 years ago. Another indication that ranches are more dependent on BLM grazing is the fact that the percentage of forage provided by BLM lands has risen from 4.6 to 5.3 percent, as shown in Table 3-12.

TABLE 3-12 -- KREMMLING RESOURCE AREA LIVESTOCK AND AUM NUMBERS

	1971 Total	1980 Total
Cattle [1]	76,000	68,000
Sheep [1]	5,100	2,700
Horses [2]	1,500	1,500
Area AUMs [2]	991,200	886,400
BLM AUMs [2]	46,059	45,648
BLM AUMs as a percentage of Area AUMs	4.6%	5.3%

[1]Colorado Crop and Livestock Reporting Service, various years, Colorado Agricultural Statistics, Denver: Colorado Department of Agriculture.

[2]BLM, 1981. Reference data on file with the Kremmling Resource Area Office of the Bureau of Land Management at Kremmling, Colorado.

There is a high demand for BLM grazing permits or leases. The present $1.86 per AUM fee that the BLM charges compares to a fair market value for western rangelands of $8.83 per AUM (USDA 1982). This does not mean that some permittees do not have more invested in their BLM permits than the $1.86 per AUM, especially if one considers mortgage costs (due to the value that BLM permits add to private land and the collateral they provide for bank loans) and maintenance costs not as-

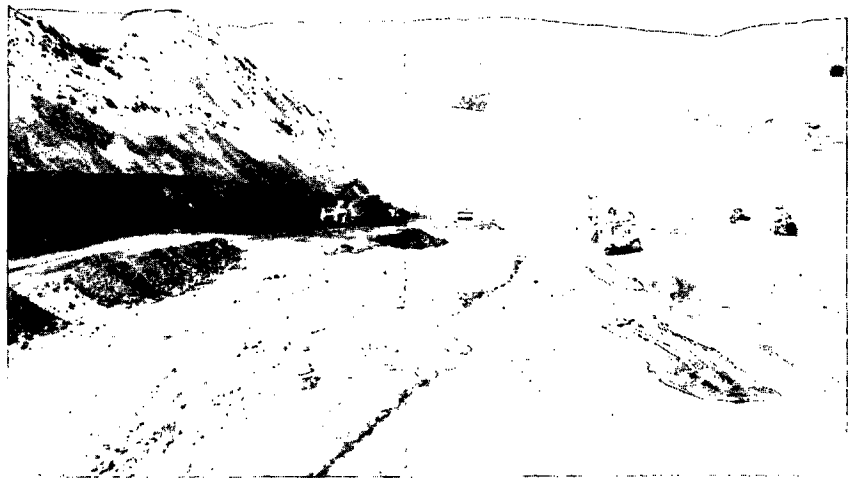


Figure 3 - 1. Marr Coal Mine in North Park

Figure 3 - 2. Livestock in Middle Park

Figure 3 - 3. Natural Regenerating Clearcuts on Independence Mountain in North Park

Figure 3 - 4. Typical Saturday Morning at the Pumphouse Recreation Area on the Upper Colorado River

sumed by BLM. However, it does mean that BLM would probably have little trouble in finding people to lease its grazing privileges at this current rate.

There is also a social and cultural significance to ranching. North Park and western Middle Park are sparsely populated and agriculturally oriented. The major communities, Kremmling and Walden, are small. Many of the people have had ranching in their families for generations. Many townspeople come from ranches or have been around ranching all their lives. For the people in the Kremmling Resource Area, ranching is not just an industry but a way of life. One of the biggest social events of the year is the rodeo.

In some cases, small ranch owners work in town in order to supplement ranch incomes or even to support unprofitable ranch activities because they want to maintain their connection with ranching. Large ranch cooperatives have bought out some of the family-owned operations, keeping former owners on as employees. Yet people continue to live on ranches that may not be economically viable, or continue to work on ranches that have been sold to large corporations, because they want to maintain a country or ranching identity.

Forest Products

Current Management

The majority of public land at the higher elevations (over 8,000 feet) is forested. One notable exception is the pinyon pine/juniper forests at the lower elevations (6,800-8,000 feet) that surround the lower Colorado River.

Forest lands under intensive management in North Park are the large parcels on Independence Mountain, Bull Mountain, Owl Mountain, Green Ridge, and Buffalo Peak. In Middle Park, the main areas are Strawberry, Reed Creek, Dice Hill, and the area north of U.S. Highway 40 between Troublesome Creek and Colorado Highway 125. The fact that these areas are under intensive management does not mean, however, that a management practice will be conducted on every stand every year. In fact, some stands may not experience any type of management practice for 20 to 40 years, or perhaps even longer.

The existing level of management was determined by the intended allowable cut for the Glenwood Springs Sustained Yield Unit (SYU) in 1977. The SYU includes all of the Craig District plus most of the Grand Junction District. The allowable cut was found by using the 10-point inventory system, so named because there were 10-points to each field plot. The inventory was done from 1971 to 1973.

The forested acreage was divided into different strata by analyzing aerial photographs and then assigning an adequate number of field plots to each stratum to assure statistical accuracy. District boundaries changed after the inventory was made. The total allowable cut for the SYU was proportioned between the two districts based on the location and productivity of the field plots. The number of plots and acreage in each stratum for the Craig District are shown in Table 3-13.

TABLE 3-13 -- FOREST ACREAGE FOR CRAIG DISTRICT FROM 1977 ALLOWABLE CUT INVENTORY

Forest Strata	Number of Plots	Acres[1]
Non-restricted manageable forest	32	40,093
WITHDRAWN LANDS[5]		
Non-commercial Species (sub-Alpine Fir & Aspen)	10	12,754[2]
Slopes over 36%[6]	25	31,635
Multiple-use consideration[3]	5	6,248
Low Site[4]	4	5,019
Withdrawn Subtotal	44	55,656[2]
TOTAL Timber Production Base	76	95,749[2]

[1]Each plot represented approximately 1,200 acres.
[2]Pinyon/juniper is not represented since there were not any plots.
[3]Stream buffers and potential natural areas.
[4]Not capable of producing 20 cubic feet of commercial wood per acre per year.
[5]No forest management is planned for withdrawn lands except such custodial practices as five protection and salvage.
[6]Current "ongoing" inventories use soil erosion, not percent slope, as the determing factor for restricting or withdrawing forest lands.

The sustained yield cut for the district, based solely on the manageable forest acreage, is 51.0 million board feet (MMBF) per decade, or 5.1 MMBF per year. Since the resource area has the bulk of the productive forest land, an arbitrary cut fluctuating between 3.7 MMBF and 5.0 MMBF, with the average being 4.5 MMBF per year, was assumed.

The criteria used in the computer model for the cut were:

1. Only data from nonrestricted manageable forest lands plots was to be used.

2. Areas were to be stocked within five years after final harvest.

3. Final harvests would not be made in stands less than 90 years old.

4. A combination of clear cuts and partial cuts were to be used. (The mistletoe and wind throw problems associated with partial cuts were not considered.)

5. Precommercial thinning of 85 percent of future clear cuts and 55 percent of future partial cut stands was to occur as they entered the 20-year age class. These same stands were to be commercially thinned as they became 50 and 80 years of age.

A major problem with the 1977 inventory is that no consideration was given to the physical or economic manageability of various stands. For example, even if a plot was taken in a 30-acre marginal lodgepole pine stand on flat ground surrounded by a 2,000-foot vertical cliff that would prevent any access, the computer model still considered it a manageable forest stratum. Other problems are that the inventory did not include all of the forested land and that a significant portion of the forested lands are in the wrong stratum. As a consequence the total forest acreage and the amount in each stratum are incorrect.

The operation inventory and timber production capability classification studies presently underway will give accurate acreage for new strata. The operation inventory will show the location, acreage, condition, volume, and silvicultural need for each forest island. The classification studies will partition land into major classes that indicate their suitability for sustained timber yields.

After combining land use plan decisions and new inventory information from the two sustained yield unit districts, the Bureau will announce a new allowable cut in 1987. Table 3-14 shows the approximate forest acreage for the resource area, which is about the same as the 1977 inventory acreage for the entire Craig District shown in Table 3-13. Based on rough estimates of other inventories, about 50,000 acres meet the current 1977 inventory manageability criteria. However, approximately 10,000 acres of this would not meet new criteria because they are composed of a multitude of economically inaccessible, marginal forest stands scattered throughout the resource area.

TABLE 3-14 -- FOREST LAND ACREAGE

Tree Species	Acres[1]		
	North Park	Middle Park	Total
Lodgepole Pine	23,025	39,945	62,970
Ponderosa Pine	320	0	320
Spruce/Fir	777	1,898	2,675
Douglas Fir	837	7,119	7,956
Pinyon/Juniper	0	9,965	9,965
Aspen	8,511	6,979	15,540
TOTAL FOREST ACRES	33,470	65,906	99,376

[1]Acres come from a combination of aerial photograph interpretation and "on-the-ground" inventories.

Prior to 1971, most of the harvesting in North Park was on Bull and Independence Mountains, while more recent harvesting has been on Buffalo Peak. The old harvests in Middle Park were very scattered. The most recent harvest activities are a result of the Beetle Abatement and Management Project established in 1973 to control the mountain pine beetle epidemic in the eastern portion of Middle Park. Approximately 19 million board feet of timber were salvaged during the project.

A variety of harvesting techniques have been used in the resource area. They range from total clearcuts to many forms of partial cuts. The vast majority of forest stand manipulations have been in lodgepole pine, although some Douglas fir, Englemann spruce, and subalpine fir have been removed. Total clearcut has shown the best reforestation results.

In early partial cuts (prior to 1965), the best trees were removed, while poorly formed or diseased trees were left. This created an understory infected by the diseased overstory, as well as a situation where it was uneconomical to harvest the remaining extremely poor quality trees. More recent partial cuts have been better designed and have produced better results. Table 3-15 shows the volume and acreage of forest harvesting since 1953.

TABLE 3-15 -- VOLUME AND ACRES OF TIMBER HARVESTING FROM 1953-1980

Year	Product	North Park		Middle Park		Total	
		Volume[1] (MMBF)	Acres	Volume (MMBF)	Acres	Volume	Acres
1953-1976	Sawlogs	[2]27.6	[3]6,100	28.7	5,80 0	56.3	11,900
1953-1976	Posts	2.9	800	.7	200	3.6	1,000
1977-1980	Sawlogs	2.6	400	12.5	2,000	15.1	2,400
1977-1980	Posts	.9	200	0	0	.9	200

TABLE 3-15 -- VOLUME AND ACRES OF TIMBER HARVESTING FROM 1953-1980—Continued

Year	Product	North Park		Middle Park		Total	
		Volume[1] (MMBF)	Acres	Volume (MMBE)	Acres	Volume	Acres
GRAND TOTALS		34.0	7,500	41.9	8,000	75.9	15,500

[1]MMBF - 1,000,000 board feet
[2]Rounded to the nearest 100,000 board feet.
[3]Rounded to the nearest 100 acres.

Harvesting is often the first intensive forest management practice, since this practice converts an overmature stand to a young, healthy stand. Clearcutting is the most common practice in overmature and mature lodgepole pine stands for the following reasons:

1. It is most similar to Nature's way of regenerating a new stand by wildfire.

2. Dwarf mistletoe, prevalent in most stands, precludes reproduction under the infected overstory remaining from partial cut systems.

3. Hard spring winds tend to blow over residual lodgepole pines after partial cutting; this occurs because lodgepole is a shallow rooted tree.

4. Lodgepole pine grows best in full sunlight.

Figure 3-3 shows a typical clearcut in the resource area.

Partial cutting is the normal practice in the few spruce and fir areas because regeneration is best with some shade present.

Other intensive management activities besides harvesting are used within the resource area. These include:

I. Artificial regeneration, which is the restocking of a harvested area by either hand planting or seeding when natural regeneration is not expected to completely revegetate the area within five years.

2. Stand conversion, which is the practice of changing an existing noncommercial stand composition to a commercial type. This practice is generally not economical unless the area is a high yield site.

3. Stand improvement, which prepares the site for reforesting; if a stand is already adequately stocked, growth or quality can be improved through pruning, fertilizing, removing diseased trees, etc.

4. Precommercial thinning, which is used to increase growth on desirable trees by "weeding out" the undesirable. A stand is usually not thinned until it is 20 years old.

5. Commercial thinning, which serves the same purpose as precommercial thinning. This practice occurs when trees are older (40 to 80 years) and are a commercial product. It includes practices such as pole and post harvesting. Table 3-16 shows acreage of forest development practices.

TABLE 3-16 -- FOREST DEVELOPMENT ACTIVITIES 1977-1980

Activity	Acres
Artificial Regeneration	787
Stand Conversion	14
Stand Improvement	371
Pre-commercial Thinning	288
Commercial Thinning	240
TOTAL	1,700

Troublesome Wilderness Study Area (WSA)

The timber type in the Troublesome WSA is mostly lodgepole pine, with some scattered islands of pure aspen. The classification of forest acreage in the Troublesome WSA is shown in Table 3-17. The manageable forest acreage is scheduled for intensive management. The remainder would have only custodial management. The majority of stands suitable for intensive management are along the south and west borders of the WSA.

TABLE 3-17 -- FOREST ACREAGE CLASSIFICATION IN THE TROUBLESOME WILDERNESS STUDY AREA

FOREST STRATA	ACRES
Non-restricted manageable forest	1,872
Withdrawn Lands	
Non-commercial Species (Aspen)	478
Slopes over 36%	5,258
Withdrawn Subtotal	5,736

TABLE 3-17 -- FOREST ACREAGE CLASSIFICATION IN THE TROUBLESOME WILDERNESS STUDY AREA—Continued

FOREST STRATA	ACRES
Total Timber Production Base	7,518

Demand and Dependency

The public users of forested lands have mixed emotions regarding the management of these lands. Opinions range from favoring complete preservation to advocating total harvest, with the majority being somewhere between these extremes.

The lumber industry is the largest and most consistent consumer of forest products, but there are other demands as well. Fence posts are required by both commercial and private users, but the demand is unpredictable, fluctuating widely from year to year. The posts come from the commercial thinning of stagnated stands. Unfortunately, the number of post-sized trees available greatly exceeds the demand, resulting in many stands remaining untreated and starting to deteriorate.

Firewood, which comes almost exclusively from slash piles resulting from harvest operations, is in some demand by homeowners. However, commercial wood cutters prefer the large supply of snags available from the U.S. Forest Service lands. Some Christmas trees are cut for individual and commercial use, but the number is negligible.

The local lumber industry employs approximately 240 people per year, with very little annual fluctuation. There has been a gradual increase in lumber industry employees at the state and national levels between 1975 and 1980, with the state showing an increase of 61 percent and the nation an increase of 23 percent. However, since 1979 there has not been an increase at either level, which is a reflection of the slowdown in the construction industry.

The average annual volume purchased by the local sawmills is approximately 25 MMBF, with roughly 95 percent of the volume coming from Federal lands. Table 3-18 shows the percentages for BLM, the U.S. Forest Service, and other suppliers.

TABLE 3-18 -- TIMBER PURCHASED BY SUPPLIERS 1975 TO 1980

Supplier Within Resource Area	Volume by Year (MMBF)						Average Volume	Percent of Total
	1975	1976	1977	1978	1979	1980		
BLM	4.8	8.5	9.7	5.4	0	0	4.7	18.7
USFS	3.0	10.7	7.5	19.9	9.5	15.4	11.0	43.8
Other[1]	2.2	.9	6.3	1.1	1.1	0	1.9	7.6
Subtotal	10.0	20.1	23.5	26.4	10.6	15.4	17.7	78.1
Outside Resource Area								
USFS	11.8	5.2	0	8.7	11.1	7.9	7.5	29.9
GRAND TOTAL	21.8	25.3	23.5	35.1	21.7	22.3	25.1	100.0

[1]Includes Colorado State forest and private ownership.

Since interest rates have started to soar, the public has begun to repair their existing homes rather than buying new homes. In 1977 a leveling off and even a decline in the use of construction lumber began. This is apparent in both the lumber source and lumber consumption tables (Tables 3-19 and 3-20). The lumber industry within the resource area appears to follow national trends. Table 3-21 indicates that employment in the local lumber industry provides considerable income to the community.

TABLE 3-19 -- LUMBER SOURCE (VOLUME IN MMBF)

Year	Resource Area	% of Colorado	Colorado	Inland Region	United States
1975	44	24.3	181	8,307	24,569
1976	48	20.9	230	9,478	27,608
1977	45	18.3	246	10,017	29,668
1978	40	21.2	189	9,815	29,673
1979	38	22.4	170	9,397	27,791
Averages	42.8	21.4	200	9,296	27,442

TABLE 3-20 -- U.S. LUMBER CONSUMPTION BY MARKETS (MMBF)

Market	1975	1976	1977	1978	1979
Residential Construction	11,065	14,397	18,473	18,360	15,733
(Housing Starts in 1,000s)	(1,384)	(1,794)	(2,267)	(2,299)	(2,026)
Repairs and Remodeling	6,922	7,357	7,477	7,940	8,041
TOTAL	17,987	21,854	25,959	26,400	23,774

TABLE 3-21 -- LUMBER-MANUFACTURING PERCENT OF RESOURCE AREA INCOME ($1,000s)

	Lumber Manufacturing	Total of Income for Resource Area	Percent of Total
Sawmill Wages and Profits	$4,111	$54,890	7
Export Produce Income:			
With Mining (AMAX)	5,254[1]	175,495	3
Without Mining	5,254[1]	34,504	15

[1]Value of Lumber

WILDLIFE AND THREATENED AND ENDANGERED PLANTS AND ANIMALS

General Description

Most current habitat management deals with just a few of the wildlife species inhabiting the Kremmling Resource Area. Management attention has been focused on these because of their value as recreational species. For example, pronghorn antelope, mule deer, and Rocky Mountain elk, along with sage grouse and waterfowl, are given more attention than are raptors, songbirds, and small mammals. This is because more management and research has been directed to these species, and not because they are necessarily more important. For other groups of wildlife, such as amphibians and reptiles, furbearers, varmits, etc., no specific BLM habitat management exists. A total of 64,584 AUMs are currently being utilized by big game (mule deer, antelope, and elk) in the Kremmling Resource Area.

The North Park Habitat Management Plan, completed in 1977, is the activity plan for wildlife in North Park. Objectives for various wildlife populations and habitats were developed in cooperation with the Colorado Division of Wildlife. Recent discussions with the Division of Wildlife indicate that population objectives will likely change in the near future.

Habitat reductions are occurring rapidly in the resource area because of the development of subdivisions, access roads, recreational facilities, vegetation modifications, and mineral operations.

Troublesome Wilderness Study Area (WSA)

The Troublesome WSA provides summer habitat for a variety of wildlife species. Mule deer and elk are common residents of the WSA from about May 1 through December 15. Depth of snow dictates the length of stay in the area for these two species. Although a detailed wildlife inventory has not been conducted in the WSA, species common to the lodgepole pine vegetation type are expected to occur. Because of the isolated and undisturbed nature of this area, populations of wildlife are expected to thrive in the Troublesome WSA.

There are two streams totaling approximately eight miles in length in the Troublesome WSA that contain resident fish populations. The predominant fish are brook trout, with some brown trout in Troublesome Creek and an occasional cutthroat trout. The majority of the stream and riparian habitat is in good condition. Approximately one mile of the riparian habitat is being adversely affected by livestock grazing. Rabbit Ears and Troublesome Creeks are under no specific management plan at the present time.

No threatened, endangered, or sensitive plant species have been identified as being present in the Troublesome WSA. Intensive field surveys have not been conducted.

Large Wild Mammals

Mule Deer and Rocky Mountain Elk

Existing management of deer and elk habitat includes coordination with other resource management activities and the implementation of improvement projects. The other resource activities include timber management, livestock grazing management, and mineral exploration and development. Deer and elk habitat improvement projects include range fertilization, fence modification, and evaluations to determine range condition.

Nearly all timber management activities occur within deer and elk habitat. Coordination with the timber management program assures the protection and enhancement of deer and elk habitat values during and after timber harvest. Measures taken include:

1. Limiting clearcuts to less than 40 acres
2. Avoiding disturbance of meadows and water sources by not building roads and trails near them
3. Closing and rehabilitating timber harvest roads and trails found unnecessary for future management.
4. Avoiding, when possible, harvesting timber during periods when wintering populations of deer and elk would be disturbed
5. Maintaining a one-to-one ratio of open habitat to forested habitat within timber management areas
6. Timing and locating timber harvest activities to avoid areas identified as elk calving habitat

Elk and mule deer habitat management is also coordinated with the range program. Forage was allocated for deer and elk on grazing allotments identified as winter range after the 1953 range survey. This allocation reserved a certain amount of forage for deer and elk on winter range allotments. Fences constructed to control livestock movement are designed to facilitate safe crossing by deer and elk. Livestock water developments are also designed to provide water for deer and elk.

Coordination with mineral exploration and development is designed to avoid conflicts with deer and elk habitat values, especially winter range. Mineral exploration on winter ranges is conducted in a manner which reduces physical harassment and loss of forage vegetation. Mineral exploration roads in deer and elk habitat not required for future resource management are closed and rehabilitated.

To date, only one habitat improvement project has been implemented to specifically improve deer winter range in North Park. Some 640 acres of sagebrush winter range were fertilized to improve the quality and quantity of winter forage. Nitrogen fertilization resulted in an increase of forage production by nearly 200 percent. A detailed report on this project is available at the Kremmling Resource Area Office.

The public lands in the resource area are currently providing habitat, primarily winter range, for approximately 3,000 elk and 7,000 deer. (Total populations were estimated at 13,000 mule deer and 8,000 elk in 1980 by the Colorado Division of Wildlife.) Deer and elk winter ranges are considered to be in fair condition. The winter range trend appears to be stable. Summer ranges are in good condition and the trend appears to be stable.

Some of the deer and elk habitat and population objectives developed in the North Park Habitat Management Plan may soon be met, assuming the following conditions:

1. Major land use changes do not occur in important deer and elk ranges.
2. Major deer and elk population changes, including both increases and decreases, do not occur.
3. Colorado Division of Wildlife population objectives remain consistent.

Specific deer and elk population and habitat objectives have not been developed for Middle Park.

Antelope

Existing management of antelope habitat includes coordination with other resources and implementation of improvement projects. The other resources are primarily range management and mineral exploration and development.

Range improvement projects are designed to benefit antelope as well as livestock. Water developments are designed to provide both livestock and antelope with high quality water. Controlled water sources, such as windmills, remain in operation after the livestock grazing season in areas where antelope need those specific waters. Ten water development projects have been implemented on antelope range in North Park. Several fence modification projects have also been implemented to improve antelope movements in North Park. Details of the projects are available in the Kremmling Resource Area.

Mineral exploration on antelope winter ranges and fawning areas is conducted in a manner which reduces physical harassment and loss of vegetation. Roads and trails constructed for mineral exploration are closed and rehabilitated if not needed after project completion. Coal development in North Park is occurring in antelope habitat. To date, mining activities such as open pits, haul roads, overburden, and stockpiles have avoided critical antelope habitats.

Existing and past management practices have basically improved antelope habitat. The additional water source developments and fence modification projects discussed above have improved antelope distribution and habitat utilization. Coordination with the other resources has reduced interresource conflicts, although antelope habitat is being lost to energy development. Public lands in North Park are currently (1980) providing yearlong habitat for an estimated 663 antelope. The Colorado Division of

Wildlife estimated the 1980 antelope population in North Park to be 750. Antelope habitat appears to be in fair condition, and the trend is stable.

Most antelope habitat and population objectives listed in the North Park Habitat Management Plan could be met with the existing management. The potential exists for loss of large areas of antelope habitat to coal development in North Park.

Bighorn Sheep

Bighorn sheep are former winter residents on several tracts of public land in North Park. Due to reductions in the population along the Continental Divide summer range, bighorns no longer winter on these public land tracts.

BLM is not involved in current management of bighorns in North Park. However, recent discussions with Routt National Forest and Division of Wildlife personnel indicate that interest exists in reintroducing bighorns on the former winter range near Sheep Mountain.

Moose

Shiras moose were reintroduced in North Park near Rand during the winter of 1977 and 1978 in a cooperative effort between the U.S. Forest Service and Colorado Division of Wildlife. Current management of moose is the responsibility of these two agencies. BLM administered lands are located within the expected 10-year moose distribution area; however, no current management of these lands as moose habitat is occurring.

Upland Game Birds

Sage Grouse

Current management of sage grouse habitat involves coordination with other resource programs and implementation of improvement projects. As discussed in the section on antelope, water development projects implemented by the range management program have been designed to benefit sage grouse as well. Protective fencing has enhanced riparian vegetation that is used by sage grouse as brooding habitat.

Much mineral exploration and development in North Park has occurred in prime sage grouse habitat. The existing surface mines are located in important sage grouse wintering and breeding habitats.

The range management practices discussed above have protected and improved sage grouse habitat. The increase in riparian vegetation has provided additional brooding habitat. The North Park sage grouse population is estimated at 20,000. Existing habitat condition is good and also appears stable. No population estimates are available for Middle Park but the sage grouse population and habitat appear to be in good condition.

Sagebrush eradication in Middle Park has reduced the quantity of habitat available to sage grouse. Approximately 11,000 acres of land, most of it private, were sprayed in 1979 to increase livestock forage production.

The objectives listed in the North Park Habitat Management Plan for sage grouse habitat can be met under current management. However, the potential exists for loss of large areas of sage grouse habitat to coal development. No specific habitat or population objectives for sage grouse have been established for Middle Park.

Blue Grouse

Virtually no data is available concerning the blue grouse populations on public lands in the Kremmling Resource Area. Current management of blue grouse habitat is limited to timber harvest practices. The impacts of timber harvest on blue grouse in the Kremmling Resource Area have not been assessed.

Waterfowl and Shorebirds

The numerous bodies of water and miles of stream throughout the resource area are used by waterfowl and shorebirds for feeding, nesting, and brooding. North Park is particularly important, so most current waterfowl habitat management occurs there.

Walden Reservoir, MacFarlane Reservoir, the Hebron Slough area, and the Colorado River have been subject to waterfowl habitat improvement practices. Manmade nesting platforms have been placed at these locations and used successfully by Canada geese. Earthen islands were constructed in ponds located in North Park during fall of 1977. These islands provide nesting and loafing habitat for a number of waterfowl and shorebird species.

A site-specific management plan was written in 1977 for an intermittent wetland area known as Hebron Slough. The plan presents a series of projects designed to improve habitat for waterfowl and shorebirds. The Colorado Division of Wildlife has provided some $70,000 for implementation of the Hebron Slough project. This plan is available for review in the Kremmling Resource Area Office.

Other waterfowl management projects are limited to protective fencing of riparian vegetation near some small reservoirs and springs. Approximately 100 acres of waterfowl habitat are maintained or improved annually under current management.

Waterfowl habitat and population objectives are not being accomplished with existing management

practices. Additional high quality waterfowl habitat is needed in North Park to meet population objectives. Overall, waterfowl and shorebird habitat is iln fair condition, and the trend appears to be stable.

The long-term average (last five years) number of breeding pairs of ducks in North Park is approximately 16,500. Canada goose production is estimated at 300 to 400 young annually in North Park. Production estimates for ducks and geese are not available for Middle Park.

Raptors

The diverse habitats of the Kremmling Resource Area support an equally diverse population of birds of prey. Current management of raptor habitat involves the identification and protection of nesting and hunting habitat. Raptor nest site inventories within the resource area are conducted during most breeding seasons.

The timber management program is changing the habitat of forest nesting species such as Cooper's hawk, goshawks, sharp-shinned hawks, and red-tailed hawks. New openings in the forest canopy, improved access to some areas, and loss of nesting and perching trees have resulted from timber harvest activities.

Threatened or Endangered Species

Plants

A list of plants designated as threatened, endangered, or sensitive by the Federal government is presented in the vegetation section of Chapter 2. The present management situation for threatened, endangered, and sensitive plant species consists of the identification of locations and habitat to ensure the protection of these areas wherever possible.

The Colorado Department of Natural Resources, on October 1, 1982, placed a North Park *Phacelia formosula* site on their Program Registry as a natural area. The legal description and data on this site are at the Kremmling Resource Area and Craig District BLM offices.

Little is known about the occurrences of these plant species because no intensive inventory has been conducted. The possibility exists that surface disturbing activities may have already extirpated one or more of these species populations or habitats. Significant data and scientific knowledge concerning the ecological and biological aspects of these rare species is unknown.

Bald Eagles

Bald eagles are winter residents along the Colorado River drainage and its major tributaries in Middle Park and are occasional migratory visitors in North Park. The Bureau actively participated in two years of bald eagle winter habitat inventory and assisted in a third winter investigation. The two years of intensive inventory in 1978-79 and 1979-80 were an attempt to determine the bald eagle winter population, concentration area locations, and value of public lands to the wintering bald eagles. The third year, winter 1981 investigation was an effort to locate bald eagle concentration areas and to assess winter food habits. This study was conducted by a Colorado State University student. Written reports for these three investigations are available in the Kremmling Resource Area Office.

North Park was included in the first two inventories. Observations of bald eagles have been recorded in North Park by the Colorado Division of Wildlife, BLM, and Arapaho Refuge personnel. However, concentration areas, nest sites, and regular winter residents have not been recorded. It was concluded that bald eagle use of North Park is limited to occasional migratory visits.

Peregrine Falcons

Current management of peregrine falcons and their habitat is limited to field surveys to locate potential nesting habitat. Surveys of suitable habitat by the Division of Wildlife have failed to locate active nests or breeding pairs of peregrines. Confirmed sighting of peregrines have occurred in the resource area, but no actual use has been recorded.

Black-footed Ferrets

One confirmed report of a black-footed ferret has been recorded in the resource area. The Denver Museum of Natural History examined a ferret taken from Grand County. More detailed data on this report is not available.

Current management of black-footed ferret habitat is limited to the mapping of white-tailed prairie dog towns in North Park. Prairie dog towns are not found in Middle Park, so no suitable habitat is thought to exist in there.

State of Colorado Listed Threatened and Endangered Species

Two species listed as threatened or endangered by the state occur in the resource area. These species are the greater sandhill crane and Rocky Mountain wood frog. Current management of these two species is limited to habitat survey work by the Colorado Division of Wildlife. Essential habitat for these species is designated in several Division of Wildlife publications available at the Kremmling Resource Area Office.

Riparian and Aquatic Habitat

Riparian areas along streams directly influence water quality. Riparian vegetation shades streams, thereby keeping the water cool; helps to maintain streambank stability; and filters sediment out of surface runoff. The riparian trend was evaluated on five characteristics: (1) plant reproduction, (2) plant residue and utilization, (3) composition changes, (4) plant vigor, and (5) soil surface factors. These five factors were evaluated and each riparian area was given a numerical rating. Values from 15 to 20 inclusive have an improving trend; 10 to 14 are in a stable, but less than optimum, condition; and 0-9 are in a declining trend state. These numerical ratings would be used to determine areas where protection or management is needed. Table 3-22 shows the miles of stream riparian habitat in each trend classification.

TABLE 3-22 -- RIPARIAN HABITAT TREND (MILES PER TREND CLASS)[1]

Trend Class	Stream Miles	Percent of Total
Improving	85	53
Stable	72	45
Declining	3	2
TOTAL	160	100

[1]Information on specific streams is available in the Kremmling Resource Area.

As shown in Table 3-22 only a small percentage of the riparian habitat is declining. The majority is either stabilized at some point below, or improving toward, an optimum level. The 3 miles of riparian habitat shown as declining would be improved under this alternative.

Stream Habitat Inventory Profile (SHIP)

The stream habitat inventory profile (SHIP) was used to give a numerical rating to the aquatic habitat on public land. Stream habitat was evaluated on five characteristics: (1) stream cover, (2) stream bank condition, (3) stream bank stability, (4) stream channel stability, and (5) sedimentation of the stream bed. Each stream was given a numerical rating classifying the habitat as excellent (17-19), good (14-16), fair (10-13), or poor (5-9). These ratings can be used to determine stream habitats that have potential or need for improvement. Table 3-23 shows the number of miles of stream in each habitat classification. The 8 miles of stream in poor condition would be managed for improvement to a higher SHIP class under this alternative.

TABLE 3-23 -- TOTAL MILES OF STREAM AND MILES OF STREAM WITH GAMEFISH POPULATIONS IN EACH STREAM HABITAT INVENTORY PROFILE (SHIP) CLASS[1]

SHIP Class	Total Miles	Percent of Total	Miles w/ Gamefish	Percent of SHIP Class w/ Gamefish
Excellent	17.7	12	13.3	75
Good	47.5	31	24.8	52
Fair	69.5	46	45.2	65
Poor	16.5	11	8	48

[1]Information on specific streams is available in the Kremmling Resource Area Office.

Fish Species

The only trout species native to the resource area is the Colorado River cutthroat trout (*salmo clarki pleuriticus*). This trout was found only in the Colorado River drainage and is classified as a state threatened species. The North Platte drainage has no native trout populations. With the introduction in the late 1800s of non-native trout species (brook, brown, and rainbow trout), the cutthroat trout was displaced by its inability to compete with these fish. No populations of Colorado cutthroat trout have been found in streams crossing public lands in the resource area. However, the Colorado Division of Wildlife has expressed interest in using one public land stream segment as a reintroduction area for this species. Table 3-23 shows the miles of stream in each habitat classification that contain gamefish populations.

Present Management of Riparian and Aquatic Habitat

Streams and Associated Riparian Habitat

The existing management of aquatic and riparian areas involves primarily maintenance and protection through mitigations for proposed environmental actions that may impact these areas. All actions that may affect riparian or aquatic habitat include protective stipulations. The timber, minerals, and range programs initiate projects that involve aquatic and riparian habitats.

Specific stipulations to protect aquatic and wetland areas include (1) buffer strips of uncut timber or unmined areas along streams, (2) settling ponds to remove suspended sediment and prevent it from entering stream habitats, (3) placement of roads out of wetland and riparian areas and placement of road crossings so they disturb as little riparian habitat as possible, (4) placement of culverts so as not to block fish migration, (5) slash being kept out of streams and slash burning kept as far as possible from streams and riparian areas, and (6) fencing of wetlands and springs developed for livestock water to protect the riparian habitat from grazing.

Lakes and Reservoirs

Recreation management of the lakes and reservoirs on public lands that contain gamefish populations is the responsibility of the Colorado Divison of Wildlife. The Divison, through cooperative agreements with BLM, is responsible for the maintenance of recreation facilities and fish stocking of Seymour Reservoir, Cowdrey Lake, and Lake John. The Division stocks East Lake in the Laramie drainage, and maintains facilities for and stocks the Williams Fork Reservoir. Walden Reservoir and MacFarlane Reservoir in North Park do not support gamefish populations at this time. Both of these reservoirs are almost entirely on public lands and may have potential for future development.

State/BLM Cooperative Agreements and Federal Regulations

BLM/Colorado Cooperative Agreements

There are three cooperative agreements between the Division of Wildlife and the Bureau that affect fisheries. The most important one is an agreement for the "Maintenance, Development, and Management of Fish and Wildlife on National Resource Lands in Colorado". It calls for the Division and BLM to "cooperate in the formulation and execution" of management plans involving wildlife resources. BLM staff are expected to consult with the Division before implementing management practices that would alter wildlife habitat conditions. The other two cooperative agreements deal with the construction and maintenance of recreational facilities at Seymour Reservoir, Cowdrey Lake, and Lake John in Jackson County. The Division has responsibility for these facilities.

Federal Regulations

Several Federal laws and regulations give the Bureau the authority to manage and protect aquatic and wetland habitats. Three specific laws limit the management of aquatic and wetland areas. The Federal Water Pollution Control Act Amendments of 1972 require a Section 404 "Dredge and Fill" Permit on any action that involves altering a stream or associated wetland area.

Two executive orders (EOs) describe items that must be considered when evaluating projects in wetlands (EO 11990, Protection of Wetlands) and in floodplains (EO 11988, Floodplain Management). These EOs outline management's responsibility to preserve and enhance the values of wetland and floodplain areas.

Demand and Dependency

Hunting, fishing, wildlife viewing, and photography are some of the important recreational opportunities provided by the wildlife resource in the resource area. Of these opportunities, big game hunting attracts the most recreationists and provides the most money to the local economy. Small game hunting, fishing, wildlife viewing, and photography also occur, but to a lesser extent. The Recreation section deals with the economic values of wildlife related recreation in more detail.

Demand and dependency on Bureau lands for fishing opportunities vary with location. In Middle Park there is a high public demand for and dependence on BLM to provide access to the Colorado River. The Colorado River between Granby and Kremmling is a high quality trout fishery with very little public access. BLM provides important access to this area. Between Kremmling and State Bridge, BLM provides access to approximately 17 miles of the Colorado River. This area supports a large recreational fishery.

In North Park, fishermen depend on three reservoirs that involve public land. Lake John, Cowdrey Reservoir, and Seymour Reservoir are partially administered by BLM. All three reservoirs support heavy fishing use during the open water season and ice fishing in the winter.

There is little dependency on the public lands in either North or Middle Park for small stream fishing. Fishermen depend more on the national forest lands for this type of fishing. However, most small

streams on public lands with public access provide some fishing opportunity, and they are important in terms of the quality of the water they contribute to downstream areas.

The real value of public lands to the users of the wildlife resource and the Colorado Division of Wildlife is an indirect one. Public lands in the Kremmling Resource Area provide the majority of the habitat for wildlife species which are dependent upon the sagebrush ecosystem. Species such as deer and elk seek the sagebrush-covered hillsides and valleys for winter forage and cover. Pronghorn antelope utilize the sagebrush ecosystem on a yearlong basis. The vitality of these species and sometimes their very survival depends on the habitat components afforded by the sagebrush ecosystem.

The value of winter habitat to the survival of these species has been well documented. Public lands provide most of the winter habitat available to these species because most of the lands are located in the lower elevation zones. Some lands located in the winter range zone are more heavily used and are termed "critical". Tables 3-24 and 3-25 present winter range and critical winter range average estimates for deer, elk, and antelope. Some 326,000 acres of upland habitat are currently available to wildlife in the Kremmling Resource Area.

TABLE 3-24 -- ACRES OF BIG GAME WINTER RANGE KREMMLING RESOURCE AREA

	Middle Park	North Park	Total
Mule Deer	96,800	85,000	181,800
Elk	86,240	61,360	147,600
Antelope	0	15,000	15,000

TABLE 3-25 -- ACRES OF CRITICAL BIG GAME WINTER RANGE KREMMLING RESOURCE AREA

	Middle Park	North Park	Total
Mule Deer	29,200	25,280	54,480
Elk	29,200	13,200	42,400
Antelope	0	8,000	8,000

Sage grouse and several species of songbirds and small mammals depend almost entirely on the sagebrush ecosystem during their life cycles. Breeding, nesting, and wintering (in the case of sage grouse) occur in the sagebrush vegetation type. Many wildlife-related recreational opportunities would not exist without the sagebrush habitat to ensure the survival of these species.

The role of public land habitat in assuring the survival of wildlife will become more important in the future. Since BLM operates under the multiple-use concept, wildlife habitat values are considered in all actions affecting public lands. This is not necessarily the case in the development or utilization of private lands for people-related needs such as energy and fiber. These private lands may provide important habitat values that are not considered in many actions. Wildlife populations displaced from these private lands will become increasingly dependent on public lands.

VISUAL RESOURCES

General Description

Visual resource management in the Kremmling Resource Area is based on a visual resource inventory done in 1979-1980. The inventory evaluated the landscape's physical appearance, or scenic quality; visual sensitivity; and location. Based upon this information, potential management classes were identified. The inventory information is contained in four booklets: the Visual Resource Inventories and Analyses for North Park and Middle Park and the Pictorial Presentation of Landscape Units in North Park and Middle Park. These booklets are on file in the Kremmling Resource Area Office. The inventory was conducted according to standard BLM procedures, which are also available for review.

Three components -- scenic quality, sensitivity, and viewing distance -- are compiled to formulate management classes. These classes are divided into five levels: I, II, III, IV, and V (see Glossary for definitions). Class I landscape designation applies only to designated areas, such as wilderness, natural areas, and wild and scenic rivers. There are no Class I areas on public lands administered by BLM in the Kremmling Resource Area. Class II areas are of special concern for visual resource management because of their scenic value, sensitivity, and location.

Current Management

Visual resource management (VRM) classes are presently established for only a portion of North Park. Upon completion of this plan, VRM classes will be established for the entire resource area.

Current management is directed towards the maintenance of visual quality in "sensitive" Class II areas. These are areas of special concern because of their inherent scenic value and locations along major travel routes, such as highways and the upper Colorado River. Maintenance of visual quality

in these areas is achieved primarily through mitigating measures designed to reduce the degree of contrast with the surrounding landscape to acceptable levels as established for Class II areas. Efforts are made to maintain the visual quality of the remaining public lands in the resource area and to meet the needs of other resource uses and activities. The vehicle for accomplishing this is the Bureau's Visual Resource Management System.

Demand and Dependency

Maintaining the visual resource is important in the Kremmling Resource Area because tourism has been and is an important industry. Both vacationers and locals drive through the landscape to hunt, fish, boat, camp, and view the countryside and surrounding mountains. Many people live in the resource area because of its remoteness and visual qualities. The visual setting is an important part of the lifestyle in both North and Middle Parks. Local people, as well as tourists, expect to see open mountain vistas, cool rushing water, high forested slopes, and vast, rolling sagelands.

RECREATION

Current Management

For ease of discussion, current management is described in terms of the major activities occurring on public lands.

River Running

Over the past few years the upper Colorado River has become a major recreation feature. Since it is the closest major whitewater river to the Denver metropolitan area, there has been a 24 percent increase in its use between 1976 and 1980. It ranks second in total use among whitewater rivers in Colorado (RE&I, Inc. 1980). The only developed BLM recreation area in the Kremmling Resource Area is the Pumphouse Recreation Area, which is the major access point on the upper Colorado.

Increasing popularity of the Colorado River for floatboating from Gore Canyon (Pumphouse) to Dotsero resulted in the preparation of an interim management plan in 1978 and a final management plan in 1982. The Kremmling and Glenwood Resource Areas share management responsibilities for public lands adjacent to over 60 miles of the Colorado River. Eighty-five percent of the land adjacent to the river is public. Kremmling manages the upper 14 miles from Pumphouse to State Bridge. Approximately 82 percent of the total use on the river originates on this upper stretch.

The management plan identified a variety of existing management problems, including a lack of public knowledge of land status along the river, river safety, available or alternative camping places, access points, water quality, and sanitation. The final management plan sets forth management guidelines to respond to these and other problems. The complete management plan is available for review in both the Kremmling and Glenwood Springs Resource Area Offices.

BLM made improvements along the river starting in 1977. These have included putting in restrooms; upgrading launching areas; improving access roads; developing parking, picnicking, and camping areas; and installing a water system. A "pack out your trash" policy was implemented and is still generally working. Commercial outfitters are particularly interested in maintaining a clean environment along the river.

In 1979 a permit system was initiated for commercial outfitters. This was done to determine river use and provide a monetary return for commercial use of public lands. No restrictions were imposed nor was use limited by the permit system. In the same year BLM began hiring seasonal workers (river rangers) to monitor use of the river and provide public information and maintenance.

The upper Colorado River is in a relatively undisturbed environment, except for a railroad. In addition, an occasional county road parallels the river.

In research conducted in 1978 and 1979, river users identified the following as moderate to serious problems:

Inadequate toilet facilities at put-in/take out points	41.2%
Too few toilet facilities along the river between points	36.4%
Too few drinking water sources	26.9%

In addition, 41.6 percent of those surveyed felt there were too many people at put-in points (see Figure 3-4), while 26.5 percent felt there were too manly people on the river. Repeat visitors and private parties generally felt stronger about the problems than did first-time visitors and commercial parties. The survey also indicated that 86.2 percent support the "pack out your trash" policy and 78 percent would support restricting the number of people using the river at any one time. A majority (69.6 percent) also felt a good job of management is being done, indicating that the management actions taken to date have addressed most concerns at present use levels (Forest Service 1978 and 1979). Complete results of the survey are available at the Kremmling Resource Area Office.

Off-Road Vehicles

Off-road vehicle use occurs mostly as a means of transportation for other types of recreation, such as hunting and firewood gathering. One exception is the North Sand Hills in North Park. In addition to their natural, cultural, and geologic value, the North Sand Hills have become an attractive place for off-road vehicles.

The North Sand Hills were withdrawn from mineral entry in 1965 because their unique geology made them worthy of protective management as a Natural Area. Use of the area remained light until the early seventies, when motorized vehicles became the predominant activity. During this time of increased use, the East Sand Hills in the Colorado State Forest were officially closed to motorized vehicles, which made the North Sand Hills the only major dune area in Colorado available for motorized use.

In order to establish management objectives for the Hills, BLM contracted for a geological study in 1976 and a cultural inventory in 1977. With the passage of the Federal Land Policy and Management Act in 1976, the North Sand Hills Natural Area and contiguous public lands became an instant wilderness study area. In order to protect the values identified by these studies and to manage the area as a wilderness study area, BLM developed an interim management plan in 1977. This plan restricted motorized vehicles to existing roads and trails and to nonvegetated portions of the dune area.

The best access route to the Hills is across private land. The owner has been inclined to allow free passage and BLM has provided signs to assist the landowner in preventing disruption of his ranching operation. Problems related to trespass, both intentional and unintentional, have been identified, but, overall, the interim management plan has worked, with no major problems on the public lands presently identified. While intensive use occurs on three to four weekends during the summer, the recreational opportunity classification for the area is semiprimitive motorized because of the opportunities available for most of the year.

Other areas in the resource area receive light to moderate off-road vehicle use. This use occurs generally where access was originally provided for some other resource use, such as logging. Places where this use is occurring in North Park include Independence Mountain and the McCallum Oil Field area. In Middle Park, recreational vehicle use is occurring in the Resource Conservation Area immediately north of Kremmling and at Smith Mesa, Corral Creek, Drowsy Water, Dice Hill, and Yarmany Mountain. As other areas are opened through access acquisition (e.g., Kinney Creek near Hot Sulphur Springs), light to moderate use can be expected to occur.

In addition to the North Sand Hills, other small areas in the resource area have been restricted or closed to ORV use on a case-by-case basis in response to specific resource management needs (e.g., cultural, wildlife, etc.). For example, two meadows on Dice Hill have been closed to protect wildlife habitat.

Hunting

The majority of big game hunting occurs on non-BLM managed lands. However, the public lands provide habitat critical in maintaining the various wildlife populations and thus maintaining the regional hunting opportunities (see Wildlife section).

Fishing

The public lands in the Kremmling Resource Area do not provide major opportunities for fishing, with the exception of segments of the Colorado River. The Colorado River from Gore Canyon to State Bridge passes primarily through public lands, thus providing some 17 miles of public fishing access. In addition, the Colorado River between Granby and Kremmling is a significant fishery. Because most of this stretch of the river is bounded by private lands, the few places where public land does adjoin the river are especially attractive to fishermen.

BLM has developed a parking area at the Sunset fishing access near Parshall. In addition, the Colorado Division of Wildlife has developed the fishery at six reservoirs bounded by public lands in North Park and maintains recreation facilities at each through cooperative agreement.

Other Types of Recreation

Most of the public lands in the resource area, excluding the upper Colorado River corridor and the North Sand Hills, are presently managed as extensive recreation management areas. These public lands provide opportunities primarily for dispersed activities in a roaded natural or semiprimitive motorized setting. Over the past several years, BLM has acquired easements across private land in order to provide public access for timber harvesting, recreation, and other resource activities. Easement acquisitions include Kinney Creek, Smith Mesa, Black Mountain, the Strawberry area, Buffalo Peak, Green Ridge, and Owl Mountain. These opportunities are important because they supplement the opportunities available on surrounding national forest and park lands. They also provide a place to recreate in a relatively unrestricted setting.

Demand and Dependancy

Recreation and tourism is the second most significant element of the regional economy (see Eco-

nomics section of Chapter 2). While a majority of the use which makes recreation an important part of the regional economy occurs on U.S. Forest Service, National Park Service and other non-BLM administered public lands, the public lands administered by BLM do play an important role in the regional recreation picture. The importance of this role is expected to increase in the future.

Because a large part of the resource base for recreation is publicly owned and provided at little or no direct cost to the user, it is difficult to determine the market value of recreation as compared to other resources such as timber and mining. Table 3-26 is an attempt to establish the value of recreation so that its relative significance may be compared to that of other resources. As can be seen in this table, there is a substantial value (i.e., the incremental value) which the public receives for which no direct cost is paid.

TABLE 3-26 -- KREMMLING RESOURCE AREA REGIONAL VALUE OF RECREATION[5]

	1978			1979		
	Recreation Visitor Days	Incremental Value/ RVD[1]	Incremental Values[2]	Recreation Visitor Days	Incremental Value/ RVD	Incremental Values[3]
			(000)			(000)
Floatboating (private trips)	4,800	$43	$206	5,922	$48	$284
Other Boating	25,953	74	1,921	29,294	82	2,402
Developed Camping	244,700	50	23,235	420,300	56	23,537
Primitive Camping	40,600	36	1,462	79,500	40	3,180
Camping Not Defined	59,177	46	2,722	48,962	51	2,497
Fishing	219,009	49	10,731	190,164	54	20,269
Hiking and Climbing	126,281	65	8,208	222,243	72	16,001
Deer Hunting	12,929	99	1,280	17,071	110	1 ,878
Other Big Game Hunting	24,979	114	2,848	28,626	127	3,636
Water Fowl Hunting	118	158	19	699	176	123
Upland Birds Hunting	2,576	86	222	4,008	96	385
Other Small Game Hunting	3,562	83	296	9,991	92	919
Off Road Vehicles	72,279	58	4,192	71,682	65	4,659
Sightseeing	214,385	70	15,007	224,954	78	17,546
Other Outdoor Recreation	263,583	27	7,117	234,286	30	7,029
Total Incremental Value	.....	.....	$68,466	.....	.....	$94,345
Local Economic Impact[4]	.....	.....	22,657	.....	.....	28,650
Total Recreation Value	.....	.....	$91,123	.....	.....	$122,995

[1]Values deflated to 1978 dollars by means of Consumer Price Index.

[2]Local economic impact equals exports of the gas stations and auto dealers, eating and drinking places, trade NEC, hotels and motels, recreation facilities, and service NEC sectors.

[3]*Incremental Value*: The value that recreationists are estimated to receive, over and above monetary costs. Average incremental values are obtained from surveys of how much recreationists would be willing to pay for different activities. They are added to monetary recreation costs in order to account for values received for which no charge, or a minimum charge is made (such as access to Public Lands, National Forests, etc.).

[4]Includes floatboating on commercial trips and skiing at Winter Park plus other local spending by all recreationists.

[5]Dispersed use on BLM lands and use in Rocky Mountain National Park are not included due to lack of adequate data. Primary data sources are National Forest use data, Colorado Division of Wildlife (hunting and fishing), and BLM (floatboating).

Note: Approximately 40 percent of the local economic impact is derived from skiing and associated activities at Winter Park.

Due to a lack of demand data, it is difficult to develop an accurate supply-demand picture, especially for BLM administered lands. However, current use and the preferences indicated by that use enable certain conclusions to be made about the supply-demand-need picture and the implications for future management of public lands.

The majority of the BLM administered lands provide recreation opportunities for dispersed activities in roaded natural and semiprimitive motorized settings. In North Park, the public lands provide significantly different types of recreation than surrounding national forests because of their topography and vegetation. However, their potential for substituting for, or supplementing, the recreation opportunities available on the national and state forests is low. Current use indicates that users generally prefer the type of opportunities available on the mountainous and forested lands surrounding the North Park basin. An exception to this is the off-road vehicle use in the North Sand Hills that currently provides a unique recreation opportunity for Colorado. The Independence Mountain area has potential similar to that available on more popular national and state forest lands.

Use of the North Sand Hills on peak weekends is approaching the point where overcrowding could become a problem, both in terms of maintaining the desired recreation experience and protecting resource values (e.g., geologic and cultural). In addition, the public lands in the North Park area are important for maintaining wildlife populations, which have a direct effect on hunting and its contributions to the local and regional economy.

Overall, the Bureau's limited management (visitor information, signing, access acquisition, limited maintenance, etc.) of the public lands in the North Park and Laramie River areas is meeting current needs. Such management, with the exception of the North Sand Hills and Independence Mountain, is expected to meet recreation needs during the life of this plan.

Because they are within a two- to three-hour drive of the Denver metropolitan area, the demand for recreational opportunities on the public lands in Middle Park and along the upper Colorado River is expected to continue to increase. Public lands adjacent to national forests will continue to receive spillover usage, especially as the forests become overcrowded and access is restricted by road closures. Because of their location and topographic and vegetation similarities, these adjacent BLM lands provide recreational opportunities in settings similar to the type available on the national forests.

As recreation use in the region continues to grow, demand on the public lands in the Middle Park region will also increase. Over the next five years, dispersed recreation in the region is expected to increase by roughly 12 percent. With this increase in demand, the existing management posture (i.e., limited management) may not be adequate to protect the existing opportunities or provide additional opportunities.

In the Colorado River corridor, management actions will continue to be necessary to maintain the current type of recreation opportunities. User studies conducted in 1978 and 1979 indicate that many users already feel certain areas (i.e., put-in points, camping areas) are overcrowded and facilities, especially sanitation, are inadequate. In addition, the Colorado River is the primary supply for river related recreation in the region, which indicates that the pressure on the river corridor will continue to increase. The possibility of blocking isolated pieces of public land along the Colorado River between Granby and Kremmling needs to be evaluated in terms of providing highly sought after fishing opportunities.

As with demand, economic dependency in terms of recreation is difficult to measure due to a lack of adequate data. Since the permit system for commercial outfitters on the upper Colorado River was implemented in 1979, data related to floatboating has become available. Total 1980 gross receipts by commercial outfitters on the upper Colorado River from the Pumphouse to Dotsero are estimated to be $904,000. It is also estimated that this river segment accounts for 19 percent of the floatboating expenditures (both direct and indirect) in Colorado, which would amount to approximately $4.3 million (1980 Colorado Whitewater Boating Use and Economic Impact Study). In 1981, there were 44 commercial outfitters permitted on the upper Colorado River. Approximately 70 percent of the use on the upper Colorado River involved commercially operated trips.

As discussed previously in the wildlife section, public lands are critical for maintaining wildlife populations upon which hunting depends. It is difficult, however, to determine a monetary value for this.

In a noneconomic sense, people, especially those living within the resource area, depend upon the public lands for contributing to their lifestyle. The availability of public lands in their "backyards" has traditionally played, and continues to play, an important part in the lifestyle of North and Middle Parks. While often taken for granted, residents of the resource area rely on the public lands for the opportunity to engage in a variety of dispersed recreation activities in roaded natural or semiprimitive settings with relatively few management restrictions.

Public attitudes regarding recreation on public land within the resource area generally center on the upper Colorado River and the North Sand Hills. Due primarily to the permitting process on the river, commercial outfitters are the dominant sector of the public heard from regarding river management. Their main concerns are adequate access and facilities and continued economic viability of their operations. Organized four-wheel drive clubs from the Ft. Collins-Loveland-Longmont area are the dominant sector of the public heard from regarding management of the North Sand Hills. These clubs have taken an active interest in seeing that the dunes remain open to use by motorized vehicles.

WILDERNESS

Current Management

With the exception of livestock grazing, there are no management activities currently taking place in the Troublesome Wilderness Study Area (WSA), the resource area's only wilderness study area. Since its identification as a potential study area during in the wilderness inventory, the area has

been managed according to the *Interim Management Policy and Lands Under Wilderness Review* (December 12, 1979). As of May 1981, there had been no proposals for activities that would have been inconsistent with the interim management policy.

Demand and Dependency

In its Colorado supplement on RARE II, the Forest Service estimated that wilderness use in Colorado had increased approximately ten percent annually to a level of about 540,000 visitor days per year in 1977. National forest wilderness areas in the region do not currently (1981) limit use through issuance of permits. Such restrictions are considered likely in the near future, especially in heavily used areas such as the Indian Peaks Wilderness Area. In Rocky Mountain National Park, the National Park Service has implemented a designated campsite permit system for its backcountry areas which encompasses the proposed wilderness area.

Due primarily to the lack of legal access from the west and south, the Troublesome WSA receives little recreation use. The owners and guests of the private inholding and adjoining private lands use the public lands for a variety of recreation activities, including hunting. Few people are currently dependent on the WSA for wilderness related opportunities and values. As use of other wilderness areas in the region increases, the demand for additional areas providing similar opportunities will increase. However, its relatively small size limits the capability of the Troublesome WSA to meet increasing demands.

Public attitudes within Grand County towards designating this area as wilderness are predominantly negative. The general feeling is that there is already enough wilderness in the county and region. Statewide, the public attitudes towards the Troublesome WSA vary from strong support for wilderness designation from the environmental community in the heavily populated areas of the Front Range, to mild opposition from industry. The main opposition has come from the absentee owners of the private inholding in the WSA.

Suitability Recommendation

The Bureau is required by Section 603 of the Federal Land Policy and Management Act (FLPMA) to study wilderness study areas and recommend to Congress, through the Secretary of Interior and the President, whether an area is suitable for wilderness designation. Continuing interim management of the study area is not allowed under FLPMA.

Under this alternative, the Troublesome WSA would not be recommended as suitable for wilderness designation. The primary reason it has been considered for wilderness designation is that it is a block of public land in an essentially undisturbed condition. When compared with other existing and potential wilderness areas in the region, the Troublesome WSA has a very similar ecosystem and provides similar opportunities for solitude and primitive, unconfined recreation.

The area lacks any geologic, ecological, educational, scenic, or historical features significant enough to recommend their protection by wilderness designation. Because it is a relatively small area and other larger areas are abundant in the region, the Troublesome WSA would not be a significant potential addition to the National Wilderness Preservation System on a regional, state, or national basis. It would not significantly expand wilderness opportunities within a day's driving time of major population centers and would not add balance to the geographic distribution of wilderness areas.

Since the adjoining national forest lands are not under wilderness management, the Troublesome WSA would not afford protection to an entire watershed or ecosystem, nor would it provide opportunities for a sustained wilderness experience. There are no significant multiple resource values, such as watersheds, wildlife habitat, or archaeological sites, that would depend on wilderness preservation for their protection.

Finally, the nonwilderness management of adjoining national forest lands, especially those upstream, and the private inholding within the Troublesome WSA would not presently adversely affect the Bureaus ability to manage the area as wilderness; however, such management is subject to change.

The Troublesome WSA will be managed under the Bureau's interim management policies for wilderness study areas until Congress makes a decision whether or not to designate it as wilderness. If Congress accepts the view presented here, that the Troublesome WSA is unsuitable, then the area would be managed for multiple use, with emphasis on intensive forestry management and continued range management for livestock.

CULTURAL RESOURCES

General Description

Cultural resources are tangible remains of man's past. They are fragile, nonrenewable, and limited in their distribution. They range from small artifacts,

such as arrowheads, to large complexes, such as a group of historic buildings.

Federal law protects significant cultural resources in several ways. First, cultural inventories are required before any surface disturbing activity can occur on public land. Then, if anything significant is found, it must either be left unmolested or be removed according to established archaeological procedures. In addition, some interpretive and research activities can be authorized.

Current Management

In the Kremmling Resource Area, emphasis has been placed on inventorying those places where surface disturbing activities will occur, such as oil well sites or proposed coal strip mines. Any cultural resources found are evaluated for their eligibility for inclusion on the National Register of Historic Places. Those that are eligible for the National Register receive some degree of protection. In some cases, other significant finds are also protected.

For the most part, the older a find is, the more significant it is. However, the Bureau tries to protect a full array of significant resources throughout the range of prehistoric and historic occupation.

The Bureau has designated three classes of cultural resource inventory (BLM Manual 1800):

Class I: Existing inventory or literature search.
Class II: Sampling field inventory (all sampled units are inventoried to Class III standards).
Class III: Intensive field inventory.

A Class III inventory is required before any surface disturbance may occur.

If the Bureau initiates a project, it must conduct its own inventory or contract an outside archaeologist to do it. If a private company or another government agency initiates a project, they must arrange and pay for a cultural inventory.

If something with potential value is found, the most immediately cost-effective approach is to redesign the project to avoid disturbing the find. In some cases this is not feasible and further study is necessary to determine the significance of the find. Impacts to significant sites eligible for listing on the National Register of Historic Places must be mitigated before any project work can take place.

In the Kremmling Resource Area, avoidance has been most successful. Fencing has been used to protect certain sites from transmission line projects, coal mines, and off-road vehicles. Sites in the North Sand Hills are monitored during periods of high use by recreational vehicles. Other forms of protection have included compliance inspections and lease stipulations to assure that cultural remains are reported or protected during construction on public lands.

Although there are no sites recorded or inventories completed within the Troublesome WSA, its topography, density of game, proximity to water, and plant resources and the presence of nearby archaeological sites indicate that sites probably exist there. Wilderness designation, which is not proposed under this alternative, would withdraw the area from mineral entry and timber production, eliminating two major impacts. Impacts to cultural resources would then be limited to incidental vandalism and natural causes.

Vandalism to cultural resources, which is not always intentional or malicious, seems to be concentrated in areas with intensive use, easy access, or special attractiveness. Off-road vehicle impacts in the North Sand Hills are substantially reduced due to protective measures and surveillance, but incidental man-caused as well as natural disturbances still occur.

Historic sites in the resource area undergo degradation due mainly to weathering, seasonal use for hunting bases, and use as bottle and barnwood collecting areas. There is also unauthorized collection (pot-hunting) of both archaeological and historic remains. Roads, trails, and ways resulting from timber sales, mineral activities, utility corridors, and off-road vehicles allow access to formerly isolated areas.

The current lack of manpower, surveillance, and enforcement make it impossible to protect most of the cultural resources in the Kremmling Area. Some areas particularly harmed by the effects of unmanaged off-road vehicle use include the Independence Mountain area, RCA pasture areas north of Kremmling, North Sand Hills Natural Area, Sulphur Gulch uranium exploration area, and Tri-State 230 kV utility corridor. Potential adverse impact areas include pipeline and utility corridors, timber sale road systems, and various other roads, trails, and ways.

Natural degradation of cultural resources due to water and wind erosion, wildlife and livestock grazing, wildfire (or spread of man-caused fire), and other forms of general decomposition is an almost unavoidable problem. While erosion may uncover previously unknown sites, unchecked erosion caused by man or nature is largely detrimental to cultural remains.

National interest in cultural resources was demonstrated when Congress passed the Antiquities Act of 1906. Other major milestones in cultural resource legislation include the National Historic Preservation Act of 1966 (as amended 1980), Ex-

ecutive Order 11593, the Advisory Council on Historic Preservation's 36 CFR VIII 800, and the Archaeological Resources Protection Act of 1979, which includes specific directives for Federal agencies to interact and exchange data with the public.

Scientific evaluation of cultural resources serves to document our country's heritage. Lessons can be learned from past cultures that can be applied to future use of our natural resources. Important cultural reports (CRs) from the resource area will be offered for publication through the Colorado BLM's CR Series.

Vandalism is seen in indiscriminate hunting for pots and arrowheads and in the removal or destruction of barnwood or other prehistoric and/or historic artifacts, all of which are frequent recreational activities. Most amateur collectors are aware that it is illegal but feel that either the government will collect artifacts and keep them isolated in storage or that other collectors will get them.

A more significant motivation for this behavior is the link to the past, to a vanished Western way of life, which artifact collection and possession provides access to. Pride of ownership adds to the overall experience of possession of artifacts. Many collectors apparently do not engage in extensive digging and sifting operations, letting natural erosive forces expose their finds.

Lack of sufficient in-house BLM manpower or industry responsibility for cultural resource inventory and evaluation has created the cultural resource consultation profession. BLM has let four contracts funded by recreation, planning, and coal in the Kremmling Resource Area since 1976. Other consultant fees are borne by industry in non-BLM initiated actions involving realty, oil and gas development, coal development, minerals exploration, water diversion/impoundment, and power transmission.

While illegal sales of cultural resources apparently take place in southern Colorado and the nearby Southwest, there is no evidence that black market activities take place in the Kremmling Resource Area. Lack of in-house law enforcement authority or cooperative agreements does not allow for control of illegal activities.

Two sites containing approximately 710 acres are currently receiving intensive management. There are no current inventory contracts in effect.

LANDS AND REALTY

The lands and realty program has primarily been a support function for Bureau and non-Bureau projects. These projects involve authorizing rights-of-way, temporary use permits, and leases where private, corporate, and governmental parties use public lands for project location. Another phase of the lands program includes other Bureau activities, such as acquisition of easements, resolution of unauthorized use situations, and disposal of lands.

Current Management

Rights-of-Way

Approximately 80 percent of the rights-of-way are linear and include highways, railroads, electrical and telephone lines, pipelines and irrigation ditches. Detailed descriptions and locations of each case may be obtained from the Master Title Plats located in the Kremmling Resource Area Office and from the individual case files.

On an annual basis, BLM issues 15 to 20 rights of way for approximately 40 linear miles and 500 acres. Corporations and utility companies account for about 50 percent of all grants. For the past five years, the types of grants have shifted from ditches, reservoirs, and major highways to residential utilities, underground telephone lines, county road realignments, and energy related roads.

After construction and rehabilitation, most existing rights-of-way have a long-term impact on other resources. Large powerlines present long-term visual intrusions on the landscape. Another problem is off-road vehicle use along powerline and pipeline corridors. With these and other projects, emphasis is now on preapplication briefings with the applicant to address these and other resource concerns and to identify feasible mitigation measures.

Historically, rights-of-way were established near traditional access routes such as county roads, state roads, and railroads. The terrain, which was usually near river bottoms, was favorable and maintenance was easily achieved. Recently, utility companies have sought new corridors approximately two to five miles from these transportation routes to reduce visual impacts. The net result has been the *de facto* development of two general corridor systems.

The Western Region Corridor Study Group has printed a map delineating probable utility corridors to 1990 and planned corridors for 1990 to 2020. Six proposed corridors traverse North Park, while five corridors traverse Middle Park.

Recreation and Public Purposes

The Recreation and Public Purposes Act provides for the sale or lease of public lands to state and local governments and nonprofit entities.

These lands may be used for parks, picnic areas, rifle ranges, sanitary landfills, and similar facilities.

Jackson and Grand Counties each contain several Recreation and Public Purpose leases and patents. Most are near the population centers of Walden, Kremmling, and Granby. The Colorado Division of Wildlife manages two recreation complexes at Lake John and Delaney Buttes. Detailed information can be found in each individual case file.

BLM monitors leases and patents for compliance with stipulations and patent reversion conditions. A major concern is adequate rehabilitation of expired leases, especially for sanitary landfills.

Exchanges, Sales, and Acquisitions

Exchanges and sales account for a small number of realty actions. However, isolated small 40- to 120-acre tracts are located throughout the resource area. Some of these parcels may not benefit BLM's resource management program due to inadequate access and the fact that they bordered or surrounded by ranches, second home developments, state lands, and national forests.

One- to five-acre public land parcels remain in three separate small tract homesite areas -- Stillwater with 2 parcels, Ptarmigan with 89 parcels,and Williams Fork with 13 parcels.

Another land ownership problem is split estates: (1) state and private surface ownership over Federal subsurface minerals and (2) Federal surface over private or state subsurface minerals. Use authorizations by any party of split estates often leads to management disparity, as experienced in North Park energy areas. For example, private residences are built over Federal minerals estate that may have high coal development potential.

The only acquisition program in the resource area involves obtaining road access easements. Since the mid-sixties, BLM has acquired 21 easements in support of the forestry program. Emphasis is now on obtaining recreation easements along the upper Colorado River between the Pumphouse and State Bridge, Colorado.

Classifications

Most public lands were classified under the Classification and Multiple Use Act of 1964 for retention in Federal ownership and multiple use management. These lands were segregated from agricultural entries and public sale but not from mining

All classifications have recently been reviewed after extensive field and case file examination. As a result of this review, revocations have been recommended in situations where the classification is no longer serving a useful, on-the-ground purpose.

Withdrawals

Since 1909, certain lands have been segregated from operations under the public land laws and the mining laws. Approximately 34,000 acres are presently withdrawn. Withdrawals are being reviewed to assess whether they are being used for the purposes intended.

One of the large acreage withdrawals consists of public water reserves, which total approximately 6,000 acres. These 40-acre parcels were identified to protect water sources from settlement, sale, or entry.

Ten power site reserves account for about 9,000 acres. No new power projects have been built on the lands during the past 10 years. However, as a result of the Windy Gap water diversion project, the Northern Colorado and the Colorado River Water Conservancy Districts agreed to study the feasibility of the proposed Azure Project, an irrigation and power reservoir south of Gore Canyon.

Permits and Leases

As a result of FLPMA, all previous special permit authorizations are being converted into temporary use permits (TUPs). These permits provide short-term revocable authorizations for land actions that involve small-scale land modification. On the average, six to seven TUPs are issued per year.

Currently, there are no realty related leases in the resource area other than Recreation and Public Purpose leases.

Unauthorized Use

A moderate level of unauthorized use occurs in the resource area. Some impose visual intrusions into the characteristic landscape or represent a public health hazard.

Resource management is inhibited when buildings or other structures block proposed access roads or recreation developments. Presently, owners of unauthorized facilities are strongly encouraged to apply for rights-of-way or other authorizations to protect capital investments.

The resource area contains approximately 5,000 acres of public lands used for hay meadow or improved pasture. Grazing fees have been adjusted, in some cases, to reflect this more intensive use. Permits may also be issued to resolve significant cases of unauthorized agricultural use, pending a decision to either (1) lease or sell the affected lands for agricultural purposes or (2) terminate the agricultural use on public lands.

Occupancy trespass is not a significant problem. Old, abandoned cabins dot the resource area but most are unsuitable structures for permanent occupancy. During a cadastral survey in 1979, two

summer cabins were found to be on public lands along Colorado Highway 125.

Unauthorized reservoirs, irrigation ditches, and other ranch improvements are common in the Kremmling Resource Area. Most owners have been notified of the situation and several right-of-way applications have been filed.

There are also small-scale, unauthorized facilities, such as small dumps, telephone lines, and advertising displays, that are not functional. Owners are required to remove these and rehabilitate the area. If the owners cannot be identified, BLM removes the structures or debris.

Zoning Regulations

Most governmental entities in the resource area have implemented zoning and subdivision regulations. A detailed description of these regulations can be found in publications on file in the Kremmling Resource Area Office.

Most of the rural private land in Grand County is zoned "Forestry" and "Open". These categories allow a wide variety of land uses, including residential developments with a minimum lot size of two acres. The Grand County zoning ordinance requires special use permits for public utility transmission facilities.

Private land in Jackson County is zoned "Ranching". Special use permits are required by the county for most structures and land alterations that are not directly related to ranching operations.

Demand

Rights-of-Way

The economics discussion in Chapter 2 points out that the resource area and Front Range populations are increasing dramatically. This is leading to a tremendous demand for new raw water supplies and efficient use of existing sources. As a result, large-scale water projects are anticipated, such as the Williams Fork Reservoir enlargement and construction of the Azure Reservoir on the Colorado River. These projects will also involve access roads, utility corridors, and other ancillary facilities.

Front Range community growth is also contributing to a significant energy demand. This, coupled with an abundant supply of coal-generated energy near Craig, Colorado, should greatly influence the number of high voltage powerlines, since the resource area lies between the area of consumption and the supplier.

Resource area population has increased 57 percent from 1970 to 1980. Projection of similar growth in the 1980s suggests a demand for more rights-of-way for residential electric and telephone lines and access roads. Demand for irrigation ditches and reservoir construction should remain constant in the future.

Future oil and gas drilling, along with coal extraction in Jackson County, will require new rights of way or amendments for haul roads, utility lines, water monitoring wells, diversion ditches, sedimentation ponds, and other support facilities.

Recreation and Public Purposes Actions

Increased second-home development in eastern Grand County, higher private land prices, and the presence of BLM land immediately adjacent to communities will lead the public to continue to depend on Recreation and Public Purposes leases and patents. Jackson and Grand Counties will rely on public lands to locate sanitary landfills and recreational facilities on public lands near Walden, Kremmling, Granby, and other small communities.

Exchanges, Sales, and Acquisitions

The public considers the sale and exchange of public lands to be a high priority. The U.S. Forest Service has earmarked numerous parcels of isolated BLM lands that are adjacent to present forest boundaries. In addition, ranchers have noted numerous, isolated 40- to 120-acre parcels that are surrounded by their privately owned ranches.

Public requests have also been received asking BLM to sell lands. Over one-half of these originate from the Dillon, Colorado, area regarding the Ptarmigan Small Tracts. Sales inquiries have also been received on small public parcels in the Winter Park and Fraser areas.

The demand for recreation easements is rapidly increasing. Numerous hunters, crosscountry skiers, and hikers have expressed a demand for public access to the Drowsy Water area. Fishermen want public access to isolated public lands along the upper Colorado River from Granby to Kremmling. In addition, recreation easements have been requested by river floatboaters along private land parcels adjacent to the upper Colorado River between the Pumphouse and State Bridge, Colorado.

Withdrawals and Classifications

The demand for major withdrawals should be insignificant in the future. Casework analysis will center on a comprehensive review of withdrawals held by the Bureau of Reclamation and the U.S. Forest Service. Land classifications will be limited to site-specific proposals for Recreation and Public Purposes leases and patents.

Permits and Leases

Energy companies have indicated a desire for permits to authorize short-term water monitoring

wells and material stockpiling areas. On the whole, 5 to 10 permits are anticipated annually.

The number of leases may increase during the next 10 years. These authorizations are designed for long-term facilities that do not transport some physical item or electronic message. Thus, leases will be issued for air and water monitoring stations, storage yards, and similar facilities.

Dependency

Dependency within the lands program can be separated into locational dependency and socio-political dependency.

The distribution of public land creates a locational dependency. Major transmission lines, pipelines, and roads must traverse BLM tracts due to the scattered distribution of public lands throughout the resource area. Failure to use public lands would result in zigzag corridors. A second type of locational dependency arises when ranches, subdivisions, and towns are bordered or surrounded by public lands. Finally, lands with prominent points are often found suitable for communication sites. Most of these are located on U.S. Forest Service or BLM administered lands.

Dependency also occurs in the political and social realm. Users have relied on public lands in the past and expect to continue to rely on these in the future. Potential applicants also feel that BLM has a special obligation to grant authorization since these are "public lands". In addition, most utility companies prefer to deal with just a few landowners to obtain easements, placing a greater dependency on large, single landowners such as BLM or the U.S. Forest Service.

PREFERRED ALTERNATIVE

The Preferred Alternative would emphasize the management, production, and use of renewable resources on the majority of the public lands in the Kremmling Resource Area. Opportunities to provide sufficient suitable coal lands would be emphasized to allow for the continuation and possible expansion of the coal industry in Jackson County. Scattered tracts of public lands would be prioritized for disposal in the Grand Lake and Granby-Fraser areas to support their recreational and tourism-based economies.

Multiple use management would be directed toward providing a flow of renewable resources from the public lands on a sustained yield basis. In addition, management attention would be directed to the expansion of local and regional economies in areas where Bureau actions could influence orderly economic growth.

The goods and resources provided by the public lands would help meet local, regional, and national needs, including the national goal of energy self-sufficiency.

Individual resources would be managed or affected in the following ways.

Locatable Minerals

All Federal lands in the planning area would remain open to entry under provisions of the Mining Law of 1872 as amended, except that mineral entry would be excluded from those lands under protective withdrawal. Development and certain types of exploration could have site-specific or temporary restrictions imposed to protect other important resource values.

Coal

The Preferred Alternative offers sufficient acreage (approximately 45,000 acres) for consideration for future coal leasing to allow for continuation and expansion of the coal industry in Jackson County. The priority areas for future coal leasing are located east of Walden in the area called the McCallum, where coal development is currently taking place, and near Coalmont, where numerous coal leases presently exist and development previously occurred. (Refer to Preferred Alternative Map.) These priority areas were determined based on current coal inventory data and indications of interest by industry.

Those lands identified as unsuitable for surface mining after application of the coal unsuitability criteria (see Continuation of Present Management Alternative in this chapter) would be excluded from future coal leasing considerations.

The remaining coal lands that were not determined to be unsuitable or identified as a priority for future leasing would be managed for other multiple use considerations, i.e., as priority areas for oil and gas, livestock grazing, or wildlife habitat. These lands would be made available for future leasing only when the coal priority areas had been depleted or a significant demand was expressed that could not be met by the coal priority area. Significant changes in the coal industry or the economy could also, at some future date, provide new information that warranted amendment of the plan to

either expand or further limit the areas considered for coal leasing.

Preference Right Lease Application (PRLA) C-0125854 would be processed and emergency coal leasing would continue as needed to support existing operating mines. Site-specific restrictions may be imposed to protect the environment or other critical resource values. These restrictions would become part of the lease or approved mine plan.

Oil and Gas

All Federal lands would remain open to oil and gas leasing, except those lands withdrawn to protect other resources (ACECs, recreation sites, etc.). These lands would be excluded from oil and gas leasing unless they were already encumbered by leases. Site-specific restrictions to protect other resources would be imposed prior to leasing or exploration if another resource was shown to have a higher priority. Where oil and gas is shown as the priority, standard lease stipulations would apply. Priority areas are shown on the Preferred Alternative Map.

Mineral Materials

Federal lands would provide mineral materials to meet demands not filled by private enterprise and would provide free materials to local, state, and Federal agencies for road maintenance and construction. Existing or priviously used sites would be favored. Sand and gravel disposal would be excluded in intensively managed forestry areas, threatened and endangered plant and wildlife habitats, riparian or fisheries areas, sensitive watershed areas, water bird habitats, and special recreation management areas. Site-specific restrictions could be required to protect other resource values. These would be addressed prior to any mineral disposal.

Paleontological Resources

Fossils of scientific interest would be protected through limited management. Types of fossils and possible locations are identified in the Geology section of Chapter 2. Sites determined to be of significant value to programs such as the Colorado Natural Areas program would be considered for special area designation (research natural area, area of critical environmental concern (ACEC), etc.).

Water Resources

Surface Water

All streams on public lands in the resource area that met or exceeded state water quality standards (refer to Tables 3-11 and 3-13) and had acceptable channel stability would be maintained in their present condition through limited management. Streams not meeting state standards or having unstable channels would be improved to meet minimum standards through intensive management.

Groundwater

Groundwater would be protected to maintain its present good quality. This would be achieved by placing restrictions on activities that may penetrate into subterranean water. Toxins and other impurities would not be allowed to flow or leach into groundwater aquifers.

Sensitive Watersheds

Sensitive watersheds would be protected by placing restrictions on activities that may adversely affect them. Improvements to sensitive watersheds would be accomplished through intensive management practices initiated by other resource programs, such as range or forest management.

Livestock Grazing

Range forage would be allocated to optimize both livestock production and big game populations where feasible. In grazing allotments where optimizing for both was not possible, livestock production would be favored, while providing sufficient forage to support present (1980) big game populations. The initial forage allocations would be as follows:

Livestock: 39,726 AUMs.

Big game (Rocky Mountain elk, mule deer and pronghorn antelope): 86,159 AUMs.

In addition to forage allocation, all grazing allotments would be intensively managed. Intensive management is defined here as selecting or classifying grazing allotments for management under one of three levels. (Refer to the Management Categories section of this chapter for a complete description.) The number of allotments within each level of management would be:

Management Level	Number of Allotments
1 (Maintain)	20-(Satisfactory Forage Condition)
2 (Improve)	76-(Unsatisfactory Forage Condition)
3 (Custodial)	215-(Small, Unconsolidated Allotments or Allotments Given Priority for Other Land Uses)

The 76 allotments that would be in Management Level 2 fall within the range priority use zones identified on the Preferred Alternative Map. These allotments comprise approximately 180,585 acres (or 51 percent of the public land under permit) and have been targeted to receive priority for increased management to improve forage production and condition. The overall effects of increased management would be a long-term increase in forage production to a level of 53,535 AUMs, with approximately 70 percent of the permitted public lands being brought into satisfactory condition. Other land uses could occur in these priority areas as long as they were compatible with the range management objectives outlined in the Management Categories section of this chapter.

Forest Products

Intensive forest management would be applied to economically accessible, productive commercial forest lands that would be suitable for producing a variety of forest products on a sustained yield basis. Estimated forest acreage under intensive management would be 40,000 acres. The remaining forest lands would have limited management to maintain and protect the forest environment (60,000 acres).

The annual allowable cut for the resource area would be about the same as the present 4 to 5 million board feet. The exact allowable cut would be determined in 1987, using the new timber products and operations inventories. All the intensively managed forest lands are shown as priority areas on the Preferred Alternative Map.

Wildlife

Aquatic Wildlife

Streams with existing fisheries or fisheries potential that have a significant portion of public lands would be intensively managed to provide more opportunities for recreational fishing. Approximately 53 miles of stream habitat are included in this category. All other fisheries habitats would have limited management to protect or maintain their present condition.

Terrestrial Wildlife

Wildlife habitat would be managed for optimum wildlife population levels as determined by the Colorado Division of Wildlife's Strategic Plan when conflicts with livestock did not exist. Population levels supported by public lands would be an estimated 10,528 deer, 3,224 elk, and 663 pronghorn. Emphasis would be placed on intensively managing critical and important wildlife habitats, with limited management on the rest of the areas. Included in the critical and important categories are 326,000 acres of upland, 3 miles of riparian, and 3,000 acres of wetland habitat. Areas where wildlife would have priority are shown on the alternative maps.

Threatened and Endangered Species

All threatened and endangered (T&E) plant and animal habitats would be protected as required. Uses or activities that endanger them would be excluded from the areas. The protection areas identified on the Renewable Resources Alternative Map include the known T&E species habitats. Sites determined to be significant to programs such as the Colorado Natural Areas Program would be considered for special area designation (e.g., research natural areas, ACECs, etc.).

Under this alternative, the registered *Phacelia formosula* site would be designated as an ACEC and maintained for the primary purpose of scientific study and education, since this area harbors an endangered species. Approximately 300 acres would be so designated.

Visual Resources

Visual quality would be managed at the existing limited management level for sensitive Class II areas (those areas seen from major travel routes and adjacent to the intensively managed recreation area).

Recreation

The upper Colorado River (approximately 6,060 acres) and the North Sand Hills (roughly 1,400 acres) would continue to be managed as special recreation management areas (SRMAs). The upper

Colorado River between Gore Canyon and State Bridge would be managed to provide and maintain floatboating opportunities and associated activities in a roaded natural setting. The proposed Azure Project would be compatible with the objectives of this alternative, provided the floatboating opportunities were maintained below the project area, including Little Gore Canyon. The North Sand Hills would be managed to protect the cultural resources and the dune environment while allowing ORV use in a roaded natural setting. The existing mineral withdrawal on the North Sand Hills would be retained, but the Natural Area designation would be changed to SRMA.

The remaining public lands in the resource area would receive limited management for dispersed recreation uses, such as hunting, hiking, and sightseeing.

Wilderness

The Troublesome Wilderness Study Area (WSA) would be recommended as not suitable for wilderness designation. The primary reason it has been considered for wilderness designation is that it is a block of public land in an essentially undisturbed condition. When compared with other existing and potential wilderness areas in the region, the Troublesome has a very similar ecosystem and provides similar opportunities for solitude and primitive, unconfined recreation.

The area lacks any geologic, ecological, educational, scenic, or historical features significant enough to recommend their protection by wilderness designation. Because it is a relatively small area and other larger areas are abundant in the region, the Troublesome WSA is not a significant potential addition to the National Wilderness Preservation System on a regional, state, or national basis. It would not significantly expand wilderness opportunities within a day's driving time of major population centers and would not add balance to the geographic distribution of wilderness areas.

Since the adjoining national forest lands are not under wilderness management, the Troublesome WSA would not afford protection to an entire watershed or ecosystem, nor would it provide opportunities for a sustained wilderness experience. There are no significant multiple resource values, such as watershed, wildlife habitat, or archaeological sites, that would depend on wilderness preservation for their protection.

Finally, the nonwilderness management of adjoining national forest lands, especially those upstream, and the private inholding within the Troublesome WSA would not presently adversely affect the Bureaus ability to manage the area as wilderness; however, such management is subject to change.

The Troublesome WSA would be managed under the Bureau's interim management policies for wilderness study areas until Congress makes a decision whether or not to designate it as wilderness. If Congress accepts the view presented here, that the Troublesome WSA is unsuitable, then the area would be managed for multiple use, with emphasis on livestock grazing and intensive forest management in the western portion of the area.

Cultural Resources

The Windy Gap Site area (700 acres) north of Granby, Colorado, and sites in the North Sand Hills (10 acres) are the only cultural areas currently identified as priority areas for intensive management in this alternative. Two other sites containing about 80 acres might be intensively managed. A total of 8,000 acres have been identified for potential inventory; six new National Register sites could result. The remaining cultural resource sites would be placed under limited management.

Lands and Realty

The lands and realty program would evaluate and process all use authorization applications, giving priority to those that enhanced or were consistent with the goals of this alternative. In order to provide better overall land management, a program of ownership consolidation would be supported. Criteria for locating major linear rights-of-way would also be established.

Use Authorizations

Applications for use authorizations for small-scale, low impact actions would be processed and approved if:

1. Applications met the requirements under the law.
2. Placement on or use of public lands was the most suitable economically and environmentally.
3. Actions supported private or governmental needs on a local or regional basis.

Applications for use authorizations for major realty actions, such as dams, reservoirs, highways, transmission lines, etc., would be processed and

approved if they met the three requirements for small-scale actions and did not adversely impact or conflict with existing uses or management of renewable resources.

Ownership Consolidation

The Bureau would process, initiate, and favor action for consolidation of ownership where overall land management would be improved. This could include boundary adjustments between state and Federal agencies; blocking of land patterns, including private, state, public, and other Federal lands; and resolution of split mineral estates. No acreage limitations would be placed on such actions.

Land considered for acquisition would include:

1. Inholdings of private, state, or other Federal land within large blocks of public lands

2. Land adjacent to intensively managed tracts of public land where overall program management would be enhanced, such as lands adjacent to special recreation management areas, intensively managed forest sites, grazing allotments, or important mineral areas

3. Lands of mineral importance where the Federal minerals are overlain by state or private surface ownerships

Public lands considered suitable for disposal, some of which may be considered for sale under the Asset Management Program, would be:

1. Tracts in the Grand Lake, Granby, and Fraser areas that would support or enhance their recreational and tourism based economy

2. Inholdings within large blocks of state or other Federal lands

3. Public lands adjacent to large blocks of state or other Federal lands that would be best managed by that agency

4. Public lands overlying other mineral estates (state minerals, public surface)

5. Isolated tracts that:

a. Have no important wildlife habitat values (winter range, nesting areas, mating areas, etc.)

b. Are not within a sensitive watershed or riparian area

c. Are in areas where Bureau initiated range management opportunities are limited because of size, isolation, and site potential

d. Are land where Bureau initiated forest management opportunities are limited because of tract size, access difficulties, or adverse sites

e. Have no resource values of major significance

f. Potentially, 16,897 acres of public land would be suitable for disposal under this alternative

Major Linear Rights-of-Way

The placement of major linear rights-of-way, such as highways, pipelines, and transmission lines, would be dependent on meeting the following location criteria:

1. Concentrate linear facilities within or contiguous to existing corridors where possible.

2. Avoid locations that would take intensive management forest land out of production.

3. Avoid locations that would cause harassment to livestock or wildlife concentration areas.

4. Avoid steep topography, poor soils, or other fragile areas, such as T&E habitats.

5. Avoid cultural sites that are on or eligible for the National Register of Historic Places.

Community Expansion

Areas near or adjacent to the towns of Kremmling or Granby have been identified for community expansion. These lands would be available through lease, grant or patent to meet the development needs of these communities.
Benefit Alternative)

Support Needs

In order to achieve the management objectives stated in this alternative, numerous support actions would be needed. This support would come both from within and outside the Bureau.

Realty Actions

Existing withdrawals that no longer fulfilled the purpose for which they were intended would be revoked so these lands could be opened to multiple use management.

Access would be acquired to intensive management areas that presently lack suitable access,

such as intensive management forested areas, and SRMAs.

Transportation and Access

The present transportation system is adequate to accomplish the management goals of this alternative, with the exception of those areas identified below which would require access in order to be intensively managed. Following the RMP, a transportation plan and map would be developed that would identify roads to remain open; roads to be closed; maintenance and improvement standards; available access; off-road designation; and coordination with local, state, and Federal agencies' road programs.

In order to fulfill the management goals of this alternative, the following types of lands would require access:

Type of Public Land Needing Access	Approximate No. of Acres	Major Areas in this Type
1. Intensive management forest lands	15	Troublesome - East & West, Canyon Creek, Drowsy Waters
2. Special recreation management areas (SRMAs)	1	North Sand Hills
3. Large blocks of public lands with expressed public interest for access.	1	McFarlane Reservoir

Resource Protection

Increased Bureau monitoring of uses and activities would be required. Cooperative agreements would be developed with local law enforcement agencies to provide needed patrols, surveillance, and law enforcement.

Cadastral

Surveys would be required in areas presently lacking adequate boundary surveys and controls of public lands. Priority would be given to those areas most likely to experience development, such as energy areas, forest management areas, areas scheduled for exchange, and areas of expanding human development (adjacent to towns or resorts).

Water Rights

The Bureau would file for water rights on those waters necessary to achieve the objective of this alternative, such as springs and well waters for livestock and wildlife.

Fire

Fire protection would be provided to most of the public lands in the resource area. Priority for initial attack would be those areas or resources of high value that may be damaged by or lost to fire, such as townsites, personal property, historic structures, forested areas, recreational sites, and critical habitats. Areas may be identified where fire would be allowed to burn to achieve management objectives. These areas would be identified site specifically in management prescriptions and would require fewer, if any, suppression efforts.

Fire Management

Fire may be used as a tool to achieve resource management objectives, such as vegetation manipulation, site preparation, and control of insects and disease. Specific treatment areas would be identified in subsequent activity plans.

Off-Road Vehicles (ORVs)

All public lands would be designated as open, limited, or closed to ORV use (as shown on the map for this alternative). Information and supervision would be provided for limited and closed areas.

Designations would be based on protecting public lands resources (e.g., soil, watershed, vegetation, and wildlife) and minimizing conflicts among various uses of the public lands. Designations would be made in accordance with the criteria set forth in 43 CFR Part 8340. Under this alternative, 10 percent of the public lands in the resource area would be subject to restrictions, with the remaining 90 percent being open (i.e., not subject to restrictions). See the alternative map and Appendix 4 for a description of these designations.

Should the Kremmling Area Manager and Craig District Manager determine that ORVs are causing or would cause considerable adverse effects on public lands resources, they would use their authority under 43 CFR 8341.2 to immediately close or restrict ORV use in the affected area.

Outside Coordination Needs

BLM would coordinate timber harvesting and forest development projects with the U.S. Forest Service, Colorado State Forest Service, and adjacent private landowners for possible timing of joint sales or projects. Transportation plans would be coordinated with the county, the U.S. Forest Service and the State of Colorado. BLM would also consult and coordinate with each livestock permittee regarding forage allocations and potential grazing management systems.

ENERGY AND MINERALS ALTERNATIVE

The Energy and Minerals Alternative would emphasize the exploration for and development and transportation of energy, energy minerals, and critical multiple use management would be directed toward providing timely Bureau actions and support necessary to help meet national needs for energy, critical minerals, and energy self-sufficiency.

Individual resources would be managed in the following ways.

Locatable Minerals

All Federal lands would remain open to entry under provisions of the Mining Law of 1872, as amended, except those lands under protective withdrawal. Areas having the greatest potential for possible development and identified as priority use areas on the Energy and Minerals Alternative Map would be committed to the exploration and development of locatable minerals. Limited reductions necessary to protect environmental values and maintain minimum standards would be applied to surface uses of the priority areas.

The remaining Federal lands not identified as priority areas could have additional limitations placed on surface use in order to protect resources having potential for energy development. Where no significant mineral potential was identified, surface use could also be restricted.

Coal

All Federal coal lands in the McCallum Known Recoverable Coal Resource Area (KRCRA), plus those lands in T9N, R78W outside the KRCRA boundary and west of the Canadian River (identified by industry), would be suitable for future consideration for coal leasing (approximately 60,000 acres). Those lands in the KRCRA that have been identified as priority areas for oil and gas development (refer to Energy and Minerals Alternative Map) and those lands identified as unsuitable for surface mining after application of the coal unsuitability criteria would be excluded from coal leasing considerations. Preference Right Lease Application (PRLA) C-0125854 would be processed and coal leasing would continue as needed to support existing operating mines. Site-specific restrictions may be imposed to protect the environment or other critical resource values. Restrictions would become part of the lease or approved mine plan.

This alternative offers sufficient acreage for coal leasing considerations to allow for expansion of the coal industry in Jackson County.

Oil and Gas

All Federal lands in the resource area would remain open to oil and gas leasing. Those areas having the greatest potential for development and identified as priority use areas on the Energy and Minerals Alternative Map would be committed to the exploration and development of oil and gas resources. The standard lease stipulations would be applied to these areas.

On remaining Federal lands not identified as priority areas but open to leasing, additional stipulations could be required to protect resources identified as having a greater potential for contributing to the economic benefit of the resource area. However, this alternative places the greatest emphasis on the exploration for, and development of, oil and gas.

Mineral Materials

Federal lands would provide mineral materials to meet demands of the energy and minerals industry not filled by private enterprise and would provide free materials to local, state, and Federal agencies for road maintenance and construction. Existing or previously used sites would be favored. Sand and gravel disposal would be excluded from threatened and endangered plant and wildlife habitats, riparian or fisheries areas, sensitive watershed areas, and water bird habitats. Site-specific restrictions may be required to protect other resource values. They would be addressed prior to any mineral disposal.

Paleontological Resources

Fossils of scientific interest would be protected through limited management. Types of fossils and possible locations are identified in the Geology section of Chapter 2.

Water Resources

Surface Water

All streams on public lands in the resource area that met or exceeded state water quality standards and had acceptable channel stability would be maintained in their present condition through limited management.

Streams not meeting state standards or having unstable channels would be improved to meet minimum standards through intensive management.

Groundwater

Groundwater would be protected to maintain its present good quality. This would be achieved by placing restrictions on activities thay may penetrate into subterranean water. Toxins and other impurities would not be allowed to flow or leach into groundwater aquifers.

Sensitive Watersheds

Sensitive watersheds would be protected by placing restrictions on activities that may adversely affect them. Improvements to sensitive watersheds would be accomplished through intensive watershed management practices.

Livestock Grazing

Forage would be allocated to optimize livestock production while maintaining sufficient forage to sustain big game populations at or near their present (1980) levels. Forage would be initially allocated as follows:

Livestock: 39,726 AUMs

Big game (Rocky Mountain elk, mule deer, and pronghorn antelope): 64,584 AUMs.

Four grazing allotments would continue to be managed under existing allotment management plans (AMPs), these being allotments 7568, 7031, 7250, and 7252. These allotments cover approximately four percent (14,120 acres) of the public lands and account for 1,621 total AUMs (as adjusted from the range condition inventory/monitoring studies). The construction and maintenance of range improvements would continue as a priority to meet the range, wildlife, and watershed objectives outlined in the AMPs. Monitoring studies would also continue as a priority in evaluating the effectiveness of the plans.

In addition to the management on existing AMPs, other opportunities for consolidating management with other agencies would be developed as opportunities arose. This could include, for example, BLM, the Colorado State Land Board, U.S. Forest Service, and private lands being consolidated under a comprehensive ranch plan designed with the assistance of the Soil Conservation Service.

The remaining 307 grazing allotments in the resource area would remain under nonintensive management, licensed under the constraints of existing individual term permits and leases. Requested changes in permits, such as changes in season of use or class of livestock and adjustments in percent Federal range, would be considered on an individual basis. Maintenance of range improvement projects would be given a high priority and enforced under the guidelines of the Bureau's Rangeland Improvement Maintenance Policy. The construction of new range improvement projects would be authorized on a case-by-case basis, with priority given to those that would enhance grazing distribution.

New projects would continue to be authorized in the following order of priority:

1. Water developments
2. Allotment boundary fencing
3. Allotment interior fencing
4. Vegetation manipulations (limited)
5. Other management facilities (corrals, trails, etc.)

Allotment monitoring studies would also receive a high priority in order to further refine the initial allocation levels as interpreted from the 1980 range condition survey. The kinds of monitoring studies conducted on a regular basis would include utilization, climate, and actual use. Allotments containing large tracts of public land would be given first priority for monitoring. These allotments would be further prioritized in the following descending order for evaluation:

1. Allotments receiving forage allocation *reductions*
2. Allotments receiving forage allocation *increases*

3. Allotments receiving neither forage allocation increases or decreases.

Allotments would also be checked for grazing use compliance in the above-described order of priority.

Generally, overall forage production and condition would be expected to decrease over the long term due to the type of management prescribed. The overall affect would be a decrease in forage production from the established level of 39,726 AUMs to a level of 38,184 AUMs.

Forest Products

Intensive forest management would be applied to all productive commercial forest lands (50,000 acres) to produce forest products on a sustained yield basis. Remaining forested lands would be placed under limited management to maintain and protect the forest environment (50,000 acres). The annual allowable cut for the resource area would remain at its current 5 million board feet until the allowable cut is recomputed in 1987.

All the intensively managed forested lands are shown as a priority on the Energy and Minerals Alternative Map.

Wildlife

Aquatic Wildlife

All streams with existing fisheries or fisheries potential and in fair or poor SHIP class would have limited management applied to them to improve their present condition.

Terrestrial Wildlife

Wildlife habitats would be managed to maintain wildlife populations at or near their present (1980) levels. Forage would be allocated for big game based on present population needs. Public lands would continue to support some 7,000 mule deer, 3,175 elk, and 660 antelope. All critical wildlife habitats (identified on inventory information available at the Kremmling Resource Area Office) would be protected. Roughly 225,000 acres of upland habitat and 1,000 acres of wetland habitat would be managed. Priority wildlife areas are portrayed on the Energy and Minerals Alternative Map.

Threatened and Endangered Species

All threatened and endangered (T&E) plant and animal species habitats would be protected as required. Uses or activities that endanger them would be excluded. Protection areas identified on the Energy and Minerals Alternative Map include the known T&E species habitats.

Visual Resources

Visual quality would be managed at the existing limited management level for sensitive Class II areas (those areas seen from the major travel routes and adjacent to the intensively managed recreation areas).

Recreation

The upper Colorado River (approximately 6,060 acres) and the North Sand Hills (roughly 1,400 acres) would continue to be managed as special recreation management areas (SRMAs). The upper Colorado River between Gore Canyon and State Bridge would be managed to provide and maintain floatboating opportunities and associated activities in a roaded natural setting. The proposed Azure Project, especially the hydroelectric aspects, would be compatible with the objectives of this alternative, provided floatboating opportunities were maintained below the project area, including Little Gore Canyon.

The North Sand Hills would be managed to protect cultural resources and the dune environment while allowing ORV use in a roaded natural setting. The existing mineral withdrawal on the North Sand Hills would be retained, but the Natural Area designation would be changed to SRMA.

In addition, approximately 6,000 acres of the upper Troublesome WSA would be designated as an SRMA and managed for primitive and backcountry recreation opportunities. Motorized access would be allowed to enter the western or southwestern portion of the unit, depending on the location of public access.

The remaining public lands in the resource areas would receive limited management for dispersed recreational uses, such as hunting, hiking, and sightseeing.

Wilderness

The Troublesome Wilderness Study Area (WSA) would be recommended as not suitable for wilderness designation. The primary reason it has been considered for wilderness designation is that it is a block of public land in an essentially undisturbed condition. When compared with other existing and potential wilderness areas in the region, the Troublesome WSA has a very similar ecosystem and provides similar opportunities for solitude and primitive, unconfined recreation.

The area lacks any geologic, ecological, educational, scenic, or historical features significant enough to recommend their protection by wilderness designation. Because it is a relatively small area and other larger areas are abundant in the region, the Troublesome WSA would not be a significant potential addition to the National Wilderness Preservation System on a regional, state, or national basis. It would not significantly expand wilderness opportunities within a day's driving time of major population centers, nor would it add balance to the geographic distribution of wilderness areas.

Since the adjoining national forest lands are not under wilderness management, the Troublesome WSA would neither afford protection to an entire watershed or ecosystem, nor would it provide opportunities for a sustained wilderness experience. There are no significant multiple resource values, such as watershed, wildlife habitat, or archaeological sites, that would depend on wilderness preservation for their protection.

Finally, the nonwilderness management of adjoining national forest lands, especially those upstream, and the private inholding within the Troublesome WSA would not presently adversely affect the Bureaus ability to manage the area as wilderness; however, such management is subject to change.

The Troublesome WSA will be managed under the Bureau's interim management policies for wilderness study areas until Congress decides whether or not to designate it as wilderness. If Congress accepts the nonsuitable recommendation presented here, then the area would be managed for multiple use, with emphasis on recreation (see Recreation section above) and intensive forestry management in the western and southern portions.

Cultural Resources

Known cultural resource sites would be protected from damage or loss through limits or restrictions placed on surface disturbing activities. The Windy Gap site north of Granby, Colorado, and sites in the North Sand Hills (10 acres) are the only cultural areas identified as priority areas for intensive management in this alternative. Four other sites containing roughly 1,000 acres may be intensively managed. A total of 4,000 acres may be inventoried, with the possibility that three new National Register sites could be added. Remaining sites would be placed under limited management.

Lands and Realty

The lands and realty program would evaluate and process all use authorization applications, giving priority to those that encouraged, facilitated, or supported energy and mineral exploration, development, and transportation.

In order to provide better overall land management, a program of ownership consolidation would be supported. Criteria for locating major linear rights-of-way would also be established.

Use Authorizations

Applications for use authorizations for small-scale, low impact actions would be processed and approved if:

1. Applications met the requirements under the law.
2. Placement on or use of public lands was the most suitable economically and environmentally.
3. Applications supported private or governmental needs on a local or regional basis.

Applications for use authorizations for major realty actions, such as dams, reservoirs, highways, transmission lines, etc., would be processed and approved if they met the three requirements for small-scale actions and either supported the objectives of this alternative or did not conflict with the development or transportation of important energy or mineral resources.

Ownership Consolidation

The Bureau would process, initiate, and favor action for the consolidation of ownership where overall land management would be improved. This could include boundary adjustments between state and Federal agencies; blocking of land patterns, including private, state, public, and other Federal lands; and resolution of split mineral estates. No

acreage limitations would be placed on such actions.

Lands considered for acquisition would include:

1. Inholdings of private, state, or other Federal land within large blocks of public lands

2. Land adjacent to intensively managed tracts of public land where overall program management would be enhanced, such as lands adjacent to special recreation management areas, intensively managed forest sites, grazing allotments, or important mineral areas

3. Lands of mineral importance where the Federal minerals are overlain by state or private surface ownerships

Public lands considered suitable for disposal, some of which may be considered for sale under the Asset Management Program, would include isolated tracts that:

1. Have no mineral values

2. Have no resource values of major significance (T&E species, National Historic Register sites)

3. Are not necessary to support the production and transportation of energy and minerals (key access or right-of-way points)

Also considered for disposal would be:

1. Inholdings within large blocks of state or other Federal lands

2. Public lands adjacent to large blocks of state or other Federal lands that would be best managed by that agency

3. Public lands overlying other mineral estates (state minerals, public surface)

4. Lands necessary to support growth associated with mineral development (community expansion, etc.)

5. Potentially, 9,225 acres of public land would be suitable for disposal under this alternative

Major Linear Rights-of-way

The placement of major linear rights-of-way, such as highways, pipelines, and transmission lines, would be dependent on meeting several location criteria. The Bureau would encourage the location of linear facilities to best meet the needs of efficient development and transportation of energy and mineral resources while meeting required environmental safeguards. Linear facilities would be located within or contiguous to existing corridors where possible. Steep topography, poor soils, or other fragile areas, such as T&E habitats, would be avoided.

Support Needs

In order to achieve the management objectives stated in this alternative, numerous support actions would be needed. This support would come both from within and outside the Bureau.

Realty Actions

Existing withdrawals that no longer fulfilled the purpose for which they were intended would be revoked so lands could be opened to multiple use management.

Access would be acquired to intensive management areas that presently lack suitable access, such as intensively managed forested areas and SRMAs.

Transportation and Access

The present transportation system is adequate to accomplish the management goals of this alternative, with the exception of those areas identified below which would require access in order to be intensively managed. Following the RMP, a transportation plan and maps would be developed that would identify roads to remain open; roads to be closed; maintenance and improvement standards; available access; off-road designation; and coordination with local, state, and Federal agencies' road programs.

In order to fulfill the management goals of this alternative, the following types of lands would require access:

Type of Public Land Needing Access	Approximate No. of Acres	Major Areas in this Type
1. Intensive management forest lands	45	Canyon Creek, Sheep Mountain, South Bull Mountain, Drowsy Waters, Numerous Small Tracts
2. Special recreation management areas (SRMAs)	2	Troublesome, North Sand Hills
3. Large blocks of public lands with expressed public interest for access	0	

Cadastral

Surveys would be required in areas presently lacking adequate boundary surveys and controls of public lands. Priority would be given to those areas most likely to experience development, such as energy areas, forest management areas, areas scheduled for exchange, and areas of expanding human development (adjacent to towns or resorts).

Water Rights

The Bureau would file for water rights on those waters necessary to achieve the objectives of this alternative, such as springs and well waters for livestock and wildlife, and other water uses necessary to achieve management objectives.

Fire

Fire protection would be provided to most of the public lands in the resource area. Priority for initial attack would be those areas or resources of high value that may be damaged by or lost to fire, such as townsites, personal property, historic structures, forested areas, recreational sites, and critical habitats. Areas may be identified where fire would be allowed to burn to achieve management objectives. These areas would be identified site specifically in management prescriptions and would require fewer, if any, suppression efforts.

Off-Road Vehicles (ORVs)

All public lands would be designated as open, limited, or closed to ORV use (as shown on the map for this alternative). Information and supervision would be provided in limited and closed areas.

Designations would be based on protecting public lands resources (e.g., soil, watershed, vegetation, and wildlife), promoting safety for all users of public lands, and minimizing conflicts among various uses of the public lands. Designation would be made in accordance with the criteria set forth in 43 CFR Part 8340. Under this alternative, five percent of the public lands in the resource area would be subject to limitations, while the remaining 95 percent would remain open (i.e., not subject to restrictions).

Should the Kremmling Resource Area Manager and Craig District Manager determine that ORVs are causing or would cause considerable adverse effects on public lands resources, they would use their authority under 43 CFR 8341.2 to immediately close or restrict ORV use in the affected area.

Outside Coordination Needs

BLM would coordinate timber harvesting and forest development projects with the U.S. Forest Service, Colorado State Forest Service, and adjacent private landowners for possible timing of joint sales or projects. Transportation plans would be coordinated with the county, U.S. Forest Service, and State of Colorado. BLM would also consult and coordinate with each livestock permittee regarding forage allocations.

Minerals Management Services would provide technical support to pre- and post- mineral lease action. The Bureau would coordinate all surface mining with the Colorado Mine Land Reclamation Board and surface coal mining with the U.S. Office of Surface Mining.

ECONOMIC BENEFIT ALTERNATIVE

The Economic Benefit Alternative would emphasize providing economic benefits to the local and regional economy. Multiple use management would be directed toward the production of goods and services on the public lands within the Kremmling Resource Area to meet expected local and regional demands. Those resources whose use and development best contributed to the employment and income of local residents and that benefited both local and regional economies would be emphasized. Economic diversification would be encouraged and opportunities for local and regional economic expansion would be provided.

Individual resources would be managed or affected in the following ways.

Locatable Minerals

All Federal lands in the planning area would remain open to entry under provisions of the Mining Law of 1872 as amended, except those lands under protective withdrawal. Lands under protective withdrawal would be excluded from mineral entry. Development and certain types of exploration could have site-specific or temporary restrictions imposed to protect other important resource values.

Coal

This alternative offers the greatest amount of acreage (roughly 107,000 acres) for consideration for future coal leasing and the greatest potential for expansion of the coal industry in Jackson County. All Federal coal lands (refer to Economic Benefit Alternative Map) in the McCallum Known Recoverable Coal Resource Area (KRCRA), plus those lands in T9N, R78W outside of the KRCRA boundary and west of the Canadian River (identified by coal industry), would be suitable for future consideration for coal leasing. Only those lands identified as unsuitable for surface mining after application of the coal unsuitability criteria (report on file in the Kremmling Resource Area Office) would be excluded from future coal leasing considerations.

Preference Right Lease Application (PRLA) C-0125854 would be processed and emergency coal leasing would continue as needed to support existing operating mines. Site-specific restrictions may be imposed to protect the environment or other critical resource values. These restrictions would become part of the lease or approved mine plan.

Oil and Gas

All Federal lands in the resource area would remain open to oil and gas leasing. Those areas having the greatest potential for development and identifed as priority use areas on the Economic Benefit Alternative Map would be committed to the exploration and development of oil and gas resources. The standard lease stipulations would be applied to these areas.

On remaining Federal lands not identified as priority areas but open to leasing, additional stipulations could be required to protect resources identified as having a greater potential for contributing to the economic benefit of the resource area.

Mineral Materials

Federal lands would provide mineral materials to meet demands not filled by private enterprise and would provide free materials to local, state, and Federal agencies for road maintenance and construction. Existing or previously used sites would be favored. Sand and gravel disposal would be excluded from intensively managed forestry areas, threatened and endangered plant and wildlife habitats, riparian or fisheries areas, sensitive watershed areas, water bird habitats, and special recreation management areas. Site-specific restrictions may be required to protect other resource values. They would be addressed prior to any mineral disposal.

Paleontological Resources

Fossils of scientific interest would be protected through limited management. Types of fossils and possible locations are identified in the Geology section of Chapter 2.

Water Resources

Surface Water

All streams on public lands in the resource area that met or exceeded state water quality standards and had acceptable channel stability would be maintained in their present condition through limited management.

Streams not meeting state standards or having unstable channels would be improved to meet minimum standards through intensive management.

Groundwater

Groundwater would be protected to maintain its present good quality. This would be achieved by placing restrictions on activities that may penetrate into subterranean water. Toxins and other impurities would not be allowed to flow or leach into groundwater acquifers.

Sensitive Watersheds

Sensitive watersheds would be protected by placing restrictions on activities that may adversely affect them. Improvements to sensitive watersheds would be accomplished through intensive management practices initiated by other resource programs, such as range or forest management.

Livestock Grazing

Forage would be allocated to optimize livestock production while maintaining a balance necessary to sustain big game populations at or near their present (1980) levels. The initial forage allocations would be as follows:

Livestock: 39,726 AUMs.

Big game (Rocky Mountain elk, mule deer and pronghorn antelope): 64,584 AUMs.

In addition to forage allocation, all grazing allotments would be intensively managed. Intensive management is defined here as selecting or classifying grazing allotments for management under one of three levels. (Refer to the Management Categories section in this chapter for a complete description of the management levels.) The number of allotments occurring within each level of management would be:

Level	Number of Allotments
1 (Maintain)	11-(Satisfactory Forage Condition)
2 (Improve)	63-(Unsatisfactory Forage Condition)
3 (Custodial)	237-(Small, Unconsolidated Allotments or Allotments Given Priority for Other Land Uses)

The 63 allotments that would be in Management Level 2 fall within the range priority use zones identified on the Economic Benefit Alternative Map. These allotments comprise approximately 160,038 acres (or 45 percent of the public land under permit) and have been targeted to receive priority for increased management in order to improve forage production and condition. Under this alternative, the overall effects of increased management would result in a long-term increase in forage production to a level of 51,241 AUMs and bring approximately 65 percent of the permitted public lands into satisfactory condition. Other land uses could occur in these priority areas as long as they were compatible with the range management objectives outlined in the Management Categories section of this chapter.

Forest Products

Intensive forest management would be applied to all productive commercial forest lands (50,000 acres) to produce forest products on a sustained yield basis. The remaining forest lands would be placed under custodial or limited management to maintain and protect the forest environment (50,000 acres). The annual allowable cut for the resource area would remain at its current 4 to 5 million board feet until the cut was recomputed in 1987. Since 10,000 acres of economically inaccessible lands would be considered manageable, the cut would be expected to increase. All the intensively managed forested lands are shown as a priority area on the Economic Benefit Alternative Map.

Wildlife

Aquatic Wildlife

All streams in poor SHIP class and/or declining riparian trend with existing fisheries or fisheries potential on public lands would have limited management applied to them to protect or maintain their present condition. Eight miles of stream and 3 miles of riparian habitat would be included.

Terrestrial Wildlife

Wildlife habitat would be managed to maintain wildlife populations at or near their present (1980) levels. Forage would be allocated for wildlife based on present population needs. Public lands would continue to support an estimated 7,000 mule deer, 3,175 elk, and 663 pronghorn. Intensive management would be applied to 225,000 acres of upland habitat and 1,000 acres of wetland habitat. Priority would be placed on protecting all critical wildlife habitats (identified on inventory information available at the Kremmling Resource Area Office).

Threatened and Endangered Species

All threatened and endangered (T&E) plant and animal species habitats would be protected as required. Uses or activities that endanger them would be excluded. The protection areas identified on the Economic Benefit Alternative Map include known T&E species habitats.

Visual Resources

Visual quality would be managed at the existing limited management level for sensitive Class II areas (those areas seen from the major travel routes and adjacent to the intensively managed recreation area).

Recreation

The Upper Colorado River (roughly 6,060 acres) and the North Sand Hills (approximately 1,400 acres) would continue to be managed as special recreation management areas (SRMAs). The Upper Colorado River between Gore Canyon and State Bridge would be managed to provide and maintain floatboating opportunities and associated activities in a roaded natural setting. The proposed Azure

Project would be compatible with the objectives of this alternative, provided the floatboating opportunities were maintained below the project area, including Little Gore Canyon.

The North Sand Hills would be managed to protect the cultural resources and the dune environment while allowing ORV use in a roaded, natural setting. The existing mineral withdrawal on the North Sand Hills would be retained, but the Natural Area designation would be changed to SRMA.

New SRMAs would be established in the Middle Park area, where intensive management and public investment would be required to maintain, protect, or enhance areas with the potential to meet projected long-term demands. The areas in Middle Park that would be considered for future SRMA designation are Dice Hill (5,200 acres), Strawberry (6,020 acres), Troublesome (6,000 acres), and the Black Mountain-Drowsy Water complex (18,940 acres). Recreation management objectives, while designed to maintain the current type of recreation opportunities, would have to be compatible with the management emphasis on forestry and range.

The remaining public lands in the resource area would receive limited management for dispersed recreational uses, such as hunting, hiking, and sightseeing.

Wilderness

The Troublesome Wilderness Study Area (WSA) would be recommended as not suitable for wilderness designation. The primary reason it has been considered for wilderness designation is that it is a block of public land in an essentially undisturbed condition. When compared with other existing and potential wilderness areas in the region, the Troublesome WSA has a very similar ecosystem and provides similar opportunities for solitude and primitive, unconfined recreation.

The area lacks any geologic, ecological, educational, scenic, or historical features significant enough to recommend their protection by wilderness designation. Because it is a relatively small area and other larger areas are abundant in the region, the Troublesome WSA would not be a significant potential addition to the National Wilderness Preservation System on a regional, state, or national basis. It would not significantly expand wilderness opportunities within a day's driving time of major population centers and would not add balance to the geographic distribution of wilderness areas.

Since the adjoining national forest lands are not under wilderness management, the Troublesome WSA would neither afford protection to an entire watershed or ecosystem, nor would it provide opportunities for a sustained wilderness experience. There are no significant multiple resource values, such as watershed, wildlife habitat, or archaeological sites, that would depend on wilderness preservation for their protection.

Finally, the nonwilderness management of adjoining national forest lands, especially those upstream, and the private inholding within the Troublesome WSA would not presently adversely affect the Bureaus ability to manage the area as wilderness; however, such management is subject to change.

The Troublesome WSA would be managed under the Bureau's interim management policies for wilderness study areas until Congress decided whether or not to designate it as wilderness. If Congress accepted the recommendation of the Troublesome WSA as unsuitable, then the area would be managed for multiple use, with emphasis on intensive forestry management and continued range management for livestock.

Cultural Resources

The Windy Gap Site area (700 acres) north of Granby, Colorado, and sites in the North Sand Hills (10 acres) are the only cultural areas identified as priority areas for intensive management in this alternative. Five other sites containing roughly 1,340 acres may be intensively managed. A total of 4,000 acres may be inventoried, with the possibility of four new National Register sites being added. The remaining cultural resource sites would be placed under limited management.

Lands and Realty

The lands and realty program would evaluate and process all use authorization applications, giving priority to those that enhanced or were consistent with the goals of this alternative. In order to provide better overall land management, a program of ownership consolidation would be supported. Criteria for locating major linear rights-of-way would also be established.

Use Authorizations

Applications for use authorizations for small-scale, low impact actions would be processed and approved if:

1. Applications met the requirements under the law.

2. Placement on or use of public lands was the most suitable economically and environmentally.

3. Applications supported private or governmental needs on a local or regional basis.

Applications for use authorizations for major realty actions, such as dams, reservoirs, highways, transmission lines, etc., would be processed and approved if they met the three requirements for small-scale actions and did not adversely impact or conflict with existing uses of ecomomic importance to the area and region.

Ownership Consolidation

The Bureau would process, initiate, and favor action for the consolidation of ownership where overall land management would be improved. This could include boundary adjustments between state and Federal agencies; blocking of land patterns, including private, state, public and other Federal lands; and resolving split mineral estates. No acreage limitations would be placed on such actions.

Land considered for acquisition would include:

1. Inholdings of private, state, or other Federal land within large blocks of public lands

2. Land adjacent to intensively managed tracts of public land where overall program management would be enhanced, such as lands adjacent to special recreation management areas, intensively managed forest sites, grazing allotments, or important mineral areas

3. Lands of mineral importance where the Federal minerals are overlain by state or private surface ownerships

Public lands considered suitable for disposal, some of which may be considered for sale under the Asset Management Program, would include isolated tracts that:

1. Have no potential for reasonable access

2. Have potential to support recreational or tourism needs in East Grand County

3. Have no resource value of major significance

Also considered for disposal would be:

1. Inholdings within large blocks of state or other Federal lands

2. Public lands adjacent to large blocks of state or other Federal lands that would be best managed by that agency

3. Public lands overlying other mineral estates (state minerals, public surface)

4. Lands necessary to support growth associated with mineral development (community expansion, etc.)

5. Potentially, 16,896 acres of public land would be suitable for disposal under this alternative

Major Linear Rights-of-Way

The placement of major linear rights-of-way, such as highways, pipelines, and transmission lines, would be dependent on meeting several location criteria. The Bureau would encourage the location of linear facilities that would result in minimal cost to the applicant and maximum revenue returned. Linear facilities would be located within or contiguous to existing corridors where possible. Steep topography, poor soils, or other fragile areas, such as T&E habitats, would be avoided. The Bureau would seek to avoid placement of facilities that would detract from economic growth of a particular revenue-producing resource (such as an intensive forest management area or special recreation management area). Finally, applicants would be asked to avoid cultural sites that are on or eligible for the National Register of Historic Places.

Community Expansion

Areas near or adjacent to the towns of Kremmling and Granby have been identified for community expansion. These lands would be available through lease, grant, or patent to meet the development needs of these communities.

Support Needs

In order to achieve the management objectives stated in this alternative, numerous support actions would be needed. This support would come both from within and outside the Bureau.

Realty Actions

Existing withdrawals that no longer fulfilled the purpose for which they were intended would be revoked so these lands could be opened to multiple use management; this procedure would apply to natural areas as well as others.

Access would be acquired to intensive management areas that presently lack suitable access,

such as intensively managed forested areas and special recreation management areas.

Transportation and Access

The present transportation system is adequate to accomplish the management goals of this alternative, with the exception of those areas identified below which would require access in order to be intensively managed. Following the RMP, a transportation plan and map would be developed that would identify roads to remain open; roads to be closed; maintenance and improvement standards; available access; off-road designation; and coordination with local, state, and Federal agencies' road programs.

In order to fulfill the management goals of this alternative, the following types of lands would require access:

Type of Public Land Needing Access	Approximate No. of Acres	Major Areas in this Type
1. Intensive management Forest Lands	45	Troublesome, Sheep Mountain, South Bull Mountain, Canyon Creek, Numerous Small Tracts
2. Special recreation management areas (SRMAs)	2	North Sand Hills, Drowsy Waters
3. Large blocks of public lands with expressed public interest for access	1	McFarlane Reservoir

Cadastral

Surveys would be required in areas presently lacking adequate boundary surveys and controls of public lands. Priority would be given to those areas most likely to experience development, such as energy areas, forest management areas, and areas of expanding human development (adjacent to towns or re sorts).

Water Rights

The Bureau would file for water rights on those waters necessary to achieve the objective of this alternative, such as springs and well waters for livestock, wildlife, or mineral development.

Fire

Fire protection would be provided to most of the public lands in the resource area. Priority for initial attack would be those areas or resources of high value that may be damaged by or lost to fire, such as townsites, personal property, historic structures, forested areas, recreational sites, and critical habitats. Areas may be identified where fire would be allowed to burn to achieve management objectives. These areas would be identified site specifically in management prescriptions and would require fewer, if any, suppression efforts.

Fire Management

Fire may be used as a tool to achieve resource management objectives, such as vegetation manipulation, site preparation, and control of insects and disease.

Off-Road Vehicles (ORVs)

All public lands would be designated as open, limited, or closed to ORV use (as shown on the map for this alternative). Information and supervision would be provided in limited and closed areas. Designations would be based on protecting the resources on public lands (e.g., soil, watershed, vegetation, and wildlife) and minimizing conflicts among various uses of the public lands. Designations would be made in accordance with the criteria set forth in 43 CFR Part 8340. Under this alternative, 10 percent of the public lands in the Kremmling Resource Area would be subject to limitations; the remaining 90 percent would remain open (i.e., not subject to restrictions). See the alternative map and Appendix 4 for a description of these designations.

Should the Kremmling Area Manager and Craig District Manager determine that ORVs are causing or would cause considerable adverse effects on other resources, they would use their authority under 43 CFR 8341.2 to immediately close or restrict ORV use in the affected area.

Outside Coordination Needs

BLM would coordinate timber harvesting and forest development projects with the U.S. Forest Service, Colorado State Forest Service, and adjacent private landowners for possible timing of joint sales or projects. Transportation plans would be coordinated with the county, the U.S. Forest Service, and the State of Colorado. BLM would also consult and coordinate with each livestock permit-

tee regarding forage allocations and potential grazing management systems.

RENEWABLE RESOURCES ALTERNATIVE

This alternative would emphasize the multiple use management of renewable resources on a sustained yield basis to meet local, regional, and national needs. The renewable resources which traditionally support the local economy would be favored. Although all renewable resources are favored, nonrenewable resource uses would be continued to sustain existing industry's demands. This alternative would come closest to present management since traditional uses of resources would continue; the most important change would be in the level of intensive management.

Individual resources or resource programs would be managed or affected in the following ways:

Locatable Minerals

All Federal lands in the planning area would remain open to entry under provisions of the Mining Law of 1872, as amended, except that mineral entry would be excluded from lands under protective withdrawal. Development and certain types of exploration may have site-specific or temporary restrictions imposed to protect other important resource values.

Coal

Emphasis on leasing Federal coal would continue as needed to support existing operating mines. Approximately 13,000 acres would be made available for leasing. Site-specific reductions would be imposed to protect the environment or other critical resource values. These reductions would become part of the lease on approved mine plans. Preference Right Lease Application (PRLA) C-0125854 would be processed.

Those lands identified as unsuitable for surface mining after application of the unsuitability criteria and those lands identified as priority areas for wildlife, livestock grazing, or oil and gas within the known recoverable coal resource area (KRCRA) would be excluded from future coal leasing consideration.

Oil and Gas

All Federal lands would remain open to oil and gas leasing except for lands withdrawn to protect a resource, such as areas of critical environmental concern (ACECs), recreation sites, etc. These lands would be excluded from oil and gas leasing unless they were already encumbered by leases. Site- specific restrictions to protect other resources would be imposed prior to leasing or exploration where another resource was shown as having a higher priority. Where oil and gas was shown as having priority, standard lease stipulations would apply. Priority areas are shown on the alternative map.

Mineral Materials

Federal lands would provide mineral materials to meet demands not filled by private enterprise and would provide free materials to local, state, and Federal agencies for road maintenance and construction. Existing or previously used sites would be favored. Sand and gravel disposal would be excluded from intensively managed forestry areas, threatened and endangered plant and wildlife habitats, riparian or fisheries areas, sensitive watershed areas, water bird habitats, and special recreation management areas (SRMAs). Site-specific restrictions may be required to protect other resource values. They would be addressed prior to any mineral disposal.

Paleontological Resources

Fossils of scientific interest would be protected through limited management. Types of fossils and possible locations are identified in the Geology section of Chapter 2. Sites determined to be of significant value to programs such as the Colorado Natural Areas program would be considered for special area designation (e.g., research natural area, ACEC, etc.).

Water Resources

Surface Water

All streams on public lands in the resource area that met or exceeded state water quality standards and had acceptable channel stability would be maintained in their present condition through limited management.

Streams not meeting state standards or having unstable channels would be improved to meet minimum standards through intensive management.

Groundwater

Groundwater would be protected to maintain its present good quality. This would be achieved by placing restrictions on activities that may penetrate into subterranean water. Toxins and other impurities would not be allowed to flow or leach into groundwater aquifers.

Sensitive Watersheds

Sensitive watersheds would be protected by placing restrictions on activities that may adversely affect them. Improvements to sensitive watersheds would be accomplished through intensive management practices initiated by other resource programs, such as range or forest management.

Livestock Grazing

Range forage would be allocated to optimize both livestock production and big game populations where feasible. In grazing allotments where optimizing for both was not possible, livestock production would be favored, while providing sufficient forage to support present (1980) big game populations. The initial forage allocations would be as follows:

Livestock: 39,726 AUMs

Big game (Rocky Mountain elk, mule deer and pronghorn antelope): 86,159 AUMs

In addition to forage allocation, all grazing allotments would be intensively managed. Intensive management is defined here as selecting or classifying grazing allotments for management under one of three levels as follows:

Level	Number of Allotments
1 (Maintain)	20-(Satisfactory Forage Condition)
2 (Improve)	81-(Unsatisfactory Forage Condition)
3 (Custodial)	210-(Small, Unconsolidated Allotments or Allotments Given Priority for Other Land Uses)

The 81 allotments that would be in management level 2 fall within the range priority use zones identified on the Renewable Resources Alternative Map. These allotments comprise approximately 195,946 acres (or 55 percent of the public land under permit) and have been targeted to receive priority for increased management to improve forage production and condition. Under this alternative, the overall effects of increased management would result in a long-term increase in forage production to a level of 55,404 AUMs and bring approximately 75 percent of the permitted public lands into satisfactory condition. Other land uses could occur in these priority areas as long as they were compatible with the range management objectives outlined in the Management Categories section of this chapter.

Forest Products

Intensive forest management would be applied to economically accessible, productive commercial forest lands that were suitable for a variety of forest products on a sustained yield basis. Estimated forest acreage under intensive management would be 40,000 acres. The remaining forest lands would have limited management to maintain and protect the forest environment (60,000 acres). The annual allowable cut for the resource area would be about the same as the present 4 to 5 million board feet, but it could decrease slightly. The exact allowable cut would be determined in 1987, using the new timber production and operation inventories. All the intensively managed forested lands are shown as priority areas on the Renewable Resources Alternative Map.

Wildlife

Aquatic Wildlife

Streams with existing fisheries or fisheries potential that have a significant portion on public lands would be intensively managed to provide more opportunities for recreational fishing. Approximately 53 miles of stream habitat and 3 miles of riparian habitat would be affected. All other fisheries habitats would have limited management to protect or maintain their present condition.

Terrestrial Wildlife

Wildlife habitats would be managed for optimum wildlife levels as determined by the Colorado Division of Wildlife when conflicts with livestock did not exist. An estimated 10,528 mule deer, 3,224 elk, and 663 antelope would be supported by public lands. Emphasis would be placed on intensively managing critical and important wildlife habitats,

with limited management on the remainder of the area. Management would occur on 326,000 acres of upland habitat and 3,000 acres of wetland habitat. Areas where wildlife have priority are shown on the alternative map.

Threatened and Endangered Species

All threatened and endangered (T&E) plant and animal habitats would be protected as required. Uses or activities that endanger them would be excluded. The protection areas identified on the Renewable Resources Alternative Map would include known T&E species habitats. Sites determined to be of significant value to programs such as the Colorado Natural Areas program would be considered for special area designation (e.g., research natural area, ACEC, etc.).

Under this alternative, the registered *Phacelia formosula* site would be designated as an ACEC and managed for the primary purpose of scientific study and education because the land harbors an endangered species. Roughly 300 acres would be designated.

Visual Resources

Visual quality would be managed at the existing limited management level for sensitive Class II areas (those areas seen from major travel routes and adjacent to the intensively managed recreation areas).

Recreation

The existing SRMA on the Upper Colorado River (approximately 6,060 acres) and developed recreation sites (Pumphouse and Sunset fishing site) would continue to be intensively managed. The proposed Azure Project would be compatible with the objectives of this alternative, provided floatboating opportunities were maintained below the project area, including Little Gore Canyon.

Motorized recreational activities in the proposed North Sand Hills ACEC (roughly 1,400 acres) would be limited to locations and types of use that were compatible with the site's cultural and natural values. The existing withdrawal on the North Sand Hills would be retained. These areas are shown on the alternative map.

Wilderness

The Troublesome Wilderness Study Area (WSA) would be recommended as not suitable for wilderness designation. The primary reason it has been considered for wilderness designation is that it is a block of public land in an essentially undisturbed condition. When compared with other existing and potential wilderness areas in the region, the Troublesome WSA has a very similar ecosystem and provides similar opportunities for solitude and primitive, unconfined recreation.

The area lacks any geologic, ecological, educational, scenic, or historical features significant enough to recommend their protection by wilderness designation. Because it is a relatively small area and other larger areas are abundant in the region, the Troublesome WSA is not a significant potential addition to the National Wilderness Preservation System on a regional, state, or national basis. It would not significantly expand wilderness opportunities within a day's driving time of major population centers and would not add balance to the geographic distribution of wilderness areas.

Since the adjoining national forest lands are not under wilderness management, the Troublesome WSA would not afford protection to an entire watershed or ecosystem, nor would it provide opportunities for a sustained wilderness experience. There are no significant multiple resource values, such as watershed, wildlife habitat, or archaeological sites, that would depend on wilderness preservation for their protection.

Finally, the nonwilderness management of adjoining national forest lands, especially those upstream, and the private inholding within the Troublesome WSA would not presently adversely affect the Bureaus ability to manage the area as wilderness; however, such management is subject to change.

The Troublesome WSA would be managed under the Bureau's interim management policies for wilderness study areas until Congress decides whether or not to designate it as wilderness. If Congress accepts the views presented here, that the Troublesome WSA is unsuitable, then the area would be managed for multiple use, with emphasis on livestock grazing and intensive forestry management in the western portion of the area.

Cultural Resources

The usual practices of inventory and avoidance of identified archaeological or historic sites would be continued. The Windy Gap Site area (700

acres), shown as a priority area, would be intensively managed. The North Sand Hills (500 acres) would be designated as an ACEC to protect and maintain the existing cultural and natural values. The remaining existing cultural resource sites would be placed under limited management. Four other sites containing roughly 2,970 acres may be intensively managed. No new extensive inventory is anticipated, though the possibility of one new National Register site being added through regular inventory exists.

Lands and Realty

The lands and realty program would evaluate and process all use authorization applications, giving priority to those that enhanced or were consistent with the goals of this alternative. In order to provide better overall land management, a program of ownership consolidation would be supported. Criteria for locating major linear rights-of-way would be established.

Use Authorizations

Applications for use authorizations for small-scale, low impact actions would be processed and approved if:

1. Applications met the requirements under the law.
2. Placement on or use of public lands was the most suitable economically and environmentally.
3. Applications supported private or governmental needs on a local or regional basis.

Applications for use authorizations for major realty actions, such as dams, reservoirs, highways, transmission lines, etc., would be processed and approved if they met the three requirements for small-scale actions and did not adversely impact or conflict with existing uses or management of renewable resources.

Ownership Consolidation

The Bureau would process, initiate, and favor action for the consolidation of ownership where overall land management would be improved. This could include boundary adjustments between state and Federal agencies; blocking of land patterns, including private, state, public, and other Federal lands; and resolving split mineral estates. No acreage limitations would be placed on such actions.

Lands considered for acquisition would include:

1. Inholdings of private, state, or other Federal lands within large blocks of public lands
2. Land adjacent to intensively managed tracts of public land where overall program management would be enhanced, such as lands adjacent to special recreation management areas, intensively managed forest sites, grazing allotments, or important mineral areas
3. Lands of mineral importance where the Federal minerals are overlain by state or private surface ownerships

Public land considered suitable for disposal, some of which may be considered for sale under the Asset Management Program, would include:

1. Inholdings within large blocks of state or other Federal lands
2. Public lands adjacent to large blocks of state or other Federal lands that would be best managed by that agency
3. Public lands overlying other mineral estates (state minerals, public surface)

Also considered for disposal would be isolated tracts that:

1. Have no important wildlife habitat values (winter range, nesting areas, mating areas, etc.)
2. Are not within a sensitive watershed or riparian area
3. Have only limited Bureau-initiated range management opportunities because of tract size, access difficulties, or adverse sites
4. Have no resource values of major significance
5. Potentially, 9,435 acres of public land would be suitable for disposal under this alternative

Major Linear Rights-of-way

The placement of major linear rights-of-way, such as highways, pipelines, and transmission lines, would be dependent on meeting several location criteria. The Bureau would concentrate linear facilities within or contiguous to existing corridors where possible and avoid locations that would take intensive management forest land out of production. Also avoided would be locations that would cause harrassment to livestock or wildlife concentration areas and steep topography, poor soils, or other fragile areas, such as T&E habitats.

Cultural sites that are on or eligible for the National Register of Historic Places would be left undisturbed.

Community Expansion

Areas near or adjacent to the towns of Kremmling and Granby have been identified for community expansion. These lands would be available through lease, grant, or patent to meet the development needs of these communities.

Support Needs

In order to achieve the management objectives stated in this alternative, numerous support actions would be needed. This support would come both from within and outside the Bureau.

Realty Actions

Existing withdrawals that no longer fulfilled the purpose for which they were intended would be revoked so lands could be opened to multiple use management.

Access would be acquired to intensive management areas that presently lack suitable access, such as intensively managed forested areas and SRMA.

Transportation and Access

The present transportation system is adequate to accomplish the management goals of this alternative, with the exception of those areas identified below which would require access in order to be intensively managed. Following the RMP, a transportation plan and map would be developed that would identify roads to remain open; roads to be closed; maintenance and improvement standards; available access; off-road designation; and coordination with local, state, and Federal agencies' road programs.

In order to fulfill the management goals of this alternative, the following types of lands would require access:

Type of Public Land Needing Access	Approximate No. of Acres	Major Areas in this Type
1. Intensive management Forest Lands	15	Troublesome East & West, Canyon Creek, Drowsy Waters
2. Special recreation management areas (SRMAs)	0	
3. Large blocks of public lands with expressed public interest for access	2	McFarlane Reservoir, North Sand Hills

Resource Protection

Increased Bureau monitoring of uses and activities would be required. Cooperative agreements would be developed with local law enforcement agencies to provide needed patrols, surveillance, and law enforcement.

Cadastral

Surveys would be required in areas presently lacking adequate boundary surveys and controls of public lands. Priority would be given to those areas most likely to experience development, such as energy areas, forest management areas, areas scheduled for exchange, and areas of expanding human development (adjacent to towns or resorts).

Water Rights

The Bureau would file for water rights on those waters necessary to achieve the objective of this alternative, such as springs and well waters for livestock and wildlife.

Fire

Fire protection would be provided to most of the public lands in the resource area. Priority for initial attack would be those areas or resources of high value that may be damaged by or lost to fire, such as townsites, personal property, historic structures, forested areas, recreational sites, and critical habitats. Areas may be identified where fire would be allowed to burn to achieve management objectives. These areas would be identified site specifically in management prescriptions and would require fewer, if any, suppression efforts.

Fire Management

Fire may be used as a tool to achieve resource management objectives, such as vegetation manipulation, site preparation, and control of insects and

disease. Specific treatment areas would be identified in subsequent activity plans.

Off-Road Vehicles (ORVs)

All public lands would be designated as open, limited, or closed to ORV use (as shown on the map for this alternative). Information and supervision would be provided in limited and closed areas.

Designations would be based on protecting resources on public lands (e.g., soil, watershed, vegetation, and wildlife) and minimizing conflicts among various uses of the public lands. Designations would be made in accordance with the criteria set forth in 43 CFR Part 8340. Under this alternative, 10 percent of the public lands in the resource area would be subject to limitations; the remaining 90 percent would remain open (i.e., not subject to restrictions).

Should the Kremmling Area Manager and Craig District Manager determine that ORVs were causing or would cause considerable adverse effects on other resources, they would use their authority under 43 CFR 8341.2 to immediately close or restrict ORV use in the affected area.

Outside Coordination Needs

BLM would coordinate timber harvesting and forest development projects with the U.S. Forest Service, Colorado State Forest Service, and adjacent private landowners for possible timing of joint sales or projects. Transportation plans would be coordinated with the county, the U.S. Forest Service, and the state of Colorado. BLM would also consult and coordinate with each livestock permittee regarding forage allocations and potential grazing management systems.

RECREATION ALTERNATIVE

The recreation alternative would emphasize providing for and managing recreation opportunities on public lands to meet both existing levels of use and projected long-term demand. Areas with opportunities that are presently highly sought after, or with that potential, would be intensively managed or protected to maintain present recreation opportunities. The remainder of public lands would be managed to ensure their continuing availability for a variety of dispersed recreation activities in relatively unregulated settings.

A growing regional population with more free time and seeking recreation opportunities closer to home will increase the use pressure on the region's public land recreation base. The BLM administered public lands in the Kremmling Resource Area are the object of growing interest and demand as other public lands in the region become overcrowded. Although provision of recreation opportunities would be emphasized in certain areas, multiple-use, sustained yield objectives and all mandatory environmental protection requirements would be met.

Individual resources or resource programs would be managed or affected in the following ways.

Locatable Minerals

All Federal lands in the planning area would remain open to entry under provisions of the Mining Law of 1872, as amended, except those lands under protective withdrawal. Lands under protective withdrawal would be excluded from mineral entry. Development and certain types of exploration may have site-specific or temporary restrictions imposed in order to protect other important resource values.

Coal

Emphasis on leasing Federal coal would continue as needed to support existing operating mines. Approximately 13,000 acres would be made available for leasing. Site-specific restrictions would be imposed to protect the environment or other critical resource values. These restrictions would become part of the lease or approved mine plans. Preference Right Lease Application (PRLA) C-0125854 would be processed.

Those lands identified as unsuitable for surface mining after application of the unsuitability criteria and those lands identified as priority areas for wildlife, livestock grazing, or oil and gas within the known recoverable coal resource area (KRCRA) would be excluded from future coal leasing consideration.

Oil and Gas

All Federal lands in the resource area would remain open to oil and gas leasing. Standard lease stipulations would continue to be used in the existing oil and gas fields.

Other public lands not in existing oil and gas fields would remain open to leasing but would be subject to additional stipulations. These would include no surface occupancy to protect recreation, wildlife, and scenic values, especially in special recreation management areas (SRMAs).

Mineral Materials

Federal lands would provide mineral materials to meet demands not filled by private enterprise and would provide free materials to local, state, and Federal agencies for road maintenance and construction. Existing or previously used sites would be favored. Sand and gravel disposal would be excluded from intensively managed forestry areas, threatened and endangered plant and wildlife habitats, riparian or fisheries areas, sensitive watershed areas, water bird habitats, special recreation management areas, developed recreation sites, and visually sensitive Class II areas. Site-specific restrictions may be required to protect other resource values. They would be addressed prior to any mineral disposal.

Paleontological Resources

Fossils of scientific interest would be protected through limited management. Types of fossils and possible locations are identified in the Geology section of Chapter 2, Affected Environment. Sites containing fossils determined to be of significant public interest would be protected and managed for their scientific and interpretive values.

Water Resources

Surface Water

All streams on public lands in the resource area that met or exceeded state water quality standards (SWQS) and had acceptable channel stability would be maintained in their present condition. Streams not meeting state standards or having unstable channels that meet the criteria for intensive management would be improved to meet minimum standards or their channel stability improved to good. For streams that did not meet the SWQS or the criteria for intensive management, the Bureau would cooperate with other agencies or adjacent landowners to improve the water quality.

Groundwater

Groundwater would be protected to maintain its present good quality. This would be achieved by placing restrictions on activities that may penetrate into subterranean waters, such as oil and gas and mineral exploration and coal mining. Toxins and other impurities would not be allowed to flow or leach into groundwater aquifers; projects or actions would be designed to prevent this.

Livestock Grazing

Range forage would be allocated to meet the projected needs of optimum big game populations as determined by the Colorado Division of Wildlife, with the balance of available forage allocated for livestock. The initial forage allocations would be as follows:

Livestock: 39,265 AUMs.

Big game (Rocky Mountain elk, mule deer and pronghorn antelope): 107,582 AUMs.

In addition to forage allocation, all grazing allotments would be intensively managed. Intensive management is defined here as selecting or classifying grazing allotments for management under one of three levels. (Refer to the Management Categories section in this chapter for a complete description.) The number of allotments occurring within each level of management would be:

Level	Number of Allotments
1 (Maintain).....	20-(Satisfactory Forage Condition)
2 (Improve).....	81-(Unsatisfactory Forage Condition)
3 (Custodial).....	210-(Small, Unconsolidated Allotments or Allotments Given Priority for Other Land Uses)

The 81 allotments that would be in Management Level 2 comprise approximately 195,946 acres (or 55 percent of the public land under permit) and have been targeted to receive priority for increased management to improve forage production and condition. Intensive range management practices would be allowed in these as well as in all other grazing allotments, provided they were compatible with other favored resource programs, such as terrestrial and aquatic habitat management. Under this alternative, the overall effects of increased management would be a long-term increase in forage production to a level of 54,942 AUMs and approximately 75 percent of the permitted public lands being brought into satisfactory condition.

Forest Products

Intensive forest management would be applied to most of the productive commercial forest lands (40,000 acres) to produce forest products on a sustained yield basis. The remaining forest lands would be placed under limited management to maintain and protect the forest environment (60,000 acres). The annual allowable cut for the resource area would be about the same as the present 4 to 5 million board feet. The exact allowable cut will be determined in 1987. The figure could be closer to the lower figure if productive woodlands were shelterwood cut (as opposed to being clearcut) to preserve visual areas.

Intensive forestry management would be subject to restrictions in SRMAs and sensitive Class II visual areas. Restrictions may include modifications in the design of a project to blend it in with the surrounding landscape and buffer zones around recreation use areas. Site-specific restrictions may be imposed on forest management practices in order to protect other resources. These would be addressed prior to the implementation of any forest management practices.

In order to maintain visual quality and protect the forested environment sought by the recreating public, uses or management practices that may take forest land out of production (in visual Class II areas or SRMAs) would have to be mitigated or restricted to ensure the return of the sites to the proper forest type.

Wildlife

Aquatic Wildlife

All streams with existing fisheries or fisheries potential on public lands would receive intensive management to protect and enhance their present condition. A total of 53 miles of stream habitat and 3 miles of riparian habitat would be intensivsely managed.

Terrestrial Wildlife

Wildlife habitat would be intensively managed to optimize wildlife populations. Forage would be allocated for big game, based on the amount needed to achieve the long-term population objectives determined by the Colorado Division of Wildlife. Populations would include 14,164 mule deer, 3,159 elk, and 663 pronghorn. Approximately 326,800 acres of upland habitat and 3,000 acres of wetlands would be intensively managed. Emphasis would be placed on protecting and enhancing habitats for game species which provide recreation opportunities on public lands.

Threatened and Endangered Species

All threatened and endangered (T&E) plant and animal species habitats would be protected as required. Uses or activities that endanger them would be excluded. The protection areas identified on the Recreation Alternative Map include known T&E species habitats.

Visual Resources

Sensitive Class II areas would receive intensive management designed to protect and maintain existing visual character. Efforts would also be made through use of mitigating measures to maintain the visual character of the remaining public lands. However, emphasis would be given to meeting the needs of other resource uses and activities.

Recreation

The public lands would be managed to meet both existing levels of use and projected long-term demand. Areas with opportunities that are presently highly sought after, or with that potential, would be intensively managed or protected to maintain present recreation opportunities. The Upper Colorado River (roughly 6,060 acres) and North Sand Hills (about 1,400 acres) would continue to be managed as SRMAs. The Colorado River between Gore Canyon and State Bridge would be managed to provide and maintain floatboating opportunities and associated opportunities in a roaded natural setting.

The North Sand Hills would be managed to protect the cultural resources and the dune environment, while allowing ORV use and other recreation activities in a roaded natural setting. The existing mineral withdrawal on the North Sand Hills would be retained, but the Natural Area designation would be changed to SRMA.

In addition, five new SRMAs would be identified. These are Independence Mountain (18,620 acres) in North Park and Dice Hill (5,200 acres), Strawberry (6,020 acres), Troublesome (11,760 acres), and the Black Mountain-Drowsy Water complex (18,940 acres) in Middle Park (See Recreation Alternative Map). The management objective would be to protect and maintain the current types of recreation opportunities in these areas. Intensive management

practices, including access acquisitions, would be implemented as use and resource conditions warranted.

The remaining public lands in the resource area would be managed for dispersed recreational uses, such as hunting, hiking, and sightseeing. These lands would be managed under the limited recreation management category.

Wilderness

Under this alternative, the Troublesome Wilderness Study Area (WSA) would not be recommended as suitable for wilderness designation. The primary reason it has been considered for wilderness designation is that it is a block of public land in an essentially undisturbed condition. When compared with other existing and potential wilderness areas in the region, the Troublesome WSA has a very similar ecosystem and provides similar opportunities for solitude and primitive, unconfined recreation.

The area lacks any geologic, ecological, educational, scenic, or historical features significant enough to recommend their protection by wilderness designation. Because it is a relatively small area and other larger areas are abundant in the region, the Troublesome WSA is not a significant potential addition to the National Wilderness Preservation System on a regional, state, or national basis. It would not significantly expand wilderness opportunities within a day's driving time of major population centers and would not add balance to the geographic distribution of wilderness areas.

Since the adjoining national forest lands are not under wilderness management, the Troublesome WSA would not afford protection to an entire watershed or ecosystem, nor would it provide opportunities for a sustained wilderness experience. There are no significant multiple resource values, such as watershed, wildlife habitat, or archaeological sites, that would depend on wilderness preservation for their protection.

Finally, the nonwilderness management of adjoining national forest lands, especially those upstream, and the private inholding within the Troublesome WSA would not presently adversely affect the Bureaus ability to manage the area as wilderness; however, such management is subject to change.

The Troublesome WSA would be managed under the Bureau's interim management policies for WSAs until Congress decides whether or not to designate it as wilderness. If Congress accepts the view presented here, that the Troublesome WSA is unsuitable, then the area would be managed for multiple use, with emphasis on providing primitive and backcountry recreation opportunities.

Cultural Resources

Management would emphasize the evaluation of all cultural resources for National Register potential and suitability for providing public information and education. Evaluation of sites in response to development or surface disturbing proposals would continue as required by law. Protection and mitigation would be required on significant sites, with protective measures emphasized on sites with scientific and/or interpretive values. The Windy Gap Site area (700 acres) north of Granby and the North Sand Hills area (500 acres) would be intensively managed. Four other sites containing roughly 290 acres may be intensively managed. An additional 2,000 acres may be inventoried, resulting in the possible addition of one new National Register site. Remaining sites would come under limited management.

Lands and Realty

The lands and realty program would evaluate and process all use authorization applications, giving priority to those that enhanced or were consistent with the goals of this alternative. In order to provide better overall land management, a program of ownership consolidation would be supported. Criteria for locating major linear rights-of-way would also be established.

Use Authorizations

Applications for use authorizations for small-scale, low impact actions would be processed and approved if:

1. Applications met the requirements under the law.
2. Placement on or use of public lands was the most suitable economically and environmentally.
3. Applications supported private or governmental needs on a local or regional basis.

Applications for use authorizations for major realty actions, such as dams, reservoirs, highways, transmission lines, etc., would be processed and approved if they met the three requirements for small-scale actions and did not adversely impact the environment or conflict with management ob-

jectives of SRMAs and sensitive Class II visual areas.

Ownership Consolidation

The Bureau would process, initiate, and favor action for the consolidation of ownership where overall land management would be improved. This could include boundary adjustments between state and Federal agencies and blocking of land patterns, including private, state, public, and other Federal lands. Land considered for acquisition would include:

1. Inholdings of private, state, or other Federal land within large blocks of public lands
2. Land adjacent to intensively managed tracts of public land where overall program management would be enhanced, such as lands adjacent to special recreation management areas, intensively managed forest sites, grazing allotments, or wildlife habitat

Public lands considered suitable for disposal, some of which may be considered for sale under the Asset Management Program, would include isolated tracts that have:

1. No important wildlife habitat values
2. No opportunities for developed recreational sites
3. No potential for economical access
4. No opportunities for scientific study or interpretive values
5. No resource values of major significance
6. Potential to support recreation or tourism need in East Grand County through private or other agency development

Inholdings within large blocks of state or other Federal lands and public lands adjacent to large blocks of state or other Federal lands that would be best managed by that agency would also be considered for disposal.

Potentially, 15,237 acres of public lands would be suitable for disposal under this alternative.

Major Linear Rights-of-Way

The placement of major linear rights-of-way, such as highways, pipelines, and transmission lines, would be dependent on meeting several location criteria. The Bureau would comply with contrast rating requirements in sensitive Class II visual areas and SRMAs. Developed sites would be avoided.

Linear facilities would be concentrated within or continguous to existing corridors where possible and would be sited to avoid steep topography, poor soils, or other fragile areas, such as T&E habitats. Cultural sites that are on or eligible for the National Register of Historic Places would also be avoided.

Support Needs

In order to achieve the management objectives stated in this alternative, numerous support actions would be needed. This support would come both from within and outside the Bureau.

Realty Actions

Existing withdrawals that no longer fulfilled the purpose for which they were intended would be revoked so lands could be opened to multiple use management. The North Sand Hills withdrawal would be retained.

Access would be acquired to intensive management areas that presently lack suitable access, such as intensively managed forested areas and SRMAs.

Transportation and Access

The present transportation system is adequate to accomplish the management goals of this alternative, with the exception of those areas identified below which would require access in order to be intensively managed. Following the RMP, a transportation plan and map would be developed that woiuld identify roads to remain open; roads to be closed; maintenance and improvement standards; available access; off-road designation; and coordination with local, state, and Federal agencies' road programs.

In order to fulfill the management goals of this alternative, the following types of lands would require access:

Type of Public Land Needing Access	Approximate No. of Acres	Major Areas in this Type
1. Intensive management Forest Lands.	15	Canyon Creek, South Bull Mountain, Troublesome - East
2. Special recreation management areas (SRMAs).	3	Troublesome - West, Drowsy Waters, North Sand Hills

Type of Public Land Needing Access	Approximate No. of Acres	Major Areas in this Type
3. Large blocks of public lands with expressed public interest for access.	1	McFarlane Reservoir

Resource Protection

Increased Bureau monitoring of uses and activities would be required. Cooperative agreements would be developed with local law enforcement agencies to provide needed patrols, surveillance, and law enforcement, especially in high use recreation areas.

Cadastral

Surveys would be required in areas presently lacking adequate boundary surveys and controls of public lands. Priority would be given to intensive forest management areas, areas of expanding human development (adjacent to towns or resorts), and areas where the land status was uncertain, resulting in frequent trespass by recreationists.

Water Rights

The Bureau would file for water rights on those waters necessary to achieve the objective of this alternative, such as springs and well waters for wildlife.

Fire

Fire protection would be provided to most of the public lands in the resource area. Priority for initial attack would be those areas or resources of high value that may be damaged by or lost to fire, such as townsites, personal property, historic structures, forested areas, recreational sites, and critical habitats. Areas may be identified where fire would be allowed to burn to achieve management objectives. These areas would be identified site specifically in management prescriptions and would require fewer, if any, suppression efforts.

Fire Management

Fire may be used as a tool to achieve resource management objectives, such as vegetation manipulation, site preparation, and control of insects and disease.

Off-Road Vehicles (ORVs)

All public lands would be designated as open, limited, or closed to ORV use (as shown on the map for this alternative), with information and supervision being provided in limited and closed areas. Designations would be based on protecting the resources on public lands (e.g., soil, watershed, vegetation, and wildlife), promoting the safety of all users of the public lands, and minimizing conflicts among various uses. Designations would be made in accordance with the criteria set forth in 43 CFR Part 8340. Under this alternative, 10 percent of the public lands in the resource area would be subject to limitations; the remaining 90 percent would remain open (i.e., not subject to restrictions). See the alternative map and Appendix 4 for a description of these designations.

Should the Kremmling Area Manager and Craig District Manager determine that ORVs were causing or would cause considerable adverse effects upon other resources, they would use their authority under 43 CFR 8341.2 to immediately close or restrict ORV use in the affected area.

Outside Coordination Needs

BLM would coordinate timber harvesting and forest development projects with the U.S. Forest Service, Colorado State Forest Service, and adjacent private landowners for possible timing of joint sales or projects. Transportation plans would be coordinated with the county, the U.S. Forest Service, and the State of Colorado. BLM would also consult and coordinate with each livestock permittee regarding forage allocations and potential grazing management systems.

NATURAL ENVIRONMENT ALTERNATIVE

The Natural Environment Alternative emphasizes the protection, maintenance, and enhancement of the current natural environment within the Kremmling Resource Area. Management practices, uses, and resources that maintain and reinforce this natural environment would be emphasized. The enjoyment and use of the natural environment for present and future generations, both locally and nationally, would be a high priority. Existing multiple use/sustained yield activities, as well as nonrenewable resource uses, would continue at sufficient levels to maintain existing industries.

Individual resources or resource programs would be managed or affected in the following ways.

Locatable Minerals

All Federal lands in the planning area would continue to remain open to entry under provisions of the Mining Law of 1872, as amended, except those lands under protective withdrawal. Lands under protective withdrawal would be excluded from mineral entry. Development and certain types of exploration would have site-specific or temporary restrictions imposed to protect other important resource values.

Coal

Emphasis on leasing Federal coal would continue as needed to support existing operating mines, with approximately 13,000 acres being made available for leasing. Site-specific restrictions would be imposed to protect the environment or other critical resource values. These restrictions would become part of the lease or approved mine plan. Preference Right Lease Application (PRLA) C-0125854 would be processed.

Those lands identified as unsuitable for surface mining after application of the unsuitability criteria and those lands identified as priority areas for wildlife, livestock grazing, or cultural resources within the known recoverable coal resource area (KRCRA) would be excluded from future coal leasing consideration.

All Federal coal lands in the McCallum KRCRA, plus those lands in T9N, R78W outside the KRCRA boundary and west of the Canadian River (identified by coal industry), would be suitable for future consideration for coal leasing. Only those lands identified as unsuitable for surface mining after application of the coal unsuitability criteria (report on file in the Kremmling Resource Area Office) would be excluded from coal leasing consideration.

Oil and Gas

All Federal lands in the resource area would continue to remain open to oil and gas leasing. The existing areas with greatest potential for development (see Natural Environment Alternative Map) would be committed to the exploration and development of oil and gas resources. The standard lease stipulations would be applied to these areas, along with site-specific or temporary restrictions imposed to protect other important resource values.

Mineral Materials

Federal lands would continue to provide mineral materials to meet demands not filled by private enterprise and would provide free materials to local, state, and Federal agencies for road maintenance and construction. Existing or previously used sites would be favored. Sand and gravel disposal would be excluded from intensively managed forestry areas, threatened and endangered plant and wildlife habitats, riparian or fisheries areas, sensitive watershed areas, water bird habitats, cultural sites, and special recreation management areas (SRMAs). Site-specific restrictions would be required to protect other resource values. They would be addressed prior to any mineral disposal.

Paleontological Resources

Fossils of scientific interest would be protected through salvage, identification, and research. Significant fossils may be developed through public education and information. Types of fossils and formation locations are identified in the Geology section of Chapter 2. Sites determined to be of significant value to programs such as the Colorado Natural Areas program would be considered for special area designation (e.g., research natural area, ACEC, etc.).

Water Resources

Intensive management of water resources to maintain public waters at or above state water quality standards would occur. Input to other land use plans and active protection of sensitive watersheds through watershed management plans, using certain forms of mechanical stabilization and vegetation treatments, would also be undertaken. Stream channels and riparian zones would be improved as needed.

Livestock Grazing

Range forage would be allocated to meet the projected needs of optimum big game populations as determined by the Colorado Division of Wildlife, with the balance of available forage allocated for

livestock. The initial forage allocations would be as follows:

Livestock: 39,265 AUMs

Big game (Rocky Mountain elk, mule deer and pronghorn antelope): 107,582 AUMs

In addition to forage allocation, all grazing allotments would be intensively managed. Intensive management is defined here as selecting or classifying grazing allotments for management under one of three levels (refer to the Management Categories section of this chapter for a complete description). The number of allotments occurring within each level of management would be:

Level	Number of Allotments
1 (Maintain)	20-(Satisfactory Forage Condition)
2 (Improve)	81-(Unsatisfactory Forage Condition)
3 (Custodial)	210-(Small, Unconsolidated Allotments or Allotments Given Priority for Other Land Uses)

The 81 allotments that would be in management level 2 comprise approximately 195,946 acres (or 55 percent of the public land under permit) and have been targeted to receive priority for increased management to improve forage production and condition. Most intensive range management practices would be allowed in these, as well as all other, grazing allotments, provided they were compatible with other favored resource programs, such as terrestrial and aquatic habitat. However, prescribed burning would be the only type of vegetation manipulation permitted since it would be most compatible with the natural setting. Under this alternative, the overall effects of increased management would be a long-term increase in forage production to a level of 54,942 AUMs and approximately 75 percent of the permitted public lands being brought into satisfactory condition.

Forest Products

Intensive forest management would continue on all productive commercial forest lands (40,000 acres) to produce forest products on a sustained yield basis. The remaining forested lands would be placed under limited management to maintain and protect the forest environment (60,000 acres). The annual allowable cut for the resource area would remain at 4 to 5 million board feet. The new allowable cut will be determined in 1987, using the new inventory information. The cut will probably be closer to 4 million board feet to allow for protection of visual and other natural environmental values.

All forested land receiving intensive management is shown as a priority on the Natural Environment Alternative Map.

Wildlife

Aquatic Wildlife

All streams with existing fisheries or fisheries potential on public lands would be managed to protect, maintain, or improve their present condition.

Terrestrial Wildlife

Wildlife habitats would be intensively managed to maintain or increase wildlife populations. Forage would be allocated for wildlife based on optimum 1980 Division of Wildlife population needs. Priority would be placed on protecting all critical wildlife habitats (identified on inventory information available at the Kremmling Resource Area Office). Habitats would be improved by natural methods (prescribed burning) rather than by mechanical means.

Threatened and Endangered Species

All threatened and endangered (T&E) plant and animal habitats would be protected as required. Uses or activities that endanger them would be excluded. The protection areas identified on the Natural Environment Alternative Map include the known T&E habitats. Sites determined to be of significant value to programs such as the Colorado Natural Areas program would be considered for special area designation (research natural area, ACEC, etc.).

Under this alternative, the registered *Phacelia formosula* site would be designated as a research natural area (RNA) in order to provide for scientific study, research, and education because the land (approximately 300 acres) harbors an endangered species. Studies would be conducted to determine the plant's response to (1) grazing and trampling from livestock and wildlife, (2) environmental changes from year to year, and (3) erosion. Monitoring would occur on the site. Population dynamics would be researched.

Visual Resources

The visual quality of all Class II visual management areas would be maintained and protected.

Recreation

The upper Colorado River (approximately 6,060 acres) would continue to be managed as a special recreation management area (SRMA). The upper Colorado River between Gore Canyon and State Bridge would be managed to provide and maintain floatboating opportunities and associated activities in a roaded natural setting. The proposed Azure Project would not be compatible with the objectives of this alternative because of its effect on the natural environment and existing recreation opportunities.

The North Sand Hills would be managed as an outstanding natural area (1,400 acres) and the minerals withdrawal retained, instead of being managed as an SRMA, to protect and enhance natural geological and cultural values. ORV use would be inconsistent with this goal and would prohibited.

Remaining lands would receive limited management for dispersed types of recreation. Significant cultural resources sites would be researched and interpreted for public information and education.

Wilderness

The Troublesome Wilderness Study Area (WSA) would be recommended as suitable for wilderness designation. As documented in the BLM Intensive Wilderness Inventory, the area has the mandatory wilderness characteristics of size, naturalness, and outstanding opportunities for both solitude and primitive and unconfined recreation. There are no identified special features (i.e., ecological, geological, or other features of scientific, educational, scenic, or historical value). The area would provide opportunities for solitude or primitive recreation within a day's driving time (i.e., 5 hours) of the Denver metropolitan area. Public access would have to be acquired to the area for these opportunities to be realized.

The area could be reasonably managed to preserve its wilderness character. No pre-FLPMA oil and gas leases or other uses, such as mining claims, which would degrade the wilderness character are known to exist. The private inholding, while impeding movement to a certain degree, is managed by its present owners essentially as a primitive retreat; however, this management is subject to change. Because of its location in a narrow stream valley in the southern part of the area, activities that take place on the inholding do not impair the area's overall wilderness characteristics. The access road to this inholding forms the boundary of the area.

No specific off-site impacts have been identified which would degrade the wilderness values of the area. The nonwilderness management of the adjoining national forest lands, while not currently conflicting with wilderness management, is subject to change. In addition, no significant energy and mineral values have been identified which would outweigh the wilderness values.

If Congress adopted the view presented in this alternative and the Troublesome WSA received wilderness designation, the area would be managed according to the Bureau's Wilderness Management Policy (September 1981).

Cultural Resources

Cultural resources would be managed at their optimum level, with protection, inventory, maintenance, enhancement, public information/education, interpretation, and research all taking place. Significant sites would be evaluated under the National Register of Historic Places (NRHP) criteria, with eligible sites being managed through a cultural resources management plan. Priority areas and areas having high potential would be inventoried. The presence of significant cultural resources would become a limiting factor for authorizations.

The Windy Gap Site area (700 acres) north of Granby and the North Sand Hills area (500 acres) are the only currently identified priority areas for intensive management. Six other important NRHP sites containing 3,310 acres would be intensively managed. Remaining sites would be placed under limited management. A total of 12,000 acres may be inventoried, resulting in the possibility of three new sites being added to the National Register.

Lands and Realty

The protection, maintenance, and enhancement of the existing natural environment would be emphasized. The lands and realty program would continue to evaluate and process all use authorization applications. In order to provide better overall land management, a program of ownership consolidation

would be supported. Criteria for locating major linear rights-of-way would be established.

Use Authorizations

Applications for use authorizations for small-scale, low impact actions would be processed and approved if:

1. Applications met the requirements under the law.
2. Placement on or use of public lands was the most environmentally suitable.
3. Applications supported private or governmental needs on a local or regional basis.

Applications for use authorizations for major realty actions, such as dams, reservoirs, highways, transmission lines, etc., would be processed and approved if they met the three requirements for small-scale actions, and did not adversely impact the environment or conflict with natural environment values of the area and region, including SRMAs, Natural Areas, special T&E areas, significant cultural resource sites, and Class II visual areas.

Ownership Consolidation

The Bureau would process, initiate, and favor action for the consolidation of ownership where overall land management would be improved. This could include boundary adjustments between state and Federal agencies; blocking of land patterns, including private, state, public, and other Federal lands; and resolving split mineral estates. No acreage limitations would be placed on such actions.

Lands considered for acquisition would include:

1. Inholdings of private, state, or other Federal land within large blocks of public lands
2. Land adjacent to intensively managed tracts of public land where overall program management would be enhanced, such as lands adjacent to special recreation management areas, intensively managed forest sites, or grazing allotments
3. Lands of mineral importance where the Federal minerals are overlain by state or private surface ownerships

Public lands considered suitable for disposal, some of which may be considered for sale under the Asset Management Program, would include isolated tracts that have:

1. No scenic values
2. No open space values
3. No important wildlife habitat values
3. No natural, cultural, or historic values
5. No resource values of major significance

In addition, public lands adjacent to large blocks of state or other Federal lands that would be best managed by that agency would also be considered for disposal.

Only 620 acres of public lands would be considered suitable for disposal under this alternative.

Major Linear Rights-of-way

The placement of major linear rights-of-way, such as highways, pipelines, and transmission lines, would be dependent on meeting several location criteria. The Bureau would encourage locations of linear facilities that would result in minimal environmental impacts and concentrate linear facilities within or contiguous to existing corridors, where possible. Steep topography, skyline effect, poor soils, and other fragile areas, such as T&E habitats, cultural resource sites, Class II visual areas, riparian areas, community areas, SRMAs, natural areas, and intensive resource management areas, would be avoided.

Community Expansion

Areas near or adjacent to the towns of Kremmling and Granby have been identified for community expansion. These lands would be available through lease, grant, or patent to meet the development needs of these communities.

Support Needs

In order to achieve the management objectives stated in this alternative, numerous support actions would be needed. This support would come both from within and outside the Bureau.

Realty Actions

Existing withdrawals that no longer fulfilled the purpose for which they were intended would be revoked so lands could be opened to multiple use management.

Access would be acquired to intensive management areas that presently lack suitable access, such as intensively managed forested areas and SRMAs.

Transportation and Access

The present transportation system is adequate to accomplish the management goals of this alternative, with the exception of those areas identified below which would require access in order to be intensively managed. Following the RMP, a transportation plan and map would be developed that would identify roads to remain open; roads to be closed; maintenance and improvement standards; available access; off-road designation; and coordination with local, state, and Federal agencies' road programs.

In order to fulfill the management goals of this alternative, the following types of lands would require access:

Type of Public Land Needing Access	Approximate No. of Acres	Major Areas in this Type
1. Intensive management forest lands	15	Canyon Creek, South Bull Mountain, Drowsy Water
2. Special recreation management areas (SRMAs)	0	
3. Large blocks of public lands with expressed public interest for access	3	Troublesome, North Sand Hills, McFarlane Reservoir

Resource Protection

Increased Bureau monitoring of uses and activities would be required. Cooperative agreements would be developed with local law enforcement agencies to provide needed patrols, surveillance, and law enforcement.

Water Rights

The Bureau would file for water rights on those waters necessary to achieve the objective of this alternative, such as springs and well waters for livestock and wildlife.

Fire

Fire protection would be provided to most of the public lands in the resource area. Priority for initial attack would be those areas or resources of high value that may be damaged by or lost to fire, such as townsites, personal property, historic structures, forested areas, recreational sites, and critical habitats. Areas may be identified where fire would be allowed to burn to achieve management objectives. These areas would be identified site specifically in management prescriptions and would require fewer, if any, suppression efforts.

Fire Management

Fire may be used as a tool to achieve resource management objectives, such as vegetation manipulation, site preparation, and control of insects and disease. Specific treatment areas would be identified in subsequent activity plans.

Off-Road Vehicles (ORVs)

All public lands would be designated as open, limited, or closed to ORV use (as shown on the map for this alternative). Information and supervision would be provided in limited and closed areas.

Designations would be based on protecting public lands resources (e.g., soil, watershed, vegetation, and wildlife) and minimizing conflicts among various public land users. Designations would be made in accordance with the criteria set forth in 43 CFR Part 8340. The North Sand Hills Outstanding Natural Area and Troublesome Wilderness Area (if designated by Congress) would be closed to ORVs. Under this alternative, 2 percent of the public lands would be closed to ORVs, 10 percent would be subject to limitations, and 88 percent would remain open (i.e., not subject to restrictions). See the alternative map and Appendix 4 for a description of these designations.

Should the Kremmling Area Manager and Craig District Manager determine that ORVs were causing or would cause considerable adverse effects on other resources, they would use their authority under 43 CFR 8341.2 to immediately close or restrict ORV use in the affected area.

Outside Coordination Needs

The Bureau would coordinate timber harvesting and forest development projects with the U.S. Forest Service, Colorado State Forest Service, and adjacent private landowners for possible timing of joint sales or projects. Transportation plans would be coordinated with the county, the U.S. Forest Service, and the State of Colorado. BLM would also consult and coordinate with each livestock permittee regarding forage allocations and potential grazing management systems.

Coordination with other Federal agencies, as well as local and regional agencies, and county and

state governments on authorizations and land use plans affecting either party would occur.

COMPARISON OF ALTERNATIVES

The resource components of each alternative are compared in summary form in Table 3-27. The table compares the alternatives by units of output, management emphasis, forage or land allocation, costs, impacts, and other significant factors. The purpose of this section is to focus the reader's attention on the major difference between the alternatives, thus providing a clearer basis for comparison and, ultimately, for the rationale behind choosing a favored alternative.

TABLE 3-27
COMPARISON OF ALTERNATIVES

RESOURCE	Continuation of Present Management	Preferred	Energy-Mineral	Economic Benefit	Renewable Resource	Recreation	Natural Environment
LOCATABLE MINERALS							
Surface use restrictions on exploration and development.	Developed on case-by-case basis when exploration or development plans submitted.	Moderate. Surface restrictions necessary to protect significant renewable resource values and environmentally sensitive areas.	Low. Surface restrictions to protect environmentally sensitive areas.	Moderate. Surface restriction necessary to protect significant renewable resource values and environmentally sensitive areas.	Moderate. Surface restriction necessary to protect significant renewable resource values and environmentally sensitive areas.	High. Surface restriction necessary to protect significant renewable and scenic resource values plus the environmentally sensitive areas.	Very High. Restrictions necessary to protect renewable scenic, and wilderness values plus environmentally sensitive areas
COAL							
Emphasis on land availability for coal mining and/or future leasing.	Least-Existing leases and tracts identified in 1977 MFP. Limited opportunities for expansion.	Moderate-Existing leases and sufficient acreage to allow for continuation and expansion of coal industry.	High-Existing leases and acreage to allow for continuation and expansion of coal industry.	Highest-Existing leases and all suitable coal land are available for continuation and expansion of coal industry.	Low-Existing leases and sufficient acreage to allow for continuation of existing operations.	Low-Existing leases and sufficient acreage to allow for continuation of existing operations.	Low-Existing leases and sufficient acreage to allow for continuation of existing operations.
a. Approximate no. of acres available	8,500	45,000	60,000	107,000	13,000	13,000	13,000
OIL AND GAS							
Surface use restrictions on exploration and development.	Moderate. Restrictions identified in Umbrella Environmental Analysis.	Moderate. Restrictions similar to those in Umbrella EAs. No leasing for T&E plant ACEC.	Low. Minimal surface restriction beyond standard lease stips. Management emphasis for oil and gas development is high.	Moderate. Restrictions similar to those in Umbrella EAs.	Moderate. Restrictions similar to those in Umbrella EAs. No leasing in ACECs (T&E plant site and N. Sand Hills).	High. Additional restrictions to protect recreation and scenic resource values.	Very High. Additional restrictions to protect scenic and natural areas No leasing in Troublesome Wilderness Area.
LIVESTOCK GRAZING							
Initial Forage Allocation Based on 1980 SVIM (AUMs)	Reduce from 45,648 AUMs authorized to 39,726.	Reduce from 45,648 AUMs authorized to 39,726	Reduce from 45,648 AUMs authorized to 39,726	Reduce from 45,648 AUMs authorized to 39,726	Reduce from 45,648 AUMs authorized to 39,726	Reduce from 45,648 AUMs authorized to 39,265 AUMs	Reduce from 45,648 AUMs authorized to 39,265 AUMs
Estimated Long-Term Forage Production							
a. No. of AUMs	38,184	53,535	38,184	51,241	55,404	54,942	54,942
b. Percentage of range land in satisfactory condition	20%	70%	20%	65%	75%	75%	75%

TABLE 3-27
COMPARISON OF ALTERNATIVES

RESOURCE	Continuation of Present Management	Preferred	Energy-Mineral	Economic Benefit	Renewable Resource	Recreation	Natural Environment
Allotment Management Plans (AMPs)							
a. No. of AMPs*	4	76	4	63	81	81	81
b. No. of acres under AMPs	14,120	180,585	14,120	160,038	195,946	195,946	195,946
c. Percentage of R.A. grazing lands under AMPs	4%	51%	4%	45%	55%	55%	55%
d. Average No. AMP/yr prepared (new)	0	8	0	6	8	8	8
Range Improvement Projects							
a. No.-Type-Cost per 10 yr. schedule	Reconstruction of existing projects--$150,000	Reconstruction-$150,000 20 springs-devel. $30,000 46 stock ponds - $92,000 14 wells - 70,000 4 miles ditch - $6,000 18 miles pipeline - $21,600 66 miles fence - $211,200 2900 acres brush-beat - $72,500 21,000 acres sprayed-$252,000 9,600 acres burned -$28,800 11,700 acres reseed -$70,200 1 corral - $3,000	Reconstruction of existing projects-$150,000	Reconstruction - $150,000 17 springs-develop. $25,500 38 stockponds - $76,000 12 wells - $60,000 4 miles ditch - $6,000 15 miles pipeline - $18,000 52 miles fence $166,400 2500 acres brush-beat - $62,500 16,000 acres sprayed-$192,000 7,700 acres burned -$23,100 9,000 acres reseed -$54,000 1 corral -$3,000	Reconstruction - $150,000 20 springs-develop. $30,000 50 stockponds - $100,000 15 wells -$75,000 4 miles ditch - $6,000 20 miles pipeline - $24,000 70 miles fence - $224,000 3000 acres brush-beat - $75,000 22,000 acres spray-$264,000 10,000 acres burn-$30,000 12,000 acres reseed-$72,000 1 corral - $3,000	Reconstruction - $150,000 20 springs-devel $30,000 50 stockponds - $100,000 15 wells-$75,000 4 miles ditch - $6,000 20 mile pipeline-$24,000 70 mile fence - $224,000 3000 acres brush-beat - $75,000 22,000 acres-$264,000 10,000 acres burn-$30,000 12,000 acres reseed-$72,000 1 corral-$3,000	Reconstruction-$150,000 20 spring-devel $30,000 50 stockponds - $100,000 15 well-$75,000 4 miles ditch-$6,000 20 mi. pipeline $24,000 70 miles fence-$224,000 25,000 acres burned-$75,000
Range Management Implementation Costs ($)							
Reconstruction	$150,000	$150,000	$150,000	$150,000	$150,000	$150,000	$150,000
New Projects	--	857,300	--	686,500	903,000	903,000	534,000
Use Supervision**	--	24,000	--	20,000	25,000	25,000	25,000
Monitoring**	--	24,000	--	20,000	25,000	25,000	25,000
Total	$150,000	$1,055,300	$150,000	$876,500	$1,103,000	$1,103,000	$734,000
FOREST PRODUCTS							
Annual Allowable Harvest (million bd. feet)***	5+	4.5	5+	5+	4.5	4.3	4.0
Management Intensity							
a. Intensive (acres)	50,000	40,000	50,000	50,000	40,000	40,000	40,000
b. Limited (acres)	50,000	60,000	50,000	50,000	60,000	60,000	60,000

TABLE 3-27
COMPARISON OF ALTERNATIVES

RESOURCE	Continuation of Present Management	Preferred	Energy-Mineral	Economic Benefit	Renewable Resource	Recreation	Natural Environment
WILDLIFE							
Initial Forage Allocation (AUMs) Public lands Inventory	64,584	86,159	64,584	64,584	86,159	107,582	107,582
Habitat Managed to Support****							
No. Deer	6,982 (26%)	10,528 (39%)	6,982 (26%)	6,982 (26%)	10,528 (39%)	14,164 (53%)	14,164 (53%)
No. Elk	3,175 (37%)	3,224 (37%)	3,175 (37%)	3,175 (37%)	3,224 (37%)	3,159 (37%)	3,159 (37%)
No. Antelope	663 (88%)	663 (88%)	663 (88%)	663 (88%)	663 (88%)	663 (88%)	663 (88%)
Miles Stream habitat improvement (Estimated costs - 1,000/mile)	8	53	8	8	53	53	53
Miles Riparian habitat improvement (Estimated cost - 3,000/mile)	3	3	3	3	3	3	3
Acres of Upland habitat maintained or improved	326,800	326,800	225,000	225,000	326,800	326,800	326,800
Acres of waterfoul/shorebird habitat maintained or improved	1,000	3,000	1,000	1,000	3,000	3,000	2,000
ACEC (T/E Species)	0	1 (300 ac.)	0	0	1 (300 ac.)	0	0
RNA (T/E Species)	0	0	0	0	0	0	1 (300 ac)
VISUAL							
Degree of potential change in overall character	Minor	Negligible	Minor	Minor	Negligible	Negligible	Negligible
WILDERNESS							
Troublesome WSA Recommendation	Not Suitable for Wilderness	Not Suitable for Wilderness	Not Suitable for Wilderness	Not Suitable for Wilderness	Not Suitable for Wilderness	Not Suitable for Wilderness	Suitable for Wilderness
RECREATION							
Intensive Management Areas							
1. Designated SRMAs (acres)	1 (6,060)	2 (7,460)	3 (13,460	2 (7,460)	1 (6,060)	7 (71,840)	1 (6,060)
2. Potential SRMAs (acres)*****	0	0	0	4 (36,160)	0	0	0
3. ACEC (acres)	0	0	0	0	1 (1,400)	0	0
4. Natural Area (acres)	1 (1,400)	0	0	0	0	0	1 (1,400)
ORVs							
Degree of restrictions (% of public land in resource area)	Small sites; mainly N. Sand Hills 1% limited 99% open	10% limited 90% open	5% limited 95% open	10% limited 90% open	10% limited 90% open	10% limited 90% open	N. Sand Hills and Troublesome WSA closed 2% closed 10% limited 88% open
CULTURAL RESOURCES							
Intensive Mgt.							
a. No.of sites	2	3	6	7	6	6	8
b. Acres	710	790	1,730	2,050	4,110	1,490	4,510
c. No. ACEC and Name	0	0	0	0	1 No. Sand Hill	0	0

TABLE 3-27
COMPARISON OF ALTERNATIVES

RESOURCE	Continuation of Present Management	Preferred	Energy-Mineral	Economic Benefit	Renewable Resource	Recreation	Natural Environment
Inventory							
a. No. of acres	0	8,000	4,000	6,000	0	2,000	12,000
b. Potential No. of New NRHP sites	0	6	3	4	2	1	3
LANDS AND REALTY							
Major linear rights-of-way							
a. Location Emphasis	None On a case-by-case basis	Somewhat restrictive Avoidance of areas to protect significant renewable resource values and environmentally sensitive area.	Least restrictive Avoidance of only environmentally sensitive areas.	Least restrictive Avoidance of only environmentally sensitive areas.	Somewhat restrictive Avoidance of areas to protect significant renewable resource values and environmentally sensitive areas.	Most restrictive Avoidance of areas to protect significant recreational, scenic and natural values as well as environmentally sensitive areas.	Most restrictive Avoidance of areas to protect significant recreational, scenic and natural values as well as environmentally sensitive areas
Land Disposal Potential number of acres available for disposal, including Asset Management	None designated Handled on a case-by-case basis	16,897	9,225	16,896	9,435	15,237	620
ACCESS							
Estimated number of areas needing access	46	17	47	48	17	19	18

* Number of AMPs shown under each alternative is for Level 2 allotments only; these will have first priority for AMP development. However, AMPs for Level 1 and 3 allotments will also be developed where needed to achieve specific objectives.

** Costs for use supervision and monitoring are in addition to present costs, not total cost.

*** Annual cut remains at 4 to 5 mmbf until recalculation in 1987. Numbers shown are estimates for years after 1987.

**** Numbers in parentheses indicate percent of Colorado Division of Wildlife's long-term population objectives (for animals supported by public lands).

***** Includes developed sites outside SRMAs managed by BLM or under cooperative agreement.

CHAPTER 4

ENVIRONMENTAL CONSEQUENCES

CHAPTER 4
ENVIRONMENTAL CONSEQUENCES

This chapter analyzes the cumulative environmental impacts of the alternatives presented in Chapter 3. Because the alternatives are based on management emphases for the Kremmling Resource Area and do not propose specific, on-the-ground projects, impacts are assessed in a general manner.

The chapter is arranged by environmental element (e.g., air quality, soils, vegetation, etc.). Environmental consequences are discussed by alternative under each element in comparative form. This is done to emphasize the differences between the alternatives. The alternatives are analyzed in the same order they are presented in Chapter 3.

The objective of this approach is to make it easier to form a clear basis for choosing among the alternatives for both the decisionmaker and the public.

AIR QUALITY

Continuation of Present Management Alternative

The impact of management activities on the air quality of the area is expected to be immeasurable and insignificant. This is due to the low number of proposed surface disturbing activities and the fact that use would be short-term and dispersed over a large area.

Vegetation removal and soil exposure caused by mineral exploration, forestry, grazing, ORV use, fire, and other surface disturbing activities would contribute to the amount of total suspended particulates (TSP) in the air. The quantity of TSP created would depend upon the type and amount of disturbance, soil type, moisture conditions of the soil, and local wind conditions. The TSP duration would depend on the type and extent of activity and the time required to revegetate the site. The effect of TSP would be localized to areas near the disturbance and would be affected by the wind speed and direction. Wind is the only form of transport for TSP, with large particles settling out closer to the disturbance and finer particles further away.

Major actions that contribute to present TSP and emission levels include coal mining, mineral development, construction activities, and vehicle use.

Range management activities in this alternative would not significantly impact air quality.

The recommendation of the Troublesome WSA as unsuitable for wilderness designation would not impact air quality.

Preferred, Renewable Resources, and Natural Environment Alternatives

There is not expected to be any significant change from the Continuation of Present Management Alternative under any of these alternatives. There is a potential for a slight decrease under the Natural Environment Alternative due to the decrease in construction activities.

Range management activities would not significantly impact air quality under either alternative.

The recommendation of the Troublesome WSA as suitable for wilderness designation would not impact air quality under the Natural Environment Alternative.

Energy and Minerals and Economic Benefit Alternatives

The impacts described in the Continuation of Present Management Alternative would occur at a potentially higher level in these two alternatives due to the projected increase in level of activity. The impact on air quality is expected to be minimal in both alternatives, due to mitigating measures to be implemented to meet Office of Surface Mining (OSM) and state air quality standards.

Range management activities and wilderness nondesignation would not significantly impact air quality under either alternative.

Recreation Alternative

The impacts of this alternative should be similar to the Continuation of Present Management Alternative. The differences should be insignificant, with one minor exception. The amount of road construction, maintenance, and use would be slightly higher, resulting in an increase in TSP. The amount of this

increase is expected to be neither significant nor measurable.

Range management activities and wilderness nondesignation would not significantly impact air quality under this alternative.

Unavoidable Adverse Effects

All Alternatives

Increases in TSP and exhaust emissions are expected to be of short duration and low quantity and to be dispersed over large areas. Due to these factors and mitigation, there are no expected unavoidable adverse impacts.

Short-Term Use vs. Long-Term Productivity

All Alternatives

Short-term uses which would cause temporary impacts to air quality would not significantly affect long-term maintenance of air quality.

Irreversible or Irretrievable Commitments of Resources

All Alternatives

No irretrievable or irreversible commitments are anticipated.

Committed Mitigation Measures

For all alternatives, including the Preferred, air quality will be considered for project authorization. Standard mitigating measures, especially revegetation, should be sufficient to protect the air quality in most cases. Mitigations and stipulations on coal leases will meet Office of Surface Mining and state standards to maintain consistency.

Uncommitted Mitigation Measures

All Alternatives

A suggested measure is to install air quality monitoring stations in several areas to obtain measurements of changes in air quality over a period of several years.

LOCATABLE MINERALS

All Alternatives

Locatable mineral activity is governed by the Mining Law of 1872. Under this law the mining claimant has the right to locate, develop, and produce mineral resources on open public land. Mitigation and stipulations can be applied to the claimant, of course, to prevent undue degradation of other resource values. At present no locatable minerals are being produced in the Kremmling Resource Area, although changes in the economy or new discoveries could precipitate renewed interest and production of locatable minerals under all alternatives.

As with the other minerals mentioned earlier, loss of production could occur due to conflicts with other activities and resources. Of particular interest in this area would be loss of production in wilderness areas and conflicts with coal. However, according to Public Law 585, Multi-Mineral Development Act, the mineral lessee and mining claimant must resolve conflicts between different minerals in the same area themselves. Designation of the Troublesome WSA as a wilderness area under the Natural Environment Alternative would preclude mineral activity by restricting surface occupancy, resulting in permanent loss of production.

Livestock grazing and wilderness management prescriptions would not significantly or adversely impact locatable mineral development in the resource area.

Unavoidable Adverse Effects

All Alternatives

Loss of production could occur due to management conflicts with other resources and activities.

Modification of topography and geology due to subsurface mining may cause surface disturbance, which would affect related surface use.

Short-Term Use vs. Long-Term Productivity

All Alternatives

Loss of mineral production could occur in the long term to achieve short-term minerals production due to the number and amount of minerals considered unrecoverable with present mining technology and practices.

Irreversible or Irretrievable Commitments of Resources

All Alternatives

Minerals mined, consumed, or left underground as unrecoverable could be irretrievably lost to future uses.

Committed Mitigation Measures

All Alternatives

Locatable minerals development is regulated by existing Federal policies, guidelines, and regulations, including the Mining Act of 1872 and stipulations for plans of development under the current 3809 regulations.

COAL

Continuation of Present Management Alternative

Current coal production from the two federally owned mines in the Kremmling Resource Area accounts for the permanent removal of approximately 2 million tons of coal annually from 4,330 acres of leased public lands.

Community expansion and other land use conflicts which reduce or preclude exploitation of mineral resources could constitute an important secondary impact to the area. For example, under this alternative, only about 9,000 out of 226,015 acres of the McCallum Known Recoverable Coal Resource Area (KRCRA) have been committed to a coal land use priority. This could mean that over 200 million tons of coal would be unavailable for production by the mining industry.

Surface mining and subsidence would not necessarily have an adverse effect on topography. To the contary, increased grazing and agriculture could result from slope modification and reclamation.

Preferred Alternative

The Preferred Alternative would offer sufficient acreage (approximately 45,000 acres) for consideration for future coal leasing to allow for continuation and expansion of the coal industry in Jackson County. The priority areas for future coal leasing are located east of Walden in the area called the McCallum, where coal development is currently taking place, and near Coalmont, where numerous coal leases presently exist and where development previously occurred (refer to Preferred Alternative Map). These priority areas were determined from current coal inventory data and economic indications of interest by industry.

Those lands identified as unsuitable for surface mining after application of the coal unsuitability criteria (see Chapter 3) would be excluded from future coal leasing considerations.

The remaining known coal lands would be made available for future leasing only when the priority areas had been depleted or a significant demand was expressed that could not be met by the priority areas. Nonpriority coal lands would be managed as priority areas for oil and gas, livestock, or wildlife.

Preference Right Lease Application (PRLA) C-0125854 would be processed and emergency coal leasing would continue as needed to support existing operating mines. Site-specific restrictions may be imposed to protect the environment or other critical resource values. These restrictions would become part of the lease or approved mine plan.

Energy and Minerals Alternative

Approximately 60,000 acres of land would be committed to a coal priority, resulting in a potentially significant increase in coal production and in the quantity of land leased for coal.

Economic Benefit Alternative

Approximately 107,000 acres of land would be committed to a coal priority, resulting in a potentially significant increase in the number of coal leases

and the possible recovery of 275 million tons of coal from the McCallum KRCRA.

Renewable Resources Alternative

Coal leases could be expanded to maintain the existing production of 2 million tons of coal per year.

The increase in coal priority land use to approximately 13,000 acres would result in a potential increase in long-term coal production.

Recreation Alternative

Approximately 13,000 acres of land would be committed to a coal priority, resulting in a potentially significant increase in coal production and the quantity of lands leased for coal (see Alternative Map). No priority intensive recreational uses occur in coal priority areas.

Natural Environment Alternative

Coal leases could be expanded to maintain the existing 2 million tons of production per year. In addition, committed coal priority land use would be increased to approximately 13,000 acres, resulting in an increase in long-term production.

Livestock Grazing and Wilderness Impacts to Coal

Livestock grazing and wilderness management prescriptions would not significantly or adversely impact coal development under any of the alternatives.

Unavoidable Adverse Effects

All Alternatives

Loss of production could occur due to management conflicts with other resources and activities.

Modification of topography and geology due to subsurface mining and surface disturbance from all resources could very likely occur, particularly under the Economic Benefit Alternative, with its potentially huge increases in amount of land mined for coal.

Short-Term Use vs. Long-Term Productivity

All Alternatives

Loss of mineral production could occur in the long term to achieve short-term minerals production, due to the number and amount of minerals considered unrecoverable with present mining technology and practices.

Irreversible or Irretrievable Commitments of Resources

All Alternatives

Minerals mined, consumed, and left underground as unrecoverable could be irretrievably lost to future use.

Committed Mitigation Measures

All Alternatives

Current stipulations governing coal exploration, leasing, and development are considered effective. These include guidelines developed under the Federal Coal Management Program and the Memorandum of Understanding between the Bureau, the Minerals Management Service, and the Office of Surface Management.

Standard and special lease stipulations, NEPA compliance, and the approval of a final mine plan are considered committed and effective mitigation.

OIL AND GAS

Continuation of Present Management Alternative

Current oil and gas production from the Kremmling Resource area is approximately 200,000 barrels of oil and 2,500,000 thousand cubic feet (MCF) of gas per year. Without new fields being discovered and developed, these figures could be expected to drop as present fields neared depletion. Presently, approximately 7,800 acres are committed to an oil and gas priority land use.

Activities such as community expansion and other resources can interfere with or preclude oil and gas production, resulting in a negative effect on this resource. However, oil and gas exploration and production can generally be mitigated so as not to entirely deny access to any area.

Preferred, Energy and Minerals, Economic Benefit, Renewable Resources, and Recreation Alternatives

Under these alternatives, impacts to oil and gas could be assumed to remain the same as under the Continuation of Present Management Alternative. In all of these alternatives, lands committed to an oil and gas priority would be increased; however, increased oil and gas production would be dependent on location and discovery, among other things, not merely on the amount of land offered or leased.

Natural Environment Alternative

Under this alternative, loss of production could result due to limited access and more stringent surface occupancy restrictions. This could occur even though the total land committed to an oil and gas priority would be increased to approximately 10,000 acres.

Unavoidable Adverse Effects

All Alternatives

Loss of production could occur due to management conflicts with other resources and imposition of surface occupancy restrictions.

Short-Term Use vs. Long-Term Productivity

Loss of production could occur in the long term to achieve short-term production, due to the possible loss of oil and gas considered unrecoverable with present technology and practices.

Irreversible or Irretrievable Commitments of Resources

All Alternatives

No irreversible or irretrievable commitments of resources have been identified.

Committed Mitigation Measures

All Alternatives

Whenever the lessee or operator of a Federal oil and gas lease decides to drill on the leasehold, all proposed drilling operations and related surface disturbance activities must be approved before entry upon the lands involved. Approval will be in accordance with (1) lease stipulations, (2) Title 30 CFR Part 221, "Oil and Gas Operating Regulations," and (3) "Notice to Lessees No. 6 (NTL-6)", as amended, issued by the Minerals Management Service.

PALEONTOLOGY

All Alternatives

Impacts to fossil remains could be caused by all surface and subsurface disturbing activities from all resources, although mineral extraction would have by far the most detrimental effect. Destruction of fossil remains by vandals and amateur collectors due to increased accessibility could also be caused by other resources uses, with the possible exception of wilderness area designation. Although the destruction of fossils of scientific value constitutes the most significant impact to paleontology, the beneficial effect of increased exposure of otherwise hidden fossil remains should be recognized.

Approximately 140,000 acres in the Kremmling Resource Area are underlain by formations containing significant paleontological resources.

None of the alternatives, with the exception of the Economic Benefit Alternative, should have any significant effect on paleontology resources. The Economic Benefit Alternative, however, with its possible dramatic increase in coal mining, could significantly affect paleontological resources.

Livestock grazing and wilderness management prescriptions would not significantly or adversely impact paleontological resources.

Unavoidable Adverse Effects

All Alternatives

Loss of fossil remains could occur due to surface and subsurface disturbing activities, especially those resulting from mineral extraction.

Irreversible or Irretrievable Commitments of Resources

All Alternatives

The paleontological resources destroyed by other resource uses and activities would be irretrievably lost.

Committed Mitigation Measures

All Alternatives

Fossil resources are to be afforded consideration under existing regulations and policies, including NEPA; FLPMA; and Bureau policy as expressed in Washington Office Instruction Memorandum No. 79-111: Treatment of Paleontologic Resources in Mining Environmental Statements, Environmental Assessment Records, and Technical Examination Reports and No. 79-267: Paleontology Inventory FY 1979 (classification of areas and required considerations). Also applicable are the proposed rulemakings under No. 82-639/43 CFR Parts 3620, 3630, and 8360.

SOILS

Introduction

Soil can be viewed in two ways. In one sense, soil is a resource required to support the production of biological resources. In another sense, soil is a medium in which engineering activities take place, a construction material or a substance with properties which must be overcome in order to achieve human goals. Land use decisions determine in which of these two ways soil will be approached.

For example, by committing a given land area to community expansion, one ceases to be concerned with soil productivity but becomes concerned with how soil would react as a road base; if soil would corrode buried pipes, wires, or foundations; and similar questions. This impacts soil as a resource because soil productivity in this area is no longer a concern, nor is it protected. Ultimately, as developments allowed by a community expansion decision are implemented, the productivity of the soil is no longer harvested by livestock, wildlife, or machines; soil, as a resource, ceases to exist in areas where the land is occupied by permanent improvements.

In addition to impacts to the soil resource from land use change, soil as a resource can be impacted by harvesting of vegetation (logging or grazing) through compaction or erosion. Fertilization, irrigation, and, in some cases, plowing can beneficially affect soil. Because different soils will react differently to the same treatment and because many different treatment techniques are available to achieve similar results, specific statements as to what will happen to the soil resource because of the implementation of a given alternative cannot be made. Before any on-the-ground improvements are made, however, detailed soils analyses would be made to determine the techniques which are least detrimental.

The recommendation of the Troublesome WSA as not suitable for wilderness designation under all but the Natural Environment Alternative would result in neither significant nor adverse impacts to soils.

Grazing management proposals would not significantly or adversely impact soils under the Preferred, Energy and Minerals, Economic Benefit, Recreation, and Natural Environment Alternatives.

Continuation of Present Management Alternative

Under the Continuation of Present Management Alternative, the conversion of land to nonagricultural uses is not expected to change in rate. Therefore, there are no foreseen impacts on soils. For the purposes of this discussion, the term *agricultural* is used in the largest possible sense to include production of all biological resources, including livestock, forests, and wildlife. Stipulations on new land use activities would generally be adequate to protect the soil resource. However, under present management, it would be difficult to correct soil problems which may have developed over many years. In addition, little is being done to enhance

the productivity of the soil because management emphasis lies elsewhere.

Livestock grazing on the public lands would have the greatest impact to the soil resource under this alternative. No adjustment of livestock numbers would be made, resulting in erosion because some plants important in protecting soil would be consumed.

Preferred Alternative

The Preferred Alternative would combine the management emphases of the Economic Benefit, Recreation, and Renewable Resource Alternatives. Because of this, the impacts to the soil resource would probably be less than under the Economic Benefit Alternative but greater than under the Renewable Resource Alternative.

Energy and Minerals Alternative

This alternative would have impacts similar to the Economic Benefit Alternative. However, since oil and gas activity would be favored over coal development, adverse impacts would be more dispersed and lands would be reclaimed more quickly.

Economic Benefit Alternative

This alternative could result in an increase in the rate at which agricultural lands were converted to other uses. Most of this conversion would be because of an increase in coal leasing, so it would represent mostly a short-term change, with land returning to agricultural uses after mining of coal was completed. Since intensive management of rangelands would not occur on coal priority use zones until after coal development was complete, improvement of the soil reserve in these areas would be foregone in the short term. The majority of this impact would occur in the North Park area.

Renewable Resources Alternative

Under this alternative, soil stabilization would be favored. Conversion of land from agricultural uses could occur but only at a low rate. Soil productivity would be enhanced whenever possible. It is possible that this alternative would result in a net benefit to the soil resource.

Generally, the grazing program proposed in the Renewable Resources Alternative would be the least impacting to the soil resource because intensive management of livestock would be practiced on the greatest amount of land.

It is important to note that some intensive livestock management practices can impair soil productivity through increasing compaction or erosion (for example, plowing or burning). However, if these practices are properly designed and sites are carefully selected, damage to the soil can be minimized and benefits to the soil resource can be realized.

Recreation Alternative

Under this alternative, conversion of agricultural land to other uses through land disposal in eastern Grand County would have the greatest impact to the soil resource. Development of coal resources in North Park would be more modest than under the Economic Benefit Alternative but of greater extent than under the Renewable Resource Alternative. Overall, adverse impacts to the soil would be greater than under the Renewable Resource Alternative.

Natural Environment Alternative

This alternative would result in the greatest protection of soil from disturbance. However, there would be less benefit to the soil than under the Renewable Resources Alternative because less mechanical stabilization of soil would occur.

Designation of the Troublesome WSA as a wilderness area under the Natural Environment Alternative could provide some protection to the soil resource within the boundaries of the designation. This protection would probably result in a slight beneficial impact to the soil resource.

Unavoidable Adverse Effects

All Alternatives

There would be no unavoidable adverse effects.

Short-Term Use vs. Long-Term Productivity

All major surface disturbing activities, including installation of watershed stabilization structures, oil

and gas development, coal mining, and other disturbances, would have a short-term adverse impact on the soils. These short-term uses would not adversely impact the long-term productivity of the soil. Disposal of land now under BLM administration could result in long-term conversion of land from agricultural to other uses, thus impacting the soil resource. No other long-term effects to soil productivity are anticipated.

Irreversible or Irretrievable Commitments of Resources

Loss of soil due to conversion of agricultural land to other uses is regarded as being irreversible. Erosion losses are considered to be irretrievable.

Committed Mitigation Measures

Mitigating measures will include standard Bureau stipulations and all applicable Office of Surface Mining coal regulations and stipulations.

WATER RESOURCES

Continuation of Present Management Alternative

The major impacts to water quality would be in the grazing and forestry programs. Watershed deterioration has largely been halted by various laws affecting range management over the years, but isolated spots are still being heavily used by livestock. The overgrazing of certain riparian zones affects water quality by decreasing channel stability, leading to increased channel erosion which causes sedimentation.

In certain areas of western Grand County, grazing intensities have impacts on watershed cover and soil infiltration rates; however, the allotment management plan (AMP) for part of this area would mitigate these impacts over time. Brush control on 19,500 acres could cause short-term water quality impacts due to sedimentation. These impacts would be dependent upon actual acreage treated, location, slope, soil characteristics, rates of recovery, and proximity to perennial streams.

There is a short-term measurable impact to water quality (sediment concentration) from logging operations and the construction of roads. Surface disturbing activities in the watersheds are detrimental to the enhancement of aquatic wildlife.

Among land activites, the potential construction of new roads would cause adverse localized sediment yield impacts due to increased surface disturbance each year. Because of the lack of site-specific information, exact severity of this impact to water quality cannot be ascertained at this time. Mitigation measures involving proper design and location of roads usually result in only a short-term erosion problem, with conditions stabilizing within 5 years. However, with new right-of-way cases being processed every year, water quality impacts downstream from road construction would persist during the life of the plan, resulting in some sedimentation to reservoirs and irrigation ditches and modification of flood channel capacities.

Public water reserve withdrawals would benefically impact water sources by protecting them from other kinds of development.

Not recommending the Troublesome WSA for inclusion in the National Wilderness Preservation System would have no significant impacts to water resources.

Preferred Alternative

This alternative would have both beneficial and adverse impacts. Some beneficial impacts would result as the range program expanded its intensive management of grazing, which could reduce grazing intensities in overgrazed areas. Recovery of these areas would improve water quality by increasing watershed cover, enhancing riparian zones, and increasing infiltration rates, all of which could have the combined effect of reducing erosion. A later turnout date would allow further spring growth of vegetation to provide better protection from splash erosion, watershed protection from better developed roads, and reduced soil compaction (resulting in increased infiltration), which results from tramping on wet soil in the spring.

Forest management would probably reduce areas of clearcuts and shelterwood cuts by less than 5 percent, if at all, compared to the Continuation of Present Management Alternative, resulting in a negligible reduction in water yield.

The Preferred Alternative would provide for intensive watershed management plans, with implementation of recommended projects benefiting water quality in the long term. (See the Renewable Resource Alternative for details of impacts.) Watershed resources would be specifically addressed in AMPs.

Energy and Minerals Alternative

The proposed development of coal mining could impact water quality. As coal spoil piles would have different aquifer and geochemical properties, leaching could occur and contaminate ground or surface water. Rehabilitation could consume some water if irrigation was needed; channel modification and resulting streambank erosion caused by stream crossings could cause additional sediment loads. Potential spills of fuels or chemicals could pollute surface water. Operating a water supply source could result in consumption of water needed by an existing user. Sewage treatment facilities and leach dumps could impact water quality if any sizeable leakage occurred.

Sediment loads could be increased from any of the surface disturbing activities related to coal mining. Groundwater would be impacted locally around deep mines due to dewatering and aquifer penetration. The current use of groundwater in North Park is for domestic purposes and livestock watering by local ranchers.

This alternative would have the least amount of acreage under intensive range management and may thus allow fewer opportunities for riparian protection. Grazing would continue to impact water resources by heavy grazing, trampling, etc., to riparian zones. Proposed grazing adjustments may improve watershed cover and result in a slow increase in water quality due to less erosion.

Not recommending the Troublesome WSA for inclusion in the National Wilderness System would not have any significant impacts to water resources.

Economic Benefit Alternative

Coal leasing would be emphasized under this alternative and the number of mines could dramatically increase. The extent and magnitude of residual impacts after mitigation is likely to increase, but it is not known by how much. Types of impacts are detailed under the Energy and Minerals Alternative.

In range management, the Economic Benefit Alternative would have fewer water developments and 4,000 fewer acres of vegetation manipulations than would the Renewable Resource Alternative. However, these range activities would probably affect water resources less than coal leasing operations. Impacts would be dependent on site-specific characteristics, which would be addressed in future AMPs.

Sand and gravel would be at its maximum development under this alternative. The potential for impacts to water quality resulting from sediment discharges from quarries would be at its greatest level, although this cannot be quantified.

Forest management would remain at present levels, so impacts from this alternative would be the same as they are at present.

Not recommending the Troublesome WSA for inclusion in the National Wilderness System would not have any significant impacts to water resources.

Renewable Resources Alternative

Recovery of overgrazed areas through proper allocation of forage would have a beneficial impact on water quality by improving watershed cover. Enhanced riparian zones and increased infiltration rates would have the combined effect of reducing erosion.

The later turnout date would have the beneficial effect of reduced soil compaction by allowing the soil surface to dry out, allowing rainfall to infiltrate the soil at a greater rate, reducing overland runoff, and causing less soil erosion. In addition, a later turnout date would allow further spring growth of vegetation to provide better protection from splash erosion, and watershed protection for better developed roots. AMPs would specifically address water resources in relation to allotments.

Range improvements could have a beneficial impact by reducing sediment yields of watersheds. Developing water facilities and vegetation manipulations under both the range and wildlife programs could affect water resources, depending on their location, size, and number. Developments and improvement projects would reduce soil saturation and recharge alluvial aquifers, sometimes reducing local contribution to streamflow. Fencing of water sources would often protect them from livestock trampling and enhance natural vegetation cover.

Vegetation manipulations would cause a temporary increase in sediment yield if mechanical treatment was used, chemical pullution if there was an accidental spill or improper use of chemical spraying, and a possibility of phosphorus and nitrate increase if the vegetation was burned. There would be residual impacts even though mitigation measures would reduce their severity.

Not recommending the Troublesome WSA for inclusion in the National Wilderness Preservation System would not have any significant impacts to water resources.

Recreation Alternative

Even though this alternative favors recreational development, impacts to water resources may not result exclusively from this activity. Sediment yield from any kind of surface disturbing activity would be the most significant impact, depending on the mitigation measures to be applied. Potential impacts from energy development due to unavoidable or accidental spills, leaks, or ruptures of oil and gas facilities could be next in significance. However, this latter impact cannot be predicted or quantified.

Increased wetland habitat by means of reservoir construction could impact flood routing, reduce peak flow, and cause sediment transport, generally resulting in less severe floods and reduced sediment yields but with some sediment deposits occurring within the structure. There is a potential for a reduction in water quality (nitrogen and coliforms) due to increased recreational development.

In lands activities, this alternative would likely have similar residual impacts in sediment yield from surface disturbance as would the Continuation of Present Management Alternative. In addition, the coal leasing program and oil and gas leases under this alternative would have similar, but expanded residual impacts (after mitigation) compared to the Continuation of Present Management Alternative, the impact level being in proportion to the additional acres leased. Site-specific impacts would be identified at the leasing stage.

Impacts from range management to water resources are detailed in the Renewable Resource Alternative, except for those resulting from vegetation manipulation. There would potentially be 12,000 acres of prescribed burning under this alternative. Studies have shown that prescribed burning could have a short-term impact to water quality, with increased amounts of phosphorus, potassium, percent nitrogen, and organic carbon of undeterminable quantities (Gifford 1981).

The forestry program would have an estimated 10 percent reduction from present management in annual clearcut acreage, which would cause corresponding reductions in water yield impacts.

Not recommending the Troublesome WSA for inclusion in the National Wilderness Preservation System would not have any significant impacts to water resources.

Natural Environment Alternative

With fewer surface disturbing actions under this alternative and the protection of environmentally sensitive areas, adverse impacts of sedimentation are expected to be less. Not allowing ORV use in North Sand Hills could increase stabilization of that area and possibly reduce sediment loads in Government and North Sand Creeks.

Impacts from the range program's prescribed burning proposals could have a short-term, but possibly significant, impact to water quality by increasing amounts of phosphorus, potassium, percent nitrogen, and organic carbon. These could cause an algae bloom and possible eutrophication (reduction in dissolved oxygen).

Improvements for wildlife habitat/sport fisheries and from watershed management plans would reduce surface disturbance and sediment yield; beneficial impacts would result from the enhanced riparian zones and improved watershed cover.

Wilderness protection for the Troublesome WSA would not be directly significant to water resources. However, the prevention of extensive surface disturbance would be a beneficial impact to water quality by preventing accelerated erosion.

Unavoidable Adverse Effects

All Alternatives

Any form of surface disturbance would expose soil to erosion, which could cause unavoidable sedimentation to streams, rivers, and lakes; the amount would be dependent on local characteristics. Mitigation would reduce this amount, but there would be a short-term impact to water quality during the construction and rehabilitation periods.

Accidential spills and ruptures of any type of fuel or chemical would be considered unavoidable. Coal mines would unavoidably impact local aquifers, though to what extent is not known.

Irreversible or Irretrievable Commitments of Resources

All Alternatives

Soil loss and the corresponding sediment trapped in lakes and reservoirs would be considered irretrievable. Irreversible commitments would probably be limited to aquifer modification by coal mining.

Short-Term Use vs. Long-Term Productivity

All Alternatives

Water, as used in and by the natural environment, is essential for any kind of productivity of living things and is used extensively in both the short and long term. Man's uses of water in the short term often result in a slight drop in quality or quantity; furthermore, man is slowly being limited by water resources in his efforts to achieve long-term productivity.

Committed Mitigation Measures

Standard Bureau regulations as described in "Surface Operating Standards for Oil and Gas Exploration and Development" are the primary source of mitigating measures. Additionally, the Federal Water Pollution Control Act, Clean Water Act, Colorado River Basin Salinity Control Act, Safe Drinking Water Act, Floodplain Management-E011988, and Surface Mining Control and Reclamation Act are applicable.

Other committed mitigation includes compliance with Office of Surface Mining regulations for coal leasing, State Water Quality Standards, and U.S. Army Corps of Engineers, Section 404 permit requirements.

VEGETATION

Introduction

There are two major ways in which vegetation would be significantly impacted by land use actions proposed in the alternatives. These are:

1. Change in productivity; either increase, decrease, or complete loss
2. Change in vegetation composition by altering the plant community successional stage

Expected changes in vegetation will be assessed for each alternative using the two parameters mentioned above.

Forest vegetation would not be significantly impacted by any resource programs (including range management) and/or authorizations under any alternative. Bureau resource programs or authorizations either do not occur in forest vegetation areas or have negligible effects on the average yearly allowable cut. Timber management programs produce the only discernable impacts to forest vegetation; however, this management only alters the size, age, stand productivity, and composition of timber, rather than producing any change in the forest environment. Bureau commitment to revegetation, reforestation, pest control, soil/water control, and rehabilitation further reduce any possible impacts.

The recommendation of the Troublesome WSA as either suitable or unsuitable for wilderness designation would not significantly, adversely impact vegetation. The suitable recommendation under the Natural Environment Alternative would ensure the preservation of all vegetation resources. The unsuitable recommendations under the remaining alternatives, including the Preferred, would not seriously impact vegetation, since only a small portion of the WSA is suitable for timber management and no other detrimental activities (minerals development or intensive range or recreation) are foreseen. Multiple use management would ensure adequate consideration of all vegetation.

Continuation of Present Management Alternative

No significant adverse impacts are expected as a result of continuing present management practices. However, small positive changes in vegetation composition and productivity on some ranges are expected as a result of adjustments in vegetation allocation for livestock. Proposed adjustment of stocking levels from 45,648 AUMs to 39,726 AUMs of forage is expected to slightly increase vegetation productivity, particularly in regard to the grass and forb components of these ranges. A net increase in the composition of key forage bunch and sod forming grasses (commonly the most heavily grazed) would be expected as grazing pressure was reduced by livestock stocking level adjustments.

However, despite these expected positive responses in forage productivity, it is expected that the productivity on most ranges would decrease over the long term. Range management would have to be intensified to correct livestock distribution problems and enhance opportunities for forage plant rest and recovery through the proper design and implementation of grazing plans (AMPs) before increases or even stabilization could be attained in the overall vegetation community.

Other potential long-term positive impacts expected from current management practices would result from the fencing of riparian areas as pro-

posed by the wildlife and watershed programs. Long-term increases in vegetation productivity and a stabilization in successional plant cummunity development would be expected within these vegetation types as stream segments were protected from or regulated for livestock use. The miles of stream and acres of watershed to be improved have not been specifically determined. However, management would be focused on those riparian areas that have historically received intensive use by livestock.

Preferred Alternative

Under the Preferred Alternative, no significant adverse impacts are expected from the various proposed resource activities. The beneficial impacts to vegetation associated with the proposed intensive range, forest, and wildlife practices would be comparable to those in the Renewable Resources Alternative. The most significant impacts would center on the proposed intensive management of 76 grazing allotments that encompass approximately 51 percent of the public land under permit. Intensive range management practices would be expected to raise the adjusted stocking level of over 39,000 AUMs to a potential level exceeding 53,000 AUMs over the long term (15 to 20 years). This increase in available forage would largely be in key herbaceous (grass and forb) species.

Energy and Minerals Alternative

In this alternative, potential cumulative impacts could occur to vegetation due to the emphasis on oil and gas and locatable mineral exploration and development. Nearly all of the resource area would remain available for oil and gas exploration and development. However, adverse impacts would be dispersed and a significant loss in vegetation productivity would not be expected. The construction of drill pads, roads, and associated support facilities would have the most permanent impacts in terms of losses in long-term productivity. However, over 90 percent of the oil and gas activities would be composed of two acres or less for each site-specific development.

Impacts brought about by the range and wildlife programs would be the same as under the Continuation of Present Management Alternative. All other resource programs would have little or no impact on vegetation.

Economic Benefit Alternative

In this alternative, coal and oil and gas production would be emphasized, primarily in the North Park area. On identified coal and oil and gas lease areas, a net loss in vegetation production would be expected due to the alteration of the sagebrush plant communities on a potential 92 percent of the resource area leased for oil and gas and on the suitable coal production areas of the KRCRA. Depending on the amount of surface mining and drilling activity and the success of reclamation, portions of the sagebrush communities in North Park would remain "mottled" or in various stages of successional development over the long term. On many of the mine sites, successful reclamation would be expected to increase vegetation productivity over that found prior to mining.

Full reclamation should be completed within three to eight years after a mine was exhausted. However, success is not guaranteed and this period could be much longer in the harsh climate of North Park.

The adverse impacts of oil and gas exploration and development activities would be the same as discussed for the Energy and Minerals Alternative. The long-term positive impacts from intensive range and wildlife management practices and proper forage allocation adjustments would be the same as outlined in the Renewable Resources Alternative. However, less acreage would be intensively managed for these resources in lieu of expanded opportunities for coal development (63 grazing allotments, or approximately 45 percent of the public lands under permit). Intensive range management practices would be expected to raise the adjusted stocking level of over 39,000 AUMs to a potential level exceeding 51,000 AUMs.

Renewable Resources and Recreation Alternatives

Under these alternatives, the largest acreages of public land would be committed for intensive management under the range, forestry, and wildlife programs. The largest increases in vegetation productivity would be expected under this alternative due to the intensive management practices employed. Such practices would include proper stocking rates of livestock and wildlife, forage and habitat improvement projects (e.g., brush eradication and riparian habitat protection/enhancement), adjustments in season of use for livestock, and implementation of grazing systems (activity plans).

Available livestock forage would be expected to gradually increase from an adjusted level of over 39,000 AUMs to a potential level of over 55,000 AUMs as intensive management practices were implemented on 81 grazing allotments over a 10-year period. The intensive range management practices, considered collectively, would be expected to show significant positive changes in vegetation composition and production, primarily in the sagebrush-dominated vegetation zones.

On approximately 55 percent of land under grazing management, a gradual conversion would be expected from a dense brush overstory to a more dispersed brush/grass association, with a substantial long-term increase in herbage cover and production. Improvement in the forage production and condition of riparian vegetation would also be optimized under these alternatives through intensive management. No other significant or large-scale impacts on vegetation from other resource programs are expected under these alternatives.

Natural Environment Alternative

In this alternative, the various resource activities would have the least potential adverse impacts on vegetation due to more stringent environmental protection stipulations, which would allow for a more stable trend in plant community successional development.

Vegetation productivity would be enhanced while maintaining as natural a setting as possible. Intensive range, forest, and wildlife practices would occur as under the Renewable Resources Alternative but would be modified to lessen adverse impacts, particularly major disturbances to established vegetation. The most significant modification is the proposed sagebrush eradication, which would be restricted to the use of prescribed burning only and be limited to substantially less acreage than the treatments proposed in the Renewable Resources Alternative. Despite this restriction, intensive range management practices would be expected to raise the adjusted stocking level of over 39,000 AUMs to a potential level exceeding 55,000 AUMs over the long term (15 to 20 years).

Unavoidable Adverse Effects

Continuation of Present Management, Preferred, Renewable Resources, Recreation, and Natural Environment Alternatives

Under the five management alternatives listed above, no major unavoidable adverse impacts to the vegetation resource are expected, except for cumulative impacts of coal development, oil and gas exploration, and major land rights-of-way actions. These actions would impact the open sagebrush ecosystems almost exclusively and would usually be well dispersed, with the exception of coal development.

Energy and Minerals and Economic Benefit Alternatives

The major impacts to vegetation as a result of increased open-pit coal mining and oil and gas exploration would be adverse over the short term as vegetation was completely removed on these areas for the life of the mines and oil and gas development sites. However, these impacts would not be considered unavoidably adverse, as existing mitigation measures and reclamation would provide for the return of the sites to a level of productivity equal to or greater than that which existed prior to development.

Short-Term Use vs. Long-Term Productivity

Continuation of Present Management

Adjustments in livestock grazing allocation should help stabilize and improve vegetation productivity over the long term (10 to 20 years), particularly in regard to the establishment and maintenance of key forage grass species. However, maintaining forage productivity could not be assured without further intensive range management. Productivity would also be expected to substantially increase in some riparian areas within 2 to 10 years after protective measures (fencing, deferred livestock use, etc.) were implemented.

Other land uses, principally energy development activities, would not be expected to severely impact the sagebrush ecosystem on an overall basis. These type of impacts would be regionally isolated, such as in the case of coal development, or dispersed, as in the case of oil and gas exploration. Protective mitigation and reclamation stipulations

would provide for restored productivity over the long term.

Preferred, Renewable Resources, and Recreation Alternatives

Long-term increases in vegetation productivity are expected by implementing intensive management practices. The most substantial increases are expected in net herbage production in the open sagebrush communities. Complementing this increase would be a change in composition from a brush dominated plant communities to a mixed brush/grass association.

Energy and Minerals and Economic Benefit Alternatives

The major short-term use, coal mining, would result in the loss of native vegetation for the life of developed mines. The effects this loss would have on the long-term productivity of an area would be largely dependent on the success of reclamation. A practical time frame for reclamation would be 3 to 8 years after mining was terminated.

No other short-term uses are expected to have a significant effect on the long-term productivity of the vegetation. Intensive range and wildlife management practices, in concert with adjusted livestock stocking rates, are expected to increase vegetation productivity over the long term, as in the Renewable Resources Alternative.

Again, any long-term impairment to the vegetation would largely occur in the sagebrush ecosystem and would result primarily from energy development activities (construction of drill pads, roads, etc.).

Natural Environment Alternative

This would be same as the Renewable Resource Alternative, although significant additional beneficial increases in vegetation production would be expected along ephemeral stream channels and gullies as a result of intensive watershed development in "highly erosive" areas. This would specifically occur in the priority (sensitive) watershed area north of Kremmling (see Natural Environment Alternative Map).

Irreversible or Irretrievable Commitments of Resources

No vegetation species or plant communities would be irretrievably lost under the proposed levels of management, except for the possibility of impacts on sensitive, threatened, or endangered species.

Committed Mitigation Measures

All Alternatives

Stipulations which are currently in effect and which have been placed on the various resource activities and authorizations are adequate to protect against any major adverse changes in native vegetation communities.

WILDLIFE AND THREATENED/ ENDANGERED PLANTS AND ANIMALS

Continuation of Present Management Alternative

There are no significant adverse impacts to wildlife or wildlife habitat and threatened and endangered species under this alternative. It would maintain wildlife habitat and population production at current levels. This alternative would emphasize wildlife habitat production more than the limited management under the Energy and Minerals, Economic Benefit, and Natural Environment Alternatives, but less than would the intensive management under the Recreation and Renewable Resources Alternatives.

Wildlife habitat management would continue at current levels. Habitat improvement projects would be implemented in the North Park HMP area, while improvements in Middle Park would be limited to small-scale aquatic projects. Habitat monitoring would continue at current small-scale levels.

Coordination with other resources to assure consideration of wildlife habitat values in management actions would continue. The resource programs most likely to cause significant wildlife habitat modification would be forestry, minerals, and range management. The extent of impacts would be dependent on the extent of development. Forage

would be allocated for big game populations at Colorado Division of Wildlife (DOW) 1980 census levels. Most wildlife populations would continue to be stable at current levels.

Threatened or endangered species habitats would be protected and monitored, particularly for bald eagles, *Haliaeetus leucocephalus*, and scorpionweed, *Phacelia formosula*.

Preferred Alternative

This alternative emphasizes wildlife habitat and population production more than the others, with the exception of the Recreation Alternative. Wildlife habitats and populations would be expected to increase in this alternative, except in the coal development area. The extent of the coal impact would be dependent on the extent and timing of development. Forage would be allocated for big game at population levels consistent with the Colorado Division of Wildlife's long-term population objectives if sufficient forage was also available to support current livestock production.

Wildlife habitat/range management conflicts could occur in areas designated for sagebrush eradication. Wildlife habitat would also be lost temporarily in areas of coal development. Net results of sagebrush eradication and coal development could be reductions in certain wildlife populations and habitat values associated with the sagebrush ecosystem (sage grouse breeding, nesting, and wintering areas and big game range), both on a site-specific basis and offsite; however, mitigation could acceptably reduce impacts to wildlife habitat.

If forest management practices complemented wildlife habitat values, an increase in habitat quality would result from this alternative. Forest management practices and impacts expected to complement wildlife habitat would include additional edge effect, road closures, and increased forage production. However, adverse impacts, such as loss of snags, access to previously undisturbed areas, and displacement of certain species during critical seasons, could occur.

Disposal or lease of scattered public land tracts could adversely impact wildlife on these lands by making possible new land uses that would be different from, or in conflict with, present use as wildlife habitat. Threatened and endangered species habitats would be protected and monitored, particularly for bald eagles, *Haliaeetus leucocephalus*, and scorpionweed, *Phacelia formosula*. The North Park *Phacelia* site would be managed as a research natural area (RNA) to enhance protection of this species.

Energy and Minerals Alternative

Of all the alternatives formulated, the Energy and Minerals Alternative would have the greatest potential to adversely impact wildlife habitat. Wildlife habitat would be lost. The degree of loss would depend on extent, location, and timing of developments. Those wildlife species associated with the sagebrush ecosystem would be the most adversely impacted because energy development would take place in this ecosystem. Stipulations on development activities would be used to reduce the energy development impacts on wildlife habitat. Mitigation would also involve habitat similar to habitat lost to development, with measures to increase the carrying capacity of unimpacted habitats being implemented. While mitigation could reduce impacts to wildlife and habitat, it is not known if a maximum development situation could be adequately mitigated. Habitat improvement projects would be avoided in areas with high potential for energy development if loss of the project could occur.

Threatened or endangered species habitats would be protected and monitored, particularly for bald eagles, *Haliaeetus leucocephalus*, and scorpionweed, *Phacelia formosula*.

Economic Benefit Alternative

This alternative would have the potential for adversely impacting wildlife, being second only to the Energy and Minerals Alternative in this respect.

Emphasis on the development of commodity resources such as oil, gas, coal, livestock forage, and timber could adversely impact wildlife habitat. The degree of impact would depend on the extent, location, and timing of mineral development, timber harvest, and livestock forage production. Critical habitats such as winter ranges, breeding habitats, and migration corridors could be lost or modified if this alternative were selected. The extent of this loss would depend on the extent of development and mitigation and the success of reclamation. Stipulations on development activites would be utilized to minimize adverse impacts to wildlife habitat. Mitigation methods to increase carrying capacities of undisturbed similar habitats would also be developed and implemented to offset habitat loss.

Habitat improvement projects would be avoided in areas with high potential for energy development if loss of the project could occur.

The potential for loss of sagebrush habitat would increase in this alternative because range management has proposed large acreages of sagebrush

eradication. Habitat values such as sage grouse breeding, nesting, and wintering areas and big game winter range could be lost if sagebrush eradication occurred and suitable replacement habitat was not available. Mitigation could adequately reduce and/or replace significant losses.

Threatened or endangered species habitats would be protected and monitored, particularly for bald eagles, *Haliaeetus leucocephalus*, and scorpionweed, *Phacelia formosula*.

Renewable Resources Alternative

There are no significant adverse impacts to wildlife or wildlife habitat under this alternative. It emphasizes wildlife habitat and population production more than all others, with the exception of the Recreation Alternative. Wildlife habitats and populations would be expected to increase because forage would be allocated for big game at population levels consistent with the Colorado Division of Wildlife's long-term population objectives if sufficient forage was also available to support current livestock production. Habitat improvement projects are also expected to increase wildlife populations.

Wildlife habitat/range management conflicts would occur in areas designated for sagebrush eradication. Net results of sagebrush eradication could be reductions or increases in certain wildlife populations, such as antelope, mule deer, sage grouse, etc., associated with the sagebrush ecosystem. Mitigation to reduce and/or replace significant losses would be necessary for authorization of development.

If forest management practices complemented wildlife habitat values, an increase in habitat quality would result from this alternative. This increase would be dependent on the extent and location of timber practices and the success of reclamation efforts. Forest management benefits expected to complement wildlife habitat would include additional edge effect, road closures, and increased forage production.

Coordination with Bureau resource development programs would adequately ensure the mitigation of significant impacts. Threatened or endangered species habitats would be protected and monitored, particularly for bald eagles, *Haliaeetus leucocephalus*, and scorpionweed, *Phacelia formosula*. The North Park *Phacelia* site would be managed as a RNA.

Recreation Alternative

There are no significant adverse impacts under this alternative. The Recreation Alternative provides the greatest emphasis on wildlife habitat management and population production. Wildlife habitat and population production would be emphasized in this alternative more than in any of the others. Habitat conditions would be improved to support increased populations of wildlife species with high recreation values. Conflicts with other resource management activities would be resolved in favor of wildlife habitat where feasible, and mitigated if not. Forage allocation for big game would be for population levels projected by the Colorado Division of Wildlife (CDOW) in their long-term objectives.

Habitat losses would occur in areas subjected to sagebrush manipulation to enhance range management, in watershed improvement project areas, and in mineral development areas. Mitigation for habitat losses due to change in vegetation composition would be mitigated by the resource activity responsible for the losses.

Threatened or endangered species habitats would be protected and monitored, particularly for bald eagles, *Haliaeetus leucocephalus*, and scorpionweed, *Phacelia formosula*.

Natural Environment Alternative

There are no significant adverse impacts to wildlife habitat and production under this alternative. Fluctuations of wildlife habitat and population conditions would depend on natural occurrences, such as mild or severe winters and natural regeneration.

Forage allocation for big game would be for population levels projected by the Colorado Division of Wildlife in their long-term objectives. Habitat improvement projects would involve natural rather than mechanical methods. Burning rather than chaining or plowing would be utilized to change vegetation structure, water developments would be constructed on a smaller scale (no large reservoirs), etc.

Habitat management for threatened or endangered (T/E) plants and animals and other nongame species would be emphasized in this alternative. Results of this alternative would be a slight improvement in habitat conditions for recreational species and a reduction in associated recreation activities. An increase in protection of T/E species habitats would result in an increase in population size. Considerations of wildlife values would become a limiting factor in authorizations and

would reduce any adverse impacts to an acceptable level.

Impacts from Wilderness Recommendations

The Troublesome Wilderness Study Area (WSA) would be recommended as unsuitable for wilderness designation under six of the seven alternatives:

1. Continuation of Present Management
2. Preferred
3. Energy and Minerals
4. Economic Benefit
5. Renewable Resources
6. Recreation

Recommendation of the Troublesome WSA as unsuitable for wilderness would not significantly impact the wildlife resource. The Troublesome WSA does not have potential for significant development of other resources, such as forestry and minerals, which would conflict with the existing wildlife habitat values.

Limited public access is expected to continue. Therefore, impacts to wildlife and habitat are not expected to be significant.

The Troublesome WSA would be recommended as suitable for wilderness designation under the Natural Environment Alternative. Designation of the Troublesome WSA would not significantly impact wildlife. The Troublesome WSA is essentially a wilderness now because of lack of resource development and poor access. Wildlife habitat is currently in good condition; improvement projects would not be necessary.

Unavoidable Adverse Effects

Continuation of Present Management Alternative

1. Reductions in some habitat types and increases in other types due to changes in vegetation composition and structure as a result of specific management actions would occur.

2. Cumulative impacts on wildlife and associated habitats would occur when apparently small, insignificant impacts accumulated over time. These impacts would become crucial as energy development proceeded in North Park.

3. Wildlife populations and habitat conditions could decrease due to natural occurrences.

4. Loss of wildlife habitat and production on lands developed for energy mineral production would constitute an adverse impact.

5. Reduction in quantity of habitat available to those species associated with the sagebrush ecosystem would occur.

6. Reduction in quantity of habitat available to those species dependent on the lodgepole pine ecosystem would occur if regeneration was unsuccessful.

Preferred Alternative

Impacts would be the same as those listed under the Continuation of Present Management Alternative.

Energy and Minerals Alternative

Impacts would be the same as under the Continuation of Present Management Alternative, except impacts would be even more extensive due to the increase in energy development.

Economic Benefit Alternative

Impacts would be the same as under the Continuation of Present Management Alternative but more widespread due to an increase in energy development, timber harvest, and range improvement impacts.

Renewable Resource Alternative

Impacts would be the same as under the Continuation of Present Management Alternative, except that more impacts would occur due to increased forest and range management.

Recreation Alternative

1. Impacts would be the same as under the Continuation of Present Management Alternative, with the extent of impacts being dependent on the extent of development.

2. Loss of some nontarget wildlife species and habitats in the development of habitat improvement projects could occur.

Natural Environment Alternative

Impacts would be the same as under the Continuation of Present Management Alternative, except that there would be fewer impacts because of decreased energy/economic development activities.

Short-term Use vs. Long-Term Productivity

All Alternatives

1. Duration of energy development impacts on wildlife habitat would depend on the success of reclamation. Restoration of wildlife habitat values associated with developed lands could take 30 years.

2. Adverse impacts from sagebrush eradication would be long term for those wildlife species dependent on the sagebrush ecosystem.

3. Range improvement projects would enhance wildlife habitat over the long term if constructed to mutually benefit wildlife. Duration of the benefit would depend on the effective life of the project. The short-term impact of these projects would be loss of use of the area by wildlife during the construction period.

4. The short-term effect of energy development and timber harvest would be abandonment of the area by most wildlife during development. Most wildlife would be expected to return to the areas at the conclusion of development and successful reclamation.

In summary, the long-term wildlife habitat productivity would depend on two major factors. These factors are the extent and timing of development and the success of reclamation efforts where key wildlife habitats have been developed.

Irreversible or Irretrievable Commitments of Resources

All Alternatives

Wildlife and wildlife habitat are renewable resources. There would be no irreversible or irretrievable commitment of wildlife habitat resources if stipulations and mitigations were utilized to reduce or minimize adverse impacts by development activities.

Uncommitted Mitigation Measures

Continuation of Present Management, Preferred, Renewable Resources, and Natural Environment Alternatives

1. Utilize habitat improvement techniques, such as range fertilization, vegetation manipulation, reseeding, etc., to increase carrying capacity of unimpacted habitat.

2. Avoid critical habitats, such as big game winter ranges, sage grouse breeding habitats, and riparian habitats when implementing vegetation manipulation projects.

3. Establish monitoring studies to determine actual impacts, both cumulative and short-term, of habitat reduction activities, such as coal mining and sagebrush eradication.

4. Develop stipulations that will reduce adverse impacts to wildlife habitat caused by mineral development, timber harvest, and livestock grazing improvement practices.

5. Assure that reclamation practices are compatible with wildlife habitat values associated with public lands prior to mineral development.

6. Allow strip mining to occur in rectangular strips, with undisturbed strips of equal size left between the disturbed sites. To maintain the sagebrush ecosystem, these undisturbed sites should remain undisturbed until the disturbed areas are successfully reclaimed with sagebrush.

VISUAL RESOURCES

Continuation of Present Management Alternative

Under the Continuation of Present Management Alternative, the emphasis is given to maintaining the visual quality in sensitive Class II visual areas. (See Chapter 2 for a description of these classes.) Mitigation, rather than exclusion, would be the primary means of reducing visual contrast in these areas. Mitigating measures designed to maintain existing visual quality would be used where practical on all other public lands in the resource area.

Timber harvesting is the major activity that has affected and would continue to affect the visual quality of sensitive visual areas. Road building and clearcutting, the preferred harvest method in lodgepole pine, are the major impacts on visual quality.

However, these impacts are mitigated by designing clearcuts to blend in with existing openings, limiting the size of clearcuts to generally less than 40 acres, or the use of partial cuttings. Since much of the BLM managed forest land is located in the transition zone between open sagebrush and dense forests, these measures are usually effective.

Other activities with the potential to create major visual contrasts (e.g., coal mining and major powerlines) generally occur in nonsensitive areas which can accommodate such contrasts, e.g., Class II, Class III, or Class IV areas. The impacts in these areas are mitigated through application of standard stipulations, which can usually meet the visual contrast requirements of these classes. Thus, these activities do not represent a significant adverse impact to visual resources. If present management practices were to continue, the visual character of the public lands in the resource area would not significantly change.

Preferred Alternative

The impacts of the Preferred Alternative are the same as under the Renewable Resources Alternative (see below).

Energy and Minerals and Economic Benefit Alternatives

If either the Energy and Minerals Alternative or the Economic Benefit Alternative were implemented, the impacts to visual resources would be the same as under the Continuation of Present Management Alternative.

Renewable Resources Alternative

Under the Renewable Resources Alternative, approximately 10,000 acres less than under current management would be intensively managed for forestry. This acreage is composed largely of scattered tracts located in adverse locations (less than 40 acres, no access, etc.); harvesting would not represent significant adverse impacts to visual resources if it did occur. Its exclusion from timber harvesting, however, would help to maintain existing visual quality, which represents an overall beneficial impact to visual resources. Otherwise, the impacts would be the same as under the Continuation of Present Management Alternative.

Recreation Alternative

The impacts under the Recreation Alternative would be similar to the Renewable Resources Alternative, except that restrictions or mitigating measures designed to protect recreation values would be imposed on all activities in addition to the standard stipulations.

Natural Environment Alternative

The Natural Environment Alternative affords the most protection to visual resources because all Class II areas would receive management emphasis through imposition of restrictions or mitigating measures imposed on all activities. In addition, the acreage under intensive forest management would be reduced the same as under the Renewable Resources Alternative. The Troublesome WSA, if designated as wilderness by Congress, would be managed as Class I, which affords the most protection to visual resources.

Unavoidable Adverse Effects

There would be no significant unavoidable adverse effects to visual resources under any of the alternatives. The landscape would be altered on a site-specific basis under all alternatives. In most cases, adverse impacts would be adequately mitigated so that proposed uses could meet the allowable contrast requirements of the various visual management classes. More flexibility in terms of restrictions would be allowed under the Continuation of Present Management, Energy and Minerals, Economic Benefit, and Renewable Resources Alternatives, allowing for more change in visual quality than under the Recreation or Natural Environment Alternatives, where visual resources would be a management emphasis.

Short-Term Use vs. Long-Term Productivity

In most cases, impacts to visual resources are short term. The impacts of timber harvesting moderate as timber grows back, the impacts of coal mining are substantially reduced as reclamation takes effect, etc. The only major long-term effect would result from the siting of a major powerline or some other permanent facility in Class II areas. Such actions could permanently alter the land-

scape. However, mitigating measures could usually reduce the impact to allowable contrast levels.

Irreversible or Irretrievable Commitments of Resources

The only irreversible or irretrievable commitment of the visual resource would be where permanent facilities, such as powerlines, could not, after application of mitigating measures, meet the allowable degree of contrast established for Class II visual management areas.

Committed Mitigation Measures

Standard mitigating measures for the protection of visual resources are identified in the management categories section of Chapter 3. Under all alternatives, the proposed range improvements would meet the contrast requirements of the various visual management classes through application of the standard mitigating measures.

RECREATION

Continuation of Present Management Alternative

Under the Continuation of Present Management Alternative, the upper Colorado River and North Sand Hills would continue to be managed as special recreation management areas (SRMAs). Off-road vehicles would continue to be allowed on the North Sand Hills, with restrictions to protect cultural resources and the dune environment. In the SRMAs, other uses, such as forestry, oil and gas development, and range improvements would be allowed as long as they were compatible with overall recreation management objectives.

For the upper Colorado River, the proposed Azure Project would be consistent with this alternative as long as floatboating opportunities were maintained on the river below the project area, including Little Gore Canyon. Impacts to recreation opportunities would be loss of the primary river access site at the Pumphouse and approximately 1-1/2 miles of river for floatboating. The recreation activity opportunities on this 1-1/2 miles would change from river related activities to flat water related activities. The setting opportunities (roaded-natural) would remain the same. Assuming that (1) adequate flows would be maintained (1000 cfs minimum), (2) raft launching could be accommodated at the base of the dam, and (3) adequate river/reservoir access and camping facilities were provided to replace the Pumphouse, the impacts to recreation could be adequately mitigated and the impacts would not be significant.

If these conditions could not be met, then the Azure Project would represent significant impacts to recreation opportunities, both in terms of quality (sufficient flows) and quantity (loss of Little Gore Canyon to floatboating) of recreation opportunities. As a specific proposal for the Azure Project was not available at the writing of this draft plan, specific impact analysis will have to done in the EIS on the project itself.

The remainder of the public lands would receive limited management for dispersed recreation. Generally, dispersed recreation is compatible with other resource activities *except* active coal mining and other active mineral development. Under present levels, these activities, including range management for livestock, do not represent major adverse impacts to recreation opportunities. In the past, dispersed recreation has benefited from activities such as forestry, which have opened up significant amounts of previously inaccessible land to the public for a wide variety of recreation opportunities.

The recreation opportunities (activities, settings, and experiences) on the public lands would remain essentially unchanged if present management were continued, with the exception of the Troublesome WSA. This area would be opened for intensive forestry management, which would alter the type of recreation opportunities available on some 12,000 acres of public land. The recreation setting opportunities of the Troublesome WSA would change from a combination of semiprimitive motorized and nonmotorized to primarily roaded natural and semiprimitive motorized. The recreation activity and experience opportunities would change correspondingly.

The Troublesome WSA is the only area on public lands in the resource area that provides recreation opportunities in a primitive nonmotorized setting. However, when the availability of these opportunities on U.S. Forest Service lands in the region is taken into account, the loss is not significant.

Preferred Alternative

The impacts of this alternative would be the same as those discussed above for the Continuation of Present Management Alternative.

Energy and Minerals Alternative

The Energy and Minerals Alternative differs from the Continuation of Present Management Alternative in that the main portion of the Troublesome WSA would be designated as a special recreation management area (SRMA), in addition to the upper Colorado River and North Sand Hills, and would be managed for primitive and backcountry recreation in the existing settings. The WSA would be maintained in essentially its present condition, except that motorized access would be allowed into either the western or southwestern portion of the unit, depending on the location of public access. Recreation use of the Troublesome WSA would increase substantially under this alternative due to provision for access. The Troublesome WSA currently receives minimal recreation use due to lack of public access.

Adverse impacts resulting from increased recreation use would include (1) disruption of wildlife, (2) compaction of soils and loss of vegetation on trails and around campsites, (3) increased human waste and trash, (4) pollution of streams, and (5) increased wildfire protential. These could be adequately mitigated through management actions and are, therefore, not considered significant.

The Energy and Minerals Alternative represents an intermediate impact to hunting opportunities in North Park due to expansion of coal development, which would, however, occur to a lesser degree than in the Economic Benefit Alternative.

Aside from the Troublesome WSA and coal development areas, recreation opportunities in the Kremmling Resource Area would remain essentially the same as under present management.

Economic Benefit Alternative

The Economic Benefit Alternative would represent the greatest adverse impact to hunting opportunities in North Park due to potential loss of wildlife populations resulting from expanded coal development. Otherwise, the impacts of this alternative, including those of the Azure Project, would be the same as under the Continuation of Present Management Alternative.

Renewable Resources Alternative

Under the Renewable Resources Alternative, the North Sand Hills would be designated an area of critical environmental concern (ACEC). Motorized recreation activities would be allowed in the ACEC only if compatible with the primary management objectives of protecting cultural resources and the dune environment. More restrictions than are currently in place or prohibiting motorized vehicles altogether may be necessary to meet these objectives. If vehicles were banned, the only opportunity in Colorado for using a motorized vehicle in sand dune environment would be lost. Otherwise, the impacts of this alternative would be the same as under the Continuation of Present Management Alternative.

Recreation Alternative

The Recreation Alternative represents the optimum management of public lands in the resource area for recreation opportunities. All areas with significant opportunities to meet current or anticipated demands would be designated as SRMAs. Other resource uses would be allowed in the SRMAs as long as they were compatible with recreation management objectivies. The Azure Project would be compatible with this alternative only if recreation opportunities could be maintained below the dam.

Outside the SRMAs, recreation opportunities would remain essentially the same as under current management, except that recreation would be considered a primary reason for access acquisition and road construction. There would be an increase in deer hunting opportunities as a result of managing the public range for optimum wildlife populations. The Recreation Alternative would be the most beneficial to recreation opportunities on public lands because potential adverse impacts resulting from other resource uses would be restricted or mitigated, especially in SRMAs.

Recreation use would increase the most under this alternative due to provision of access and management designed to enhance recreation opportunities. Adverse impacts associated with this increased use would be similar to those discussed under the Energy and Mineral Alternative but would be more widespread. Management actions would be designed to adequately mitigate these impacts.

Natural Environment Alternative

The Natural Environment Alternative represents maintenance of the status quo for recreation except for the North Sand Hills. The natural area status of the North Sand Hills would be retained and ORVs would be prohibited on the dune area. The only opportunity in Colorado for using motorized vehicles in

a sand dune environment would be lost. The Azure Project in any form would not be compatible with the objectives of this alternative due to changes in both the environment and in recreation opportunities. With the exception of the upper Colorado River, this alternative would emphasize the provision of dispersed recreation opportunities in settings similar to existing conditions. Hunting opportunities would benefit from management of the public rangelands to optimize wildlife populations.

Unavoidable Adverse Effects

The Continuation of Present Management, Economic Benefit, and Renewable Resources Alternatives represent the greatest potential for adverse impacts to recreation due to emphasis on other resource activities. The major areas where this would occur would be the potential coal expansion areas in North Park and the Troublesome WSA in Middle Park, where recreation opportunities would be lost or altered. The adverse impacts under the Energy and Minerals Alternative would differ in one respect: the northern area of the Troublesome WSA would be managed as an SRMA, thus reducing adverse impacts from other resource activities in that area.

Short-Term Use vs. Long-Term Productivity

Intensive forestry management of the Troublesome WSA, expansion of coal development in North Park, and construction of the Azure Project would be the significant long-term commitments affecting existing recreation resources and productivity. These commitments would occur in all alternatives, but the degree would vary, depending on the emphasis of the alternative.

Irreversible or Irretrievable Commitments of Resources

In all alternatives except the Natural Environment Alternative, the only irreversible or irretrievable commitment of recreation resources to uses other than existing recreation opportunities would be the Azure Project.

Committed Mitigation Measures

Standard Bureau stipulations and regulations will apply. Refer to the planning criteria for further details.

WILDERNESS

Continuation of Present Management Alternative

Under the Continuation of Present Management Alternative, the Troublesome Wilderness Study Area (WSA) would be recommended as nonsuitable for wilderness designation. Continuing interim management for the protection of wilderness values would not be allowed under law. The suitability or unsuitability of the WSA for wilderness must be determined through this resource management plan.

If existing management were continued, portions of the WSA would be subject to intensive forest management (see alternative map). Management practices would include road building and timber harvest. Such activities would permanently alter the wilderness characteristics (i.e., naturalness, opportunities for solitude, primitive/unconfined recreation) in portions of the area to the point where these characteristics would no longer be present. The wilderness characteristics would remain largely unaffected in the northern portions of the area between the drainages of Rabbit Ears and Troublesome Creeks.

Intensive forestry management would also open the western portion of the area to motorized recreation. Provision of public access resulting from intensive forest management would substantially increase the recreation use of the area. Problems associated with increased use, e.g., litter, unattended campfires, motor vehicles off roads and trails, etc., would increase correspondingly.

Range management would continue at essentially the same level, with some minor projects such as fences and stock ponds being constructed in the area. These projects would have a negligible impact on wilderness characteristics. No other resources, including energy and minerals, have been identified as having moderate to high potential for development within the WSA boundaries.

Preferred Alternative

Under the Preferred Alternative, the majority of the Troublesome WSA would be managed intensively for livestock grazing. The western portion would be managed intensively for forestry (see alternative map). Intensive range management would primarily involve construction of fences and stock ponds and would not significantly alter the existing situation. In those areas on the western fringe where intensive forestry practices would be implemented, the wilderness characteristics would be permanently altered to the point where they would no longer be present. Intensive forestry management would open the western portions of the area to motorized recreation and increase recreation use through provision of public access. The wilderness characteristics of the 6,000 acre block of public lands in the "V" between Rabbit Ears and Troublesome Creek would remain essentially unchanged.

Energy and Minerals Alternative

The impacts of the Energy and Minerals Alternative would be essentially the same as under the Recreation Alternative, except that portions of the areas on the west and south would be intensively managed for forestry. This would alter, and could even destroy, the wilderness characteristics of these areas.

Economic Benefit Alternative

The impacts of the Economic Benefit Alternative would be the same as those described for the Continuation of Present Management Alternative.

Renewable Resources Alternative

The impacts of the Renewable Resources Alternative would be the same as those under the Preferred Alternative.

Recreation Alternative

The Recreation Alternative represents the least degree of adverse impact to wilderness characteristics of all the nonwilderness alternatives. Under the Recreation Alternative, the Troublesome WSA would be managed as a special recreation management area (SRMA) for primitive and backcountry recreation opportunities. The area would be maintained in essentially its present condition, except that motorized access would be allowed into either the western or southwestern portion of the unit, depending on the location of public access.

Recreation use would increase most under this alternative due to provisions for access and the SRMA designation, which would attract use to the area. This would represent a significant change, as the area is presently little used for recreation because of a lack of public access. Adverse impacts resulting from increased recreation use would include (1) disruption of wildlife, (2) compaction of soils and loss of vegetation on trails and around campsites, (3) increased human waste and trash, (4) pollution of streams, and (5) increased wildfire potential. Other uses, such as forestry (selective cuttings), oil and gas development, and range improvements, would be allowed only as long as they were compatible with the recreation management objectives; therefore, they would not represent major impacts to wilderness characteristics.

Natural Environment Alternative

The Natural Environment Alternative would recommend the Troublesome WSA as suitable for wilderness designation, pending further mineral evaluation as required by FLPMA. Should Congress designate the area as wilderness, the wilderness values would receive statutory protection. No valid existing rights are known to exist which would significantly degrade wilderness values or impair the Bureau's ability to manage the area as wilderness.

Increased use resulting from wilderness designation and provision of access would change the use patterns from the existing situation. Impacts from increased recreation use would be similar to those identified under the Recreation Alternative. Overall, the Natural Environment Alternative would be beneficial to wilderness values because of statutory protection and management objectives designed to protect those values.

Unavoidable Adverse Effects

Under all alternatives, except the Natural Environment Alternative, wilderness values would be adversely impacted due to intensive management practices for other resources. The Continuation of Existing Management and Economic Benefit Alternatives represent the most extensive alteration of wilderness characteristics. The Renewable Re-

sources and Preferred Alternatives represent an intermediate level of adverse impacts, while the Recreation and Energy and Minerals Alternatives represent the least degree of adverse impact of all the nonsuitability alternatives. The Natural Environment Alternative, while having the potential to adversely impact wilderness values because of increased recreation use, would have a net beneficial impact to wilderness values because of statutory protection and management actions designed to mitigate any adverse impacts.

Short-Term Use vs. Long-Term Productivity

All of the alternatives, except the Natural Environment Alternative, represent both a short-term and long-term commitment to manage the Troublesome WSA for resource values other than wilderness. In the short term, the area would remain essentially the same until access could be acquired and intensive management plans prepared. In the long term, productivity in terms of the wilderness resource would decline and could be lost entirely.

The Natural Environment Alternative represents a long-term commitment to protection of wilderness values.

Irreversible or Irretrievable Commitments of Resources

All alternatives, except the Recreation and Natural Environment Alternatives, represent an irreversible commitment of portions of the area to uses other than wilderness, resulting in the associated loss of wilderness values. In all alternatives, the area between Rabbit Ears and Troublesome Creeks would remain essentially unchanged. Under the Recreation Alternative, the character of the entire area would show little change over present conditions; wilderness characteristics would thus not be irretrievable.

While wilderness designation is viewed as a permanent form of management, it is the prerogative of Congress to revoke wilderness designation and open an area to multiple use management. Thus, the Natural Environment Alternative does not represent an irreversible or irretrievable commitment of the area to wilderness management or a permanent loss of nonwilderness resources.

Committed Mitigation Measures

Refer to management level discussion for wilderness management in Chapter 3, standard Bureau regulations and stipulations, and the USDI-BLM Wilderness Management Policy, September, 1981.

CULTURAL RESOURCES

Continuation of Present Management Alternative

Under this alternative, cultural resources in the resource area would not be significantly adversely impacted, given compliance with existing regulations and the present emphasis of the Bureau's major program policies. The management of these resources is largely in support of other impacting programs and authorizations.

Significant adverse impacts to cultural resources are those that destroy or substantially disturb cultural remains without benefit of at least some level of evaluation. All surface disturbing actions have the potential to cause adverse impacts, though in different ways because of the independent development of Bureau regulations and legislation which has emerged to meet different program needs.

Cultural resources in the resource area are of low visibility, with little potential for general public consumption, which largely eliminates intensive management of the resource. Only protection and avoidance are available as options.

An exception is the Windy Gap Site area, which has potential for contributing new and unique information on prehistoric lifestyles. The Bureau has placed an emergency protective withdrawal on the area until further uses can be determined and implemented. Cultural resource management plans for sites meeting National Register of Historic Places (NRHP) criteria assure similar consideration. Identification and evaluation of cultural resources for planning or predevelopment data collection also occurs in response to projected management trends. This is considered beneficial because it aids project location and adds to knowledge.

Cultural resource inventory reports are on file in the Kremmling Resource Area Office. The recommendation of the Troublesome WSA as unsuitable for wilderness designation would not constitute a significant adverse impact due to this area's low potential for energy or timber development, current-

ly limited access, dispersed recreational use, and limited range management.

Preferred Alternative

There would be no significant adverse impacts to cultural resources under this alternative. Any adverse impacts that occurred could be legally mitigated. Avoidance of significant cultural remains would be emphasized.

Impacts in the North Park energy/economic areas would be similar to those under the Energy and Minerals and Economic Benefit Alternatives in regard to potential coal and oil and gas lands available for lease and development. Significant cultural resource sites are either unsuitable for coal development or would have no surface occupancy stipulations placed on them.

Realty actions, especially rights-of-way and disposals, would have potentially the greatest negative impacts. Lands suitable for disposal are in relatively small, scattered, largely unmanaged tracts.

The majority of right-of-way actions throughout the resource area would tend to adversely impact cultural resources in the long run, if avoidance was not a feasible mitigation. However, salvage excavation would preserve some cultural remains.

The BLM Windy Gap sites are blocked lands which are more easily managed and are currently protected by an emergency protective withdrawal. Directed research goals are being formulated for these sites.

The management of the North Sandhills as a formal SRMA, instead of as an ACEC, would allow ORV use on the open sand areas while avoiding cultural resource exclosures. Detection and use supervision and maintenance of barriers, along with public information, would probably continue to be the extent of management, though uses under the SRMA would be re-evaluated through the recreation area management plan. Sites are adequately protected during high-use ORV periods by exclosures and use detection. Incidental instances of disturbances by ORVs are minor and unavoidable. There is no evidence of any other man-caused disturbances.

The recommendation of the Troublesome WSA as not suitable for wilderness designation would not cause adverse impacts on any cultural resources that may be present. The proposed use of the area for multiple use management of renewable resources or energy development would include consideration for cultural resources. Lack of access and the present, generally low priority for the prevalent renewable resource or energy programs ensure a continued low level of impacts in the area.

Energy and Minerals Alternative

There would be no significant, adverse impacts under this alternative that could not be mitigated. Cultural resources would potentially undergo the second highest level of negative impacts (next to the Economic Benefit Alternative) under this alternative. Impacts to cultural resources would increase in direct proportion to increases in energy development.

Another potentially negative impact is locatable mineral development, which comes under the authority of the Mining Act of 1872 and is only minimally checked by Bureau compliance and the 3809 Regulations. However, interest in locatable minerals is not expected to increase during the life of the plan, though this alternative maximizes the potential for their development.

An increase in energy minerals development would lead to an increase in sites located, with an attendant increase in unsuitable, avoidance, and no-surface-occupancy areas. In instances where significant resources could not be avoided, salvage would likely be the mitigation employed.

Cultural resource management would remain a support program to assure minimum legal compliance. In order to facilitate energy development, BLM would be expected to generate cultural resource inventories prior to industry application to aid in locating development. Other program implementation could be undertaken in conjunction with normal compliance procedures, especially for range management and improvements.

Economic Benefit Alternative

While there would be no significant, adverse impacts to cultural resources under this alternative that could not be legally mitigated, these resources would be the most negatively impacted under this alternative because it supports the most actions with disparate and/or negative considerations of affected cultural resources (ROWs, land disposal) and the most surface disturbing actions (development of coal or oil and gas). A conflict between actions to be taken and protection of cultural resources has the highest potential for occurrence in this alternative, since immediate, relatively short-term economic gains would take preference over the preservation of cultural resources. Avoidance

would not be practical, so loss or salvage of these cultural resources may be the only level of management under this alternative.

Large-scale economic and/or energy development could generate BLM-sponsored inventory and evaluation in response to land use planning decisions and/or industry/applicant demands for cultural resources information. This would be beneficial, as sites would be located and evaluated. Information would be gained if only to be used for project locations and to be given limited distribution.

However, minimum legal compliance would remain the emphasis of cultural resource management under this alternative.

Renewable Resources Alternative

Cultural resources would not be significantly adversely impacted under this alternative. Impacts would be similar to the Continuation of Present Management Alternative, but they would be intensified somewhat due to increased range management and wildlife habitat improvements. As these programs are Bureau initiated, cultural resources compliance would be assured. All other program emphases and/or authorizations would be the same as under the Continuation of Present Management Alternative.

All impacts to cultural resources under this alternative could be mitigated. Cultural resources management would continue to be a support compliance oriented program. The North Sand Hills Natural Area would be designated as an ACEC to protect its geologic and cultural values. The sites within this area would be nominated to the NRHP as a district, and a cultural resource management plan would be implemented.

Recreation Alternative

No significant adverse impacts to cultural resources would occur under this alternative. This second highest (next to the Natural Environment Alternative) intensive management level of cultural resources beyond prescribed protection and legal compliance would result in most of the impacts listed under the Continuation of Present Management Alternative. Significant cultural resources would become a limiting factor for authorization and project approval, so compliance with legislation and protection (the Bureau's basic cultural resources management program) would be upheld for both Bureau initiated programs and authorizations. Public information dissemination through the Colorado State BLM Office's Cultural Resources Series publication would be emphasized for significant resources. Resources with high visibility or public interest would be managed for public information and education.

As recreation values are stressed under this alternative, both the North Sand Hills and the Troublesome WSA would be managed as special recreation management areas (SRMAs). Continued monitoring and use supervision of protected sites in the North Sand Hills and the Troublesome WSA, low development potential, remoteness, and inaccessibility would adequately reduce impacts in these areas. Recreation management of sites (interpretation) is not anticipated; little is foreseen beyond maintenance, monitoring, and information dissemination. Sites associated with current SRMAs could be emphasized through NRHP nominations, e.g., North Sand Hills sites and the Upper Gore Canyon Historic site (Denver and Rio Grande/Western Railroad).

Benefits to cultural resources would include BLM supported inventories and studies in support of SRMA designations and the dissemination of public information.

Natural Environment Alternative

No significant adverse impacts to cultural resources would occur. This alternative represents the optimum extent of cultural resource management. Negative impacts would be similar to those under the Continuation of Present Management Alternative but would be potentially the least of all the alternatives, given the fact that cultural resource considerations would become a limiting factor for authorizations.

Avoidance through project redesign and no surface occupancy stipulations would be used to the greatest extent under this alternative. Cultural resources would be managed in compliance with legal requirements; for public information, education, and interpretation; and for seeking new knowledge through research and evaluation.

The recommendation of the Troublesome WSA as suitable for wilderness designation would be, for the most part, compatible. Public access into the area could lead to unauthorized collection of artifacts. Significant benefits would result from cultural resource investigations in this potentially rich area and the restriction of major surface disturbing authorizations. The management of the North Sand Hills as an outstanding natural area to protect and enhance geologic and cultural values beyond their

current, largely protective stance would be highly beneficial.

Bureau programs would provide for the consideration of cultural resources, so compliance is assured. The range and wildlife management program's use of prescribed burns and less disruptive construction techniques would have less potential for adverse impacts.

Increasing knowledge of cultural resources through research would be actively pursued under this alternative. Both the general public and scientific/academic community would benefit.

Cultural resource management would be optimized under this alternative. All of BLMs assumed roles for protection, preservation, enhancement, and development could be realized.

Unavoidable Adverse Effects

Under all alternatives, these impacts could occur:

1. Loss of subsurface cultural remains with little or no surface cultural manifestations
2. Loss of identified or unidentified cultural sites due to unauthorized or unsupervised actions
3. Loss of detailed information due to accepted mitigation (use of salvage instead of complete, research-oriented excavation)

The extent of consideration for, and final disposition of, cultural resources depends more on the type of action and its authorization than on the impact on the resource itself. Certain extremely disruptive actions, such as surface coal mining, have extensive mitigation to the point of making site areas unsuitable for surface mining. Other actions, notably rights-of-way and land disposals, can be equally disruptive. If project parameters cannot avoid even significant sites, then these sites can be mitigated through salvage, with detailed information being lost in the process.

The Economic Benefit Alternative would have the potential for generating the most unavoidable adverse impacts because it has the potential to cause the most surface disturbing actions. The Energy and Minerals, Renewable Resources, and Continuation of Present Management Alternatives represent progressively lower levels of unavoidable, adverse impacts due to the amount and types of actions and emphasis on mitigation, which tends to give cultural resources more consideration. The Recreation and Natural Environmental Alternatives represent scenarios where unavoidable adverse impacts would be lessened due to the emergence of cultural resources as a limiting factor for authorizations. The Natural Environment Alternative has the fewest unavoidable adverse impacts, since it contains the optimum balanced management of cultural resources.

The Preferred Alternative contains elements of the Economic Benefit, Energy and Minerals, Renewable Resources, and Continuation of Present Management Alternatives, which places the level of unavoidable adverse impacts second only to the Economic Benefit Alternative.

Short-Term Use vs. Long-Term Productivity

Short-term uses are defined as authorizations that impact cultural resources without giving adequate consideration to cultural resources' long-term benefit of providing knowlege and land use planning information. Cultural resource management itself can produce negative short-term uses when sites are avoided, with no research to exploit the protected resource.

An alternative that supports relatively short-term uses, with limited concern for the long-term productivity of affected resoures, is the Economic Benefit Alternative, which maximizes relatively large-scale, immediate, short-term actions to quickly benefit a depressed local and regional economy. The kinds of actions supported here largely do not provide for the long-term productivity of cultural resources.

The Energy and Minerals, Preferred, Renewable Resources, and Continuation of Present Management Alternatives represent progressively lower levels of short-term use affecting long-term production. Their impacts are less than under the Economic Benefit Alternative because of more effective mitigation, increased consideration of cultural resources, and the lesser number of surface disturbing actions. The Recreation and Natural Environment Alternatives represent alternatives with cultural resources as a limiting factor, which would lessen adverse impacts. Cultural resources management itself also appears as a short-term protective use to provide for later, long-term benefits from research.

The Natural Environment Alternative represents the optimum, most balanced management emphasis that provides both short-term use (protection) and long-term productivity (research).

The Preferred Alternative maximumizes a combination of short-term uses which would provide minimally for the long-term productivity of cultural resources. This alternative would protect and manage sites that are significant but would not seek out and

manage for potentially significant finds or knowledge.

Irreversible or Irretrievable Commitments of Resource(s)

All Alternatives

Subsurface cultural remains which include few or no surface components may be lost forever or irreparably disturbed by approved authorizations. The most significant, informative sites often contain intact, subsurface cultural remains which can be irreversibly and irretrievably lost if not afforded some level of evaluation and protection.

Mitigation oriented salvage excavation and even detailed research oriented excavations irreversibly and irretrievably commit cultural resources. Once a site is excavated, it is more or less exhausted.

As the majority of actions are mitigable through avoidance and through salvage as a last resort, there are no apparent significant levels of irreversible/irretrievable impacts in any alternative. The Economic Benefit Alternative would exhibit the greatest number of potential losses due to the potential for the most actions under which these losses could occur.

The Energy and Minerals, Preferred, Renewable Resources, Continuation of Present Management, Recreation, and Natural Environment Alternatives (in descending order) contain virtually similar levels of irreversible/irretrievable impacts despite different emphases and levels of mitigation.

Committed Mitigation Measures

All Alternatives

Standard stipulations based on existing regulations, legislation, guidelines, policies, memoranda of agreement, and program emphases would be effective. Major regulations and stipulations include 36 CFR VIII 800, 36 CFR I 60 - NRHP Criteria, Coal Unsuitability Criteria #7 and Standard Stipulation #14, Oil and Gas Surface Occupancy Stipulations, and compliance with NEPA and CEQ guidelines. Procedural compliance would increase with the number of actions, along with the time needed for processing. The number of actions would be dependent on the amount of development proposed under each alternative.

Avoidance of significant sites is the preferred mitigation.

BLM and applicant sponsored inventory would increase with numbers of actions. Benefiting programs and/or actions would be expected to fund and support cultural resource inventories.

ECONOMICS

Only one element in the resource management plan would cause a significant change in any part of the resource area. That would be the possibility of leasing a tract for coal mining in North Park, which would significantly impact the town of Walden and Jackson County. A statistical summary of the economic impacts of the alternatives is given in Table 4-1.

TABLE 4-1 -- ECONOMIC IMPACTS SUMMARY

	No Action Alternative			Changes From No Action Alternative		
				Energy/Minerals and Economic Benefit		
	1983	1988	1993	1983	1988	1993
Industry Sales ($000)[1]						
Agriculture[2]	$6,300	$5,300	$4,300	$0	$0	$0
Forestry	6,100	6,100	6,100	0	0	0
Mining	63,600	263,600	265,200	0	15,500	15,500
Recreation	36,800	45,200	53,700	0	0	0
Employment						
Grand County	3,570	3,900	4,300	1	6	0
Jackson County	700	730	760	0	140	140
Wage and Salary Income ($000)						
Grand County	$42,900	$46,400	$51,000	$20	$70	$0
Jackson County	10,600	11,100	11,700	0	3,600	3,600

TABLE 4-1 -- ECONOMIC IMPACTS SUMMARY—Continued

	No Action Alternative			Changes From No Action Alternative		
				Energy/Minerals and Economic Benefit		
	1983	1988	1993	1983	1988	1993
Population						
Granby Division	5,880	6,590	7,450	0	0	0
Kremmling Division	2,150	2,160	2,170	3	14	0
Jackson County	1,950	2,010	2,100	0	310	310
Additional Housing Needs (Cumulative)						
Grand County	210	470	800	1	5	0
Jackson County	30	60	90	0	110	110

[1]Several small changes occur in employment, income, population, and housing figures without comparable changes in industry sales. Those changes result from additional BLM contracting and would affect only the local construction industry, which is not included in this table because it is not considered a part of the resource area's economic base.

[2]Agricultural sales figures in this table differ from ranch gross sales figures in the grazing program analysis because different sources of data were used. Figures in this table are obtained from an input-output model of the Kremmling area, while figures in the grazing analysis are based on a statewide ranch survey. Proportionate changes are the same in both.

Changes From No Action Alternative

	Renewable Resources			Recreation and Natural Environment		
	1983	1988	1993	1983	1988	1993
Industry Sales ($000)[1]						
Agriculture[2]	$0	$0	$0	$0	$59	$59
Forestry	0	52	52	0	254[3]	254[3]
Mining	0	0	0	0	0	0
Recreation	0	0	0	0	0	0
Employment						
Grand County	1	4	0	1	5	8
Jackson County	0	2	2	0	6	6
Wage and Salary Income ($000)						
Grand County	$20	$60	$0	$20	$60	$120
Jackson County	0	40	20	0	40	90
Population						
Granby Division	0	0	0	0	0	0
Kremmling Division	3	8	0	3	8	19
Jackson County	0	5	5	0	11	14
Additional Housing Needs (Cumulative)						
Grand County	1	3	0	1	0	0
Jackson County	0	2	0	0	0	0

[1]Several small changes occur in employment, income, population, and housing figures without comparable changes in industry sales. Those changes result from additional BLM contracting and would affect only the local construction industry, which is not included in this table because it is not considered a part of the resource area's economic base.

[2]Agricultural sales figures in this table differ from ranch gross sales figures in the grazing program analysis because different sources of data were used. Figures in this table are obtained from an input-output model of the Kremmling area, while figures in the grazing analysis are based on a statewide ranch survey. Proportionate changes are the same in both.

[3]These decreases in sales result from an assumed reduction in BLM timber sales under these alternatives. Industry sales are reduced in proportion to the supposed drop in timber supply. In fact, local sawmills would probably obtain timber from outside the resource area, adding to their costs but not reducing their sales and employment.

Changes From No Action Alternative

	Preferred		
	1983	1988	1993
Industry Sales ($000)			
Agricultural	$0	$0	0
Forestry	0	52	52
Mining	0	15,500	15,500
Recreation	0	0	0
Employment			
Grand County	1	4	1
Jackson County	0	140	140
Wage and Salary Income ($000)			
Grand County	$20	$50	$10
Jackson County	0	3,600	3,600
Population			
Granby Division	0	0	0
Kremmling Division	3	8	3
Jackson County	0	310	310
Additional Housing Needs (Cumulative)			
Grand County	1	4	4
Jackson County	0	110	110

The recommendation of the Troublesome WSA as not suitable for wilderness designation would not significantly beneficially or adversely impact the economic structure of the region, the resource area, or the immediate area of Grand County involved.

Continuation Of Present Management Alternative

All of the changes described under this alternative are expected to occur without regard to any BLM actions under this RMP. They would not depend on use of BLM land and are not impacts of the RMP. The purpose of this section is to describe the economic setting in which the actions of the RMP would take place. There is, however, one instance in which a significant development would be prevented under this alternative, that being the coal mine mentioned above. The only coal resources sufficient for such a mine are on public land, and BLM action (as would occur under the Energy and Minerals or Economic Benefit Alternatives) would be required to enable any additional coal production to take place.

Growth in the resource area's economic base is expected to be concentrated almost entirely in the tourist industry. Between 1983 and 1993, sales in the recreation oriented sectors are projected to expand almost 50 percent. Continued growth of the eastern slope population belt and further expansion of east Grand County's skiing facilities will be the primary source of increased sales to tourists, although there should also be gains in summer vacation visits and the development of recreation and retirement homes. Practically all of this activity will take place in eastern Grand County, which is the only part of the resource area where sizeable growth is projected.

The mineral industry will show a small increase, all of it in the energy sector. Exploration activity is taking place in the oil and gas fields and on the Rabbit Ears Range, and there is continued interest in the area's coal deposits. A rapid expansion of mineral production is unlikely, however, due both to current softness in the petroleum and coal markets and the limitations and costs of transporting products, particularly coal, from this remote area. Therefore, mineral industry sales are expected to remain at about their current level. Almost all of this activity will take place in Jackson County, providing the basis for a small increase in population. Grand County's only important mineral-related operation, the AMAX Henderson Mill, is expected to recover from its current slump and maintain its previous level of output, helping to stabilize the county's economy.

Recovery from the present depression is also expected for the lumber industry, but little or no further growth is anticipated. Interest rates are expected to fall to at least a level where the present unsatisfied demand for housing will stimulate another round of construction. Nevertheless, a large growth in timber production is unlikely because of the small supply of sawtimber, the slow reproduction rate, and shipping costs. The industry is located mostly in western Grand and Jackson Counties and will serve to maintain population stability in those areas.

Area ranching is coming under increasing pressure, both from the long-term price-cost squeeze and from conversion of land to other uses. A number of ranches have been converted in recent years, mostly to recreational uses and largely in Grand County. No slackening in the demand for land in choicer locations is foreseen, and agricultural costs show no sign of stabilizing. As a result, the long-term downtrend in ranching activity is projected to continue, with agricultural sales in 1993 at a level about 30 percent below those of 1983 (in constant dollars). Population in the ranching areas, primarily in western Grand and Jackson Counties, will decline at a much slower rate, however, since many ranchers will remain in the ranching business on a part-time basis as long as they can supplement their income with outside work.

Four major construction projects complete the economic picture for the 10-year period of analysis:

the Windy Gap Dam just outside Granby, the Azure Dam west of Kremmling, Tri-State Generation Company's 345 kV transmission line across western Grand County, and the Silver Creek Ski Development east of Granby. Although construction schedules - and even project feasibility in some cases - are still uncertain, it appears likely that these developments will be spread over the next 10 years, with the Windy Gap, Azure, and Tri-State projects being built in the early to mid-1980s and the Silver Creek development extending into the late 1980s and early 1990s. These developments should maintain a stable level of construction activity.

Trends in employment, wage, and salary income, and in local government revenues and expenditures will follow the patterns set by the various industry growth rates. The only area that will experience rapid growth is eastern Grand County, and those communities will be facing continuing needs to expand their facilities and services. In other parts of the area, population should remain sufficiently stable to prevent present debt burdens from becoming excessive.

Preferred Alternative

Since the Preferred Alternative combines the proposed actions of the Energy and Minerals, Economic Benefit, and Renewable Resources Alternatives, its economic effects would be a composite of those three. By providing for the leasing of additional coal resources it could cause the same significant impacts on Walden and Jackson County that are described under the Energy and Minerals and Economic Benefit Alternatives. It would also result in similar minor losses to wildlife and hunting. However, long-term deterioration of range conditions would be far less under this alternative. In other respects, it would be the same as the Renewable Resources Alternative, with a small, if any, reduction in timber offerings and a slightly higher level of BLM contracting. As noted earlier, the only action that would create significant economic impacts would be the leasing of coal.

Energy And Minerals And Economic Benefit Alternatives

Since these two alternatives would have virtually the same economic effects, they are described together. Along with the Preferred Alternative, they would be the only alternatives to cause a significant change in the area's economy, that being the potential opening of a new coal mine on BLM-leased land in Jackson County. If such a mine were developed, it would have several significant impacts on Walden and Jackson County. First, operations employment at a mine producing one million tons per year (the size assumed) would reach about 100, with a peak work force of 40 to 50 being required for construction. These new jobs would represent about a 20 percent increase in Jackson County's employment and, because of the relatively high wages paid in construction and mining, a gain of around 30 percent in wage and salary income. The mine would pay a total of approximately $3.3 million annually in ad valorem and severence taxes and Federal royalty. Of that amount, some $640,000 would accrue or be returned to Jackson County. Walden would receive an additional $90,000 annually in property and sales taxes induced by growth plus its severance tax share. However, a 25 percent increase in population could create capital improvement needs in Walden totaling as much as $1 million.

No significant changes would occur in range and timber management under these alternatives. However, the reduced level of range management would permit a continued deterioration in the rate of forage production so that, unlike the other alternatives, the capability of the range to support livestock production would be lowered. These impacts, which are described under the grazing program, would not be economically significant. Wildlife losses, resulting mainly from increased mining, would have a minor effect on hunting. A small increase in BLM construction contracting would be likely in the middle and late 1980's, ending around 1990. Again, neither the wildlife nor contracting impacts would be significant.

Renewable Resources Alternative

This alternative would have no significant economic effect on the area, either positive or negative. A small reduction in the amount of timber offered for sale could have a slightly depressing effect on the lumber industry. However, as noted in Table 4-1, the sawmills would more likely go outside the resource area to obtain needed supplies, with little change occurring in industry sales and employment. A slightly higher level of BLM contracting would be planned, particularly in range and watershed improvements. Otherwise, activities in the range, minerals, recreation, and other BLM programs would continue in the same manner as under the Continuation of Present Management Alternative, or the changes would be so small as to cause few economic ripples.

Recreation and Natural Environmental Alternatives

These two alternatives are similar enough in their economic consequences that they can be described together. Like the Renewable Resources Alternative, their impacts on the local economy would all be insignificant, but some impacts would have a slightly more depressing effect on local economies than those of the other alternatives.

Designation of the Troublesome WSA as wilderness under the Natural Environment Alternative would have an insignificant economic effect on the area. As explained in the Affected Environment, no resource values would be foregone. Inclusion of the area in the wilderness system would attract visitors to it, assuming access was provided, but the increase would constitute a negligible portion of the local recreation industry.

Annual numbers of visitors are estimated at 2,700 in 1988, increasing to 7,100 by 1993, using a time series model developed for the U.S. Forest Service (Jungst 1978). The estimates, of course, assume both designation and availability of access by that time. Resource values gained, based on recreationists' willingness to pay (Walsh, Gillman, and Loomis 1981), would be about $40,000 annually in 1988 and about $100,000 in 1993. Direct and indirect benefits to local business, derived from an input-output study of the Kremmling region (McKean and Weber 1981), would total about $10,000 in 1988 and $30,000 by 1993. Compared to the estimated $2.4 million in local sales to recreationists in 1979, the addition would be insignificant.

A further decrease in the amount of timber offered for sale would occur in order to enhance environmental and recreation objectives. However, it should again be pointed out that the statistical analysis probably exaggerates the economic impact that this reduction would cause.

BLM contracting would be at the slightly higher level described for the Renewable Resources Alternative until around 1990. Recreation programs would be affected in two different ways. A reduction in dispersed recreation would result from closure of the North Sandhills to off-road vehicles, while an increase would likely occur should the Troublesome WSA be designated as part of the wilderness system. In both cases, however, the probable effect would be little more than a shift in the location and type of activity, since the total number of recreation visits to the resource area is determined by factors largely unaffected by BLM programs. None of the above effects would have economic significance.

Grazing Program: All Alternatives

The grazing program would not significantly affect the resource area as a whole, but it would significantly affect some individual ranchers. Reductions in allotments (including those that are part of the Continuation of Present Management) of 30 percent or more would be incurred by 29 operators: 21 in Jackson County and 8 in western Grand County. There is considerable variation between the alternatives. Estimates of the short-term and long-term effects of each alternative are given in Tables 4-2 through 4-8.

TABLE 4-2 -- COMPARISON OF GRAZING PROGRAM ALTERNATIVES

(dollar values in thousands)

	Changes Under Other Alternative					
	Short-Term		Long-Term			
	No Action Alternative in 1988 (Baseline)[1]	Recreation, Natural Environment	No Action Energy/ Minerals	Economic Benefit	Renewable Resources, Recreation, and Natural Environment	Preferred
Ranch gross sales	$15,368	$31	$134	$891	$1,245	$1,107
Ranch net income	1,685	12	24	207	305	260
Resource area business sales	364,001	102	395	2,703	3,803	3,364
Resource area employment	4,630	4	5	17	20	20
Resource area population	10,770	8	10	34	41	41
Assessed valuation, all ranches	$10,410	$2	$6	$35	$49	$43
Resource area property tax revenue	8,996	[2]	[2]	2	3	3

[1]Includes Energy/Minerals, Economic Benefit, Renewable Resources, and Preferred Alternatives.
[2]Less than $500.

TABLE 4-3 -- PROJECTED RANCH OPERATOR DATA

NO ACTION, ENERGY/MINERALS, ECONOMIC BENEFIT, RENEWABLE RESOURCES, AND PRE FERRED ALTERNATIVES

SHORT-TERM

Ranch Class	Number of Ranches	Allotments			Gross Sales		Net Income	
		BLM AUMs	Private AUMs	Total AUMs	Per Ranch	All Ranches	Per Ranch	All Ranches
1	43	5,025	5,035	10,060	$25,193	$1,083,000	$15,552	$669,000
2	61	12,555	18,730	31,285	49,779	3,037,000	6,064	370,000
3	16	5,047	6,234	11,281	100,524	1,608,000	24,635	394,000
4	17	11,022	23,559	34,581	234,744	3,991,000	15,564	265,000
5	5	3,651	14,842	18,493	703,043	3,515,000	256,484	1,282,000
8	3	2,426	1,715	4,141	783,945	2,352,000	274,828	824,000
Total	145	39,726	70,115	109,841		15,586,000		1,726,000

Secondary business sales generated by ranching	$26,726
1988 resource area total business sales	$364,647
1988 resource area total employment	4,634
1988 resource area population	10,779
Assessed valuation, all ranches	$10,420,000
Resource area property tax revenue	$8,996

TABLE 4-4 -- PROJECTED CHANGES IN RANCH OPERATIONS[1]

RECREATION AND NATURAL ENVIRONMENT ALTERNATIVES

SHORT-TERM

Ranch Class	Number of Ranches	Changes in Allotments			Average change Per Ranch	Gross Sales		Net Income	
		BLM AUMs	Private AUMs	Total AUMs		Per Ranch	All Ranches	Per Ranch	All Ranches
1	43	0	0	0	0	$0	$0	$0	$0
2	61	390	453	843	14	395	24,000	185	11,000
3	16	0	0	0	0	0	0	0	0
4	17	71	151	222	13	401	7,000	15	1,000
5	5	0	0	0	0	0	0	0	0
8	3	0	0	0	0	0	0	0	0
Total	145	461	604	1,065			31,000		12,000

Change in secondary business sales	$59,000
Change in resource area total business sales	$102,000
Change in resource area employment	4
Change in resource area population	8
Change in assessed valuation, all ranches	$1,700
Change in resource area property tax revenue	$100

[1]Changes from Table 4-3

TABLE 4-5 -- PROJECTED CHANGES IN RANCH OPERATIONS[1]

NO ACTION AND ENERGY/MINERALS ALTERNATIVES

LONG-TERM

Ranch Class	Number of Ranches	Changes in Allotments			Average Change per Ranch	Gross Sales		Net Income	
		BLM AUMs	Private AUMs	Total AUMs		Per Ranch	All Ranches	Per Ranch	All Ranches
1	43	40	40	80	2	$51	$2,000	$7	$300
2	61	465	646	1,111	18	535	33,000	250	15,000
3	16	255	310	565	35	1,138	18,000	283	5,000
4	17	761	1,635	2,396	141	4,347	74,000	170	3,000
5	5	21	94	115	23	1,411	7,000	241	1,000
8	3	0	0	0	0	0	0	0	0
Total	145	1,542	2,725	4,267			134,000		24,300

Change in secondary business sales	$237,000
Change in resource area total business sales	$395,000
Change in resource area employment	5
Change in resource area population	10
Change in assessed valuation, all ranches	$6,000
Change in resource area property tax revenue	$300

[1]Changes from Table 4-3

TABLE 4-6 -- PROJECTED CHANGES IN RANCH OPERATIONS[1]

ECONOMIC BENEFIT ALTERNATIVE

LONG-TERM

Ranch Class	Number of Ranches	Changes in Allotments			Average Change Per Ranch	Gross Sales		Net Income	
		BLM AUMs	Private AUMs	Total AUMs		Per Ranch	All Ranches	Per Ranch	All Ranches
1	43	1,576	1,577	3,153	73	$2,143	$92,000	$313	$13,000
2	61	4,451	6,050	10,501	172	5,034	307,000	2,358	144,000
3	16	1,440	1,811	3,251	203	6,649	106,000	576	9,000
4	17	2,534	5,412	7,946	467	14,413	245,000	564	10,000
5	5	200	888	1,088	218	13,232	66,000	2,258	11,000
8	3	1,314	671	1,985	662	25,025	75,000	6,601	20,000
Total	145	11,515	16,409	27,924			891,000		207,000

Change in secondary business sales	$1,605,000
Change in resource area total business sales	$2,703,000
Change in resource area employment	17
Change in resource area population	34
Change in assessed valuation, all ranches	$35,000
Change in resource area property tax revenue	$2,000

[1]Changes from Table 4-3

TABLE 4-7 -- PROJECTED CHANGES IN RANCH OPERATIONS[1]

RENEWABLE RESOURCES, RECREATION, AND NATURAL ENVIRONMENT ALTERNATIVES

LONG-TERM

Ranch Class	Number of Ranches	Changes in Allotments			Average Changes Per Ranch	Gross Sales		Net Income	
		BLM AUMs	Private AUMs	Total AUMs		Per Ranch	All Ranches	Per Ranch	All Ranches
1	43	1,576	1,577	3,153	73	$2,143	$92,000	$313	$13,000
2	61	6,692	9,417	16,109	264	7,727	471,000	3,619	221,000

TABLE 4-7 -- PROJECTED CHANGES IN RANCH OPERATIONS[1]—Continued

RENEWABLE RESOURCES, RECREATION, AND NATURAL ENVIRONMENT ALTERNATIVES

LONG-TERM

Ranch Class	Number of Ranches	Changes in Allotments			Average Changes Per Ranch	Gross Sales		Net Income	
		BLM AUMs	Private AUMs	Total AUMs		Per Ranch	All Ranches	Per Ranch	All Ranches
3	16	2,631	3,242	5,873	367	12,001	192,000	1,167	19,000
4	17	3,083	6,579	9,662	568	17,526	298,000	686	12,000
5	5	382	1,536	1,918	384	23,339	117,000	3,982	20,000
8	3	1,314	671	1,985	662	25,025	75,000	6,601	20,000
Total	145	15,678	23,022	38,700	.....	.....	1,245,000	.....	305,000

Change in secondary business sales	$2,253,000
Change in resource area total business sales	$3,803,000
Change in resource area employment	20
Change in resource area population	41
Change in assessed valuation, all ranches	$49,000
Change in resource area property tax revenue	$3,000

[1]Changes from Table 4-3

TABLE 4-8 -- PROJECTED CHANGES IN RANCH OPERATIONS[1L]

PREFERRED ALTERNATIVE

LONG-TERM

Ranch Class	Number of Ranches	Changes in Allotments			Average Change Per Ranch	Gross Sales		Net Income	
		BLM AUMs	Private AUMs	Total AUMs		Per Ranch	All Ranches	Per Ranch	All Ranches
1	43	1,576	1,577	3,153	73	$2,143	$92,000	$313	$13,000
2	61	5,553	7,707	13,260	217	6,371	389,000	2,984	182,000
3	16	2,035	2,526	4,561	285	9,334	149,000	873	14,000
4	17	2,949	6,295	9,244	544	16,772	285,000	657	11,000
5	5	382	1,536	1,918	384	23,339	117,000	3,982	20,000
8	3	1,314	671	1,985	662	25,025	75,000	6,601	20,000
Total	145	13,809	20,312	34,121	.....	.....	1,107,000	.....	260,000

Change in secondary business sales	$1,997,000
Change in resource area total business sales	$3,364,000
Change in resource area employment	20
Change in resource area population	41
Change in assessed valuation, all ranches	$43,000
Change in resource area property tax revenue	$3,000

[1]Changes from Table 4-3

Adjustments in grazing allotments are included in the Continuation of Present Management Alternative, against which the other alternatives are measured, and are not shown separately. (These adjustments were indicated by the range condition inventory but have not been substantiated by monitoring data.) The following figures will place those adjustments and the other alternatives in perspective.

The adjustments would increase ranch gross sales one percent but decrease ranch net income three percent. This apparent contradiction is explained by the fact that the upward adjustments would affect primarily small ranches which have low or negative income. Effects on total business sales, employment, population, ranch assessed valuation, and property tax revenue would each be less than one-half percent.

BLM allotments include private and state land as well as Federal land. It is assumed that the Federal range is in the same condition as the remainder of the allotments. BLM allotment adjustments are based on the natural productivity of the forage, and

the same natural factors should apply to the private and state lands. The economic projections, therefore, include estimates of changes in private (and state) AUMs proportionate to the changes in BLM AUMs.

In the short term, no further cuts in allotments would be made under the Energy and Minerals, Economic Benefit, Renewable Resources, or Preferred Alternatives. Small cuts would be made under the Recreation and Natural Environmental Alternatives, which would affect the moderately small and moderately large cattle ranches. These cuts would decrease ranch gross sales and net income less than one percent and would have negligible effects on the rest of the economy.

Long-term results of the grazing program would vary considerably between alternatives. Under the Continuation of Present Management and Energy and Minerals Alternatives, further losses in forage are anticipated due to deterioration of the range. These would reduce ranch gross sales and net income an additional one percent. Effects on resource area business sales, employment, net income, ranch assessed valuation, and property tax revenue would again be less than one half percent.

Range improvements planned under the other alternatives would increase the available forage and improve the ranching economy. Under the Economic Benefit Alternative, gains of 6 percent in gross sales and 12 percent in net income would occur. Under the Preferred Alternative, there would be gains of 7 percent in gross sales and 15 percent in net income, while the Renewable Resources, Recreation, and Natural Environment Alternatives would bring about increases of 8 percent in gross sales and 18 percent in net income. However, induced gains in the rest of the economy would still be in the range of one percent or less.

Unavoidable Adverse Effects

Adverse impacts to the town of Walden's finances would be unavoidable if a new coal mine were developed under the Energy and Minerals or Economic Benefit Alternatives, resulting from costs for required capital improvements far in excess of increases in revenues. There would be no other significant adverse impacts.

Short-Term Use Vs. Long-Term Productivity

There would be no effects on long-term productivity because the only significant economic impact would be short term. Walden's financial problems would be resolved either by revenue growth over time or by state or Federal impact assistance.

Irreversible or Irretrievable Commitments of Resources

Construction materials used for coal mine development would be irretrievable. Relocations of population (which might be necessary when the coal operation terminated) can and do happen frequently, but these would have only short-term negative effects. Labor and capital resources expended on development would be renewable.

SOCIAL ANALYSIS

All Alternatives

Two social considerations have particularly important implications for BLM land use planning.

First, any decision will usually produce trade-off social advantages for some persons or groups and social disadvantages for others. For instance, a given decision might provide primitive areas desired by wilderness hikers but would restrict the freedom of snowmobilers, while a decision involving loss of wildlife habitat would hurt hunters (and those who gain from their presence) but might benefit energy companies, ranchers, or ORV users.

This winner-loser situation means that land use decisions will often appear to play favorites among potential users, a frequent public relations problem of some concern to BLM managers and policymakers. The problem cannot be solved simply in terms of the greatest good to the greatest number.

A second social consideration has to do with "futures foregone". Land use decisions affect not only present land use but also help shape decisions that are possible for the future. Other things being equal, a decision that restricts future options is socially less desirable than one which leaves future choices open. This notion of the need for flexible futures, in fact, underlies the whole philosophy of conservation, protection of endangered species, etc. For example, land preserved as wilderness could conceivably be opened for, say, mining in the future; however, land opened for mining cannot be made into wilderness. A land use decision which maintains or enhances productivity leaves open more potential future uses than does a decision

which permits deterioration. The mining of a nonrenewable resource such as coal foregoes the uses to which that resource could be put in the future. Thus, land management must take into consideration the futures foregone, both for society as a whole and for local communities and people, as well as considering who wins and loses.

Futures foregone must, however, be weighed against presents foregone, i.e., immediate national and local needs and goals. To keep future options open may require more sacrifices in the present than decisionmakers are willing to impose. In addition, closing future options of one type in one location may provide a greater future flexibility of choice in some other area of concern. Social responsibility to posterity has to be tempered by responsibility to those now living. Decisionmakers must consider both present and future needs in evaluating alternatives for land management.

The social impacts of the alternatives are summarized for the above two elements in Tables 4-9 and 4-10. Attitudes reflect the perceptions that groups or individuals hold of their own places in the social system. Those who would expect to be winners would be most likely to have positive attitudes toward a given land use emphasis, whereas losers would hold negative attitudes.

TABLE 4-9 -- PROBABLE ATTITUDES OF KREMMLING RESOURCE AREA CITIZENS TOWARD RESOURCES MANAGEMENT ALTERNATIVE EMPHASIS

Public	Alternative Emphasis				
	Energy/Minerals and Preferred	Economic Benefit	Renewable Resources	Recreation	Natural Environment
Directly Affected					
Energy Workers/Companies	Very Positive	Very Positive	Neutral/Negative	Negative	Very Negative
Ranchers*	Positive/ Negative[1].	Positive	Positive (except some rec.).	Negative (Hunters, ORV) Neutral (Other).	Negative to very negative [1]
Recreationists:					
Commercial	Positive	Positive	Positive	Very Positive	Negative to Positive
ORV Users	Positive	Positive	Positive/Neutral	Very Positive	Negative
Hunters/Fishers	Negative	Positive/Negative	Positive	Very Positive	Very Positive
Wilderness	Very Negative	Negative	Positive	Very Positive	Very Positive
Conservationists	Very Negative	Negative	Positive to Negative.	Negative (ORV, Commercial) Positive (Other).	Very Positive
Indirectly Affected					
Have knowledge of and interest in BLM issues	Positive to Negative.	Positive	Positive	Positive to Negative.	Positive to Negative
Do not have knowledge of BLM issues	None ** (Positive to Negative).	None (Positive)	None (Positive)	None (Positive to Negative).	None (Positive to Negative)
Not Affected					
Have knowledge of and interest in BLM issues	***(Positive to Negative).	(Positive)	(Positive)	(Positive to Negative).	(Positive to Negative)
Do not have knowledge of BLM issues	***(Positive to Negative).	(Positive)	(Positive)	(Positive to Negative).	(Positive to Negative)

* These estimates are based on data collected for Ranch Inventory in LSRA, Spring, 1982.

** With no knowledge of BLM there can be no attitudes toward BLM issues, so these represent a "silent" public here; however, these citizens would have (presumably) some knowledge and opinions regarding the general issues involved. Therefore, their views are assumed to represent the general public. Our best estimates of general public views are shown in parentheses.

*** It is assumed here that attitudes toward BLM emphases would reflect attitudes of the general public, that knowledge of and interest in BLM would not be a distinguishing attitudinal variable, since these persons would not be affected one way or the other.

[1]A slash between attitudes means "either/or" - that is, a probable dichotomy of views; a "to" between attitudes represents a range of views from one to the other.

TABLE 4-10 -- SOCIAL FUTURES FOREGONE VS. FLEXIBLE FUTURES FOR VARIOUS ALTERNATIVE EMPHASES

Comparison Alternatives	Alternative Emphasis					
	Energy/ Minerals and Preferred	Economic Benefit	Renewable Resources	Recreation		Natural Environment
				ORV/ Commercial	Wilderness	
Energy/Minerals and Preferred.	.....	Flexible*	Flexible	Flexible/ Neutral.	Flexible	Flexible
Economic Benefit	Futures Foregone.	.....	Flexible	Neutral	Flexible	Flexible
Renewable Resources.....	Futures Foregone.	Futures Foregone**.	.....	Neutral	Neutral	Neutral
Recreation:						
ORV/Commercial	Neutral***	Neutral	Neutral/ Futures Foregone.	.....	Flexible	Flexible
Wilderness.....	Futures Foregone.	Futures Foregone.	Neutral/ Futures Foregone.	Futures Foregone.	.....	Neutral
Natural Environment	Futures Foregone.	Futures Foregone.	Neutral	Futures Foregone.	Neutral	

* Flexible: Emphasis on this alternative would provide more "flexible future" choices than emphasis on comparison alternatives.
** Futures Foregone: Emphasis on this alternative would provide more "futures foregone" (thus less flexibility of future choice) than would emphasis on comparison alternative.
*** Neutral: Alternative emphases would provide about the same flexibility of future choices.

Table 4-9 shows the various pertinent categories of persons in the resource area and the expected direction and intensity of their attitudes toward each alternative. These categories are not all of equal size, nor do they share equally in social power. Further, the alternatives refer only to emphasis. An emphasis on energy development, for instance, would not preclude range, forestry, or recreation but would mean only that where trade-offs were necessary and regulations permitted, decisions would favor energy development. Therefore, the attitudes shown in Table 4-9 reflect basic personal philosophies as well as the fact that various emphases would impact individuals differently.

Group attitudes are assumed to be located on a continuum from very positive through a neutral point ("It doesn't matter to me") to very negative.

Also affecting attitudes is the degree to which local persons not directly affected have knowledge of the activities of BLM. Persons with no knowledge of BLM activities cannot, of course, have attitudes about these. Their attitudes, and those of persons with knowledge of, but who are unaffected by, BLM activities, presumably would reflect their own existing values regarding these areas of concern, and thus here would represent a "general public" view. Table 4-9 takes all these elements into account.

Table 4-10 compares futures foregone among the various alternatives. The table should not be taken as implying that *every* decision of one alternative would lead to more or less flexibility for future choices than *any* decision of the other. It does show that where trade-offs must be made, a decision favoring one emphasis over the other would do so. The table should be read by columns rather than by rows and assumes emphasis is given to the alternative heading each column.

Tables 4-9 and 4-10 do not show one alternative as having greater or more negative social impacts than another alternative, so it cannot be used for *ranking* alternatives in the usual sense. However, their elements are truly important social values which Bureau decisions will affect. The tables provide a means for including these meaningfully in the decisionmaking process.

In addition to effects of BLM land use decisions on attitudes and futures foregone, specific social changes may occur at the local level. Table 4-11 considers these.

TABLE 4-11 -- LOCAL SOCIAL CHANGE AGENTS, INDICATORS, ELEMENTS, AND CONDITIONS

Change Agent	Selected Indicators of Change	Selected Affected Social Elements and Conditions
Population Growth*	Annual Growth Rate	Services
(Rate)	Economic Growth (e.g., retail sales tax base)	Facilities
(Size)	Economic Diversification (e.g., new stores)	Housing
	Formalization of Govt. and Other Institutions	Social Structural Complexity
	Community Geographic Expansion	Traffic Congestion
	Demographic Shifts	Social Power
	Cultural Diversification	Ind. Psych. Well-Being
Demographic Shifts	Occupational Distribution	Social Structural Complexity
(Extent)	Age Structural Change	Social Stratification
(Type)	Sex Structural Change	Recreational Interests and Demands
	Marital Structural Change	Types of Housing
	Trends since 1970 in above	Services and Facilities Needed
	Transiency	
Cultural Diversification	Occupational Diversification	Social power group formation modification
	Transiency	Social Structural Complexity
	Attitude Diversity	Intergroup Conflict, Polarization, Prejudice
	New Minority Entries	

*These changes, of course, overlap, with population growth as the generating force for the other two. Theoretically, it would be possible for growth to occur without producing demographic shifts or cultural diversification, but, in reality, growth always leads to demographic shifts and cultural diversity.

If population remains stable or either declines or grows slowly, social changes occur gradually and are seldom problematic. If growth is more rapid but new people are similar both demographically (proportions of males, females, occupational groups, ages, etc., remain about the same) and culturally (race, religion, child rearing practices, wealth, historical backgrounds, etc., are like the host population), changes can still occur without much turmoil except for increased demands on physical and services facilities. If newcomers are very different, social disruption may be severe, depending upon the degree of differences and rates of growth. Table 4-11 shows the three primary change agents that might be activated by the alternative emphases, some selected indicators of the changes, and examples of the social elements and conditions involved in these.

Table 4-12 summarizes and ranks these specific social impacts and their significance for each alternative emphasis. Only the Energy and Minerals emphasis would make any socially important difference, as noted. However, decisionmakers must also evaluate alternatives in terms of "winners and losers" and "futures foregone", which are highly significant social issues.

The Preferred Alternative, derived from analysis of the initial range of alternatives, maximizes the economic benefits from both renewable resources and energy development in North Park wherever trade-offs must be made with other land uses.

Additional social effects of this alternative emphasis would roughly follow those of the Energy and Minerals Alternative. The same pattern would hold true for the futures foregone.

Specific social impacts of a positive economic nature would occur for Walden from the Preferred Alternative. The degree of these impacts cannot be measured due to lack of data, but they would be accompanied by moderately significant social-structural changes in the community and social-psychological changes for many individuals. As shown in Table 4-9, these would be negative for some persons and positive for others, depending upon position in the social structure. For example, long-term ranchers might lose considerable political power to incoming energy managers.

In addition, the economic impacts (jobs, income, addition of coal or other materials to the local and national resources bank) of the Energy and Minerals, Economic Benefits, Renewable Resources, and Preferred Alternatives would generate the social resources associated with these, i.e., better employment opportunities, higher standards of living, cheaper fuel, etc. These are discussed in the section on short-term use vs. long-term productivity.

No significant social impacts would occur from either the grazing or wilderness proposals.

Unavoidable Adverse Effects

Intergroup conflicts, particularly for the two extreme alternatives (Energy and Minerals and Natural Environment), would be unavoidable. So would

TABLE 4-12
TYPES AND SIGNIFICANCE OF SOCIAL IMPACTS BY ALTERNATIVE EMPHASES

Alternative Emphasis	Probable Population and Demographic Changes	Probable Increase in Cultural Diversity	Most Important Social Impacts
Energy/Minerals and Preferred	Increase in proportions of men, young workers, single, higher pay, construction and mining trades Significance of social impacts: Walden: Short-term, considerable; long-term, low Kremmling: Short-term, moderate; long-term, low Other Communities: Insignificant	Greater diversity of recreational interests, less community involvement, more nonsocial drinking, less orthodox religious views, transient life styles, morality variation, diversity of housing needs	Loss of some community social integration, increased intergroup conflict (esp. between transients and locals, and between environmentalists and energy developers), also increased tolerance for some differences; increased community services needs (esp. law enforcement and mental health), better employment opportunities for local people, improved shopping and other facilities, shifts in power structure away from the traditional rancher-merchant dominance, status inconsistency problems (working class interests combined with high income)
Economic Benefit	Increase in population but probably insignificant. No significant demographic changes Significance of social impacts: Insignificant		Some increase in social structural differentiation due to increased population, some increase in conflict between environmentalists and those favoring development
Renewable Resources	Sustained small increases in population, no significant demographic changes Significance of social impacts: Insignificant	Insignificant	Insignificant
Recreation	Increase in hunters, floatboaters, ORV users, etc., all temporary, with positive effects on local employment (seasonal) Significance of social impacts: insignificant	None in stable community, seasonal diversity in spending patterns and behavior tolerated	Temporary law enforcement, trash clean-up, and other problems; increased conflicts between "foot" and "motorized" recreationists and between ranchers and "motorized;" temporary employment benefits
Natural Environment	None Significance of social impacts: insignificant	None	None except from some increase in conflicts between those favoring conservation and those favoring development

the reduction in community social integration in Walden and Kremmling under the Energy and Minerals and Economic Development Alternatives. The "losers", such as the long-term ranchers mentioned above, and futures foregone would be unavoidable adverse impacts.

Short-Term Use Vs. Long-Term Productivity

The Energy and Minerals and Preferred Alternatives would add social resources for the short-term in the form of jobs and income and the benefits derived from use of the substances themselves (cheaper fuel, for instance). The Renewable Resources and Economic Benefits Alternatives would produce or maintain the greatest sustained economic base, with its accompanying social benefits. The Energy and Minerals Alternative (and the coal portion of the Preferred Alternative) would result in resources and the jobs associated with them being used up, reducing social benefits for the long term and closing future social options. The Natural Environment emphasis would reduce those benefits for the short term but retain their potential for the future, thus keeping future options open. Of all these, only the Energy and Minerals emphasis would be significant, since all of the other differences would be small relative to the present situation. No other alternative would be socially significant, except as noted in Tables 4-9 and 4-10.

Irreversible or Irretrievable Commitments of Resources

The social benefits of minerals and energy resources can only be enjoyed once. As these nonrenewable resources are used up, all future potential uses are permanently lost.

Uncommitted (Suggested) Mitigation Measures

Community social and political leaders can inform themselves more fully of the BLM decision processes, stay up to date on actual decisions to be made, and seek to influence these, when appropriate. They can thus anticipate social effects upon their areas, and, when necessary, prepare in advance to provide needed facilities or services. Through continually monitoring community attitudes, they can likewise anticipate potential trouble spots where conflicts may arise and assist in defusing these through public education.

TABLE 4-13

SUMMARY OF IMPACTS

Environmental Elements	Continuation of Present Management Alternative	Preferred Alternative	Energy and Minerals Alternative	Economic Benefit Alternative	Renewable Resources Alternative	Recreation Alternative	Natural Environment Alternative
Air Quality	No change	No significant increases in particulates	No significant increases in particulates Potential minor adverse, given maximum minerals development	No significant increases in particulates Potential minor adverse, given maximum coal development	No significant increases in particulates Potential minor adverse in short term, given maximum range and forestry prescribed burning	No significant increases in particulates	Potential minor decrease in particulates (beneficial)
Minerals/Geology	No change	Beneficial: Highest potential coal lands available for lease Oil and gas and other minerals development maintained	Beneficial: Oil and gas development maximized - High potential coal lands available for lease	Potential major beneficial: All suitable coal lands available for lease Oil and gas development maintained	Minor beneficial: Existing coal leases and oil and gas fields and expansion areas maintained	Minor beneficial: Existing coal leases, and oil and gas fields and expansion areas maintained. Recreation values do not largely coincide with mineral development areas.	Minor beneficial: Existing coal leases and oil and gas fields and expansion areas maintained. Natural values do not largely coincide with mineral development areas.
Soils/Water Quality	No change	Beneficial: Active management for improvement in water and soil	No significant major degradation - Potential minor adverse, given maximum cumulative mineral development	No significant degradation - Impacts mitigable	Major beneficial: Maximum management for improving water and soil	Potential major beneficial: Active management for improvements	Potential major beneficial actions impacting water and soils limited-Active management for improvement
Vegetation	Potential minor adverse in long term due to forage allocation adjustments with no increase in grazing management from present (no new AMPs or new range improvement projects)-38,184 AUMs potential for livestock.	Beneficial: Forage allocation adjustments and increases in grazing management (major reconstruction of existing projects, new range improvement project construction, and additional AMPs developed) - 53,535 AUMs potential for livestock	Potential minor adverse, with grazing management constrained by expanded opportunities for mineral development. Forage allocation adjustments and grazing management same as Continuation of Present Management (no new AMPs or range improvements)-38,184 AUMs potential for livestock	Beneficial: Forage allocation adjustments and increase in grazing management but constrained by expanded opportunities for oil and gas production (major range improvement reconstruction, new projects and additional AMPs) - 51,241 AUMs potential for livestock	Major beneficial: Optimum forage allocations and opportunities for increased grazing management (major reconstruction of existing projects, new project construction and additional AMPs) - 55,404 AUMs potential for livestock.	Major beneficial (Same as Renewable Resources Alternative)	Major beneficial (Same as Renewable Resources Alternative)
(All alternatives: Forest and other vegetation - no significant impacts in quality, productivity or utilization)							
Wildlife/Threatened and Endangered Species	No change	Beneficial: Habitat management and maintenance	Potential adverse, given maximum cumulative mineral development	Potential adverse, given maximum coal development and land disposals	Beneficial: Maximum habitat management	Beneficial (Same as Renewable Resources Alternative)	Beneficial (Same as Renewable Resources Alternative)
Visual Resources	Minor adverse	Minor beneficial	Minor adverse	Minor adverse	Minor beneficial	Moderate beneficial	Beneficial: All Class II areas (sensitive and seldom-seen) maintained
(All alternatives, except Natural Environment: all "sensitive" Class II areas maintained)							

TABLE 4-13

SUMMARY OF IMPACTS

Environmental Elements	Continuation of Present Management Alternative	Preferred Alternative	Energy and Minerals Alternative	Economic Benefit Alternative	Renewable Resources Alternative	Recreation Alternative	Natural Environment Alternative
Recreation	No change	Beneficial: Existing opportunities maintained	No significant degradation: Significant opportunities do not largely coincide with mineral development areas	No significant degradation: Existing opportunities maintained - Potential major adverse impacts to hunting, given maximum coal	No significant degradation: Existing opportunities maintained	Major beneficial: Optimum management for recreation opportunities	No significant degradation: Existing opportunities maintained, including floatboating on the upper Colorado River
(All alternatives except Natural Environment: Potential adverse impact from major developments affecting recreational rafting on upper Colorado River)							
Wilderness	Extensive loss of wilderness characteristics	Partial loss of wilderness characteristics	Partial loss of wilderness characteristics	Extensive loss of wilderness characteristics	Partial loss of wilderness characteristics	Partial loss of wilderness characteristics	Beneficial: Troublesome WSA suitable - Wilderness values protected
Cultural Resources	No change	No significant degradation: Basic management minimizes impact to cultural resources	No significant degradation (same as Preferred Alternative): Highest potential for disturbance of unidentified subsurface sites	Potential minor adverse due to increase in actions requiring mitigation rather than development of cultural remains	No significant degradation (same as Preferred Alternative)	Beneficial (same as Preferred Alternative): Also management for public information and education	Major beneficial: Maximum management for protection, preservation, public information and education, and scientific knowledge
Economic	No change	All alternatives: No significant adverse impacts from management prescriptions are foreseen, with the exception of the development of a new coal mine in Jackson County, which would cause moderately significant impacts to Walden. The greatest potential for new mine development would occur under the Economic Benefit Alternative.					
Social	No change	All alternatives: No significant adverse impacts from management prescriptions are foreseen, with the exception of the development of a new coal mine in Jackson County and its attendant low to moderate impacts on the local community. The greatest potential for new mine development would occur under the Economic Benefit Alternative.					
Overall Alternative Analysis	All Alternatives: No significant, major, adverse cumulative impacts to environmental elements due to management alternatives are foreseen. Analysis depicted in this summary takes into account effective and successful committed mitigation. All alternatives are implementable. Major, significant adverse impacts on social and economic resources could occur in Jackson County should a new coal mine be developed. Other major impacts could occur should maximum energy/economic development occur - these potential impacts are indicated under the Energy and Minerals and/or the Economic Benefit Alternatives. Major adverse impacts to white-water rafting could occur if flows on the upper Colorado River were significantly altered.						

NOTE: Refer to specific impact analysis narrative under each alternative for detailed discussion.

CHAPTER 5

CONSULTATION AND COORDINATION

Jackson County Planning Department

Other Organizations

American Institute of Professional Geologists

Audobon Society

Colorado Cattlemen's Association

Colorado Historical Society

Colorado Mining Association

Colorado Open Space Council, Wilderness Workshop

Colorado River Water Conservancy District

Colorado Whitewater Association

Craig District Grazing Advisory Board

Craig District Multiple Use Advisory Council

Denver Water Board

Friends of the Earth

Independent Petroleum Association of Mountain States

Middle Park Stock Growers

Mile-High Jeep Club

National Association of Counties

National Institute of Socioeconomic Research

Nature Conservancy

North Park Stock Growers

Rocky Mountain Oil and Gas Association

Sierra Club

Trailridge Rock and Mineral Club

Western River Guides Association

Universities

Colorado State University

University of Colorado

University of Wyoming

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APPENDICES

APPENDIX 1
VEGETATION MANIPULATIONS

Chemical Control. The use of herbicides to control undesirable vegetation would be used when two or more of the following conditions existed:

A. Expected benefits outweigh those of other control methods, or other methods would not be feasible.
B. Contamination of water supplies would not occur.
C. Treatment could provide a selective means of killing certain brush species that could not be efficiently controlled by other methods.
D. Vegetation cover needs to be maintained in order to protect the soil profile from erosion.
E. Understory vegetation consists of sensitive and desirable plant species that could be lost through other treatments, such as burning.

Prescribed Burning. The use of fire to control undesirable vegetation would be used when two or more of the following conditions existed:

A. Undesirable brush species occupy at least 35 percent of the canopy cover.
B. Erosion potential is minimal.
C. Understory vegetation consists of desirable forage plants that are resistant to fire.
D. Expected benefits would outweigh other control methods, or other methods would be infeasible.
E. Understory vegetation does not contain undesirable species that resprout vigorously after burning.
F. Desirable big game browse species are nonexistent or make up a very small portion of existing vegetation composition.

Mechanical Control. The use of mechanical forms of manipulation, such as brush beating, mowing, and plowing, would be used when the following conditions existed:

A. Topographic conditions are suitable (i.e., slopes are 20 percent or less and large rocks are absent).
B. Expected benefits would outweigh other control methods, or other methods are deemed infeasible.
C. Overstory development (stature and density) is low profiled and, therefore, more economically suited to mechanical removal.

Reseeding. Artificial seeding could be considered after implementing any of the above-mentioned vegetation manipulations if insufficient desirable forage plants remained or introduced species were needed to supplement early spring or late fall pasture. Such areas would receive proper seedbed preparation, followed by the drilling or broadcasting of selected seed.

APPENDIX 2

This appendix displays which management level each allotment within the resource falls under, by alternative, according to the criteria discussed in Chapter 3 under Management Prescription Catagories. In addition, the appendix contains the proposed forage allocations for livestock and wildlife along with the potential livestock forage production for all allotments in a mangement levels 1 and 2.

A specific appendix displaying similiar type data has not been developed for the Present Management or Energy and Minerals Alternatives. Because categorization of allotments is not being proposed. For initial livestock allocation and present authorized use for these two alternatives refer to appropriate columns in Appendix 2.

APPENDIX 2

PREFERRED ALTERNATIVE

INITIAL ALLOTMENT CATEGORIZATION AND PROPOSED FORAGE ALLOCATION

MANAGEMENT LEVEL 1

Allot. No.	Acres Public Land	Present Authorz. Lvstock. Use (AUM's)	Propos. Initial Lvstock. Alloc.1/ (AUM's)	Potent. Lvestock. Forage Produc.2/ (AUM's)	Proposed Initial Big Game Allocation (AUM's) Elk	Deer	Ant.
7015	15,408	200	1,140	1,351	1,272	7,956	336
7017	2,442	241	283	359	327	917	-
7019	804	176	135	141	--	8	5
7044	3,519	565	456	509	--	278	156
7045	1,016	90	138	166	--	72	6
7051	2,502	258	337	363	--	108	223
7064	918	91	113	137	--	--	22
7065	2,429	231	335	356	75	--	114
7073	1,424	229	188	207	--	151	89
7116	2,319	268	315	338	--	169	117
7172	2,089	100	291	308	--	199	111
7175	2,312	150	315	337	--	--	156
7501	899	152	156	208	216	418	-
7534	1,055	69	86	115	77	276	-
7541	2,977	486	576	627	118	14	-
7550	1,370	63	157	202	133	400	-
7553	1,883	236	256	341	4	457	-
7562	1,048	241	253	294	62	159	-
7585	1,400	144	157	209	--	--	-
7769	105	14	14	19	--	--	-
TOTALS 20	47,919	4,004	5,701	6,587	2,284	11,582	1,335

MANAGEMENT LEVEL 2

Allot. No.	Acres Public Land	Present Authorz. Lvstock. Use (AUM's)	Propos. Initial Lvstock. Alloc.1/ (AUM's)	Potent. Lvstock. Forage Produc.2/ (AUM's)	Proposed Initial Big Game Allocation (AUM's) Elk	Deer	Ant.
7002	1,729	200	186	261	--	--	39
7003	3,089	336	476	602	133	260	-
7004	2,743	266	383	544	79	151	72
7008	1,651	105	105	105	--	--	-
7009	171	60	60	60	--	--	-
7014	3,079	200	114	288	368	397	161
7016	1,733	143	61	217	207	524	-
7018	1,952	514	119	308	163	--	123
7020	9,527	1,164	898	1,430	75	--	91

APPENDIX 2

PREFERRED ALTERNATIVE

INITIAL ALLOTMENT CATEGORIZATION AND PROPOSED FORAGE ALLOCATION

MANAGEMENT LEVEL 2

Allot. No.	Acres Public Land	Present Authorz. Lvstock. Use (AUM's)	Propos. Initial Lvstock. Alloc.1/ (AUM's)	Potent. Lvstock. Forage Produc.2/ (AUM's)	Proposed Initial Big Game Allocation (AUM's) Elk	Deer	Ant.
7032	2,830	250	218	526	90	147	2
7046	441	70	38	91	6	--	17
7054	1,009	150	67	158	--	60	17
7081	1,179	225	109	283	6	17	100
7082	949	107	66	168	30	--	45
7084	2,174	237	220	414	--	133	39
7087	513	54	30	77	--	--	-
7093	2,945	210	310	623	--	--	11
7096	6,816	795	652	1,207	217	--	345
7100	560	100	36	99	--	--	2
7103	1,239	190	149	254	--	--	-
7105	1,450	194	143	234	--	--	-
7107	1,612	472	156	409	153	100	-
7110	1,552	242	147	242	--	--	-
7119	2,246	259	170	440	--	91	143
7120	1,914	200	60	255	193	449	93
7133	2,857	329	293	673	162	474	-
7136	1,381	232	96	278	--	123	-
7139	1,667	184	144	410	66	133	33
7141	1,813	267	177	364	95	181	6
7142	1,117	186	123	188	57	118	27
7143	482	67	25	90	--	--	-
7144	274	74	24	49	--	--	-
7151	836	25	81	138	--	--	-
7155	250	10	24	42	--	--	-
7164	690	172	87	120	--	--	-
7187	1,506	75	150	217	--	--	78
7189	1,589	160	92	198	--	322	-
7191	1,720	242	55	364	147	344	105
7192	2,366	457	245	344	--	--	-
7250	4,563	803	362	716	83	229	-
7252	1,726	185	79	257	107	24	-
7253	3,876	782	220	786	326	48	-
7254	4,859	364	255	455	203	641	-
7255	2,443	198	164	297	59	193	-

APPENDIX 2

PREFERRED ALTERNATIVE

INITIAL ALLOTMENT CATEGORIZATION AND PROPOSED FORAGE ALLOCATION

MANAGEMENT LEVEL 2

Allot. No.	Acres Public Land	Present Authorz. Lvstock. Use (AUM's)	Propos. Initial Lvstock. Alloc.1/ (AUM's)	Potent. Lvstock. Forage Produc.2/ (AUM's)	Proposed Initial Big Game Allocation (AUM's) Elk	Deer	Ant.
7256	3,357	297	219	670	224	242	-
7258	2,602	209	156	280	69	181	-
7500	3,314	351	43	991	957	2,205	-
7503	513	93	66	168	53	56	-
7505	4,251	532	656	847	579	2,096	-
7506	7,722	362	1,023	1,423	1,259	1,052	-
7507	5,504	582	652	1,152	4,194	9,306	-
7510	2,506	252	273	512	201	643	-
7511	4,914	238	224	569	1,919	8,653	-
7523	520	20	20	--	--	--	-
7527	5,580	470	553	914	403	704	-
7537	5,726	307	514	919	273	2,097	-
7540	1,264	211	145	268	161	484	-
7542	986	250	170	321	--	112	-
7545	1,238	303	303	--	--	--	-
7551	1,228	141	87	179	--	--	-
7552	1,057	149	123	277	81	96	-
7555	2,997	245	111	437	464	855	-
7560	2,077	420	331	411	236	285	-
7565	6,470	380	366	606	--	2,358	-
7568	6,741	1,600	991	1,280	442	927	-
7569	1,381	113	122	377	113	347	-
7574	2,095	179	203	383	109	972	-
7579	4,032	345	417	444	257	1,420	-
7580	1,298	210	217	252	76	809	-
7588	3,982	350	332	332	--	13	-
7589	160	20	20	40	--	--	-
7754	2,268	414	373	522	160	196	-
7765	1,075	118	101	236	143	506	-
7766	1,477	182	149	349	96	131	-
7767	372	64	63	102	--	64	-
7783	760	102	102	--	--	--	-
TOTALS							
76	180,585	21,034	17,184	30,532	15,494	43,526	2,084

APPENDIX 2

PREFERRED ALTERNATIVE

INITIAL ALLOTMENT CATEGORIZATION AND PROPOSED FORAGE ALLOCATION

MANAGEMENT LEVEL 3

Allot. No.	Acres Public Land	Present Authorz. Lvstock. Use (AUM's)	Propos. Initial Lvstock. Alloc.1/ (AUM's)	Potent. Lvstock. Forage Produc.2/ (AUM's)	Proposed Initial Big Game Allocation (AUM's) Elk	Deer	Ant.
7001	718	100	75		8	6	-
7005	218	32	26		--	--	-
7006	88	14	9		--	--	-
7007	12	1	1		--	--	-
7010	2,326	565	157		--	160	-
7011	120	30	30		--	--	-
7012	640	93	93		--	--	-
7013	632	74	74		--	--	-
7021	654	116	66		22	406	-
7022	286	44	23		--	--	-
7023	4,122	423	256		--	269	-
7024	536	100	40		--	112	-
7025	856	67	53		--	62	-
7026	72	2	5		--	--	-
7027	36	5	8		--	9	-
7028	126	37	12		--	1	-
7029	160	17	17		--	--	-
7030	1,103	118	97		107	--	-
7031	3,129	262	189		--	588	171
7033	160	64	64		--	--	-
7034	153	25	11		31	--	-
7035	120	20	20		--	--	-
7036	120	38	38		--	--	-
7037	129	22	9		--	--	-
7038	846	312	312		--	--	-
7039	36	126	126		--	--	-
7040	278	18	19		28	33	-
7041	262	10	19		44	84	-
7042	80	27	14		23	--	-
7043	557	84	39		--	--	-
7047	77	14	9		--	--	-
7048	191	90	90		--	--	-
7049	322	27	25		19	117	-
7050	552	59	46		35	24	-

APPENDIX 2

PREFERRED ALTERNATIVE

INITIAL ALLOTMENT CATEGORIZATION AND PROPOSED FORAGE ALLOCATION

MANAGEMENT LEVEL 3

Allot. No.	Acres Public Land	Present Authorz. Lvstock. Use (AUM's)	Propos. Initial Lvstock. Alloc.1/ (AUM's)	Potent. Lvstock. Forage Produc.2/ (AUM's)	Proposed Initial Big Game Allocation (AUM's) Elk	Deer	Ant.
7052	317	16	21		11	30	54
7053	593	102	44		--	4	13
7055	526	75	36		--	73	-
7056	177	23	20		15	19	-
7057	812	111	60		42	36	-
7058	1,014	159	48		--	172	169
7059	35	10	3		13	13	-
7060	878	93	77		--	106	15
7061	188	49	49		--	--	-
7062	102	18	17		11	--	18
7063	1,036	110	152		24	--	44
7066	858	170	170		--	--	-
7067	874	174	174		--	--	-
7068	450	170	86		--	--	-
7069	80	29	29		--	--	-
7070	55	31	31		--	--	-
7071	334	224	224		--	--	-
7072	258	30	37		--	24	-
7074	12	74	74		--	--	-
7075	46	4	1		--	--	-
7077	96	43	25		2	--	2
7078	520	27	27		--	--	-
7079	1,023	137	96		--	62	-
7080	6,073	816	382		--	466	195
7083	780	150	150		--	--	-
7085	194	47	44		--	--	-
7086	159	50	25		--	--	-
7088	137	12	7		--	--	-
7089	397	126	126		--	--	-
7090	400	49	49		--	--	-
7091	315	35	35		--	--	-
7092	1,237	149	149		--	--	-
7094	48	80	19		--	--	-
7095	110	19	19		--	--	-

APPENDIX 2

PREFERRED ALTERNATIVE

INITIAL ALLOTMENT CATEGORIZATION AND PROPOSED FORAGE ALLOCATION

MANAGEMENT LEVEL 3

Allot. No.	Acres Public Land	Present Authorz. Lvstock. Use (AUM's)	Propos. Initial Lvstock. Alloc.1/ (AUM's)	Potent. Lvstock. Forage Produc.2/ (AUM's)	Proposed Initial Big Game Allocation (AUM's) Elk	Deer	Ant.
7097	106	8	6		--	--	5
7098	418	62	41		--	--	-
7099	50	24	16		--	--	-
7101	127	37	17		--	--	17
7102	516	48	35		--	37	1
7104	240	27	36		--	9	-
7106	141	175	61		--	--	-
7108	205	38	25		--	--	15
7109	431	88	88		--	--	-
7111	1,036	455	455		--	--	-
7112	730	65	65		--	--	-
7113	120	9	9		--	--	-
7114	520	12	12		--	--	-
7115	1,232	306	306		--	--	-
7117	55	7	7		--	17	-
7118	191	39	18		--	--	-
7121	404	48	41		--	18	29
7122	40	6	6		--	--	-
7123	219	102	102		--	--	-
7124	370	134	134		--	--	-
7125	245	52	30		--	2	1
7126	104	9	15		--	--	-
7127	110	23	23		--	--	-
7128	330	51	51		--	--	-
7129	180	36	36		--	--	-
7130	159	65	65		--	--	-
7131	741	180	180		--	--	-
7134	475	53	51		14	45	-
7135	2,334	336	150		42	40	-
7137	332	70	30		--	--	-
7138	236	20	20		--	42	-
7140	520	125	125		--	--	-
7145	246	74	12		--	--	-
7146	160	36	36		--	--	-

APPENDIX 2

PREFERRED ALTERNATIVE

INITIAL ALLOTMENT CATEGORIZATION AND PROPOSED FORAGE ALLOCATION

MANAGEMENT LEVEL 3

Allot. No.	Acres Public Land	Present Authorz. Lvstock. Use (AUM's)	Propos. Initial Lvstock. Alloc.1/ (AUM's)	Potent. Lvstock. Forage Produc.2/ (AUM's)	Proposed Big Game Initial Allocation (AUM's) Elk	Deer	Ant.
7147	178	27	18		6	42	6
7148	195	27	23		--	--	-
7149	127	24	21		--	--	-
7150	1,011	175	102		--	--	-
7152	466	312	109		--	--	-
7153	240	77	77		--	--	-
7154	80	35	35		--	--	-
7156	422	31	44		--	--	-
7157	624	134	53		13	522	-
7158	104	64	11		--	52	-
7159	2,610	809	809		--	--	-
7160	349	113	30		--	80	-
7161	475	117	133		--	--	-
7162	906	192	43		--	373	-
7163	749	83	70		42	12	-
7165	39	3	3		--	--	-
7166	322	39	28		--	--	-
7167	1,240	78	78		--	--	-
7168	964	131	69		--	13	-
7169	1,361	114	87		--	26	-
7170	328	10	20		--	--	-
7171	279	45	19		--	21	-
7173	420	37	42		--	--	-
7174	238	19	26		--	--	-
7176	60	11	11		--	--	-
7177	93	6	6		--	--	-
7178	206	40	40		--	--	-
7179	453	48	33		17	113	-
7180	59	142	142		--	--	-
7181	108	45	45		--	--	-
7182	160	53	53		--	--	-
7183	625	113	113		--	--	-
7184	270	29	29		--	--	-
7185	240	80	80		--	--	-

APPENDIX 2

PREFERRED ALTERNATIVE

INITIAL ALLOTMENT CATEGORIZATION AND PROPOSED FORAGE ALLOCATION

MANAGEMENT LEVEL 3

Allot. No.	Acres Public Land	Present Authorz. Lvstock. Use (AUM's)	Propos. Initial Lvstock. Alloc.1/ (AUM's)	Potent. Lvstock. Forage Produc.2/ (AUM's)	Proposed Big Game Initial Allocation (AUM's) Elk	Deer	Ant.
7186	234	68	68		--	--	-
7188	94	27	18		--	--	9
7190	90	60	60		--	180	-
7193	317	101	63		--	--	-
7194	120	50	50		--	--	-
7195	80	41	41		--	--	-
7196	120	66	66		--	--	-
7197	180	84	84		--	--	-
7198	60	97	97		--	--	-
7199	190	26	19		--	--	-
7251	40	10	10		--	--	-
7257	2,500	95	145		--	--	-
7259	430	12	12		52	10	-
7260	887	227	46		137	24	-
7261	500	124	124		--	--	-
7502	828	177	128		45	--	-
7504	1,237	340	116		--	--	-
7508	355	59	61		52	--	-
7512	324	60	46		4	17	-
7513	68	3	3		--	84	-
7515	387	90	50		--	28	-
7519	314	18	18		--	--	-
7520	148	48	48		--	--	-
7521	437	44	44		--	--	-
7522	5,240	225	225		--	--	-
7524	1,289	120	120		--	--	-
7525	803	145	145		--	--	-
7526	120	30	30		--	--	-
7528	80	12	12		--	--	-
7529	1,440	98	98		--	--	-
7530	789	105	105		--	--	-
7532	403	24	24		--	--	-
7533	839	225	225		--	--	-
7535	1,750	171	137		72	1,178	-

APPENDIX 2

PREFERRED ALTERNATIVE

INITIAL ALLOTMENT CATEGORIZATION AND PROPOSED FORAGE ALLOCATION

MANAGEMENT LEVEL 3

Allot. No.	Acres Public Land	Present Authorz. Lvstock. Use (AUM's)	Propos. Initial Lvstock. Alloc.1/ (AUM's)	Potent. Lvstock. Forage Produc.2/ (AUM's)	Proposed Initial Big Game Allocation (AUM's) Elk	Deer	Ant.
7536	3,627	720	720		--	--	-
7538	2,264	268	268		--	--	-
7539	589	97	97		--	--	-
7544	88	7	7		--	7	-
7546	873	75	76		82	301	-
7547	727	113	97		28	141	-
7552	225	70	70		33	78	-
7556	3,536	295	295		--	--	-
7557	234	59	40		34	55	-
7558	2,426	611	597		34	1,011	-
7559	80	10	10		--	--	-
7561	4,097	518	503		--	948	-
7563	712	61	59		--	122	-
7564	654	87	98		24	474	-
7566	47	88	88		--	--	-
7573	2,526	184	184		--	--	-
7576	85	20	20		--	--	-
7577	959	120	106		--	--	-
7581	120	22	22		--	--	-
7582	200	44	44		--	--	-
7583	612	112	85		61	--	-
7584	330	16	32		60	161	-
7586	48	12	12		11	18	-
7587	509	83	78		72	44	-
7750	481	49	49		--	--	-
7751	767	60	65		28	36	-
7752	40	4	4		--	--	-
7753	360	24	24		--	--	-
7755	600	120	120		--	--	-
7757	265	40	40		--	--	-
7758	550	113	99		--	90	-
7760	676	70	78		75	128	-
7762	1,368	149	142		59	11	-
7763	440	57	57		--	--	-
7764	342	51	40		20	129	-

APPENDIX 2

PREFERRED ALTERNATIVE

INITIAL ALLOTMENT CATEGORIZATION AND PROPOSED FORAGE ALLOCATION

MANAGEMENT LEVEL 3

Allot. No.	Acres Public Land	Present Authorz. Lvstock. Use (AUM's)	Propos. Initial Lvstock. Alloc.1/ (AUM's)	Potent. Lvstock. Forage Produc.2/ (AUM's)	Proposed Initial Big Game Allocation (AUM's) Elk	Deer	Ant.
7770	760	84	84		--	--	-
7775	1,040	173	173		--	--	-
7776	80	7	7		--	--	-
7777	280	24	24		--	--	-
7778	820	135	127		11	4	-
7780	40	6	6		--	--	-
7781	223	38	38		--	--	-
7782	78	6	6		--	--	-
7784	996	108	108		--	--	-
7785	120	20	20		--	--	-
TOTALS							
215	127,756	20,610	16,841		1,563	8,062	229
TOTALS ALL LEVELS							
311	356,260	45,648	39,726	53,535	19,341	63,170	3,648

1/ The proposed initial forage allocations displayed in this table were determined by using soils & vegetation data collected in 1980, utilization data collected during 1981 & 1982, and comparisons made with U.S. Soil Conservation Service stocking guides to determine possible initial stocking. The Bureau recognizes the limitations of data collected during a one time inventory. Therefore, additional monitoring studies will be conducted in order to support or refine the allocations displayed before making final allocation decisions.

2/ The Potential Livestock Forage Production (A.U.M.'s) is not shown for Management Level 3 allotments. These allotments are low priority for intensive management and therefore, are not expected to increase in production above existing levels.

APPENDIX 2

ECONOMIC ALTERNATIVE

INITIAL ALLOTMENT CATEGORIZATION AND PROPOSED FORAGE ALLOCATION

MANAGEMENT LEVEL 1

Allot. No.	Acres Public Land	Present Authorz. Lvstock. Use (AUM's)	Propos. Initial Lvstock. Alloc.1/ (AUM's)	Potent. Lvstock. Forage Produc.2/ (AUM's)	Proposed Initial Big Game Allocation (AUM's) Elk	Deer	Ant.
7015	15,408	200	1,140	1,351	1,272	2,568	336
7017	2,442	241	283	359	327	917	-
7045	1,016	90	138	166	--	24	6
7501	899	152	156	208	216	418	-
7534	1,055	69	86	115	76	138	-
7541	2,977	486	576	627	118	14	-
7550	1,370	63	157	202	134	226	-
7553	1,883	236	256	341	4	320	-
7562	1,048	241	253	294	62	159	-
7585	1,400	144	157	209	--	--	-
7769	105	14	14	19	--	--	-
TOTALS 11	29,603	1,936	3,216	3,891	2,209	4,784	342

MANAGEMENT LEVEL 2

Allot. No.	Acres Public Land	Present Authorz. Lvstock. Use (AUM's)	Propos. Initial Lvstock. Alloc.1/ (AUM's)	Potent. Lvstock. Forage Produc.2/ (AUM's)	Proposed Initial Big Game Allocation (AUM's) Elk	Deer	Ant.
7002	1,729	200	186	261	--	--	39
7003	3,089	336	476	602	133	260	-
7004	2,743	266	383	544	79	151	72
7008	1,651	105	105	105	--	--	-
7009	171	60	60	60	--	--	-
7014	3,079	200	114	288	368	397	161
7016	1,733	143	61	217	207	524	-
7018	1,952	514	119	308	163	--	123
7020	9,527	1,164	898	1,430	75	--	91
7032	2,830	250	218	526	90	147	2
7054	1,009	150	67	158	--	60	17
7081	1,179	225	109	283	6	6	100
7093	2,945	210	310	623	--	--	11
7100	560	100	36	99	--	--	2
7107	1,612	472	156	409	153	100	-
7120	1,914	200	60	255	193	449	93
7133	2,857	329	293	673	162	474	-
7139	1,667	184	144	410	66	133	33

APPENDIX 2

ECONOMIC ALTERNATIVE

INITIAL ALLOTMENT CATEGORIZATION AND PROPOSED FORAGE ALLOCATION

MANAGEMENT LEVEL 2

Allot. No.	Acres Public Land	Present Authorz. Lvstock. Use (AUM's)	Propos. Initial Lvstock. Alloc.1/ (AUM's)	Potent. Lvstock. Forage Produc.2/ (AUM's)	Proposed Initial Big Game Allocation (AUM's) Elk	Deer	Ant.
7141	1,813	267	177	364	95	181	6
7142	1,117	186	123	188	57	118	27
7143	482	67	25	90	--	--	-
7144	274	74	24	49	--	--	-
7187	1,506	75	150	217	--	--	78
7189	1,589	160	92	198	--	322	-
7191	1,720	242	55	364	147	344	105
7192	2,366	457	245	344	--	--	-
7250	4,563	803	362	716	70	170	-
7252	1,726	185	79	257	107	24	-
7253	3,876	782	220	786	251	42	-
7254	4,859	364	255	455	182	474	-
7255	2,443	198	164	297	55	151	-
7256	3,357	297	219	670	224	242	-
7258	2,602	209	156	280	64	163	-
7500	3,314	351	433	991	957	2,205	-
7503	513	93	66	168	53	56	-
7505	4,251	532	656	847	579	2,096	-
7506	7,722	362	1,023	1,423	1,259	1,052	-
7507	5,504	582	652	1,152	4,194	5,128	-
7510	2,506	252	273	512	201	643	-
7511	4,914	238	224	569	1,919	3,946	-
7523	520	20	20	--	--	--	-
7527	5,580	470	553	914	403	704	-
7537	5,726	307	514	919	273	2,097	-
7540	1,264	211	145	268	161	484	-
7542	986	250	170	321	--	112	-
7545	1,238	303	303	--	--	--	-
7551	1,228	141	87	179	--	--	-
7552	1,057	149	123	277	81	96	-
7555	2,997	245	111	437	464	855	-
7560	2,077	420	331	411	236	285	-
7565	6,470	380	366	606	--	2,358	-
7568	6,741	1,600	991	1,280	442	927	-

APPENDIX 2

ECONOMIC ALTERNATIVE

INITIAL ALLOTMENT CATEGORIZATION AND PROPOSED FORAGE ALLOCATION

MANAGEMENT LEVEL 2

Allot. No.	Acres Public Land	Present Authorz. Lvstock. Use (AUM's)	Propos. Initial Lvstock. Alloc.1/ (AUM's)	Potent. Lvstock. Forage Produc.2/ (AUM's)	Proposed Initial Big Game Allocation (AUM's) Elk	Deer	Ant.
7569	1,381	113	122	377	113	347	-
7574	2,095	179	203	383	109	972	-
7579	4,032	345	417	444	257	1,420	-
7580	1,298	210	217	252	76	809	-
7588	3,982	350	332	332	--	13	-
7589	160	20	20	40	--	--	-
7754	2,268	414	373	522	160	196	-
7765	1,075	118	101	236	143	506	-
7766	1,477	182	149	349	96	131	-
7767	372	64	63	102	--	64	-
7783	760	102	102	--	--	--	-
TOTALS 63	160,038	18,477	15,281	26,827	15,163	30,434	960
MANAGEMENT LEVEL 3							
7001	718	100	75		8	5	-
7005	218	32	26		--	--	-
7006	88	14	9		--	--	-
7007	12	1	1		--	--	-
7010	2,326	565	157		--	52	-
7011	120	30	30		--	--	-
7012	640	93	93		--	--	-
7013	632	74	74		--	--	-
7019	804	176	135		--	3	5
7021	654	116	66		18	58	-
7022	286	44	23		--	--	-
7023	4,122	423	256		--	86	-
7024	536	100	40		--	36	-
7025	856	67	53		--	20	-
7026	72	2	5		--	--	-
7027	36	5	8		--	--	-
7028	126	37	12		--	--	-
7029	160	17	17		--	--	-
7030	1,103	118	97		07	--	-

APPENDIX 2

ECONOMIC ALTERNATIVE

INITIAL ALLOTMENT CATEGORIZATION AND PROPOSED FORAGE ALLOCATION

MANAGEMENT LEVEL 3

Allot. No.	Acres Public Land	Present Authorz. Lvstock. Use (AUM's)	Propos. Initial Lvstock. Alloc.1/ (AUM's)	Potent. Lvstock. Forage Produc.2/ (AUM's)	Proposed Initial Big Game Allocation (AUM's) Elk	Deer	Ant.
7031	3,129	262	189		--	588	171
7033	160	64	64		--	--	-
7034	153	25	11		31	--	-
7035	120	20	20		--	--	-
7036	120	38	38		--	--	-
7037	129	22	9		--	--	-
7038	846	312	312		--	--	-
7039	36	126	126		--	--	-
7040	278	18	19		23	19	-
7041	262	10	19		44	13	-
7042	80	27	14		23	--	-
7043	557	84	39		--	--	-
7044	3,519	565	456		--	100	156
7046	441	70	38		6	--	17
7047	77	14	9		--	--	-
7048	191	90	90		--	--	-
7049	322	27	25		19	57	-
7050	552	59	46		35	24	-
7051	2,502	258	337		--	108	223
7052	317	16	21		11	30	54
7053	593	102	44		--	3	13
7055	526	75	36		--	19	-
7056	177	23	20		11	2	-
7057	812	111	60		42	36	-
7058	1,014	159	48		--	66	169
7059	35	10	3		13	13	-
7060	878	93	77		--	33	15
7061	188	49	49		--	--	-
7062	102	18	17		11	--	18
7063	1,036	110	152		24	--	44
7064	918	91	113		--	--	22
7065	2,429	231	335		75	--	114
7066	858	170	170		--	--	-
7067	874	174	174		--	--	-

APPENDIX 2

ECONOMIC ALTERNATIVE

INITIAL ALLOTMENT CATEGORIZATION AND PROPOSED FORAGE ALLOCATION

MANAGEMENT LEVEL 3

Allot. No.	Acres Public Land	Present Authorz. Lvstock. Use (AUM's)	Propos. Initial Lvstock. Alloc.1/ (AUM's)	Potent. Lvstock. Forage Produc.2/ (AUM's)	Proposed Initial Big Game Allocation (AUM's) Elk	Deer	Ant.
7068	450	170	86		--	--	-
7069	80	29	29		--	--	-
7070	55	31	31		--	--	-
7071	334	224	224		--	--	-
7072	258	30	37		--	6	-
7073	1,424	229	188		--	48	89
7074	12	74	74		--	--	-
7075	46	4	1		--	--	-
7077	96	43	25		2	--	2
7078	520	27	27		--	--	-
7079	1,023	137	96		--	20	-
7080	6,073	816	382		--	151	195
7082	949	107	66		30	--	45
7083	780	150	150		--	--	-
7084	2,174	237	220		--	42	39
7085	194	47	44		--	--	-
7086	159	50	25		--	--	-
7087	513	54	30		--	--	-
7088	137	12	7		--	--	-
7089	397	126	126		--	--	-
7090	400	49	49		--	--	-
7091	315	35	35		--	--	-
7092	1,237	149	149		--	--	-
7094	48	80	19		--	--	-
7095	110	19	19		--	--	-
7096	6,816	795	652		217	--	345
7097	106	8	6		--	--	5
7098	418	62	41		--	--	-
7099	50	24	16		--	--	-
7101	127	37	17		--	--	17
7102	516	48	35		--	12	1
7103	1,239	190	149		--	--	-
7104	240	27	36		--	3	-
7105	1,450	194	143		--	--	-

APPENDIX 2

ECONOMIC ALTERNATIVE

INITIAL ALLOTMENT CATEGORIZATION AND PROPOSED FORAGE ALLOCATION

MANAGEMENT LEVEL 3

Allot. No.	Acres Public Land	Present Authorz. Lvstock. Use (AUM's)	Propos. Initial Lvstock. Alloc.1/ (AUM's)	Potent. Lvstock. Forage Produc.2/ (AUM's)	Proposed Initial Big Game Allocation (AUM's) Elk	Deer	Ant.
7106	141	175	61		--	--	-
7108	205	38	25		--	--	15
7109	431	88	88		--	--	-
7110	1,552	242	147		--	--	-
7111	1,036	455	455		--	--	-
7112	730	65	65		--	--	-
7113	120	9	9		--	--	-
7114	520	12	12		--	--	-
7115	1,232	306	306		--	--	-
7116	2,319	268	315		--	54	117
7117	55	7	7		--	6	-
7118	191	39	18		--	--	-
7119	2,246	259	170		--	91	143
7121	404	48	41		--	4	29
7122	40	6	6		--	--	-
7123	219	102	102		--	--	-
7124	370	134	134		--	--	-
7125	245	52	30		--	1	1
7126	104	9	15		--	--	-
7127	110	23	23		--	--	-
7128	330	51	51		--	--	-
7129	180	36	36		--	--	-
7130	159	65	65		--	--	-
7131	741	180	180		--	--	-
7134	475	53	51		14	45	-
7135	2,334	336	150		42	12	-
7136	1,381	232	96		--	40	-
7137	332	70	30		--	--	-
7138	236	20	20		--	14	-
7140	520	125	125		--	--	-
7145	246	74	12		--	--	-
7146	160	36	36		--	--	-
7147	178	27	18		6	12	6
7148	195	27	23		--	--	-

APPENDIX 2

ECONOMIC ALTERNATIVE

INITIAL ALLOTMENT CATEGORIZATION AND PROPOSED FORAGE ALLOCATION

MANAGEMENT LEVEL 3

Allot. No.	Acres Public Land	Present Authorz. Lvstock. Use (AUM's)	Propos. Initial Lvstock. Alloc.1/ (AUM's)	Potent. Lvstock. Forage Produc.2/ (AUM's)	Proposed Initial Big Game Allocation (AUM's) Elk	Deer	Ant.
7149	127	24	21		--	--	-
7150	1,011	175	102		--	--	-
7151	836	25	81		--	--	-
7152	466	312	109		--	--	-
7153	240	77	77		--	--	-
7154	80	35	35		--	--	-
7155	250	10	24		--	--	-
7156	422	31	44		--	--	-
7157	624	134	53		13	168	-
7158	104	64	11		--	17	-
7159	2,610	809	809		--	--	-
7160	349	113	30		--	45	-
7161	475	117	133		--	--	-
7162	906	192	43		--	120	-
7163	749	83	70		42	12	-
7164	690	172	87		--	--	-
7165	39	3	3		--	--	-
7166	322	39	28		--	--	-
7167	1,240	78	78		--	--	-
7168	964	131	69		--	3	-
7169	1,361	114	87		--	9	-
7170	328	10	20		--	--	-
7171	279	45	19		--	7	-
7172	2,089	100	291		--	60	111
7173	420	37	42		--	--	-
7174	238	19	26		--	--	-
7175	2,312	150	315		--	--	156
7176	60	11	11		--	--	-
7177	93	6	6		--	--	-
7178	206	40	40		--	--	-
7179	453	48	33		17	35	-
7180	59	142	142		--	--	-
7181	108	45	45		--	--	-
7182	160	53	53		--	--	-

APPENDIX 2

ECONOMIC ALTERNATIVE

INITIAL ALLOTMENT CATEGORIZATION AND PROPOSED FORAGE ALLOCATION

MANAGEMENT LEVEL 3

Allot. No.	Acres Public Land	Present Authorz. Lvstock. Use (AUM's)	Propos. Initial Lvstock. Alloc.1/ (AUM's)	Potent. Lvstock. Forage Produc.2/ (AUM's)	Proposed Initial Big Game Allocation (AUM's) Elk	Deer	Ant.
7183	625	113	113		--	--	-
7184	270	29	29		--	--	-
7185	240	80	80		--	--	-
7186	234	68	68		--	--	-
7188	94	27	18		--	--	9
7190	90	60	60		--	58	-
7193	317	101	63		--	--	-
7194	120	50	50		--	--	-
7195	80	41	41		--	--	-
7196	120	66	66		--	--	-
7197	180	84	84		--	--	-
7198	60	97	97		--	--	-
7199	190	26	19		--	--	-
7251	40	10	10		--	--	-
7257	2,500	95	145		--	--	-
7259	430	12	12		45	7	-
7260	887	227	46		123	18	-
7261	500	124	124		--	--	-
7502	828	177	128		45	--	-
7504	1,237	340	116		--	--	-
7508	355	59	61		52	--	-
7512	324	60	46		4	16	-
7513	68	3	3		--	48	-
7515	387	90	50		--	16	-
7519	314	18	18		--	--	-
7520	148	48	48		--	--	-
7521	437	44	44		--	--	-
7522	5,240	225	225		--	--	-
7524	1,289	120	120		--	--	-
7525	809	145	145		--	--	-
7526	120	30	30		--	--	-
7528	80	12	12		--	--	-
7529	1,440	98	98		--	--	-
7530	789	105	105		--	--	-

APPENDIX 2

ECONOMIC ALTERNATIVE

INITIAL ALLOTMENT CATEGORIZATION AND PROPOSED FORAGE ALLOCATION

MANAGEMENT LEVEL 3

Allot. No.	Acres Public Land	Present Authorz. Lvstock. Use (AUM's)	Propos. Initial Lvstock. Alloc.1/ (AUM's)	Potent. Lvstock. Forage Produc.2/ (AUM's)	Proposed Initial Big Game Allocation (AUM's) Elk	Deer	Ant.
7532	403	24	24		--	--	-
7533	839	225	225		--	--	-
7535	1,750	171	137		72	776	-
7536	3,627	720	720		--	--	-
7538	2,264	268	268		--	--	-
7539	589	97	97		--	--	-
7544	88	7	7		--	4	-
7546	873	75	76		82	259	-
7547	727	113	97		28	89	-
7552	225	70	70		33	47	-
7556	3,536	295	295		--	--	-
7557	234	59	40		34	47	-
7558	2,426	611	597		34	1,011	-
7559	80	10	10		--	--	-
7561	4,097	518	503		--	948	-
7563	712	61	59		--	50	-
7564	654	87	98		24	474	-
7566	47	88	88		--	--	-
7573	2,526	184	184		--	--	-
7576	85	20	20		--	--	-
7577	959	120	106		--	--	-
7581	120	22	22		--	--	-
7582	200	44	44		--	--	-
7583	612	112	85		61	--	-
7584	330	16	32		60	93	-
7586	48	12	12		11	14	-
7587	509	83	78		72	44	-
7750	481	49	49		--	--	-
7751	767	60	65		28	20	-
7752	40	4	4		--	--	-
7753	360	24	24		--	--	-
7755	600	120	120		--	--	-
7757	265	40	40		--	--	-
7758	550	113	99		--	56	-

APPENDIX 2

ECONOMIC ALTERNATIVE

INITIAL ALLOTMENT CATEGORIZATION AND PROPOSED FORAGE ALLOCATION

MANAGEMENT LEVEL 3

Allot. No.	Acres Public Land	Present Authorz. Lvstock. Use (AUM's)	Propos. Initial Lvstock. Alloc.1/ (AUM's)	Potent. Lvstock. Forage Produc.2/ (AUM's)	Proposed Initial Big Game Allocation (AUM's) Elk	Deer	Ant.
7760	676	70	78		75	80	-
7762	1,368	149	142		59	11	-
7763	440	57	57		--	--	-
7764	342	51	40		20	72	-
7770	760	84	84		--	--	-
7775	1,040	173	173		--	--	-
7776	80	7	7		--	--	-
7777	280	24	24		--	--	-
7778	820	135	127		11	2	-
7780	40	6	6		--	--	-
7781	223	38	38		--	--	-
7782	78	6	6		--	--	-
7784	996	108	108		--	--	-
7785	120	20	20		--	--	-
TOTALS 237	166,619	25,235	21,229		1,858	6,671	2,346
TOTALS ALL LEVELS 311	356,260	45,648	39,726	51,241	19,047	41,889	3,648

1/ The proposed initial forage allocations displayed in this table were determined by using soils & vegetation data collected in 1980, utilization data collected during 1981 & 1982, and comparisons made with U.S. Soil Conservation Service stocking guides to determine possible initial stocking. The Bureau recognizes the limitations of data collected during a one time inventory. Therefore, additional monitoring studies will be conducted in order to support or refine the allocations displayed before making final allocation decisions.

2/ The Potential Livestock Forage Production (A.U.M.'s) is not shown for Management Level 3 allotments. These allotments are low priority for intensive management and therefore, are not expected to increase in production above existing levels.

APPENDIX 2

RENEWABLE RESOURCE ALTERNATIVE

INITIAL ALLOTMENT CATEGORIZATION AND PROPOSED FORAGE ALLOCATION

MANAGEMENT LEVEL 1

Allot. No.	Acres Public Land	Present Authorz. Lvstock. Use (AUM's)	Propos. Initial Lvstock. Alloc.1/ (AUM's)	Potent. Lvstock. Forage Produc.2/ (AUM's)	Proposed Initial Big Game Allocation (AUM's) Elk	Deer	Ant.
7015	15,408	200	1,140	1,351	1,272	7,956	336
7017	2,442	241	283	359	327	917	-
7019	804	176	135	141	--	8	5
7044	3,519	565	456	509	--	278	156
7045	1,016	90	138	166	--	72	6
7051	2,502	258	337	363	--	108	223
7064	918	91	113	137	--	--	22
7065	2,429	231	335	356	75	--	114
7073	1,424	229	188	207	--	151	89
7116	2,319	268	315	338	--	169	117
7172	2,089	100	291	308	--	199	111
7175	2,312	150	315	337	--	--	156
7501	899	152	156	208	216	418	-
7534	1,055	69	86	115	77	276	-
7541	2,977	486	576	627	118	14	-
7550	1,370	63	157	202	133	400	-
7553	1,883	236	256	341	4	457	-
7562	1,048	241	253	294	62	159	-
7585	1,400	144	157	209	--	--	-
7769	105	14	14	19	--	--	-
TOTALS 20	47,919	4,004	5,701	6,587	2,284	11,582	1,335

MANAGEMENT LEVEL 2

Allot. No.	Acres Public Land	Present Authorz. Lvstock. Use (AUM's)	Propos. Initial Lvstock. Alloc.1/ (AUM's)	Potent. Lvstock. Forage Produc.2/ (AUM's)	Proposed Initial Big Game Allocation (AUM's) Elk	Deer	Ant.
7002	1,729	200	186	261	--	--	39
7003	3,089	336	476	602	133	260	-
7004	2,743	266	383	544	79	151	72
7008	1,651	105	105	105	--	--	-
7009	171	60	60	60	--	--	-
7014	3,079	200	114	288	368	397	161
7016	1,733	143	61	217	207	524	-

APPENDIX 2

RENEWABLE RESOURCE ALTERNATIVE

INITIAL ALLOTMENT CATEGORIZATION AND PROPOSED FORAGE ALLOCATION

MANAGEMENT LEVEL 2

Allot. No.	Acres Public Land	Present Authorz. Lvstock. Use (AUM's)	Propos. Initial Lvstock. Alloc.1/ (AUM's)	Potent. Lvstock. Forage Produc.2/ (AUM's)	Proposed Initial Big Game Allocation (AUM's) Elk	Deer	Ant.
7018	1,952	514	119	308	163	--	123
7020	9,527	1,164	898	1,430	75	--	91
7023	4,122	423	256	769	--	269	-
7031	3,129	262	189	451	--	588	171
7032	2,830	250	218	526	90	147	2
7046	441	70	38	91	6	--	17
7054	1,009	150	67	158	--	60	17
7058	1,014	159	48	182	--	172	169
7079	1,023	137	96	259	--	62	-
7080	6,073	816	382	1,040	--	466	195
7081	1,179	225	109	283	6	17	100
7082	949	107	66	168	30	--	45
7084	2,174	237	220	414	--	133	39
7087	513	54	30	77	--	--	-
7093	2,945	210	310	623	--	--	11
7096	6,816	795	652	1,207	217	--	345
7100	560	100	36	99	--	--	2
7103	1,239	190	149	254	--	--	-
7105	1,450	194	143	234	--	--	-
7107	1,612	472	156	409	153	100	-
7110	1,552	242	147	242	--	--	-
7119	2,246	259	170	440	--	91	143
7120	1,914	200	60	255	193	449	93
7133	2,857	329	293	673	162	474	-
7136	1,381	232	96	278	--	123	-
7139	1,667	184	144	410	66	133	33
7141	1,813	267	177	364	95	181	6
7142	1,117	186	123	188	57	118	27
7143	482	67	25	90	--	--	-
7144	274	74	24	49	--	--	-
7151	836	25	81	138	--	--	-
7155	250	10	24	42	--	--	-
7164	690	172	87	120	--	--	-
7187	1,506	75	150	217	--	--	78

APPENDIX 2

RENEWABLE RESOURCE ALTERNATIVE

INITIAL ALLOTMENT CATEGORIZATION AND PROPOSED FORAGE ALLOCATION

MANAGEMENT LEVEL 2

Allot. No.	Acres Public Land	Present Authorz. Lvstock. Use (AUM's)	Propos. Initial Lvstock. Alloc.1/ (AUM's)	Potent. Lvstock. Forage Produc.2/ (AUM's)	Proposed Initial Big Game Allocation (AUM's) Elk	Deer	Ant.
7189	1,589	160	92	198	--	322	-
7191	1,720	242	55	364	147	344	105
7192	2,366	457	245	344	--	--	-
7250	4,563	803	362	716	83	229	-
7252	1,726	185	79	257	107	24	-
7253	3,876	782	220	786	326	48	-
7254	4,859	364	255	455	203	641	-
7255	2,443	198	164	297	59	193	-
7256	3,357	297	219	670	224	242	-
7258	2,602	209	156	280	69	181	-
7500	3,314	351	433	991	957	2,205	-
7503	513	93	66	168	53	56	-
7505	4,251	532	656	847	579	2,096	-
7506	7,722	362	1,023	1,423	1,259	1,052	-
7507	5,504	582	652	1,152	4,194	9,306	-
7510	2,506	252	273	512	201	643	-
7511	4,914	238	224	569	1,919	8,653	-
7523	520	20	20	--	--	--	-
7527	5,580	470	553	914	403	704	-
7537	5,726	307	514	919	273	2,097	-
7540	1,264	211	145	268	161	484	-
7542	986	250	170	321	--	112	-
7545	1,238	303	303	--	--	--	-
7551	1,228	141	87	179	--	--	-
7552	1,057	149	123	277	81	96	-
7555	2,997	245	111	437	464	855	-
7560	2,077	420	331	411	236	285	-
7565	6,470	380	366	606	--	2,358	-
7568	6,741	1,600	991	1,280	442	927	-
7569	1,381	113	122	377	113	347	-
7574	2,095	179	203	383	109	972	-
7579	4,032	345	417	444	257	1,420	-
7580	1,298	210	217	252	76	809	-
7588	3,982	350	332	332	--	13	-

APPENDIX 2

RENEWABLE RESOURCE ALTERNATIVE

INITIAL ALLOTMENT CATEGORIZATION AND PROPOSED FORAGE ALLOCATION

MANAGEMENT LEVEL 2

Allot. No.	Acres Public Land	Present Authorz. Lvstock. Use (AUM's)	Propos. Initial Lvstock. Alloc.1/ (AUM's)	Potent. Lvstock. Forage Produc.2/ (AUM's)	Proposed Initial Big Game Allocation (AUM's) Elk	Deer	Ant.
7589	160	20	20	40	--	--	-
7754	2,268	414	373	522	160	196	-
7765	1,075	118	101	236	143	506	-
7766	1,477	182	149	349	96	131	-
7767	372	64	63	102	--	64	-
7783	760	102	102	--	--	--	-
TOTALS 81	195,946	22,798	18,155	33,233	15,494	43,526	2,084
MANAGEMENT LEVEL 3							
7001	718	100	75		8	6	-
7005	218	32	26		--	--	-
7006	88	14	9		--	--	-
7007	12	1	1		--	--	-
7010	2,326	565	157		--	160	-
7011	120	30	30		--	--	-
7012	640	93	93		--	--	-
7013	632	74	74		--	--	-
7021	654	116	66		22	406	-
7022	286	44	23		--	--	-
7024	536	100	40		--	112	-
7025	856	67	53		--	62	-
7026	72	2	5		--	--	-
7027	36	5	8		--	9	-
7028	126	37	12		--	1	-
7029	160	17	17		--	--	-
7030	1,103	118	97		107	--	-
7033	160	64	64		--	--	-
7034	153	25	11		31	--	-
7035	120	20	20		--	--	-
7036	120	38	38		--	--	-
7037	129	22	9		--	--	-
7038	846	312	312		--	--	-

APPENDIX 2

RENEWABLE RESOURCE ALTERNATIVE

INITIAL ALLOTMENT CATEGORIZATION AND PROPOSED FORAGE ALLOCATION

MANAGEMENT LEVEL 3

Allot. No.	Acres Public Land	Present Authorz. Lvstock. Use (AUM's)	Propos. Initial Lvstock. Alloc.1/ (AUM's)	Potent. Lvstock. Forage Produc.2/ (AUM's)	Proposed Initial Big Game Allocation (AUM's) Elk	Deer	Ant.
7039	36	126	126		--	--	-
7040	278	18	19		28	33	-
7041	262	10	19		44	84	-
7042	80	27	14		23	--	-
7043	557	84	39		--	--	-
7047	77	14	9		--	--	-
7048	191	90	90		--	--	-
7049	322	27	25		19	117	-
7050	552	59	46		35	24	-
7052	317	16	21		11	30	54
7053	593	102	44		--	4	13
7055	526	75	36		--	73	-
7056	177	23	20		15	19	-
7057	812	111	60		42	36	-
7059	35	10	3		13	13	-
7060	878	93	77		--	106	15
7061	188	49	49		--	--	-
7062	102	18	17		11	--	18
7063	1,036	110	152		24	--	44
7066	858	170	170		--	--	-
7067	874	174	174		--	--	-
7068	450	170	86		--	--	-
7069	80	29	29		--	--	-
7070	55	31	31		--	--	-
7071	334	224	224		--	--	-
7072	258	30	37		--	24	-
7074	12	74	74		--	--	-
7075	46	4	1		--	--	-
7077	96	43	25		2	--	2
7078	520	27	27		--	--	-
7083	780	150	150		--	--	-
7085	194	47	44		--	--	-
7086	159	50	25		--	--	-
7088	137	12	7		--	--	-

APPENDIX 2

RENEWABLE RESOURCE ALTERNATIVE

INITIAL ALLOTMENT CATEGORIZATION AND PROPOSED FORAGE ALLOCATION

MANAGEMENT LEVEL 3

Allot. No.	Acres Public Land	Present Authorz. Lvstock. Use (AUM's)	Propos. Initial Lvstock. Alloc.1/ (AUM's)	Potent. Lvstock. Forage Produc.2/ (AUM's)	Proposed Initial Big Game Allocation (AUM's) Elk	Deer	Ant.
7089	397	126	126		--	--	-
7090	400	49	49		--	--	-
7091	315	35	35		--	--	-
7092	1,237	149	149		--	--	-
7094	48	80	19		--	--	-
7095	110	19	19		--	--	-
7097	106	8	6		--	--	5
7098	418	62	41		--	--	-
7099	50	24	16		--	--	-
7101	127	37	17		--	--	17
7102	516	48	35		--	37	1
7104	240	27	36		--	9	-
7106	141	175	61		--	--	-
7108	205	38	25		--	--	15
7109	431	88	88		--	--	-
7111	1,036	455	455		--	--	-
7112	730	65	65		--	--	-
7113	120	9	9		--	--	-
7114	520	12	12		--	--	-
7115	1,232	306	306		--	--	-
7117	55	7	7		--	17	-
7118	191	39	18		--	--	-
7121	404	48	41		--	18	29
7122	40	6	6		--	--	-
7123	219	102	102		--	--	-
7124	370	134	134		--	--	-
7125	245	52	30		--	2	1
7126	104	9	15		--	--	-
7127	110	23	23		--	--	-
7128	330	51	51		--	--	-
7129	180	36	36		--	--	-
7130	159	65	65		--	--	-
7131	741	180	180		--	--	-
7134	475	53	51		14	45	-

APPENDIX 2

RENEWABLE RESOURCE ALTERNATIVE

INITIAL ALLOTMENT CATEGORIZATION AND PROPOSED FORAGE ALLOCATION

MANAGEMENT LEVEL 3

Allot. No.	Acres Public Land	Present Authorz. Lvstock. Use (AUM's)	Propos. Initial Lvstock. Alloc.1/ (AUM's)	Potent. Lvstock. Forage Produc.2/ (AUM's)	Proposed Initial Big Game Allocation (AUM's) Elk	Deer	Ant.
7135	2,334	336	150		42	40	-
7137	332	70	30		--	--	-
7138	236	20	20		00	42	-
7140	520	125	125		--	--	-
7145	246	74	12		--	--	-
7146	160	36	36		--	--	-
7147	178	27	18		6	42	6
7148	195	27	23		--	--	-
7149	127	24	21		--	--	-
7150	1,011	175	102		--	--	-
7152	466	312	109		--	--	-
7153	240	77	77		--	--	-
7154	80	35	35		--	--	-
7156	422	31	44		--	--	-
7157	624	134	53		13	522	-
7158	104	64	11		--	52	-
7159	2,610	809	809		--	--	-
7160	349	113	30		--	80	-
7161	475	117	133		--	--	-
7162	906	192	43		--	373	-
7163	749	83	70		42	12	-
7165	39	3	3		--	--	-
7166	322	39	28		--	--	-
7167	1,240	78	78		--	--	-
7168	964	131	69		--	13	-
7169	1,361	114	87		--	26	-
7170	328	10	20		--	--	-
7171	279	45	19		--	21	-
7173	420	37	42		--	--	-
7174	238	19	26		--	--	-
7176	60	11	11		--	--	-
7177	93	6	6		--	--	-
7178	206	40	40		--	--	-
7179	453	48	33		17	113	-

APPENDIX 2

RENEWABLE RESOURCE ALTERNATIVE

INITIAL ALLOTMENT CATEGORIZATION AND PROPOSED FORAGE ALLOCATION

MANAGEMENT LEVEL 3

Allot. No.	Acres Public Land	Present Authorz. Lvstock. Use (AUM's)	Propos. Initial Lvstock. Alloc.1/ (AUM's)	Potent. Lvstock. Forage Produc.2/ (AUM's)	Proposed Initial Big Game Allocation (AUM's) Elk	Deer	Ant.
7180	59	142	142		--	--	-
7181	108	45	45		--	--	-
7182	160	53	53		--	--	-
7183	625	113	113		--	--	-
7184	270	29	29		--	--	-
7185	240	80	80		--	--	-
7186	234	68	68		--	--	-
7188	94	27	18		--	--	9
7190	90	60	60		--	180	-
7193	317	101	63		--	--	-
7194	120	50	50		--	--	-
7195	80	41	41		--	--	-
7196	120	66	66		--	--	-
7197	180	84	84		--	--	-
7198	60	97	97		--	--	-
7199	190	26	19		--	--	-
7251	40	10	10		--	--	-
7257	2,500	95	145		--	--	-
7259	430	12	12		52	10	-
7260	887	227	46		137	24	-
7261	500	124	124		--	--	-
7502	828	177	128		45	--	-
7504	1,237	340	116		--	--	-
7508	355	59	61		52	--	-
7512	324	60	46		4	17	-
7513	68	3	3		--	84	-
7515	387	90	50		--	28	-
7519	314	18	18		--	--	-
7520	148	48	48		--	--	-
7521	437	44	44		--	--	-
7522	5,240	225	225		--	--	-
7524	1,289	120	120		--	--	-
7525	803	145	145		--	--	-
7526	120	30	30		--	--	-

APPENDIX 2

RENEWABLE RESOURCE ALTERNATIVE

INITIAL ALLOTMENT CATEGORIZATION AND PROPOSED FORAGE ALLOCATION

MANAGEMENT LEVEL 3

Allot. No.	Acres Public Land	Present Authorz. Lvstock. Use (AUM's)	Propos. Initial Lvstock. Alloc.1/ (AUM's)	Potent. Lvstock. Forage Produc.2/ (AUM's)	Proposed Initial Big Game Allocation (AUM's) Elk	Deer	Ant.
7528	80	12	12		--	--	-
7529	1,440	98	98		--	--	-
7530	789	105	105		--	--	-
7532	403	24	24		--	--	-
7533	839	225	225		--	--	-
7535	1,750	171	137		72	1,178	-
7536	3,627	720	720		--	--	-
7538	2,264	268	268		--	--	-
7539	589	97	97		--	--	-
7544	88	7	7		--	7	-
7546	873	75	76		82	301	-
7547	727	113	97		28	141	-
7552	225	70	70		33	78	-
7556	3,536	295	295		--	--	-
7557	234	59	40		34	55	-
7558	2,426	611	597		34	1,011	-
7559	80	10	10		--	--	-
7561	4,097	518	503		--	948	-
7563	712	61	59		--	122	-
7564	654	87	98		24	474	-
7566	47	88	88		--	--	-
7573	2,526	184	184		--	--	-
7576	85	20	20		--	--	-
7577	959	120	106		--	--	-
7581	120	22	22		--	--	-
7582	200	44	44		--	--	-
7583	612	112	85		61	--	-
7584	330	16	32		60	161	-
7586	48	12	12		11	18	-
7587	509	83	78		72	44	-
7750	481	49	49		--	--	-
7751	767	60	65		28	36	-
7752	40	4	4		--	--	-
7753	360	24	24		--	--	-

APPENDIX 2

RENEWABLE RESOURCE ALTERNATIVE

INITIAL ALLOTMENT CATEGORIZATION AND PROPOSED FORAGE ALLOCATION

MANAGEMENT LEVEL 3

Allot. No.	Acres Public Land	Present Authorz. Lvstock. Use (AUM's)	Propos. Initial Lvstock. Alloc.1/ (AUM's)	Potent. Lvstock. Forage Produc.2/ (AUM's)	Proposed Initial Big Game Allocation (AUM's) Elk	Deer	Ant.
7755	600	120	120		--	--	-
7757	265	40	40		--	--	-
7758	550	113	99		--	90	-
7760	676	70	78		75	128	-
7762	1,368	149	142		59	11	0
7763	440	57	57		--	--	-
7764	342	51	40		20	129	-
7770	760	84	84		--	--	-
7775	1,040	173	173		--	--	-
7776	80	7	7		--	--	-
7777	280	24	24		--	--	-
7778	820	135	127		11	4	-
7780	40	6	6		--	--	-
7781	223	38	38		--	--	-
7782	78	6	6		--	--	-
7784	996	108	108		--	--	-
7785	120	20	20		--	--	-
TOTALS 210	112,395	18,846	15,870		1,563	8,062	229
TOTALS ALL LEVELS 311	356,260	45,648	39,726	55,404	19,341	63,170	3,648

1/ The proposed initial forage allocations displayed in this table were determined by using soils & vegetation data collected in 1980, utilization data collected during 1981 & 1982, and comparisons made with U.S. Soil Conservation Service stocking guides to determine possible initial stocking. The Bureau recognizes the limitations of data collected during a one time inventory. Therefore, additional monitoring studies will be conducted in order to support or refine the allocations displayed before making final allocation decisions.

2/ The Potential Livestock Forage Production (A.U.M..'s) is not shown for Management Level 3 allotments. These allotments are low priority for intensive management and therefore, are not expected to increase in production above existing levels.

APPENDIX 2

RECREATION AND NATURAL ENVIRONMENT ALTERNATIVE

INITIAL ALLOTMENT CATEGORIZATION AND PROPOSED FORAGE ALLOCATION

MANAGEMENT LEVEL 1

Allot. No.	Acres Public Land	Present Authorz. Lvstock. Use (AUM's)	Propos. Initial Lvstock. Alloc.1/ (AUM's)	Potent. Lvstock. Forage Produc.2/ (AUM's)	Proposed Initial Big Game Allocation (AUM's) Elk	Deer	Ant.
7015	15,408	200	1,140	1,351	1,272	7,956	336
7017	2,442	241	283	359	333	1,439	-
7019	804	176	135	141	--	8	5
7044	3,519	565	456	509	--	278	156
7045	1,016	90	138	166	--	72	6
7051	2,502	258	336	363	--	338	223
7064	918	91	113	137	--	--	22
7065	2,429	231	335	356	75	--	114
7073	1,424	229	188	207	--	151	89
7116	2,319	268	315	338	--	169	117
7172	2,089	100	291	308	--	199	111
7175	2,312	150	315	337	--	--	156
7501	899	152	152	208	217	737	-
7534	1,055	69	86	115	77	276	-
7541	2,977	486	575	627	119	33	-
7550	1,370	63	157	202	133	400	-
7553	1,883	236	256	341	4	457	-
7562	1,048	241	252	294	57	302	-
7585	1,400	144	157	209	--	--	-
7769	105	14	14	19	--	--	-
TOTALS 20	47,919	4,004	5,651	6,587	2,287	12,814	1,335

MANAGEMENT LEVEL 2

Allot. No.	Acres Public Land	Present Authorz. Lvstock. Use (AUM's)	Propos. Initial Lvstock. Alloc.1/ (AUM's)	Potent. Lvstock. Forage Produc.2/ (AUM's)	Proposed Initial Big Game Allocation (AUM's) Elk	Deer	Ant.
7002	1,729	200	186	261	--	--	39
7003	3,089	336	473	602	133	738	-
7004	2,743	266	381	544	79	471	72
7008	1,651	105	105	105	--	--	-
7009	171	60	60	60	--	--	-
7014	3,079	200	113	288	368	1,227	161
7016	1,733	143	59	217	207	757	-
7018	1,952	514	119	308	163	--	123
7020	9,527	1,164	898	1,430	75	--	91

APPENDIX 2

RECREATION AND NATURAL ENVIRONMENT ALTERNATIVE

INITIAL ALLOTMENT CATEGORIZATION AND PROPOSED FORAGE ALLOCATION

MANAGEMENT LEVEL 2

Allot. No.	Acres Public Land	Present Authorz. Lvstock. Use (AUM's)	Propos. Initial Lvstock. Alloc.1/ (AUM's)	Potent. Lvestock. Forage Produc.2/ (AUM's)	Proposed Initial Big Game Allocation (AUM's) Elk	Deer	Ant.
7023	4,122	423	256	769	--	269	-
7031	3,129	262	180	451	--	1,495	171
7032	2,830	250	214	526	100	662	2
7046	441	70	38	91	6	--	17
7054	1,009	150	63	158	--	186	17
7058	1,014	159	48	182	--	172	169
7079	1,023	137	96	259	--	62	-
7080	6,073	816	382	1,040	--	466	195
7081	1,179	225	109	283	6	17	100
7082	949	107	66	168	30	--	45
7084	2,174	237	220	414	--	133	39
7087	513	54	30	77	--	--	-
7093	2,945	210	310	623	--	--	11
7096	6,816	795	652	1,207	217	--	345
7100	560	100	36	99	--	--	2
7103	1,239	190	149	254	--	--	-
7105	1,450	194	143	234	--	--	-
7107	1,612	472	154	409	154	313	-
7110	1,552	242	147	242	--	--	-
7119	2,246	259	169	440	--	217	143
7120	1,914	200	40	255	203	872	93
7133	2,857	329	291	673	162	1,394	-
7136	1,381	232	96	278	--	123	-
7139	1,667	184	143	410	66	410	33
7141	1,813	267	175	364	96	558	6
7142	1,117	186	121	188	56	370	27
7143	482	67	25	90	--	--	-
7144	274	74	24	49	--	--	-
7151	836	25	81	138	--	--	-
7155	250	10	24	42	--	--	-
7164	690	172	87	120	--	--	-
7187	1,506	75	150	217	--	--	78
7189	1,589	160	91	198	--	1,205	-
7191	1,720	242	25	364	147	536	105

APPENDIX 2

RECREATION AND NATURAL ENVIRONMENT ALTERNATIVE

INITIAL ALLOTMENT CATEGORIZATION AND PROPOSED FORAGE ALLOCATION

MANAGEMENT LEVEL 2

Allot. No.	Acres Public Land	Present Authorz. Lvstock. Use (AUM's)	Propos. Initial Lvstock. Alloc.1/ (AUM's)	Potent. Lvstock. Forage Produc.2/ (AUM's)	Proposed Initial Big Game Allocation (AUM's) Elk	Deer	Ant.
7192	2,366	457	245	344	--	--	-
7250	4,563	803	362	716	83	229	-
7252	1,726	185	78	257	114	32	-
7253	3,876	782	220	786	326	48	-
7254	4,859	364	255	455	203	641	-
7255	2,443	198	164	297	59	193	-
7256	3,357	297	216	670	289	266	-
7258	2,602	209	156	280	69	181	-
7500	3,314	351	432	991	957	2,259	-
7503	513	93	65	168	49	100	-
7505	4,251	532	636	847	590	3,708	-
7506	7,722	362	1,020	1,423	721	1,845	-
7507	5,504	582	652	1,152	4,194	9,306	-
7510	2,506	252	268	512	201	1,085	-
7511	4,914	238	224	569	1,919	8,653	-
7523	520	20	20	--	--	--	-
7527	5,580	470	552	914	404	1,122	-
7537	5,726	307	452	919	272	3,715	-
7540	1,264	211	145	268	161	484	-
7542	986	250	169	321	--	196	-
7545	1,238	303	303	--	--	--	-
7551	1,228	141	87	179	--	--	-
7552	1,057	149	122	277	80	168	-
7555	2,997	245	109	437	464	1,504	-
7560	2,077	420	330	411	248	557	-
7565	6,470	380	366	606	--	2,358	-
7568	6,741	1,600	982	1,280	442	1,826	-
7569	1,381	113	122	377	113	347	-
7574	2,095	179	114	383	144	1,380	-
7579	4,032	345	398	444	257	5,083	-
7580	1,298	210	217	252	76	809	-
7588	3,982	350	332	332	--	13	-
7589	160	20	20	40	--	--	-
7754	2,268	414	371	522	156	339	-

APPENDIX 2

RECREATION AND NATURAL ENVIRONMENT ALTERNATIVE

INITIAL ALLOTMENT CATEGORIZATION AND PROPOSED FORAGE ALLOCATION

MANAGEMENT LEVEL 2

Allot. No.	Acres Public Land	Present Authorz. Lvstock. Use (AUM's)	Propos. Initial Lvstock. Alloc.1/ (AUM's)	Potent. Lvstock. Forage Produc.2/ (AUM's)	Proposed Initial Big Game Allocation (AUM's) Elk	Deer	Ant.
7765	1,075	118	101	236	143	506	-
7766	1,477	182	148	349	96	232	-
7767	372	64	63	102	--	64	-
7783	760	102	102	--	--	--	-
TOTALS							
81	195,946	22,798	17,847	33,233	15,098	61,882	2,084

MANAGEMENT LEVEL 3

7001	718	100	75		8	6	-
7005	218	32	26		--	--	-
7006	88	14	9		--	--	-
7007	12	1	1		--	--	-
7010	2,326	565	157		--	160	-
7011	120	30	30		--	--	-
7012	640	93	93		--	--	-
7013	632	74	74		--	--	-
7021	654	116	66		22	406	-
7022	286	44	23		--	--	-
7024	536	100	40		--	112	-
7025	856	67	53		--	62	-
7026	72	2	5		--	--	-
7027	36	5	8		--	9	-
7028	126	37	12		--	1	-
7029	160	17	17		--	--	-
7030	1,103	118	97		107	--	-
7033	160	64	64		--	--	-
7034	153	25	11		31	--	-
7035	120	20	20		--	--	-
7036	120	38	38		--	--	-
7037	129	22	9		--	--	-
7038	846	312	312		--	--	-
7039	36	126	126		--	--	-
7040	278	18	19		28	33	-

APPENDIX 2

RECREATION AND NATURAL ENVIRONMENT ALTERNATIVE

INITIAL ALLOTMENT CATEGORIZATION AND PROPOSED FORAGE ALLOCATION

MANAGEMENT LEVEL 3

Allot. No.	Acres Public Land	Present Authorz. Lvstock. Use (AUM's)	Propos. Initial Lvstock. Alloc.1/ (AUM's)	Potent. Lvstock. Forage Produc.2/ (AUM's)	Proposed Initial Big Game Allocation (AUM's) Elk	Deer	Ant.
7041	262	10	19		44	84	-
7042	80	27	14		23	--	-
7043	557	84	39		--	--	-
7047	77	14	9		--	--	-
7048	191	90	90		--	--	-
7049	322	27	25		19	117	-
7050	552	59	45		37	77	-
7052	317	16	20		8	78	54
7053	593	102	44		--	4	13
7055	526	75	36		--	73	-
7056	177	23	20		15	19	-
7057	812	111	56		42	186	-
7059	35	10	1		14	42	-
7060	878	93	77		--	106	15
7061	188	49	49		--	--	-
7062	102	18	17		11	--	18
7063	1,036	110	152		24	--	44
7066	858	170	170		--	--	-
7067	874	174	174		--	--	-
7068	450	170	86		--	--	-
7069	80	29	29		--	--	-
7070	55	31	31		--	--	-
7071	334	224	224		--	--	-
7072	258	30	37		--	24	-
7074	12	74	74		--	--	-
7075	46	4	1		--	--	-
7077	96	43	25		2	--	2
7078	520	27	27		--	--	-
7083	780	150	150		--	--	-
7085	194	47	44		--	--	-
7086	159	50	25		--	--	-
7088	137	12	7		--	--	-
7089	397	126	126		--	--	-
7090	400	49	49		--	--	-

APPENDIX 2

RECREATION AND NATURAL ENVIRONMENT ALTERNATIVE

INITIAL ALLOTMENT CATEGORIZATION AND PROPOSED FORAGE ALLOCATION

MANAGEMENT LEVEL 3

Allot. No.	Acres Public Land	Present Authorz. Lvstock. Use (AUM's)	Propos. Initial Lvstock. Alloc.1/ (AUM's)	Potent. Lvstock. Forage Produc.2/ (AUM's)	Proposed Initial Big Game Allocation (AUM's) Elk	Deer	Ant.
7091	315	35	35		--	--	-
7092	1,237	149	149		--	--	-
7094	48	80	19		--	--	-
7095	110	19	19		--	--	-
7097	106	8	6		--	--	5
7098	418	62	41		--	--	-
7099	50	24	16		--	--	-
7101	127	37	17		--	--	17
7102	516	48	35		--	37	1
7104	240	27	36		--	9	-
7106	141	175	61		--	--	-
7108	205	38	25		--	--	15
7109	431	88	88		--	--	-
7111	1,036	455	455		--	--	-
7112	730	65	65		--	--	-
7113	120	9	9		--	--	-
7114	520	12	12		--	--	-
7115	1,232	306	306		--	--	-
7117	55	7	7		--	17	-
7118	191	39	18		--	--	-
7121	404	48	41		--	18	29
7122	40	6	6		--	--	-
7123	219	102	102		--	--	-
7124	370	134	134		--	--	-
7125	245	52	30		--	2	1
7126	104	9	15		--	--	-
7127	110	23	23		--	--	-
7128	330	51	51		--	--	-
7129	180	36	36		--	--	-
7130	159	65	65		--	--	-
7131	741	180	180		--	--	-
7134	475	53	50		14	139	-
7135	2,334	336	150		42	40	-
7137	332	70	30		--	--	-

APPENDIX 2

RECREATION AND NATURAL ENVIRONMENT ALTERNATIVE

INITIAL ALLOTMENT CATEGORIZATION AND PROPOSED FORAGE ALLOCATION

MANAGEMENT LEVEL 3

Allot. No.	Acres Public Land	Present Authorz. Lvstock. Use (AUM's)	Propos. Initial Lvstock. Alloc.1/ (AUM's)	Potent. Lvstock. Forage Produc.2/ (AUM's)	Proposed Initial Big Game Allocation (AUM's) Elk	Deer	Ant.
7138	236	20	20		--	42	-
7140	520	125	125		--	--	-
7145	246	74	12		--	--	-
7146	160	36	36		--	--	-
7147	178	27	18		6	42	6
7148	195	27	23		--	--	-
7149	127	24	21		--	--	-
7150	1,011	175	102		--	--	-
7152	466	312	109		--	--	-
7153	240	77	77		--	--	-
7154	80	35	35		--	--	-
7156	422	31	44		--	--	-
7157	624	134	53		13	522	-
7158	104	64	11		--	52	-
7159	2,610	809	809		--	--	-
7160	349	113	30		--	80	-
7161	475	117	133		--	--	-
7162	906	192	43		--	373	-
7163	749	83	69		42	86	-
7165	39	3	3		--	--	-
7166	322	39	28		--	--	-
7167	1,240	78	78		--	--	-
7168	964	131	69		--	13	-
7169	1,361	114	87		--	26	-
7170	328	10	20		--	--	-
7171	279	45	19		--	21	-
7173	420	37	42		--	--	-
7174	238	19	26		--	--	-
7176	60	11	11		--	--	-
7177	93	6	6		--	--	-
7178	206	40	40		--	--	-
7179	453	48	33		17	113	-
7180	59	142	142		--	--	-
7181	108	45	45		--	--	-

APPENDIX 2

RECREATION AND NATURAL ENVIRONMENT ALTERNATIVE

INITIAL ALLOTMENT CATEGORIZATION AND PROPOSED FORAGE ALLOCATION

MANAGEMENT LEVEL 3

Allot. No.	Acres Public Land	Present Authorz. Lvstock. Use (AUM's)	Propos. Initial Lvstock. Alloc.1/ (AUM's)	Potent. Lvstock. Forage Produc.2/ (AUM's)	Proposed Initial Big Game Allocation (AUM's) Elk	Deer	Ant.
7182	160	53	53		--	--	-
7183	625	113	113		--	--	-
7184	270	29	29		--	--	-
7185	240	80	80		--	--	-
7186	234	68	68		--	--	-
7188	94	27	18		--	--	9
7190	90	60	60		--	180	-
7193	317	101	63		--	--	-
7194	120	50	50		--	--	-
7195	80	41	41		--	--	-
7196	120	66	66		--	--	-
7197	180	84	84		--	--	-
7198	60	97	97		--	--	-
7199	190	26	19		--	--	-
7251	40	10	10		--	--	-
7257	2,500	95	145		--	--	-
7259	430	12	12		52	10	-
7260	887	227	46		137	24	-
7261	500	124	124		--	--	-
7502	828	177	128		45	--	-
7504	1,237	340	116		--	--	-
7508	355	59	61		52	--	-
7512	324	60	46		4	17	-
7513	68	3	3		--	84	-
7515	387	90	50		--	28	-
7519	314	18	18		--	--	-
7520	148	48	48		--	--	-
7521	437	44	44		--	--	-
7522	5,240	225	225		--	--	-
7524	1,289	120	120		--	--	-
7525	803	145	145		--	--	-
7526	120	30	30		--	--	-
7528	80	12	12		--	--	-
7529	1,440	98	98		--	--	-

APPENDIX 2

RECREATION AND NATURAL ENVIRONMENT ALTERNATIVE
INITIAL ALLOTMENT CATEGORIZATION AND PROPOSED FORAGE ALLOCATION

MANAGEMENT LEVEL 3

Allot. No.	Acres Public Land	Present Authorz. Lvstock. Use (AUM's)	Propos. Initial Lvstock. Alloc.1/ (AUM's)	Potent. Lvstock. Forage Produc.2/ (AUM's)	Proposed Initial Big Game Allocation (AUM's) Elk	Deer	Ant.
7530	789	105	105		--	--	-
7532	403	24	24		--	--	-
7533	839	225	225		--	--	-
7535	1,750	171	137		72	1,178	-
7536	3,627	720	720		--	--	-
7538	2,264	268	268		--	--	-
7539	589	97	97		--	--	-
7544	88	7	7		--	7	-
7546	873	75	76		82	301	-
7547	727	113	97		28	141	-
7552	225	70	70		33	78	-
7556	3,536	295	295		--	--	-
7557	234	59	40		34	55	-
7558	2,426	611	508		36	1,565	-
7559	80	10	10		--	--	-
7561	4,097	518	502		--	1,732	-
7563	712	61	59		--	122	-
7564	654	87	96		24	835	-
7566	47	88	88		--	--	-
7573	2,526	184	184		--	--	-
7576	85	20	20		--	--	-
7577	959	120	106		--	--	-
7581	120	22	22		--	--	-
7582	200	44	44		--	--	-
7583	612	112	85		61	--	-
7584	330	16	32		60	161	-
7586	48	12	12		11	18	-
7587	509	83	77		74	75	-
7750	481	49	49		--	--	-
7751	767	60	65		28	36	-
7752	40	4	4		--	--	-
7753	360	24	24		--	--	-
7755	600	120	120		--	--	-
7757	265	40	40		--	--	-

APPENDIX 2

RECREATION AND NATURAL ENVIRONMENT ALTERNATIVE
INITIAL ALLOTMENT CATEGORIZATION AND PROPOSED FORAGE ALLOCATION

MANAGEMENT LEVEL 3

Allot. No.	Acres Public Land	Present Authorz. Lvstock. Use (AUM's)	Propos. Initial Lvstock. Alloc.1/ (AUM's)	Potent. Lvstock. Forage Produc.2/ (AUM's)	Proposed Initial Big Game Allocation (AUM's) Elk	Deer	Ant.
7758	550	113	99		--	90	-
7760	676	70	78		75	128	-
7762	1,368	149	141		60	56	-
7763	440	57	57		--	--	-
7764	342	51	40		20	129	-
7770	760	84	84		--	--	-
7775	1,040	173	173		--	--	-
7776	80	7	7		--	--	-
7777	280	24	24		--	--	-
7778	820	135	127		11	4	-
7780	40	6	6		--	--	-
7781	223	38	38		--	--	-
7782	78	6	6		--	--	-
7784	996	108	108		--	--	-
7785	120	20	20		--	--	-
TOTALS 210	112,395	18,846	15,767		1,568	10,285	229
TOTALS ALL LEVELS 311	356,260	45,648	39,265	54,942	18,953	84,981	3,648

1/ The proposed initial forage allocations displayed in this table were determined by using soils & vegetation data collected in 1980, utilization data collected during 1981 & 1982, and comparisons made with U.S. Soil Conservation Service stocking guides to determine possible initial stocking. The Bureau recognizes the limitations of data collected during a one time inventory. Therefore, additional monitoring studies will be conducted in order to support or refine the allocations displayed before making final allocation decisions.

2/ The potential Livestock Forage Production (A.U.M.'s) is not shown for Management Level 3 allotments. These allotments are low priority for intensive management and therefore, are not expected to increase in production above existing levels.

APPENDIX 3
WILDERNESS STUDY POLICY AND PLANNING CRITERIA

The primary goal of the BLM wilderness study process is to recommend for wilderness designation those areas for which it has been determined, through the multiple resource planning process and public involvement, that wilderness is the most appropriate alternative use of the land and its resources. The two planning criteria and six quality standards described below will be used in making the analysis on which that determination will be based. These criteria and quality standards will be applied to BLM wilderness study areas (WSAs) through the BLM planning process, and each criterion and quality standard will be fully considered and documented in determining whether a WSA is more suitable for wilderness or for other uses and in making all BLM wilderness recommendations--both "suitable for preservation as wilderness" and "nonsuitable".

Criterion No. 1. Evaluation of Wilderness Values

Consider the extent to which each of the following components contributes to the overall value of an area for wilderness purposes.

a. Mandatory wilderness characteristics: The quality of the area's wilderness characteristics--size, naturalness, and outstanding opportunities for solitude or primitive recreation

b. Special features: The presence or absence, and the quality of the optional wilderness characteristics--ecological, geological, or other features of scientific, educational, scenic, or historical value

c. Multiple resource benefits: The benefits to other multiple resource values and uses which only wilderness designation could ensure

d. Diversity in the National Wilderness Preservation System: The extent to which wilderness designation of the area under study would contribute to expanding the diversity of the National Wilderness Preservation System from the standpoint of each of the factors listed below:

(1) Expanding the diversity of natural systems and features, as represented by ecosystems and landforms

(2) Assessing the opportunities for solitude or primitive recreation within a day's driving time (5 hours) of major population centers

(3) Balancing the geographic distribution of wilderness

The analysis should consider--in separate categories--Federal and state lands designated as wilderness, areas officially recommended for wilderness, and other Federal and state lands under wilderness study (the state lands referred to here are those involved in state governments' wilderness programs).

Criterion No. 2. Manageability

The area must be capable of being effectively managed to preserve its wilderness character.

Quality Standard No. 1. Energy and Mineral Resource Values

Recommendations as to an area's suitability or nonsuitability for wilderness designation will reflect a thorough consideration of any identified or potential energy and mineral resource values.

Quality Standard No. 2. Impacts on Other Resources

Consider the extent to which other resource values or uses of the area would be foregone or adversely affected as a result of wilderness designation.

Quality Standard No. 3. Impact of Nondesignation on Wilderness Values

Consider the alternative use of land under study if the area is not designated as wilderness, and the extent to which wilderness values of the area would be foregone or adversely affected as a result of this use.

Quality Standard No. 4. Public Comment

In determining whether an area is suitable or nonsuitable for wilderness designation, the BLM wilderness study process will consider comments received from interested and affected publics at all levels--local, state, regional, and national. Wilderness recommendations will not be based exclusively on a vote-counting majority rule system. BLM will develop its recommendations by considering public comment in conjunction with its analysis of a wilderness study area's multiple resource and social and economic values and uses.

Quality Standard No. 5. Local Social and Economic Effects

In determining whether an area is suitable or nonsuitable for wilderness designation, BLM will give special attention to adverse or favorable social and economic effects, as identified through the wilderness study process, which designation would have on local areas.

Quality Standard No. 6. Consistency with Other Plans

In determining whether an area is suitable or non-suitable for wilderness designation, BLM recommendation is consistent with officially approved and adopted resource-related plans of other Federal agencies, state and local governments, and Indian tribes (and the policies and programs contained in such plans), as required by FLPMA and the BLM planning regulations.

APPENDIX 4
PROPOSED OFF-ROAD VEHICLE (ORV) DESIGNATIONS

Proposed designations are shown on the alternative maps.

North Park

1. Area: North Sand Hills

All Alternatives except the Natural Environment Alternative

Limitations: Restricted to existing roads and trails and open sand areas

Rationale: Continue existing restrictions in place since 1977. Restrictions are needed to protect cultural resources and the natural processes of the dunes.

Natural Environment Alternative

Limitations: Closed to all motorized use except for administrative purposes

Rationale: Motorized use is inconsistent with Natural Area management, where the emphasis is on protection of cultural resources and the natural dune processes.

2. Area: Hebron Sloughs

Preferred, Renewable Resources, Recreation, and Natural Environment Alternatives

Limitations: Restricted to designated roads and trails; seasonal closure (approximately June 1 to August 1)

Rationale: This area is an important nesting area for waterfowl. The Bureau has undertaken several projects to improve the nesting habitat. The seasonal closure would occur during nesting season.

Middle Park

1. Area: Strawberry

All Alternatives except Continuation of Present Management

Limitations: Seasonal closure - snowmobiles excepted (approximately December 15 to May 1)

Rationale: Poaching and wildlife harassment are problems in this area. In past years, the Colorado Division of Wildlife has requested that the area be closed after hunting season.

2. Area: Windy Gap

All Alternatives except Continuation of Present Management

Limitations: Restricted to designated roads and trails

Rationale: Significant cultural resources have been discovered in these areas. The area has been placed under emergency protective withdrawals.

3. Area: Sulphur Gulch

All Alternatives except Continuation of Present Management and Energy and Minerals

Limitations: Restricted to designated roads and trails; seasonal closure of the Black Mountain Road - snowmobiles excepted (approximately December 15 to May 1)

Rationale: Critical big game winter habitat is involved. Loss of vegetation due to ORV's is occurring.

4. Area: Lawson Ridge

All Alternatives except Continuation of Present Management

Limitations: Restricted to existing roads and trails

Rationale: Critical big game winter habitat is involved. Loss of vegetation due to ORV's is occurring. Disruption of livestock grazing and vandalism during hunting season also occur.

5. Area: Resource Conservation Area

All Alternatives except Continuation of Present Management

Limitations: Restricted to designated roads and trails

Rationale: Critical big game winter habitat is involved. Loss of vegetation due to ORV's is occurring. This area receives the most recreational ORV use because of its proximity to Kremmling. Numerous trails crisscross the area.

Note: Separate public meetings on this designation and a site-specific plan may be necessary after completion of the RMP due to anticipated intense public interest in designations on the "ORV playground" in Kremmling's backyard.

6. Area: Troublesome WSA

Natural Environment Alternative only

Limitations: Closed to all motorized use except as allowed by the Bureau's Wilderness Management Policy

Rationale: Under this alternative, the Troublesome WSA would be recommended as suitable for wilderness designation. Motorized vehicles are prohibited in wilderness areas except in certain circumstances outlined in the Wilderness Management Policy.

*The following designations are small areas or road segments closed or limited to motorized use in otherwise open areas and apply to **all** alternatives:*

7. Area: Dice Hill Meadows

Limitations: Closed to all motorized use

Rationale: These meadows, encompassing approximately 15 acres, are presently closed to motorized use (signs and barricades along the county road). The meadows are prime summer wildlife habitat and highly susceptible to vegetation destruction and soil erosion from ruts caused by vehicles.

8. Area: Dice Hill Fence Line

Limitations: Closed to all motorized use except for administrative use (e.g., fire, fence maintenance)

Rationale: This trail follows an allotment fence from the end of the Dice Hill road. While never intended as a road, this trail is popular during hunting season. The Division of Wildlife has requested that the trail be closed because motorized use chases the game down onto the adjacent private land, resulting in trespass situations and diminishing hunting opportunities. The trail is currently gated, but the gate was ineffective during the 1981 hunting seson.

9. Area: Inspiration Point Flats

Limitations: Road leading from the bench to the Colorado River is restricted to 4-WD vehicles only.

Rationale: This is a rough road which experience has shown not to be suitable for regular passenger-type vehicles. In past years, sedans have been stuck on the road and required towing. The road is currently signed for 4-WD's only.

APPENDIX 5
RECREATION OPPORTUNITY SPECTRUM (ROS) CLASSES

Table A5-1 describes each of the six ROS classes in terms of (1) experience opportunities, (2) setting opportunities, and (3) activity opportunities. These descriptors provide a general overview of the opportunities included in each class. These overview statements do not describe each class in detail but rather provide a point of departure from which the planner or manager can develop more precise prescriptions for each class based on specific situations encountered in field operations. The listing of activity opportunities is provided for illustrative purposes. It is not an all-inclusive list of activity opportunities on the public lands.

TABLE A5-1 -- RECREATION OPPORTUNITY SPECTRUM CLASS DECRIPTIONS

Opportunity Class	Experience Opportunity	Setting Opportunity	Activity Opportunity
Primitive	Opportunity for isolation from the sights and sounds of man, to feel a part of the natural environment, to have a high degree of challenge and risk, and to use outdoor skills.	Area is characterized by essentially unmodified natural environment of fairly large size. Concentration of users is very low and evidence of other users is minimal. The area is managed to be essentially free from evidence of man-induced restrictions and controls. Only facilities essential for resource protection are used. No facilities for comfort or convenience of the user are provided. Spacing of groups is informal and dispersed to minimize contacts between groups. Motorized use within the area is not permitted.	Camping, hiking, climbing, enjoying scenery or natural features, nature study, photography, spelunking, hunting (big game, small game, upland birds, waterfowl) ski touring and snowshoeing, swimming, diving (skin and scuba), fishing, canoeing, sailing, and river running (non-motorized craft).
Semi-Primitive Non-motorized	Some opportunity for isolation from the sights and sounds of man, but not as important as for primitive opportunities. Opportunity to have high degree of interaction with the natural environment, to have moderate challenge and risk, and to use outdoor skills.	Area is characterized by a predominantly unmodified natural environment of moderate to large size. Concentration of users is low, is often evidence of other area users is present. On-site controls and restrictions may be present but are subtle. Facilities are provided only for the protection of resource values and the safety of users. Formal spacing of groups may be made to disperse use and limit contacts between groups. Motorized use is not permitted.	Camping, hiking, climbing, enjoying scenery or natural features, nature study, photography, spelunking, hunting (big game, small game, upland birds, waterfowl), ski touring and snowshoeing, swimming, diving (skin and scuba), fishing, canoeing, sailing, and river running (non-motorized craft).
Semi-Primitive Motorized	Some opportunity for isolation from the sights and sounds of man, but not as important as for primitive opportunities. Opportunity to have high degree of interaction with the natural environment, to have moderate challenge and risk, and to use outdoor skills. Explicit opportunity to use motorized equipment while in the area.	Area is characterized by a predominantly unmodified natural environment of moderate to large size. Concentration of users is low, but often there is evidence of other area users present. On-site controls and restrictions may be present, but are subtle. Facilities are provided for the protection of resource values and safety of users only. Formal spacing of groups may be made to disperse use and limit contacts between groups. Motorized use is permitted.	Same as the above, plus the following: off-road vehicle use, four-wheel drive, dune buggy, dirt bike, snowmobile, power boating.

TABLE A5-1 -- RECREATION OPPORTUNITY SPECTRUM CLASS DECRIPTIONS—Continued

Opportunity Class	Experience Opportunity	Setting Opportunity	Activity Opportunity
Roaded Natural	About equal opportunities for affiliation with other user groups and for isolation from sights and sounds of man. Opportunity to have a high degree of interaction with the natural environment. Challenge and risk opportunities are not very important except in specific challenging activities. Practice of outdoor skills may be important. Opportunities for both motorized and non-motorized recreation are present.	Area is charcterized by a generally natural environment with moderate evidence of the sights and sounds of man. Resource modification and use practices are evident but harmonize with the natural environment. Concentration of users is low to moderate with facilities sometimes provided for group activity. On-site controls and restrictions offer a sense of security. Rustic facilities are provided for user convenience as well as for safety and resource protection. Conventional motorized use is provided for in construction standards and design of facilities.	All activities listed previously plus the following: picnicking, rock collecting, wood gathering, auto touring, downhill skiing, snowplay, ice skating, water skiing and other water sports, hand gliding, interpretive use, rustic resorts and organized camps.
Semi-Urban (also called Rural)	Opportunities to experience affiliation with individuals and groups are prevalent as is the convenience of sites and opportunities. These factors are generally more important than the natural setting. Opportunities for wildland challenges. Risk taking and testing of outdoor skills are unimportant, except in those activities involving challenge and risk.	Area is characterized by substantially modified natural environment. Resource modification and use practices are obvious. Signs and sounds of man are readily evident and the concentration of users is often moderate to high. A considerable number of facilities are designed for use by a large number of people. Facilities are often provided for specific activities. Developed sites, roads and trails are designed for moderate to high use. Moderate densities are provided far away from developed sites. Facilities for intensive motorized use are available.	All activities used previously plus the following: competitive games, spectator sports, bicycling, jogging, outdoor concerts, and modern resorts.
Urban	Opportunities to experience affiliation with individuals and groups are prevalent as is the convenience of sites and opportunities. Experiencing the natural environment and the use of outdoor skills are largely unimportant.	Area is characterized by a highly modified environment, although the background may have natural elements. Vegetation is often exotic and manicured. Soil may be protected by surfacing. Sights and sounds of man, on-site, predominate. Large numbers of users can be expected. Modern facilities are provided for the use and convenience of a large number of people. Controls and restrictions are obvious and numerous. Facilities for high intensity motor use and parking are present with forms of mass transit often available.	All activities listed previously.

GLOSSARY

ACTIVE GRAZING PREFERENCE: The total number of AUMs that can be licensed.

AD VOLOREM TAX: A tax based on the value of property. Another term for property tax.

ALLOCATION: The division of limited resource capabilities or supplies among the competitors for use.

ALLOTMENT: An area of land designated and managed for grazing of livestock.

ALLOTMENT MANAGEMENT PLAN: A document program which applies to livestock operations on the public lands, prepared in consultation, cooperation, and coordination with the permittee(s), lessee(s), or other affected interests.

ALLUVIUM: Unconsolidated rock or soil material deposited by running water, including gravel, sand, silt, clay, and various mixtures of these.

ANIMAL UNIT (AU): One mature (1,000 lb) cow or its equivalent (4 deer, 5 antelope, 5 bighorn sheep, 1.25 elk, or 1 horse) based upon an average daily forage consumption of 26 pounds of dry matter per day.

ANIMAL UNIT MONTH (AUM): The amount of forage necessary for the sustenance of one animal for one month, e.g., one deer for one month equals one deer AUM.

APPARENT TREND: Change in vegetation and soil characteristics resulting directly from environmental factors, primarily climate and grazing as observed at one point in time.

AQUATIC: Living or growing in or on a stream or other water body or source.

AQUIFER: A water bearing bed or stratum of permeable rock, sand, or gravel capable of yielding considerable quantities of water.

AREA OF CRITICAL ENVIRONMENTAL CONCERN (ACEC): An area where special management attention is required to protect and prevent irreparable damage to important historic, cultural, or scenic values, fish and wildlife resources, or other natural systems or processes, or to protect life and safety from natural hazards.

ASSET MANAGEMENT: The Department of Interior program to implement the Reagan Administration's initiative to dispose of excess Federal land and real property in order to facilitiate better management.

ATTITUDE: An intellentual or emotional position with regard to a fact, condition, person, issue, etc., which carries some readiness to act in a particular way.

BROWSE: That part of the current leaf and twig growth of shrubs, woody vines, and trees available for animal consumption.

BUREAUCRATIZATION: A social process whereby an organization in growing larger and more complex becomes more efficient by depending more and more on impersonal rather than personal decision criteria, more clearly and formally defined roles, more detailed and spelled-out rules and procedures, more specialization and use of experts throughout the organization, more objective hiring and promotion policies, etc. Often the process carries with it the danger of over-rigidity of structure which may become an operational handicap (too much "red tape"), so that an informal "underground" system develops to prevent or break serious bottlenecks. Both the formal and informal social structures seem to be necessary for the most effective functioning of the organization. In the modern world, virtually all large businesses, industries, governmental agencies, religious bodies, universities, and other organizations are bureaucracies.

CANOPY: The uppermost layer of vegetation consisting of crowns of trees or shrubs in a forest or woodland.

CARRYING CAPACITY: Also known as stocking rate; an estimate of the maximum number of animals (expressed in AUMs) a given area can support each year without inducing damage to the vegetation or related resources.

CLASS CONSCIOUSNESS: An awareness among persons of similar general social status that they share commonalities in life styles, values, attitudes, interests, problems, and life opportunities. The term was popularized in the writings of Karl Marx, with special connotations, but in general use merely calls attention to mutural awareness of these shared commonalities.

CLOSED DESIGNATION: Areas and trails where the use of motor vehicles is permanently or temporarily prohibited.

CONSERVATION PLANS/LONG-TERM AGREEMENTS: Ranch plans developed by the Soil Conservation Service in cooperation with ranchers/local managers. Such plans outline and prescribe conservation practices and allow for a comprehensive ranch improvement program by providing for cost/share incentives.

CRITICAL RANGE: Range on which a species depends for survival; there are no alternative ranges available due to climate conditions or other limiting factors. May also be called key range, or crucial range.

CULTURAL REMAINS: All prehistoric and historic physical evidence of past human activity which can be used to reconstruct lifeways and cultural history of past peoples. These include sites, artifacts, environmental data, and other relevant information and the contexts in which they occur.

CULTURAL RESOURCES: Those fragile and nonrenewable remains of human activity, occupation, or endeavor reflected in districts, sites, structures, buildings, objects, artifacts, ruins, works of art, architecture, and natural features that were of importance in human events. These resources consist of (1) physical remains, (2) areas where significant human events occurred--even though evidence of the event no longer remains, and (3) the environment immediately surrounding the resource.

CULTURAL RESOURCE INVENTORY: A descriptive listing and documentation, including photographs and maps, of cultural resources; included are the processes of locating, identifying, and recording sites, structures, buildings, objects, and districts through library and archival research, information from persons knowledgeable about cultural resources, and varying levels of intenity of on-the-ground field surveys.

CULTURAL RESOURCE SITE: A physical location of past human activities or events. Cultural resource sites are extremely variable in size and range from the location of a single cultural resource object to a cluster of cultural resource strutures with associated objects and features. Prehistoric and historic sites which are recorded as cultural resources have sociocultural or scientific values and meet the general criterion of being more than 50 years old.

DISSOLVED SOLIDS: The total amount of dissolved material, organic and inorganic, contained in water or wastes.

EASEMENT: A right afforded a person or agency to make limited use of another's real property for access or other purposes.

ECOSYSTEM: Collectively, all populations in a community, plus the associated environmental factors.

EXCAVATION: The controlled scientific removal of artifacts and recording of data from subsurface cultural resource deposits.

EXTENSIVE RECREATION MANAGEMENT AREA: In these areas, significant recreation opportunities and problems are limited and intensive recreation management is not required. Minimal management actions related to the Bureau's stewardship responsibilities are adequate in these areas.

FAIR MARKET VALUE: The average value of forage consumed (in Animal Unit Months) based on annual livestock market conditions as determined by the USDA.

FEDERAL LANDS: Lands owned by the United States, without reference to how the lands were acquired or what Federal agency administers the lands, including mineral estates or coal estates underlying private surface, but excluding lands

held by the United States in trust for Indians, Aleuts, or Eskimos.

FINAL DEMAND: Exports plus purchases made inside the area with money originating outside.

FLOODPLAIN: The nearly level alluvial plain that borders a stream and is subject to inundation during high water.

FORAGE: All browse and herbaceous foods that are available to grazing animals. It may be grazed or harvested for feeding.

FORAGE POTENTIAL: The optimium amount (lbs/acre) of forage that could be produced in a grazing allotment that is stable, self-perpetuating and in equilbrium with its physical habitat.

FORB: A nongrass, seed-producing plant that does not develop persistent woody tissue.

GRAZING PREFERENCE: The total number (active and suspended nonuse) of animal unit months of livestock grazing on public land apportioned and attached to base property owned or controlled by a permittee.

GRAZING SYSTEM: A systematic sequence of grazing treatments applied to an allotment to reach identified multiple-use goals or objectives by improving the quality and quantity of vegetation.

GRAZING TREATMENT: A prescription under a grazing system which grazes or rests a unit of land at particular times each year to attain specific vegetation goals.

GROUND COVER (SOIL): The material covering the soil and providing protection from, or resistance to, the impact of raindrops, expressed in percent of the area covered. Composed of vegetation, litter, erosion pavement, and rock.

HABITAT: The place where an animal or plant normally lives, often characterized by a dominant plant and co-dominant form (pinyon-juniper habitat).

HABITAT MANAGEMENT PLAN: A written and officially approved plan for a specific geographic area which identifies wildlife habitat and related objectives, establishes the sequence of actions for achieving objectives, and outlines procedures for evaluating accomplishments.

HUNTER DAY: One hunter spending 12 hours hunting on BLM land, or 12 hunters spending 1 hour each, or any combination of these.

INPUT-OUTPUT STUDY: A type of economic model that is based on data about the dollar volume of transactions between different types of businesses in the area. It can estimate the impacts of a change in one type of business on all the other businesses.

INTENSIVE MANAGEMENT: Managing a vegetation or other resource through a system to obtain desired results.

KEY FORAGE AND BROWSE SPECIES: (1) Forage species whose use serves as an indicator of the degree of use of associated species; (2) those species which must, because of their importance, be considered in the management program.

KNOWN GEOLOGIC STRUCTURE: A trap in which an accumulation of oil and gas has been discovered by drilling and which is determined to be productive, the limits of which include all acreage that is presumptively productive (43 CFR 3100.0-5(a)). If lands are underlain by a "known geologic structure" (KGS), they may be leased only through a competitive system.

KNOWN RECOVERABLE COAL RESOURCE AREA (KRCRA): An area, including Federal lands which meet minimum standards for recoverable coal deposits in accordance with accepted mining practices, as determined by the Director, U.S. Geological Survey. The Federal lands in a KRCRA are classified for coal leasing.

LEASABLE MINERALS: Minerals such as coal, oil shale, oil and gas, phosphate, potash, sodium, geothermal resources, and all other minerals that may be acquired under the Mineral Leasing Act of 1920, as amended.

LEASE: An instrument through which interests are transferred from one party to another, subject to certain obligations and considerations.

LEGAL DESCRIPTION: The description of a particular parcel of land according to the official plat of its cadastral survey.

LICENSED USE: Active use AUMS that a permittee has paid for during a given grazing period.

LINEAR RIGHT-OF-WAY: An easement or permit which authorizes public lands to be used for a specified purpose that generally requires a long narrow strip of land; examples are roads, powerlines, pipelines, etc.

LOCATABLE MINERALS: Minerals that may be acquired under the Mining Law of 1872, as amended.

LONG-TERM: A point in time 20 years following the beginning of the implementation phase for the RMP.

MORES: Strong moral rules for behavior, informally developed over time by a society or other social group. May or may not be formalized into a written legal system. Mores tell members what they *must* do and what they must *not* do for moral reasons. In the U.S. society, most of the mores are also written into formally enacted laws.

MULTIPLE-USE: The management of public lands and their various resource values so that they are utilized in the combination that will best meet the present and future needs of the American people.

OFF-ROAD VEHICLE (ORV): Any motorized vehicle capable of, or designed for travel on or immediately over land, water, or other natural terrain.

OFF-ROAD VEHICLE DESIGNATION

- **OPEN**: Designated areas and trails where off-road vehicles may be operated (subject to operating regulations and vehicle standards set forth in BLM Manuals 8341 and 8343).
- **LIMITED**: Designated areas and trails where the use of off-road vehicles is subject to restrictions, such as limiting the number or types of vehicles allowed, dates, and times of use (seasonal restrictions); limiting use to existing roads and trails; or limiting use to designated roads and trails. Under the designated roads and trails designation, use would be allowed only on roads and trails that are signed for use. Combinations of restrictions are possible, such as limiting use to certain types of vehicles during certain times of the year.
- **CLOSED**: Designated areas and trails where the use of off-road vehicles is permanently or temporarily prohibited. Emergency use of vehicles is allowed.

OPTIMUM NUMBERS: The number of animals that may survive on a given range in reasonable condition.

PALEONTOLOGY: A science dealing with the life and past geological periods as known from fossil remains.

PERENNIAL WATER: Bodies of water or streams which contain water yearlong.

PERMITTEE: One who holds a permit to graze livestock on public land.

PHENOLOGY: The study of periodic biological phenomenon such as flowering and seeding, especially as related to climate.

PLANT VIGOR: The state of health of a plant. The capacity of a plant to respond to growing conditions, to make and store food, and to complete the reproductive stages.

POPULATION: All the individuals belonging to a single species occupying a particular area of space.

PREFERENCE RIGHT LEASE: The right of an applicant to apply for resources in public lands before the general public. For example, an applicant who had discovered a mineral deposit under a prospecting permit might be allowed a preference right lease over any other lease applicant.

PRIORITY USE AREA: An area where a particular resource, such as wildlife habitat, would receive management emphasis or priority. The areas are either unique, significant, or best suited for the development, management, use, or protection of a resource. The principles of multiple use and sustained yield would be maintained in each priority use area. Many different uses would be allowed in each priority area, but the priority use would have the first priority. Other

land uses would have limits placed on them to prevent conflicts with the priority resource. In some instances, a use totally incompatible with the priority resource would be excluded.

PUBLIC LAND: Vacant, unappropriated, and unreserved lands which have never left Federal Ownership; also, lands in Federal ownership which were obtained by the Government in exchange for public lands or for timber on public lands. Land administered by the Bureau of Land Management.

RANGE CONDITION INVENTORY: An Inventory conducted during 1980 which include field mapping of range sites by condition class for individual grazing allotments. This information was used to determine initial livestock allocation levels using the parameters of the Soil Conservation Service Range Stocking Guide.

RANGE FORAGE CONDITION: A condition rating based on the amount of forage (lbs/acre) currently produced on an allotment in relation to its potential forage production (lbs/acre). Unsatisfactory -- currently <75 percent of potential. Satisfactory -- currently > 75 percent of potential.

RANGE IMPROVEMENT: A structure, development, or treatment used to rehabilitate, protect, or improve the public lands to enhance the range resource.

RANGELAND MONITORING PROGRAM: A program designed to measure changes in plant composition, ground cover, animal populations, and climatic conditions on the public rangeland. Vegetation studies are used to monitor changes in rangeland condition and determine the reason for any changes that are occurring. The vegetation studies consist of actual use, utilization, trend, and climatic conditions.

RANGE SITE: A distinctive kind of rangeland that differs from other kinds of rangeland in its potential to produce native plants.

RECREATION OPPORTUNITY SPECTRUM: A continuum used to characterize recreation opportunities in terms of setting, activity, and experience opportunities. (See Appendix 5 for a description of specific classes.)

RECREATION VISITOR DAY: An aggregation of 12 visitor hours, where a visitor hour is the presence of one or more person on lands and water for outdoor recreation purposes for continuous, intermittent, or simultaneous periods aggregating 60 minutes; e.g., one person for one hour, two persons for one-half hour each, etc.

RESEARCH NATURAL AREA (RNA): An area that is established and maintained for the primary purpose of research and education because the land has a threatened or endangered plant or animal species. It is a biological unit in which present natural conditions are maintained. These conditions are achieved by allowing natural biological processes to prevail without human intervention.

RIPARIAN: Situated on or pertaining to the bank of a river, stream, or other body of water. Normally used to refer to the plants of all types that grow rooted in the watertable of streams, ponds, and springs.

RIPARIAN COMMUNITIES: Vegetation communities found in association with either open water or water close to the surface; includes meadows, aspen, and other trees and shrubs in association with streams and other water sources.

RIPARIAN HABITAT, AQUATIC (STREAMSIDE): Vegetation communities found in association with streams (both perennial and intermittent), lakes, ponds and other open water. This unique habitat, comprising less than 1 percent of the land area, is crucial to the continued existance of the fish species known to occur. Streamside vegetation maintains high water tables, stablizes streambanks, creates quality fishery habitat, and maintains water quality. It is also essential to most terrestrial wildlife species.

RIPARIAN HABITAT, TERRESTRIAL: Vegetation communities found in association with either open water or water close to the surface; includes such habitat features as meadows, aspen stands, and/or other trees and shrubs. This unique habitat is crucial to the continued existance of the majority of the terrestrial wildlife species known to occur. Many species are found no where else.

ROAD: Vehicle routes which have been improved and maintained by mechanical means to insure relatively regular and continuous use.

SALABLE MINERALS: Minerals such as common varieties of sand, stone, gravel, cinders, pumice, pumicite, and clay that may be acquired under the Materials Act of 1947, as amended.

SALVAGE: The recovery of material and data from an affected cultural resource prior to its alternation or destruction, through recordation, documentation, partial or total excavation, and collection for analysis and interpretation.

SCOPING PROCESS: An early and open process for determining the scope of issues to be addressed and for identifying the significant issues related to a proposed action.

SEDIMENTATION: The act or process of depositing a material, such as water depositing suspended soil particles in an area, such as a stream bottom.

SEDIMENT YIELD: The amount of sediment given up by a watershed over a specific time period, usually a year. Ordinarily, it is expressed as tons, acre feet, or cubic yards of sediment per unit of drainage area per year.

SHORT-TERM: The period of time needed to implement management's decisions following the completion of the EIS, approximately 5 to 7 years.

SOCIAL CONTROLS: Those devices, techniques, facilities, social institutions, or persons responsible for keeping human behavior within socially defined bounds. Formal social controls would be such institutions as police departments, prison systems, or schools; informal controls would be parental discipline, gossip, shunning or other personal rejection, or social rewards given for the purpose of producing desired behavior.

SOCIAL PSYCHOLOGICAL: Having to do with those aspects of individual personality, opportunities, needs, beliefs, behaviors, or other characteristics of individuals which are social induced; the junction of the external society and the individual biological person, whose social influences and demands produce an effect upon the person.

SOCIAL RELATIONSHIP: The set of reciprocal norms and statuses which define how persons occupying the statuses are expected to behave and think toward each other. For example, the statuses of "father" and "son" are *defined by* reciprocal norms (behavioral obligations recognized not only by a given father and his son, but also expected of them by the general society of which they are a part). Therefore "father - son" is a social relationship.

SOCIAL STRATIFICATION: An observable but not clearly defined placement of the members of a society into a hierarchical social class system, based on some combination of factors usually including education, income, and occupation. For convenience, the logical continuum is often arbitrarily divided into "social class" levels (upper, working, lower, middle) depending on these factors plus other criteria such as common life styles, belief systems, life chances, etc.

SOCIAL STRUCTURE: A concept referring to the highly complex set of normatively developed interrelationships among sub-groups within a society, especially among those social institutions (education, economics, politics, etc.) whose integration is essential to the smooth functioning of the society. Social structure does not refer to the behaviors of individuals, but to socially constructed *relational patterns among groups* and among positions within groups which produce orderly and comprehensible interaction among persons and groups.

SOCIAL VALUES: Learned ideological stances which guide social norms, help integrate social groups, and guide personal and group goals, beliefs, attitudes, and behavior. The societal values of "justice" in the U.S., for instance, directs the way we socialize children; define, judge, and punish crimes; distribute goods and money; grade students; pro-

mote employees; elect politicians; and many other daily choices. The sharing of values underlies our choices of friends and mates, and gives us a sense of "belonging" to the general group.

SPECIAL RECREATION MANAGEMENT AREA: Areas requiring explicit recreation management to achieve the Bureau's recreation objectives and to provide specific recreation opportunities. Special management areas are identified in the RMP, which also defines the management objectives for the area. Major Bureau recreation investments are concentrated in these areas.

SPECIES, ENDANGERED: An animal or plant whose prospects of survival and reproduction are in immediate jeopardy, and as is further defined by the Endangered Species Act of 1973, as amended.

SPECIES, SENSITIVE: A Designation which is (1) applied to species not yet officially listed but which are undergoing a status review or are proposed for listing according to Federal Register notices published by the Secretary of the Interior, or the Secretary of Commerce, or in accordance with comparable state documents published by state officials; (2) applied to species whose populations are consistently small and widely dispersed or whose ranges are restricted to a few localities, such that any appreciable reduction in numbers, habitat availability, or habitat condition might lead toward extinction; or (3) applied to species whose numbers are declining so rapidly that official listing may become necessary as a conservation measure.

SPECIES, THREATENED: Any species which is likely to become an endangered species within the foreseeable future throughout all or a significant portion of its range, and as is further defined by the Endangered Species Act of 1973, as amended.

STEPPE-TYPE VEGETATION: Vegetation found on arid lands that usually have extreme temperature ranges and loess (wind deposited) soils.

SUSTAINED YIELD: The achievement and maintenance in perpetuity of a high level of annual or regular periodic output of the various renewable resources of the public lands consistent with multiple use.

TIME SERIES MODEL: A statistical method, using multiple correlation, that relates changes over time in the item under study to changes in several other items that are assumed to affect the first one.

TOTAL SUSPENDED PARTICULATES: All solid or semi-solid material found in the atmosphere.

TREND: The direction of change in range condition over a period of time, expressed as upward, static, or downward.

UNDERSTORY: Plants growing beneath the canopy of other plants. Usually refers to grasses, forbs, and low shrubs under tree or brush canopy.

UTILIZATION: The portion of the current year's forage production that is consumed or destroyed by grazing animals. May refer either to a single species or to the vegetation as a whole.

VEGETATION: Plants in general or the sum total of the plant life above and below ground in an area.

VEGETATION MANIPULATION PROJECTS: Actions taken which alter the existing natural plant communities to achieve the goals of management in a particular area. There are several ways in which vegetation can be altered: (1) with fires; (2) mechanically, which includes chaining, plowing, or crushing; (3) chemically; and (4) biologically.

VEGETATION TYPE: A plant community with distinguishable characteristics.

VISUAL RESOURCE: Land, water, vegetation, animal, and other visible features.

VISUAL RESOURCE MANAGEMENT (VRM): The planning, designing, and implementation of management objectives to provide acceptable levels of visual impacts for all BLM resource management activities.

VISUAL RESOURCE MANAGEMENT CLASSES: The degree of acceptable visual change within a characteristic landscape. A class is based upon the physical and sociological characteristics of any given homogeneous area and serves as a management objective.

CLASS I: Areas (preservation) provide for natural ecological changes only. This class includes primitive areas, some natural areas, some wild and scenic rivers, and other similar sites where landscape modification activities should be restricted.

CLASS II: (partial retention of the landscape character) includes areas where changes in any of the basic elements (form, line, color, or texture) caused by management activity should not be evident in the characteristic landscape.

CLASS III: (partial retention of the landscape character) includes areas where changes in the basic elements (form, line color, or texture) caused by a management activity may be evident in the characteristic landscape. However, the changes should remain subordinate to the visual strength of the existing character.

CLASS IV: (modification of the landscape character) includes areas where changes may subordinate the original composition and character; however, they should reflect what could be a natural occurrence within the characteristic landscape.

CLASS V: (rehabilitation or enhancement of the landscape character) includes areas where change is needed. This class would apply to areas where the quality class has been reduced because of unacceptable intrusions. It should be considered an interim short-term classification until one of the other classes can be reached through rehabilitation or enhancement.

VISUAL SENSITIVITY: Degree of concern expressed by the user toward scenic quality and existing or proposed visual change in a particular characteristic landscape.

VOLUNTARY ASSOCIATIONS: Those formal organizations (such as clubs, churches, the C of C) to which individuals belong from free choice because of the benefits they preceive for themselves in membership.

WATERSHED: A total area of land above a given point on a waterway that contributes runoff water to the flow at that point.

WATERSHED, SENSITIVE: An area with adverse geologic, soil, and/or vegetative conditions which cause a fragile situation. Small changes in land use intensity can cause large changes in erosion rates. Some of these areas are already experiencing accelerated erosion.

WILDERNESS CHARACTERISTICS: Identified by Congress in the 1964 Wilderness Act: namely, size, naturalness, outstanding opportunities for solitude or a primitive and unconfined type of recreation, and supplemental values such as geological, archaeological, historical, ecological, scenic, or other features. It is required that the area possess at least 5,000 acres or more of continguous public land or be of a size to make practical its preservation and use in an unimpaired condition; be substantially natural or generally appear to have been affected primarily by the forces of nature, with the imprint of man being sustantially unnoticeable; and have either outstanding opportunities for solitude or a primitive and unconfined type of recreation. Congress stated that a wilderness area may also have supplemental values, which include ecological, geological, or other features of scientific, educational, scenic, or historical value.

WILDERNESS MANAGEMENT POLICY: A policy document prescribing the general objectives, policies, and specific activity guidance applicable to all designate BLM wilderness areas. Specific management objectives, requirements, and decisions implementing administrative practices and visitor activities in individual wilderness areas are developed and described in the wilderness management plan for each unit.

WILDERNESS STUDY AREA (WSA): A roadless area which has been found to have wilderness characteristics.

WILDERNESS VALUES: The wilderness characteristics and multiple resource benefits of an area.

WILD HORSES: All unbranded and unclaimed horses and their progency that have public lands on or after December 15,

1981, or that do use these lands as all or part of their habitat.

XERIC VEGETATION: Vegetation adopted to dry conditions.

ACRONYMS

ACEC: Area of Critical Environmental Concern
AMP: Allotment Management Plan
AUM: Animal Unit Month
BLM: Bureau of Land Management
CEQ: Council of Environmental Quality
CDOW: Colorado Division of Wildlife
EIS: Environmental Impact Statement
ERMA: Extensive Recreation Management Area
HMP: Habitat Management Plan
KGS: Known Geologic Structure
KRCRA: Known Recoverable Coal Resource Area
ONA: Outstanding Natural Area
PRLA: Preference Right Lease Application
RNA: Research Natural Area
RMP: Resource Management Plan
SRMA: Special Recreation Management Area
USDA: U.S. Department of Agriculture
USDI: U.S. Department of Interior
USFS: U.S. Forest Service
USFWS: U.S. Fish and Wildlife Service
WSA: Wilderness Study Area

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