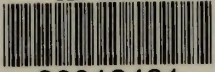


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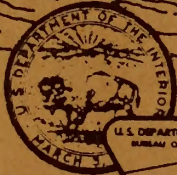


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GRAND RESOURCE AREA MANAGEMENT PLAN

DRAFT

ENVIRONMENTAL IMPACT STATEMENT



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

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

Moab District
Grand Resource Area, Utah





United States Department of the Interior

IN REPLY REFER TO

1601/1792
(U-060)

BUREAU OF LAND MANAGEMENT
Moab District
Bureau of Land Management
P.O. Box 970
Moab, Utah 84532

March 11, 1983

Dear Reviewer:

Enclosed is the Draft Resource Management Plan and Environmental Impact Statement (RMP/EIS) for the Grand Resource Area, Moab District, Utah.

The Bureau of Land Management has prepared this document as a partial fulfillment of its responsibilities under the Federal Land Policy and Management Act of 1976 and the National Environmental Policy Act of 1969. The RMP and EIS have been combined into one document, which describes and analyses four alternatives (see cover sheet). Please review and evaluate the document. Any comments on it should be sent to the Grand Resource Area Manager at the address shown on the cover sheet no later than June 13, 1983.

This is the first part of a two-part RMP/EIS. The second part, the Final Grand Resource Area RMP/EIS will be in an abbreviated format. It will contain: a response to public comments; a summary of major changes (including any additional required analysis); and a description of the proposed action.

In order to have the complete Grand Resource Area RMP/EIS, the reviewer must retain both the Draft and the Final RMP/EIS documents.

Thank you for your interest in the management of the public lands.

Sincerely yours,

Kenneth Rhea
Associate Moab District Manager

Enclosures:
Draft RMP/EIS

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RESOURCE MANAGEMENT PLAN/ENVIRONMENTAL IMPACT STATEMENT
FOR THE GRAND RESOURCE AREA, MOAB DISTRICT, UTAH

(X) Draft

() Final

Lead Agency

U.S. Department of the Interior, Bureau of Land Management

Type of Action

Administrative (X)

Legislative ()

Abstract

This draft resource management plan and environmental impact statement describes and analyzes four alternatives for managing the public lands and resources in the Grand Resource Area. They are: Alternative A, No Action; Alternative B, Production; Alternative C, Limited Protection; and Alternative D, Protection. BLM's preferred alternative is Alternative C for all issues except Livestock Requirements. For this issue, Alternative A is the proposed action.

Comments have been requested from those agencies and individuals listed in Chapter 5, Consultation and Coordination.

For further information, contact:

Colin P. Christensen, Area Manager
Bureau of Land Management
Grand Resource Area
P.O. Box M
Moab, Utah 84532

Telephone: (801) 259-8193

Comments on the draft statement must be received no later than: June 13, 1983.

ERRATA SHEET

The following are corrections in the summary portion of this RMP/EIS.

1. Corrections in Table S-2 (Pages S-5 through S-10)

for Wildlife Habitat Requirements

- on Page S-6, Alternative C, first entry. The first line should read, "Maintain existing wildlife..." (not "Maintina...").
- on page S-6, Alternative D, third entry, third line should read, "... stable big game populations..." (not "... stble big game ...").
- on page S-7, Aternative D, first entry, first line should read, "Also limit ORV use to ..." (not "Also limite ORV ...").

for Lands Actions

- on page S-7, Alternative D, first entry, "Retain 1,806,318 acres of public land" (not "... of public lnad").

for Minerals

- on page S-8, Alternative D, fourth entry. First line should read, "continue to allow sales of..." (not "continue to allow ...").

2. Corrections in Table S-3 (pages S-11 through S-19).

for Vegetation

- on page S-11, Alternative B, first entry. Second sentence should read, "Vegetative vigor would be maintained or improved on 403,655 acres under existing AMPs". (not "... on 408,655 acres...").
- on page S-12, Alternative A, first entry. The fifteenth line should read "...improvements would prevent..." (not "... improvement would prevent...").
- on Page S-12, Alternative B, second entry. Last line should read, "...where new ones are implemented" (not "... where new ORVs are implemented.")

for Mineral Resources

- on page S-14, Alternative A, last entry. Should include this statement on the end, "Also, uranium production could run as high as 1,000,000 pounds of yellowcake per year."

for Mineral Rights

- on page S-15, Alternative C, last sentence should read, "Existing claims that are located within the 32,000 acre withdrawal area along the Colorado River would still be recognized, but when claims are abandoned in the area they cannot be restaked."

- on Page S-15, Alternative D, second sentence should read, "Existing claims that are located within the 47,000 acre withdrawal are along the Colorado River would still be recognized, but when claims are abandoned in the area they cannot be restaked."

for Recreation

- on page S-18, Alternative D, the fifth entry describing the impacts of both rest room construction and prescribed fires should not appear under this alternative. It should be the fifth entry under Alternative C.
- on page S-18, Alternative D, the new fifth entry here should read, "Construction of rest rooms at heavily used sites along the Colorado River will improve river recreational opportunities."

for Economic Conditions

- on Page S-18, Alternatives C and D, the statement (starting on line 12 Alternative C and line 14 Alternative D), should read the same for both alternatives, "... , less local government revenue from reduced property taxes and indirectly from reduced royalty payments to the State."

The following are corrections in Chapter 3 of this RMP/EIS.

1. Discussion under Economic Conditions

for Lands Actions

- page 3-34, fourth paragraph, first sentence should read: "Payments in lieu of taxes (PILT) from entitlement lands in Grand County have amounted to \$327,559 in 1981 and \$229,251 in 1982, which has comprised 17 percent of Grand County's revenues."

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DRAFT RESOURCE MANAGEMENT PLAN and ENVIRONMENTAL IMPACT STATEMENT

FOR THE GRAND RESOURCE AREA

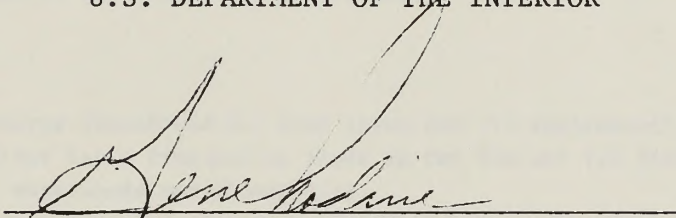
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UTAH

Prepared by

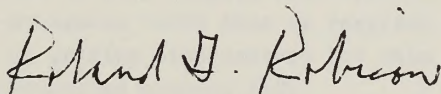
THE BUREAU OF LAND MANAGEMENT

U.S. DEPARTMENT OF THE INTERIOR



Gene Nodine
Moab District Manager

I concur:



Roland G. Robison
Utah State Director

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Summary

Grand Resource Area Resource Management Plan

The Grand Resource Area (GRA) is comprised of 1,852,424 acres of public land located in Utah within Grand county and the northern third of San Juan county. The Grand Resource Management Plan (RMP) has been developed to provide a basis for managing these public lands. This RMP is one of six pilot RMPs being prepared by the Bureau of Land Management to pioneer the development of this type of plan. In contrast with the more general program-oriented plans of the past, the Resource Management Plan is primarily planning issue-driven. It focuses on the planning issues because they represent problem areas where management effort needs to be concentrated. The intended result is that management actions will take place where they are most needed in order to improve the overall efficiency of BLMs public land management. The Grand RMP focuses on ten planning issues:

Critical Watersheds	Utility Corridors
Livestock Requirements	Minerals
Wildlife Habitat Requirements	Recreation
Off-Road Vehicle Use and Management	Fire Management
Lands Actions	Wilderness

These basic topics encompass related concerns identified by members of the public, other agencies, entities of State and local governments, and BLM staff. These concerns are generally centered around unresolved problems. The concerns that comprise the ten planning issues in this document are summarized as follows:

CRITICAL WATERSHEDS

The two significant concerns identified for this issue are (1) sedimentation and salinity in the Upper Colorado River Basin from public lands in the GRA and (2) disturbance and degradation of critical watersheds and floodplains.

LIVESTOCK REQUIREMENTS

This issue is concerned with four basic conflicts: (1) mineral activities are causing a loss of forage for livestock in specific heavy use areas; (2) improper season of use on some allotments has resulted in grazing during periods critical to the growth of forage plants; and (3) land treatments are needed to improve forage and better disperse and management livestock.

The Livestock Requirements issue is also closely associated with the court-mandated grazing environmental impact statement (EIS) that is required to be part of this plan. The development and analysis of grazing alternatives for this issue must meet the requirements specified for the court-mandated grazing EIS.

WILDLIFE HABITAT REQUIREMENTS

The concerns associated with this issue result from three basic conflicts: (1) in some parts of the GRA, competition is occurring between livestock and wildlife for forage,

water, and space; (2) mineral activities can result in a loss of forage and space for wildlife; and (3) recreational uses such as ORV travel in portions of the GRA may be conflicting with wildlife.

OFF-ROAD VEHICLE USE AND MANAGEMENT

The GRA is known for its high quality recreational ORV opportunities. ORV use is also important for livestock management, mineral exploration and development, agricultural, and other commercial use. This issue focuses on existing and potential conflicts (1) among different types of ORV use and (2) between ORV uses and other resource values.

LANDS ACTIONS

This issue is concerned with (1) the identification of lands suitable for disposal and (2) the need to guarantee continued public access to whitewater rafting and (3) supporting the protection of scenic and other values along the Colorado and Dolores rivers.

UTILITY CORRIDORS

Because of the topography in some areas, existing and proposed rights-of-way are creating congestion that could be avoided by formal designation of corridors, which would minimize width requirements and maximize multiple occupancy. Avoidance and exclusion areas should be identified for protection of critical resources from disturbances that would occur within utility corridors.

MINERALS

The primary concern here is closely related to minerals activities on the GRA. How can the GRA continue to encourage mineral production while preventing irreparable damage to other resource values? This will require (1) areas and values requiring protection and (2) measures that can be taken to provide the needed protection.

RECREATION

Concerns here are related to increased recreational use, which (1) poses greater potential for impairment of recreational and other resource values and (2) increases conflicts between recreationists and other uses.

FIRE MANAGEMENT

The concern here is related to the use of fire as a management tool. Full suppression of all fires can be costly and does not always benefit rangeland resources, lands with potential for improvement through the use of induced or natural fires need to be identified.

WILDERNESS

Wilderness, like grazing, is a mandated issue in the Grand RMP. Certain requirements specified in Section 603 of the Federal Land Policy and Management Act (FLPMA) of 1976 had to be met in the wilderness review program. These requirements determined the concerns that had to be addressed in the RMP. They are (1) which WSAs will be recommended as

suitable for designation as wilderness; and (2) which WSAs will be recommended as nonsuitable for wilderness. The wilderness issue will be analyzed with regards to impacts related to the RMP in the Grand RMP/EIS.

The preferred alternative for wilderness suitability recommendations will also be identified in the RMP. The wilderness issue will then become part of the Utah statewide wilderness EIS, which will analyze impacts on both the regional and National levels. Final decisions with regard to wilderness suitability recommendations will be made following the completion of the statewide EIS.

THE RESOURCE MANAGEMENT PLAN ALTERNATIVES

Four alternatives were developed for resolving the ten planning issues already identified. These alternatives are actually complete alternative plans.

They are (1) No Action, (Alternative A); (2) Production, (Alternative B); (3) Limited Protection, (Alternative C); and (4) Protection, (Alternative D). As an initial step in the alternative development process, management goals were developed for each of the alternatives these are summarized in Table S-1.

Management objectives for each issue were written to meet these goals. Following this, management actions were formulated to meet these objectives by the Grand RMP team, which worked together in resolving conflicts between the management action before the final versions were adopted.

The alternative plans and their component management actions are summarized in Table S-2.

ALTERNATIVES CONSIDERED BUT NOT ANALYZED

Two other alternatives were considered for the Livestock Requirements issue. They were: (1) no grazing and (2) grazing at full preference. During the consideration of these alternatives it was decided that they did not fall within the limits of practicality. For this reason, they were not analyzed further.

IMPACT ANALYSIS

The changes (or impacts) that would be imposed upon land uses and components of the human environment by the management actions set forth in each alternative were identified and analyzed. The land uses and environmental components were:

Soils	Wildlife	Visual Resources
Water Quality	Mineral Resources	Special Designation Areas
Air Quality	Mineral Rights	Recreation
Vegetation	Transportation	Economic Conditions
Livestock Grazing	Cultural Resources	Social Conditions

A summary of these impacts can be seen in Table S-3.

Table S-1

Management Goals for the Alternatives

Alternative A No Action	Alternative B Production	Alternative C Limited Protection	Alternative D Protection
<p><u>Goal:</u> To continue present level of resource use.</p>	<p><u>Goal:</u> To implement a resource management plan that obtains the highest degree of consumptive use and commodity production allowable, considering legal constraints (environmental protection requirements, multiple use mandates, etc.).</p>	<p><u>Goal:</u> To implement a resource management plan that provides a variety of uses within the sustained yield capability of the resource. It represents a balancing of conflicts between renewable and nonrenewable resources for the optimum multiple use mix, incorporating the necessary constraints for protecting resources from irreversible decline.</p>	<p><u>Goal:</u> To implement a resource management plan that is oriented toward protection and enhancement of the natural values, while allowing use and production only at levels that do not risk diminishing such values as wildlife habitat, critical watersheds, primitive recreation opportunities, and wilderness qualities.</p>
	<p>Trade-offs would emphasize consumptive uses (emphasize energy related mineral production, grazing, and development of commercial recreation, including off-road vehicle (ORV) use.</p>	<p>Trade-offs would safeguard wildlife habitat, critical watersheds, wilderness values and non-ORV recreation, while accommodating production of minerals, livestock grazing, ORV recreation, and other commodities.</p>	<p>Trade-offs would favor protection of the resource over use of the resource, and would emphasize protection of wildlife habitat, critical watersheds, primitive recreation opportunities, and wilderness qualities.</p>

Planning Issue	Alternative A No Action	Alternative B Production	Alternative C Limited Protection	Alternative D Protection
Critical Watersheds	Install instream drop structures on eight streams (8 allotments affecting 3,500 acres).	Install instream drop structures as in Alternative A.	Install instream drop structures as in Alternatives A and B. Implement salinity control treatments (gully plugs, contour furrows, retention dams) on 41,000 acres (10 allotments). Divert and evaporate water from Stinking Spring.	Install instream drop structures as in Alternatives A, B, and C. Implement salinity control treatments as in Alternative C. Divert and evaporate water from Stinking Spring as in Alternative C.
Livestock Requirements	Continue present management on 1,348,527 acres (61 allotments) as follows: Continue 6 allotment management plans (AMPs) (403,655 acres); maintain existing land treatments on 51,999 acres; and continue present levels of grazing (72,236 animal unit months (AUMs)).	Continue present management on 986,898 acres (45 allotments) as follows: Continue AMPs, maintain existing land treatments, and continue present levels of grazing as in Alternative A. Additional management is proposed as follows: Implement livestock manipulation techniques (fences, water developments, rotation of grazing use areas) on 765,284 acres (22 allotments).	Continue present management on 833,545 acres (37 allotments) as follows: Continue AMPs, maintain existing land treatments and continue present levels of grazing as in Alternative A and B. Additional management is proposed as follows: Implement livestock manipulation techniques as in Alternative B on 488,636 acres (15 allotments).	Continue present management on 827,850 acres (34 allotments) as follows: Continue AMPs, maintain existing land treatments and continue present levels of grazing as in Alternatives A, B, and C. Additional management is proposed as follows: Implement livestock manipulation techniques as in Alternatives B and C on 382,429 acres (11 allotments).

Continued

TABLE S-2

Summary of Management Actions for the Alternatives

Planning Issue	Alternative A No Action	Alternative B Production	Alternative C Limited Protection	Alternative D Protection
Wildlife Habitat Requirements	Maintain existing wildlife waters and habitat conditions in support of current big game populations (11,433 deer; 747 elk; 259 bighorn; and 229 antelope).	Same as Alternative A.	Maintain existing wildlife waters. Reserve all forage on the following areas for deer and elk winter use: Pear Park, 14,720 acres; Spring Creek, 924 acres; and Castle Valley, 6,400 acres. Manage wildlife habitat in support of current bighorn population (259) and estimated prior stable numbers of other big game (22,250 deer; 2,300 elk; and 887 antelope).	Implement land treatments as in Alternative C. Change season of use on 478,478 acres (17 allotments). Change class of livestock on 154,215 acres (2 allotments). Restrict livestock grazing from 50,000 acres (portions of 19 allotments; 1,099 AUMs). Eliminate livestock grazing on 33,489 acres (4 allotments). Estimated future livestock AUMs are 73,874. Maintain existing wildlife waters. Reserve all forage on the same areas as Alternative C. Manage wildlife habitat in support of estimated prior stable big game populations (22,250 deer, 2,300 elk; 1,216 bighorn; and 887 antelope).
Off-Road Vehicle Use and Management	Maintain the entire CRA (1.8 million acres) as open for ORVs.	Designate the entire CRA as open for ORVs.	Designate 596,234 acres as limited to existing roads and trails. This includes Mancos Shale areas; the Colorado,	Cover same areas listed in Alternative C under the same designation.

TABLE S-2 (Continued)
Summary of Management Actions for the Alternatives

Green and Dolores river corridors; the Canyon Rims Recreation Area; and the viewshed for the Dead Horse Point State Park.

Designate 24,454 acres as closed to ORVs. This would include Negro Bill Canyon; Westwater Canyon; Windwhistle and Hatch Point campgrounds; Canyonlands, Needles and Anticline overlook and Onion Creek sensitive plant site.

Also limite ORV use to existing roads and trails in the floodplains of 150 miles of streams (10 floodplains); and 250 miles of stream channel (10 major washes).

Cover same areas listed in Alternative C under the same designation.

Designate 15,206 acres (Mill Creek area) as limited to designated roads and trails.

Cover the same area under same designation as Alternative C.

Retain 1,801,331 acres of public land.

Retain 1,806,318 acres of public land.

Consider 11,629 acres of public land for disposal.

Identify 6,594 acres of public land for further study as in Alternative B.

Acquire an access easement involving 6 acres of private land as in Alternative B.

Acquire scenic easements on 9,990 acres of private land along 80 miles of the Dolores and Colorado River corridors.

Consider designating approximately 140 miles of de facto corridors as in Alternative B.

Lands Actions Continue to process lands disposal requests individually.

Consider 22,411 acres of public land for disposal.

Identify 6,594 acres of public land for further study to determine whether it should be retained or disposed of.

Acquire an access easement involving 6 acres of private land at the Cisco boat launch area on the Colorado River.

Acquire scenic easements on 9,990 acres of private land along 80 miles of the Dolores and Colorado River corridors.

Consider designating approximately 140 miles of de facto corridors as official utility corridors.

Consider designating approximately 140 miles of de facto corridors as in Alternative B.

Consider designating approximately 140 miles of de facto corridors as in Alternatives B and C.

Utility Corridors Continue to handle all major right-of-way requests individually. Consider siting new facilities within existing de facto corridors.

TABLE S-2 (Continued)

Summary of Management Actions for the Alternatives

Planning Issue	Alternative A No Action	Alternative B Production	Alternative C Limited Protection	Alternative D Protection
Minerals	Leave the entire GRA (1.8 million acres) open to mining claims for locatable minerals under the 1872 Mining Law; with the exception of 1,850 acres of existing mineral withdrawals.	Leave the entire GRA open to mining claims as in Alternative A (with same exceptions).	Withdraw 32,000 acres along the Colorado River from mineral entry. This is in addition to 1,850 acres of existing withdrawals. Areas left open to mining claims would total 1.77 million acres.	Withdraw 47,000 acres along the Colorado River from mineral entry in addition to 1,850 acres of existing withdrawals. Area left open to mining claims would total 1.75 million acres.
	Maintain existing potash leases on approximately 4,600 acres. Allow potash prospecting on approximately 150,000 acres.	Same action for potash leasing and prospecting as Alternative A.	Same actions for potash leasing and prospecting as Alternatives A and B.	Same action for potash leasing as Alternatives A, B, and C.
	Continue management of oil and gas under present application of the oil and gas category system. Acreage under this application is Category 1, 1,682,762; Category 2, 58,221; Category 3, 704,011; and Category 4, 8,170.	Classify the entire GRA (1.8 million acres) as Category 1 under the oil and gas category system for managing oil and gas.	Adopt a modified application of the oil and gas category system for managing oil and gas. Acreage under this application would be Category 1, 1,156,560; Category 2, 563,808; Category 3; 70,274; and Category 4, 28,912.	Adopt a modified application of the oil and gas category system for managing oil and gas. Acreage under this application would be Category 1, 744,262; Category 2, 776,359; Category 3; 53,815; and Category 4, 245,118.
	Continue to allow sales of common varieties of minerals (sand and gravel) on 6,000 acres free of mining claims.	Continue to allow sales of common varieties of minerals as in Alternative A.	Continue to allow sales of common varieties of minerals as in Alternatives A and B.	Continue to allow sales of common varieties of minerals as in Alternatives A, B, and C.
	Continue existing contract for sale of humates on 250 acres.	Continue existing contract for sale of humates as in Alternative A.	Continue existing contract for sale of humates as in Alternatives A and B.	Continue existing contract for sale of humates as in Alternatives A, B, and C.
		Allow sales of humates on approximately 1,500 additional acres that are free of mining claims.		

TABLE S-2 (Continued)
Summary of Management Actions for the Alternatives

Recreation	Maintain developed facilities including 2 developed campgrounds, 5 developed picnic sites, 5 miles of hiking trails, 10 miles of motorcycle trails, and 27 miles of scenic road system.	Maintain same developed facilities as in Alternative A. Construct rest rooms at seven heavily used recreation sites along the Colorado River.	Maintain same developed facilities and in Alternatives A, B and C. Construct rest rooms as in Alternative B.	Maintain same developed facilities as in Alternatives A, B and C. Construct rest rooms as in Alternatives B and C.
	Continue to issue recreation permits (four-wheel drive vehicle tours, horse-back trips, etc.)	Continue to issue recreation use permits as in Alternative A.	Continue to issue recreation use permits as in Alternatives A and B.	Continue to issue recreation use permits as in Alternatives A, B, and C.
	Continue to permit competitive and non-competitive ORV events.	Continue to permit ORV events as in Alternative A.	Continue to permit ORV events as in Alternatives A and B.	Continue to permit ORV events as in Alternatives A, B, and C.
	Continue the existing river management program on the Colorado and Dolores Rivers (24,000 passenger days per year; 30 commercial outfitters).	Continue the existing river management program as in Alternative A.	Continue the existing river management program as in Alternatives A and B.	Continue the existing river management program as in Alternatives A, B, and C.
	Continue to manage 65 miles of the Colorado and Dolores river study corridors as required under the Wild and Scenic Rivers Act.	Continue to manage the river study corridors as under Alternative A.	Continue to manage the river study corridors as under Alternatives A and B. Except also designate an Outstanding Natural Area (1,375 acres).	Continue to manage the river study corridors as under Alternative A and B.
Fire Management	Continue to suppress all fires on public lands.	Implement a limited fire suppression policy on the entire GRA (1.8 million acres).	Implement a limited fire suppression policy as in Alternative B.	Implement a limited fire suppression policy as in Alternatives B and C.
		Initiate prescribed fires and seeding on approximately 14,149 acres (11 allotments).	Initiate prescribed fire as in Alternative B.	
Wilderness	Recommend no WSAs as suitable for wilderness designation.	Recommend no WSAs as suitable for wilderness designation and continue presnet levels of resource management as in Alternative A.	Follow preliminary suitability recommendations contained in site specific analyses for the seven WSAs studied. They recommended the following for designation as wilderness:	Recommend 219,480 acres (all eight WSAs) for wilderness designation.

TABLE S-2 (Continued)
Summary of Management Actions for the Alternatives

Planning Issue	Alternative A No Action	Alternative B Production	Alternative C Limited Protection	Alternative D Protection
Wilderness (continued)			(1) 26,000 of Westwater Canyon WSA's 31,160 acres;	
			(2) 50,280 of Desolation Canyon WSA's 51,250 acres; and	
			(3) All of Behind the Rocks WSA's 12,635 acres.	
			The remaining acreage of the WSA's is recommended as not suitable for wilderness design- nation.	
			Total WSA acreage included in this nonsuitability recommenda- tion is 124,925.	
			As a subalternative for the Desolation Canyon WSA, 1,780 acres of it would be recommend- ed as suitable for wilderness. The other recommendations would not be changed. Under this subalternative, the total acreage recommended as non- suitable would be 168,565.	

TABLE S-2 (Concluded)
Summary of Management Actions for the Alternatives

Alternative A No Action	Alternative B Production	Alternative C Limited Protection	Alternative D Protection
<p><u>Soils</u>-Short-term increase in erosion from land treatments, energy and mineral development. Increase in soil erosion and loss of site productivity in the long term as a result of ORV use.</p>	<p><u>Soils</u>-Short-term increase in erosion from land treatments, energy and mineral development. Increase in soil erosion and loss of site productivity in the long term as a result of ORV use.</p>	<p><u>Soils</u>-Short-term increase in erosion from land treatments. Minimal short term increase in erosion from oil and gas activity. Improved water infiltration, minimal soil compaction resulting in decreased soil loss and increase in productivity due to ORV restrictions in the long term.</p>	<p><u>Soils</u>-Short-term increase in erosion from land treatments. Restrictions on oil and gas activity, livestock grazing and ORV use would improve water infiltration, minimize soil compaction retain onsite soil productivity, and overall result in a decrease in productivity.</p>
<p><u>Water Quality</u>-Short-term increase in sediment and salinity from maintenance of land treatments, energy and mineral development. Long term decrease in water quality from increases in sediment and salinity from ORV use.</p>	<p><u>Water Quality</u>-Short-term increase in sediment and salinity from maintenance of land treatments, energy and mineral development. Long term decrease in water quality from increases in sediment and salinity from ORV use.</p>	<p><u>Water Quality</u>-Short-term increase in sediment and salinity from land treatments, energy and mineral development. Long term net decrease of 19,408 tons of salt and 187,640 tons of sediment annually into the Colorado River through instream drop structures, salinity control projects, changing the season of livestock use, control of ORV use, and the application of the oil and gas categories.</p>	<p><u>Water Quality</u>-Short-term increase in sediment and salinity from land treatments, energy and mineral development. Long term net decrease of 28,970 tons of salt and 261,360 tons of sediment annually into the Colorado River through instream drop structures, salinity control projects, changing the season of livestock use, control of ORV use, and the application of the oil and gas categories.</p>
<p><u>Air Quality</u>-No significant impact would occur to air quality.</p>	<p><u>Air Quality</u>-Some significant short-term impacts on air quality could occur under a limited fire suppression policy or during prescribed fires.</p>	<p><u>Air Quality</u>-Some significant short-term impacts on air quality could occur under a limited fire suppression policy or during prescribed fires.</p>	<p><u>Air Quality</u>-Some significant short-term impacts on air quality could occur under a limited fire suppression policy.</p>
<p><u>Vegetation</u>-Vegetation would be affected as follows:</p>	<p><u>Vegetation</u>-Vegetation would be affected as follows:</p>	<p><u>Vegetation</u>-Vegetation would be affected as follows:</p>	<p><u>Vegetation</u>-Vegetation would be affected as follows:</p>
<p>Vegetative conditions would be maintained where grazing is permitted at present levels and would increase around instream structures. Overall vigor of the vegetation would be maintained or improved on 403,655 acres under 6 existing allotment plans (AMPs).</p>	<p>Present livestock management at level of past 5 years' licensed use would maintain ecological conditions, while these conditions would be maintained or improved by livestock manipulations on 765,284 acres. Vegetative vigor would be maintained or improved on 408,655 acres under existing AMPs.</p>	<p>Present livestock management at the level of past 5 years' licensed use would maintain ecological conditions; while, these conditions would be maintained or improved by livestock manipulations on 488,655 acres. Vegetative vigor would be maintained or improved on 403,655 acres under existing AMPs.</p>	<p>Present livestock management at level of past 5 years' licensed use would maintain ecological conditions; while, these conditions would be maintained or improved by livestock manipulations on 282,429 acres. Vegetative vigor would be maintained or improved on 403,655 acres under existing AMPs.</p>

Continued

TABLE S-3

Summary of Management Actions and Impacts

Alternative A No. Action	Alternative B Production	Alternative C Limited Protection	Alternative D Protection
<p>Maintenance of land treatments would change vegetative composition on 52,000 acres. Decreases in vegetation would include decreases on 350-500 acres per year because of oil and gas activities under the present oil and gas category system and on 250 acres in the humate sale; undetermined losses due to activities under recreation use permits, areas transferred in land disposal; decreases in areas where ORV use is continued; and maintenance of existing watershed improvement would prevent improvement of vegetation in those areas.</p>	<p>Vegetation would increase around instream structures and on 14,149 acres treated with prescribed fire and seeding. Vegetation would also increase around instream structures.</p> <p>Species composition would be changed on 52,000 acres where existing land treatments and are maintained, and on 70,705 acres where new ORVs are implemented.</p> <p>Decreases in vegetation would include decreases because of mining claim development; some long-term decreases in pinyon-juniper because of limited fire suppression; oil and gas activities would cause decreases on 400-550 acres per year under an all Category 1 in the Oil and Gas Category System; decreases on 1,750 acres where humates would be removed; loss of vegetation on 22,471 acres transferred in land disposal actions; maintenance of existing watershed improvements would prevent improvements would prevent improvements around those areas.</p>	<p>Ecological conditions would be improved through restriction of grazing on saline soils (27,000 acres). Vegetative condition would improve on three perennial streams and would be maintained on 32,000 acres where mineral withdrawals would be implemented. Perennial forage plants would be protected through season of livestock use changes on 358,775 acres, and by the restrictions on ORV use. Change in class of livestock would increase vigor of browse species, while decreasing vigor of grass on 69,042 acres. Vegetation would increase around instream drop structures, salinity control structures, watershed treatment areas, and 14,149 acres treated by prescribed fire.</p> <p>Species composition would be changed on 52,000 acres where existing land treatments are maintained and, on 68,105 acres where new ones are implemented.</p> <p>Decrease in vegetation would include decreases because of mining claim development; decreases on 300 to 400 acres per year because of oil and gas activities under the modification of the oil and gas category system application; decreases in the 250 acres humate sale area; decreases due to recreation use permits; long-term losses of pinyon-juniper due to limited fire suppression; loss of BLM management of vegetation on 11,690 acres transferred through land disposal actions; maintenance</p>	<p>Ecological condition would be improved through restriction of grazing on 50,000 acres of saline soils, and through elimination of grazing on 34,189 acres. Vegetation would be maintained on 47,000 acres under mineral withdrawals. Vegetative conditions would improve on 2 miles of perennial streams. Perennial forage plants would be protected through season of livestock use changes on 476,478 acres. Vigor of browse would be increased and vigor of grass decreased on 154,215 acres through change in class of livestock. Species composition would be changed on 52,000 acres where existing land treatments are maintained and on 68,105 acres where new ones are implemented.</p> <p>Increases in vegetation include increases around instream structures; increases around salinity control areas; long-term increases where watershed treatments take place; a 5 percent increase due to ORV closure.</p> <p>Decreases in vegetation include decreases because of mining claim development; decreases on 250 to 400 acres per year because of oil and gas activities under the modification of the oil and gas category system application; decrease on the 250 acre humate sale area; humate sale area; long-term losses of pinyon-juniper due to limited fire suppression; loss of BLM man-</p>

TABLE S-3 (Continued)
Summary of Management Actions and Impacts

<p>agement of vegetation on 6,642 acres transferred through land disposal actions; maintenance of existing watershed improvements would prevent improvement of vegetation in those areas.</p>	<p><u>Livestock Grazing</u>-There would be a net gain of 1,640 AUMs due to restriction on livestock grazing and land treatments. A total of 4,374 sheep AUMs would be converted to cattle AUMs.</p>	<p><u>Livestock Grazing</u>-There would be a net gain of 5,330 AUMs due to restriction to grazing and land treatments. A total of 1,497 sheep AUMs would be converted to cattle AUMs.</p>	<p><u>Livestock Grazing</u>-There would be a net gain of 6,860 AUMs due to land disposal, oil and gas development, and land treatments.</p>	<p><u>Livestock Grazing</u>-There would be a net gain of 5,330 AUMs due to restriction to grazing and land treatments. A total of 1,497 sheep AUMs would be converted to cattle AUMs.</p>	<p><u>Wildlife-Wildlife</u> habitat would be affected as follows:</p> <p>Continuing present livestock management would cause a loss of wildlife habitat productivity on 6 allotments. It would cause continued competition with livestock for big game species on 8 allotments for forage and space. It would also cause a continued decrease of riparian and aquatic habitat on one allotment. Livestock manipulation techniques would improve 3 miles of perennial stream and improve habitat on 15 allotments (including prescribed fire) would provide an additional 4,886 AUMs. Season of livestock use changes would reduce competition for bighorn, antelope and elk on 16 allotments and improve both aquatic and riparian habitats on one allotment. Season of use changes would reduce competition for bighorn, antelope and elk on 13 allotments and riparian habitat on one allotment. Change in class of livestock would reduce competition with livestock for elk and deer on winter and spring forage areas in one allotment. Restricting livestock grazing from portions of 10 allotments (27,000 acres) would improve forage for non-game wildlife species and allow big</p>	<p><u>Wildlife-Wildlife</u> habitat would be affected as follows:</p> <p>Continuing present livestock management would cause a loss of wildlife habitat productivity on 14 allotments. It would cause continued competition with livestock for big game species on 10 of these allotments for forage and space. It would also cause a continued decrease in ecological condition for riparian and aquatic habitat on four allotments. Livestock manipulation techniques would improve habitat and reduce spatial competition on 22 allotments would add 2,617 AUMs for deer, elk, and antelope. Potash development could result in the loss of 50 percent (13,507 acres of desert bighorn sheep habitat. The disposal of two 80-acre tracts along the Colorado River could cause loss of habitat for game and nongame species (including Bald Eagle). Placing the entire GRA under Oil and Gas System Category 1 would allow year-round oil and gas activities that could affect 200,769 acres of deer and elk winter range,</p>
<p>of existing watershed improvement of vegetation in those areas.</p>	<p><u>Livestock Grazing</u>-There would be a net gain of 6,860 AUMs due to land disposal, oil and gas development, and land treatments.</p>	<p><u>Wildlife-Wildlife</u> habitat would be affected as follows:</p> <p>Continuing present livestock management would cause a loss of wildlife habitat productivity on 14 allotments. It would cause continued competition with livestock for big game species on 10 of these allotments for forage and space. It would also cause a continued decrease in ecological condition for riparian and aquatic habitat on four allotments. Livestock manipulation techniques would improve habitat and reduce spatial competition on 22 allotments would add 2,617 AUMs for deer, elk, and antelope. Potash development could result in the loss of 50 percent (13,507 acres of desert bighorn sheep habitat. The disposal of two 80-acre tracts along the Colorado River could cause loss of habitat for game and nongame species (including Bald Eagle). Placing the entire GRA under Oil and Gas System Category 1 would allow year-round oil and gas activities that could affect 200,769 acres of deer and elk winter range,</p>	<p><u>Livestock Grazing</u>-There would be a net gain of 6,860 AUMs due to land disposal, oil and gas development, and land treatments.</p>	<p><u>Wildlife-Wildlife</u> habitat would be affected as follows:</p> <p>Continuing present livestock management would cause a loss of wildlife habitat productivity on 14 allotments. It would cause continued competition with livestock for big game species on 10 of these allotments for forage and space. It would also cause a continued decrease in ecological condition for riparian and aquatic habitat on four allotments. Livestock manipulation techniques would improve habitat and reduce spatial competition on 22 allotments would add 2,617 AUMs for deer, elk, and antelope. Potash development could result in the loss of 50 percent (13,507 acres of desert bighorn sheep habitat. The disposal of two 80-acre tracts along the Colorado River could cause loss of habitat for game and nongame species (including Bald Eagle). Placing the entire GRA under Oil and Gas System Category 1 would allow year-round oil and gas activities that could affect 200,769 acres of deer and elk winter range,</p>	<p><u>Wildlife-Wildlife</u> habitat would be affected as follows:</p> <p>Continuing present livestock management would cause a loss of wildlife habitat productivity on 14 allotments. It would cause continued competition with livestock for big game species on 10 of these allotments for forage and space. It would also cause a continued decrease in ecological condition for riparian and aquatic habitat on four allotments. Livestock manipulation techniques would improve habitat and reduce spatial competition on 22 allotments would add 2,617 AUMs for deer, elk, and antelope. Potash development could result in the loss of 50 percent (13,507 acres of desert bighorn sheep habitat. The disposal of two 80-acre tracts along the Colorado River could cause loss of habitat for game and nongame species (including Bald Eagle). Placing the entire GRA under Oil and Gas System Category 1 would allow year-round oil and gas activities that could affect 200,769 acres of deer and elk winter range,</p>	<p><u>Wildlife-Wildlife</u> habitat would be affected as follows:</p> <p>Continuing present livestock management would cause a loss of wildlife habitat productivity on 14 allotments. It would cause continued competition with livestock for big game species on 10 of these allotments for forage and space. It would also cause a continued decrease in ecological condition for riparian and aquatic habitat on four allotments. Livestock manipulation techniques would improve habitat and reduce spatial competition on 22 allotments would add 2,617 AUMs for deer, elk, and antelope. Potash development could result in the loss of 50 percent (13,507 acres of desert bighorn sheep habitat. The disposal of two 80-acre tracts along the Colorado River could cause loss of habitat for game and nongame species (including Bald Eagle). Placing the entire GRA under Oil and Gas System Category 1 would allow year-round oil and gas activities that could affect 200,769 acres of deer and elk winter range,</p>

TABLE S-3 (Continued)
Summary of Management Actions and Impacts

Continued

Alternative A No Action	Alternative B Production	Alternative C Limited Protection	Alternative D Protection
<p>the Rattlesnake area, and 68 percent of the Potash area is open to year-round oil and gas exploration and development activities.</p>	<p>Including calving and fawning areas. It could cause the loss of 25,168 acres of antelope habitat. Oil and gas activities could cause impacts on approximately 44,816 acres of desert bighorn sheep habitat.</p>	<p>game populations to remain stable. Limiting ORVs to existing roads and trails would reduce disturbance to wildlife. The exclusion and/or avoidance of establishing rights-of-way within 130,164 acres in resource conflict areas would protect 48,245 acres of bighorn sheep habitat. Oil and gas category stipulations would provide protection for 200,769 acres of deer and elk winter range; 25,431 acres of antelope habitat; 16,873 acres of bighorn habitat; and 3,840 acres of Golden eagle nest sites. Potash development could cause loss of 13,567 acres (50 percent) of bighorn sheep habitat.</p>	<p>(22,044 acres) will assure winter/spring forage for deer and elk. Limiting ORV use to existing roads and trails would reduce disturbance to wildlife. Exclusion and avoidance of 533,496 acres of bighorn sheep habitat and deer and elk winter range in establishing rights-of-way will protect those areas. Oil and gas category stipulations would provide protection for 200,769 acres of deer and elk habitat, 16,873 acres of bighorn sheep habitat, 25,431 acres of antelope habitat, and 3,840 acres of Golden eagle nest sites.</p>
<p>Mineral Resources-As a result of oil and gas activities under the oil and gas category system now being applied, 150 oil and gas wells are being drilled annually, with annual production of approximately 10,000,000 MCF of natural gas and 50,000 barrels of oil resulting.</p>	<p>Mineral Resources-As a result of oil and gas activities under the oil and gas category system application for this alternative, 155 oil and gas wells will be drilled annually, with annual production of approximately 10,000,000 MCF of natural gas and 50,000 barrels of oil resulting.</p>	<p>Mineral Resources-As the result of oil and gas activities under the oil and gas category system application for this alternative, 145 oil and gas wells would be drilled annually, with annual production of approximately 9,560,000 to 9,960,000 MCF of natural gas and 49,500 barrels of oil resulting.</p>	<p>Mineral Resources-As the result of oil and gas activities under the oil and gas category system application for this alternative, approximately 9,480,000 to 9,880,000 MCF of natural gas and 47,500 barrels of oil would be produced per year.</p>
<p>Salable mineral management has resulted in the annual removal of as much as 2.5 million tons of gravel per year. Also, humate production is estimated to become 50,000 tons annually after the project begins.</p>	<p>Salable minerals management would result in the annual removal of as much as 2.5 million tons of gravel per year. Humate production is estimated to become as much as 150,000 tons a year depending on the production and market situations after project begins.</p>	<p>Salable minerals management would result in the removal of the same amount of sand, gravel and humate material as that for Alternative A.</p>	<p>Salable minerals management would result in the removal of the same amount of sand, gravel and humate material as that for Alternatives A and C.</p>
<p>As a result of locatable minerals management, gold production could run as high as 600 ounces per year.</p>	<p>As a result of locatable minerals management, gold production could run as high as 600 ounces annually.</p>	<p>As a result of locatable minerals management, the same amount of gold and yellowcake would be produced.</p>	<p>As a result of locatable minerals management, the same amount of gold and yellowcake would be produced.</p>

TABLE S-3 (Continued)
Summary of Management Actions and Impacts

	duced as that for Alternatives A and C.	duced as that for Alternative A.	and uranium production could run as high as 1,000,000 pounds of yellowcake per year.	Mineral Rights-Under the existing management action the entire resource area is open to mining claims, with the exception of 1,850 acres withdrawn from mineral entry for protection of widely scattered campgrounds and scenic sites. About 200,000 mining claims exist in the resource area; of these about 500 are for placer gold and the balance are for uranium.	Mineral Rights-The entire resource area would be open to mining claims with the exception of 1,850 acres withdrawn from mineral entry for protection of campgrounds and scenic sites; 32,000 acres under new withdrawal orders for protection of scenic lands along the Colorado River. Under the new withdrawal existing mining claims would still be recognized but lands where abandoned could be restaked at any location in the resource area.	Mineral Rights-The entire resource area would be open to mining claims with the following exceptions: 1,850 acres under existing withdrawal orders for protection of campgrounds and scenic sites; 47,000 acres under new withdrawal orders for protection of scenic lands along the Colorado and Dolores rivers. Under this withdrawal, existing mining claims that were abandoned could not be restaked. There is no means of estimating any rate of abandonment under this alternative. A few uranium claims and virtually all of the 500 placer gold mining claims in the resource area would fall within the withdrawal area.	Transportation-A total of 596,234 acres would be limited to existing roads and trails. An additional 24,454 acres would be closed to ORVs. New road construction from oil and gas exploration would fall below the current 75 to 100 miles per year. The amount of acreage open to mining claims will decrease the number of new roads below the current level of 10 to 15 miles per year.

TABLE S-3 (Continued)
Summary of Management Actions and Impacts

Alternative A No Action	Alternative B Production	Alternative C Limited Protection	Alternative D Protection
<p>areas would return to the original VRM class over the long term.</p>	<p>classes; however affected areas would return to the original VRM class in the long-term.</p>	<p>classes; however affected areas would return to the original VRM class in the long-term.</p>	<p>classes; however affected areas would return to the original VRM class in the long-term.</p>
<p><u>Special Designation Areas-Wilderness</u> values would be lost due to not designating WSAs as wilderness on 219,480 acres. ORVs would cause some loss of scenic values on 219,480 acres. ORVs would cause some loss of scenic values on 635,894 acres of area, 150 miles stream and 50 miles of stream channel.</p>	<p><u>Special Designation Areas-Wilderness</u> values would be lost due to not designating WSAs as wilderness on 219,480 acres. ORVs would cause some loss of scenic values on 219,480 acres. ORVs would cause some loss of scenic values on 635,894 acres of area, 150 miles stream and 50 miles of stream channel.</p>	<p><u>Special Designation Areas-Wilderness</u> values would be protected by wilderness designation based on suitability recommendations for 89,455 acres. The designation of 635,894 acres as under restrictions for ORV use would provide protection for 22 areas identified as possessing exceptional scenic qualities, 65 miles of Wild and Scenic river study corridors and additional protection for wilderness values.</p>	<p><u>Special Designation Areas-The</u> designation of 219,480 acres (all WSAs) would protect their wilderness values. The designation of 635,894 acres as under restrictions for ORV use would provide protection for 22 areas identified as possessing exceptional scenic qualities, 65 miles of Wild and Scenic river corridors, 250 miles of stream channel, and additional protection for wilderness values.</p>
<p>Recreation-A long-term increase in recreational ORV use on the 70,000 acres now in use would occur.</p>	<p>The access easement would help preserve essential recreation values on the Colorado River.</p>	<p>The access easement would help preserve essential recreation values on the Colorado River.</p>	<p>The access easement would help preserve essential recreation values on the Colorado River.</p>
<p>Oil and gas activities permitted under the prevailing oil and gas category system application would cause the loss of some resource values on seven of the 22 areas identified as containing exceptional scenic recreational opportunities.</p>	<p>Recreation-A long-term increase in recreational ORV use on 70,000 acres now in use would occur.</p> <p>Oil and gas activities permitted under the prevailing oil and gas category system stipulations would cause the loss of some resource values on 22 areas identified as containing exceptional scenic recreational opportunities.</p>	<p>Recreation-Restrictions on ORV use will decrease recreational ORV opportunities.</p> <p>Oil and gas activities permitted under the oil and gas category stipulations for this alternative will protect resource values in the 22 areas identified as containing exceptional scenic recreational opportunities.</p>	<p>Recreation-Restrictions on ORV use will decrease recreational ORV opportunities.</p> <p>Oil and gas activities permitted under the oil and gas category stipulations for this alternative will protect resource values in the 22 areas identified as containing exceptional scenic recreational opportunities.</p>
<p>Maintenance of existing recreational improvements will protect recreational values and dollar in-</p>	<p>Maintenance of existing recreational improvements will protect recreational values and dollar in-</p>	<p>Maintenance of existing recreational improvements will protect recreational values and dollar in-</p>	<p>Maintenance of existing recreational improvements will protect recreational values and dollar in-</p>

TABLE S-3 (Continued)

Summary of Management Actions and Impacts

vestments. Protection of Wild and Scenic river study corridors will ensure that their essential recreational values are not diminished.	vestments. Protection of Wild and Scenic river study corridors will ensure that their essential recreational values are diminished.	vestments. Protection of Wild and Scenic river study corridors will ensure that their essential recreational values are not diminished.	vestments. Protection of Wild and Scenic river study corridors will ensure that their essential recreational values are diminished.
The access easement to the Colorado River will help protect essential recreational opportunities.	The access easement to the Colorado River will help protect essential recreational opportunities.	The access easement to the Colorado River will help protect essential recreational opportunities.	The access easement to the Colorado River will help protect essential recreational opportunities.
Construction of rest rooms at heavily used sites along the Colorado River will improve river recreational opportunities. Prescribed fire will improve recreational hunting opportunities.	Construction of rest rooms at heavily used sites along the Colorado River will improve river recreational opportunities. Prescribed fire will improve recreational hunting opportunities.	Construction of rest rooms at heavily used sites along the Colorado River will improve river recreational opportunities. Prescribed fire will improve recreational hunting opportunities.	Construction of rest rooms at heavily used sites along the Colorado River will improve river recreational opportunities. Prescribed fire will improve recreational hunting opportunities.
Acquiring scenic easements on 9,990 acres of private land along 80 miles of the Colorado and Dolores rivers would protect scenic recreational qualities there.	Acquiring scenic easements on 9,990 acres of private land along 80 miles of the Colorado and Dolores rivers would protect scenic recreational qualities there.	Acquiring scenic easements on 9,990 acres of private land along 80 miles of the Colorado and Dolores rivers would protect scenic recreational qualities there.	Acquiring scenic easements on 9,990 acres of private land along 80 miles of the Colorado and Dolores rivers would protect scenic recreational qualities there.
<u>Economic Conditions-The reductions from active preference could decrease ranch values by as much as 6 percent. The prices commercial outfitters could charge for their services could be affected in some recreation areas, and commercial use of one area could be discontinued.</u>	<u>Economic Conditions-Twenty-nine of 45 livestock operators would have more available forage. If this forage was grazed, their returns above cash cost would increase by \$162,832 (+8 percent) which should increase their ranch values. However, reduction from active preference could reduce ranch values by as much as 4 percent. Increased production from ranchers residing in the FIS area would increase regional income by \$168,320 (+0.3 percent) and eight jobs (+0.2 percent). Land sales near Moab, Spanish Valley and Castle Valley could have a depressing effect on nearby private land market prices; however, all land sales would increase county revenues. Increased oil and gas</u>	<u>Economic Conditions-Watershed actions that could have quantifiable effects on water yield and salt loading would decrease the annual cost borne by water users in the Lower Colorado River Basin by \$535,000 to \$170,000 and result in a \$55,000 loss of value from decreased water yield. Two of the 45 livestock operators would have less available forage; 24 of the 45 would have more available forage; and 12 of the 45 would receive major exclusions during the spring. Aggregate returns above cash costs would increase by \$33,573 (+1 percent) which should also increase ranch values. However, the reductions from active preference could reduce ranch values by as much as 5 percent. Greater wildlife popula-</u>	<u>Economic Conditions-Watershed actions that could have quantifiable effects on water yield, salt loading, and sedimentation would decrease the annual cost borne by water users in the Lower Colorado River Basin by \$920,000 to \$1,220,000 and result in a \$130,000 loss of value from decreased water yield. Ten of the 45 livestock operators would have less available forage; 18 of the 45 would have more available forage; and 38 of the 45 would receive major exclusions during the spring. Aggregate returns above cash costs would decrease by \$61,000 (-3 percent), which should also decrease ranch values. Reductions from active preference could reduce ranch values by as much as 6</u>

TABLE S-3 (Continued)

Summary of Management Actions and Impacts

Alternative A No Action	Alternative B Production	Alternative C Limited Protection	Alternative D Protection
<p>drilling and production would eventually result in five to ten added local jobs (+0.1 to +0.2 percent) and \$85,000 to \$170,000 local income. Local units of government would receive increased property tax revenues and indirectly receive increased revenues from increased royalty payments to the State. There may be an unquantifiable reduced increase in tourist visitation and expenditures. The price outfitters charge for their services could be affected in some areas, and existing commercial use in other areas could be discontinued.</p>	<p>tions would increase hunter success rates and result in greater hunter pressure, local expenditures, and an added \$190,000 of local income and seven local jobs. Land sales near Castle Valley, Moab, and Spanish Valley would have a depressing effect on nearby private land market prices. Decreased oil and gas drilling and production would eventually result in two to five fewer local jobs (-0.1 percent) and less local government revenues from reduced royalty payments to the State. Future gold production and associated employment and income would also be impacted. Primitive nonmotorized recreation use and related local expenditures could be higher than would otherwise be the case. Existing commercial use of recreation areas would be preserved and the potential for commercial use of other areas would increase.</p>	<p>percent. Greater wildlife populations would increase hunter success rates and result in greater hunter pressure, local expenditures, and an added \$190,000 of local income and seven local jobs. Land sales near Castle Valley would have a depressing effect on nearby private land market prices. Decreased oil, gas, and uranium activities would eventually result in 65 fewer local jobs (-1.5 percent), less local government revenue from reduced property taxes and indirectly from reduced royalty payments to the State. Future gold production and associated employment and income would also be impacted. Primitive nonmotorized recreation use and related local expenditures could be higher than would otherwise be the case. Existing commercial use of recreational areas and the potential for commercial use of other areas would increase.</p>	<p><u>Social Conditions</u>-There would be little or no change from the existing environment. Under this alternative, changes in attitudes toward BLM would be affected only by outside factors and the way management actions are implemented.</p>
<p><u>Social Conditions</u>-Local groups and communities would not be affected to such a degree as to noticeably affect their existing social environment. In general local attitudes toward BLM would improve because restrictions would be reduced and greater local resource use and development would be allowed. These attitudes would</p>	<p><u>Social Conditions</u>-None of the management actions would impact the local groups or communities to such a degree as to affect their existing social environment. However, this alternative would probably be perceived by most residents as having a significant negative impact upon the local community.</p>	<p><u>Social Conditions</u>-The social well-being of nine of the 45 livestock operators would be significantly affected. Local attitudes toward BLM would worsen because restrictions would be increased, less local resource use and development would be allowed, and this alternative would be perceived to have a significant negative im-</p>	<p><u>Social Conditions</u>-The social well-being of nine of the 45 livestock operators would be significantly affected. Local attitudes toward BLM would worsen because restrictions would be increased, less local resource use and development would be allowed, and this alternative would be perceived to have a significant negative im-</p>

TABLE S-3 (Continued)
Summary of Management Actions and Impacts

vary, however, by those individuals and groups who would gain and those who would lose under this alternative.

pact on the local economy. These attitudes would vary, however, by those individuals and groups who would gain and those who would lose under this alternative.

TABLE S-3 (Concluded)
Summary of Management Actions and Impacts

THE PREFERRED ALTERNATIVE

Alternative C, Limited Protection, is the agency's preferred alternative for all planning issues. It is also the proposed action for all issues except Livestock Requirements, for which Alternative A, No Action, is the proposed action. The 5-year monitoring period will allow determination of grazing capacity to be based upon evaluation of ongoing studies of actual use, utilization, trend, and climate.

Selection of the preferred alternative and proposed action were based on (1) the planning criteria, (2) the environmental consequences, and (3) policy directions specified for the grazing portion of the document.

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INTRODUCTION

PURPOSE OF AND NEED FOR ACTION

Under the authority of Section 202(f) of the Federal Land Policy and Management Act (FLPMA) and Section 202(c) of the National Environmental Policy Act (NEPA), a process was initiated for the development, approval, maintenance, and amendment of resource management plans (RMPs) and their associated environmental impact statements (EISs). The process is guided by Bureau of Land Management (BLM) planning regulations found in Title 43 of the Code of Federal Regulations, Subpart 1600 (43 CFR 1600) and Council on Environmental Quality regulations found in 40 CFR 1500.

The Moab District, Grand Resource Area (GRA) RMP/EIS, prepared in compliance with these laws and regulations, will be presented in two volumes, the Draft RMP/EIS, which will be sent out for public review in March of 1983, and the Final RMP/EIS, which will include analysis of comments on the draft and all necessary changes. Both volumes will be filed with the Environmental Protection Agency.

This RMP and its EIS, which assesses the environmental consequences of the management actions described in the alternatives, have been integrated into one document. Although integrated, both the RMP and the EIS are clearly distinguishable.

The Grand RMP/EIS is being completed at this time for two reasons:

- (1) The existing management framework plan (MFP) is outdated and in need of revision. Preparation of the RMP has been determined preferable to amendment of the MFP.
- (2) The GRA was scheduled to complete a court mandated grazing EIS, and it was decided that this would be more appropriately made a part of an RMP than done separately.

Because of the considerations and timing involved, the District was instructed to complete an RMP that could serve as a pilot project. Since it is a pilot RMP, the methodology used has not previously been tried.

OBJECTIVES

The Grand RMP has several objectives. It is designed to guide and control future management actions and the subsequent development of activity plans, as required by the Bureau planning issues with a related set of management problems and, at the same time, provide a framework for further planning. The EIS portion analyzes the impacts imposed by the management actions identified in the plan.

In addition, the RMP process stimulates participation by the public and agencies of the Federal, State, and local governments. It also makes use of the best available data and analyses of alternatives. All of this will improve the basis for resource management decisions for public lands in the GRA.

An ancillary but important objective of this particular RMP is that of serving as one of the six pilot projects that will help provide guidance for future RMPs.

LOCATION AND SIZE

The GRA (Figure I-1), which is part of Utah's Moab District, comprises BLM administered lands in Grand County and the northeastern tip of San Juan County in southeast Utah. The planning area is bordered on the north by the Vernal District, on the south by the San Juan Resource Area, on the east by the Utah-Colorado state line, and on the west by the Green River.

The boundaries of the GRA contain 2,454,891 acres, of which 1,852,885 acres are public land. Of this 1,739,973 acres are administered by GRA. Also administered by the GRA are 40,653 acres that lie outside the boundaries, in Colorado. This area is part of BLM's Grand Junction, Colorado District, and the grazing is administered by the GRA under an interdistrict agreement. BLM's Grand Junction District and the Forest Service of the U.S. Department of Agriculture (USFS) administers grazing on a total of 79,581 acres within the GRA. The Vernal District administers all resources on 33,331 acres in the GRA. Table I-1 summarizes land ownership and public land administration in the GRA. Refer to the pocket map at the back of this volume for complete land ownership information.

TABLE I-1

Land Ownership and Public Land Administration
in the Grand Resource Area

<u>Acres of Public Land in the GRA</u>	<u>Utah</u>	<u>Colorado</u>
Administered by GRA in grazing allotments	1,711,529	40,653
Administered by GRA but not within an allotment	28,444	
^a Administered by Vernal BLM	33,331	
^b Grazing administered by Grand Junction BLM	76,613	
Grazing administered by USFS	2,968	
<u>Acres of State Land in the GRA</u>	432,519	
<u>Acres of Private Land in the GRA</u>	169,487	

^a Will be included in an RMP/EIS being developed by BLM's Vernal District.

^b A Livestock Grazing EIS was completed on this area by BLM's Grand Junction District in 1979.

THE PLANNING PROCESS

Before the actual process work on this document was begun, a preplanning analysis was completed, which resulted in initial identification of planning issues and criteria, and also in the preparation of an action plan.

Based on the action plan and other guidance, the process documents were prepared. These are the management situation analysis (MSA) and the RMP/EIS. This entire process is explained in detail in the introduction to Chapter 1.

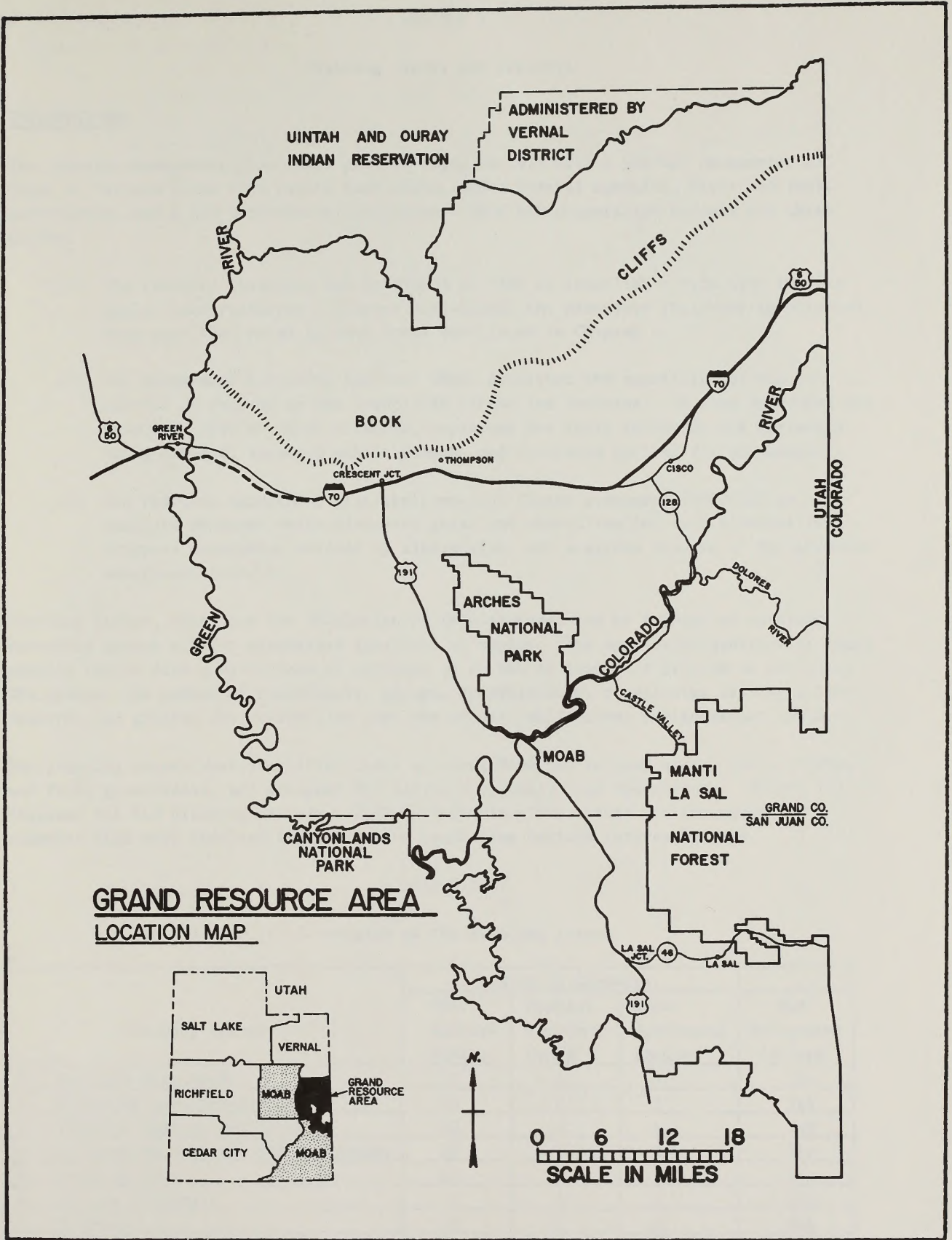


FIGURE I-1

Grand Resource Area General Location Map

CHAPTER 1

Planning Issues and Criteria

INTRODUCTION

The resource management plan (RMP) process began in 1979 with a gradual procession of input at various times from public land users, other Federal agencies, State and local governments, and a BLM interdisciplinary team. This RMP preparation process had three phases:

- (1) The resource inventory was initiated in 1980 to establish a data base for the public land resources. Chapter 3 discusses the resources that were inventoried. Data gaps that exist in some areas are listed in Chapter 4.
- (2) The management situation analysis (MSA) described the capability of the resources to respond to the identified issues and concerns. It also described the resources that would be affected, explained how those resources are currently being managed, assessed public demand, and discussed options for management.
- (3) The resource management plan/environmental impact statement (RMP/EIS) is an analysis document which discusses goals and objectives for each alternative, proposes management actions by alternative, and analyzes impacts of the proposed management actions.

Planning issues, which are the foundation of this process, can be defined as concerns centering around similar unresolved questions or topics. The unresolved question or topic usually begins with a difference of opinions as to how to resolve a problem or conflict. The greater the number of individuals, groups, organizations, or agencies sharing a like concern, the greater the possibility that the concern will become a significant issue.

Ten planning issues were identified based on input from public land users, city, county, and State governments, and assigned BLM interdisciplinary team specialists. Figure 1-1 diagrams the BLM planning process. Table 1-1 displays the issues and the number of comments that were received regarding each issue from various interest groups.

TABLE 1-1

Origins of the Planning Issues

Planning Issues	Number of Comments			BLM Management Concern
	The General Public	Special Interest Group	Other Government Agency	
1. Critical Watersheds	17	4	3	Yes
2. Livestock Requirements	23	8	3	Yes
3. Wildlife Habitat Requirements	23	6	4	Yes
4. Off-Road Vehicle Use and Management	20	3	2	Yes
5. Lands Actions	12	3	2	Yes
6. Utility Corridors	4	5	1	Yes
7. Minerals	20	22	2	Yes
8. Recreation	16	4	3	Yes
9. Fire Management	13	4	4	Yes
10. Wilderness	8	9	2	Yes

BLM PLANNING PROCESS

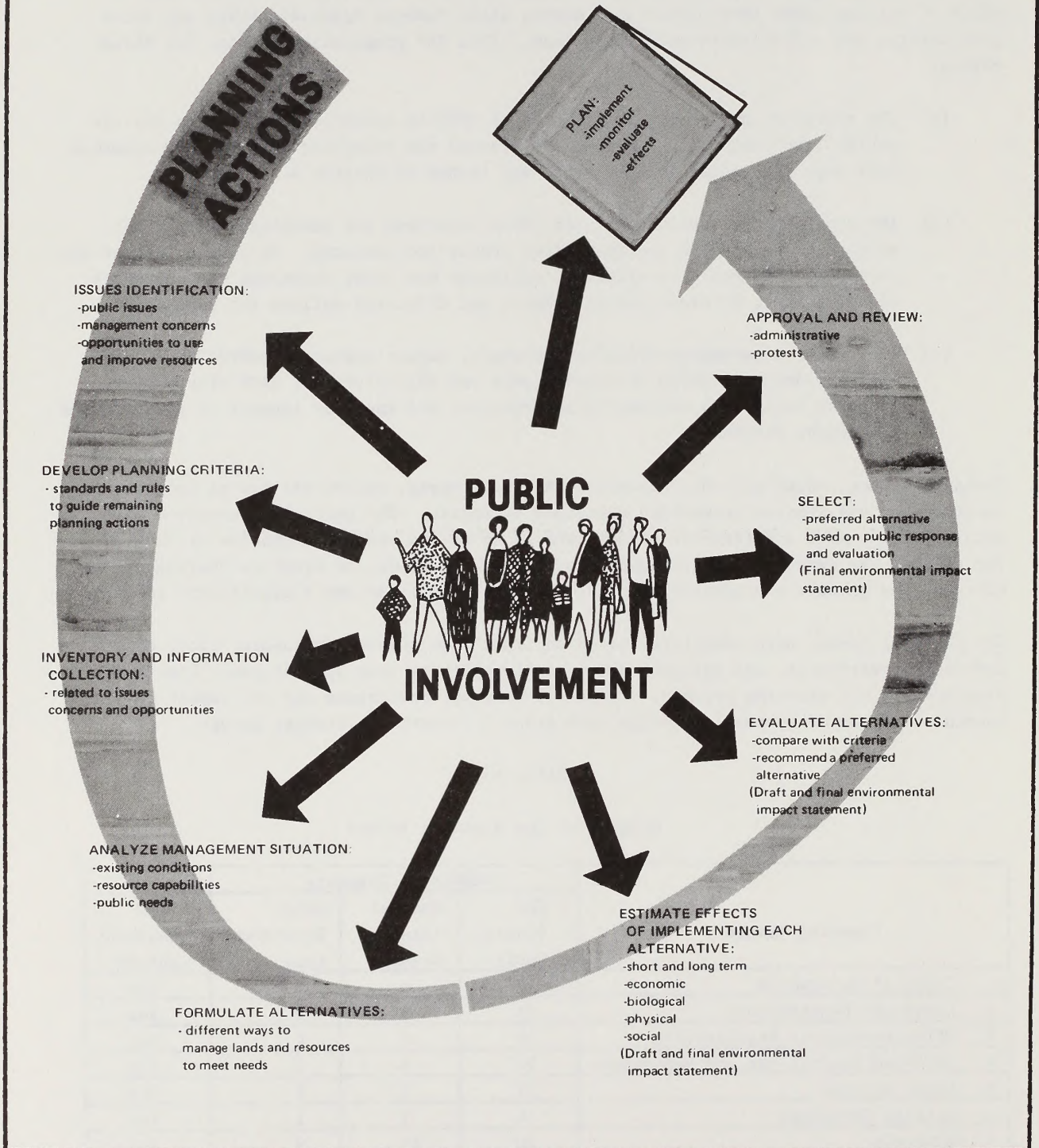


FIGURE 1-1

The Bureau of Land Management's Planning Process

According to the criteria used to identify the planning issues contained in this document, an issue must:

- (1) be capable of being outlined on a map;
- (2) be of considerable concern, either to the public, to another agency, or to BLM management;
- (3) not be capable of being resolved administratively; and
- (4) not require resolution before completion of the RMP.

The Livestock Requirements and Wilderness issues were mandated to be covered in this document.

The planning criteria guided decision making in data collection and the formulation of the alternatives, and were also used in the impact analysis process. Specific purposes of the planning criteria were:

- (1) to guide the development, revision, and amendment of RMPs;
- (2) to identify the management decisions needed;
- (3) to guide the collection and use of inventory data and information needed for analysis and to make decisions for managing public land resources and resolving issues;
- (4) to reduce or eliminate the collection of information not related to the issues;
- (5) to help establish subunits for data collection and analysis based on the issues, management problems and situations, capabilities, and characteristics of the resource area;
- (6) to identify the questions to be addressed in the MSA;
- (7) to guide the design and formulation of alternatives in the RMP; and
- (8) to help in estimating the effects of the alternatives and in selecting the preferred alternative and proposed action.

Issues to be resolved through the RMP process were identified throughout the planning process and were utilized to develop feasible alternatives, which will lead to management decisions and serve as a guide to future management. The ten issues are described in this chapter, and each issue is shown on a map.

CHANGES IN THE PLANNING CRITERIA

Changes in the planning criteria for the Livestock Requirements issue included recognition of the need to consider livestock manipulation techniques and new land treatments. Capability of the soil and vegetation to respond to the treatment or development was dropped from the list of planning criteria because this consideration was encompassed by other criteria for the issue.

The need for access and scenic easements surfaced during development of the plan and were added to the planning criteria for the Lands Actions issue.

The criteria for BLM's newly initiated Asset Management Program, which requires classification of lands for retention, disposal, or further study, were incorporated into the planning criteria for the Lands Actions issue.

In the planning criteria for the Wilderness issue, two changes were required:

- Criterion No. 3 incorporated the Lost Spring Canyon WSA (UT-060-131B) as an example of a WSA that was contiguous to a proposed WSA of another agency. This WSA was dropped from consideration by action of the Secretary of the Interior on December 30, 1982 and was therefore deleted from the planning criteria.
- Criterion No. 4 was merely an explanation of the relationship between the wilderness review process and the Interior Board of Land Appeals (IBLA) appeal process. It stated that the review of WSAs involved in wilderness inventory units that are under appeal to IBLA would continue, but no final decision on wilderness recommendations could be made until the appeals were resolved. This explanation was not relevant to the RMP process for the Wilderness issue, since final decisions regarding wilderness suitability will not be made in the RMP. Final suitability recommendations will be made after the Utah statewide wilderness EIS, and the final decisions will be made by Congress.

CRITICAL WATERSHEDS

Two significant concerns associated with critical watersheds have been identified in the Grand Resource Area (GRA). They are (1) sedimentation and salinity from public lands in the Upper Colorado River Basin; and (2) disturbance and degradation of critical watersheds, including floodplains. Saline-alkali soils are shown in Figure 1-2, and critical erosion areas are shown in Figure 1-3. Floodplains, salinity point sources, and major washes are shown in Figure 1-4.

PLANNING CRITERIA

Critical watersheds on public lands are primary sources of sedimentation and salinity in the Colorado River. These lands are also more susceptible to surface disturbing activities than are other watersheds. For these reasons, the protection of watershed values on these lands must be a primary consideration of the management planning and decision process.

Objectives that must guide the management planning and decision process on critical watershed areas are:

- surface disturbance must be kept to a minimum;
- development on floodplains must be avoided wherever there is a practical alternative;
- the beneficial functions of degraded floodplains must be restored; and
- the cost and effectiveness of various management actions in reducing the degradation must be considered.

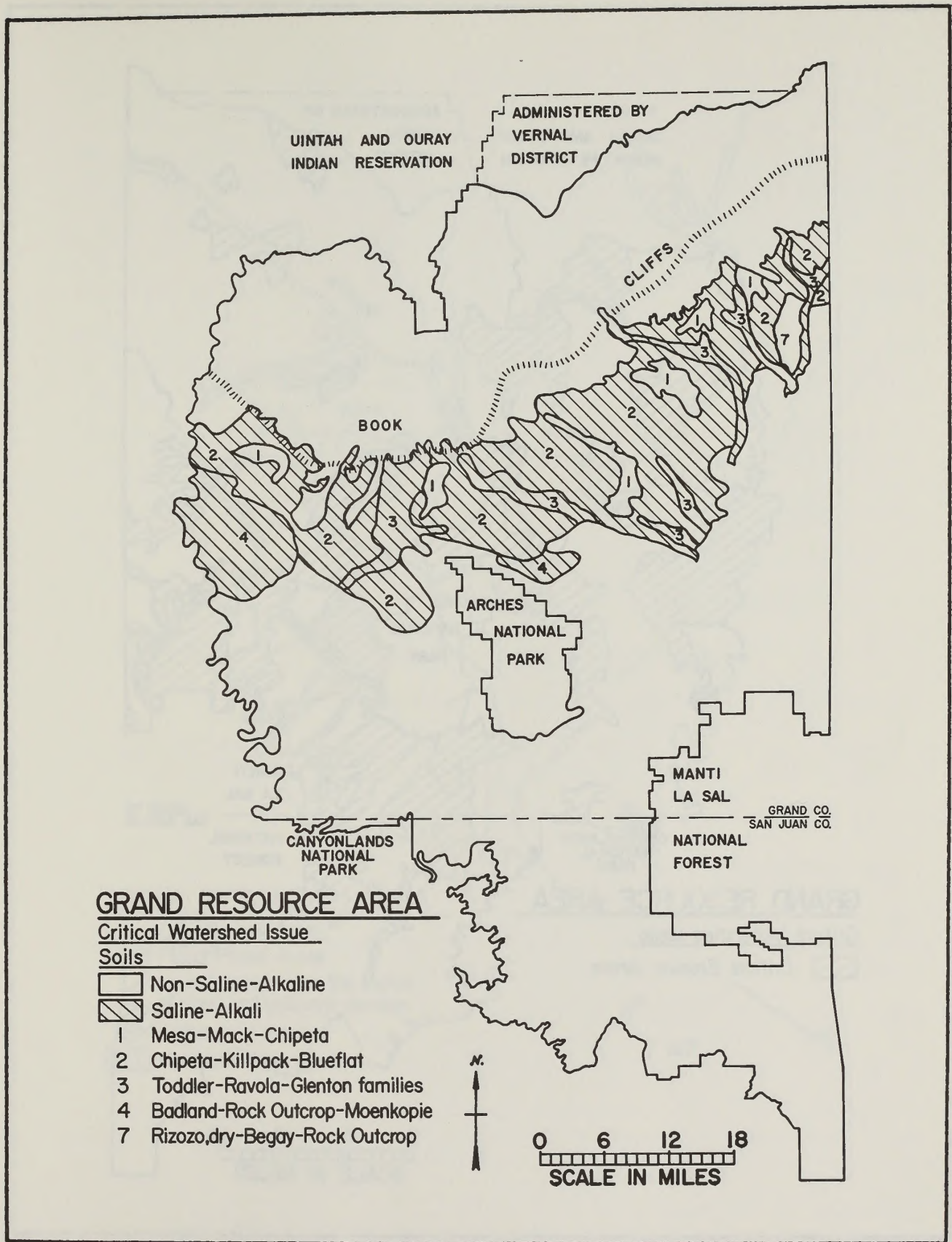


FIGURE 1-2

Nonsaline and Saline-Alkali Soils

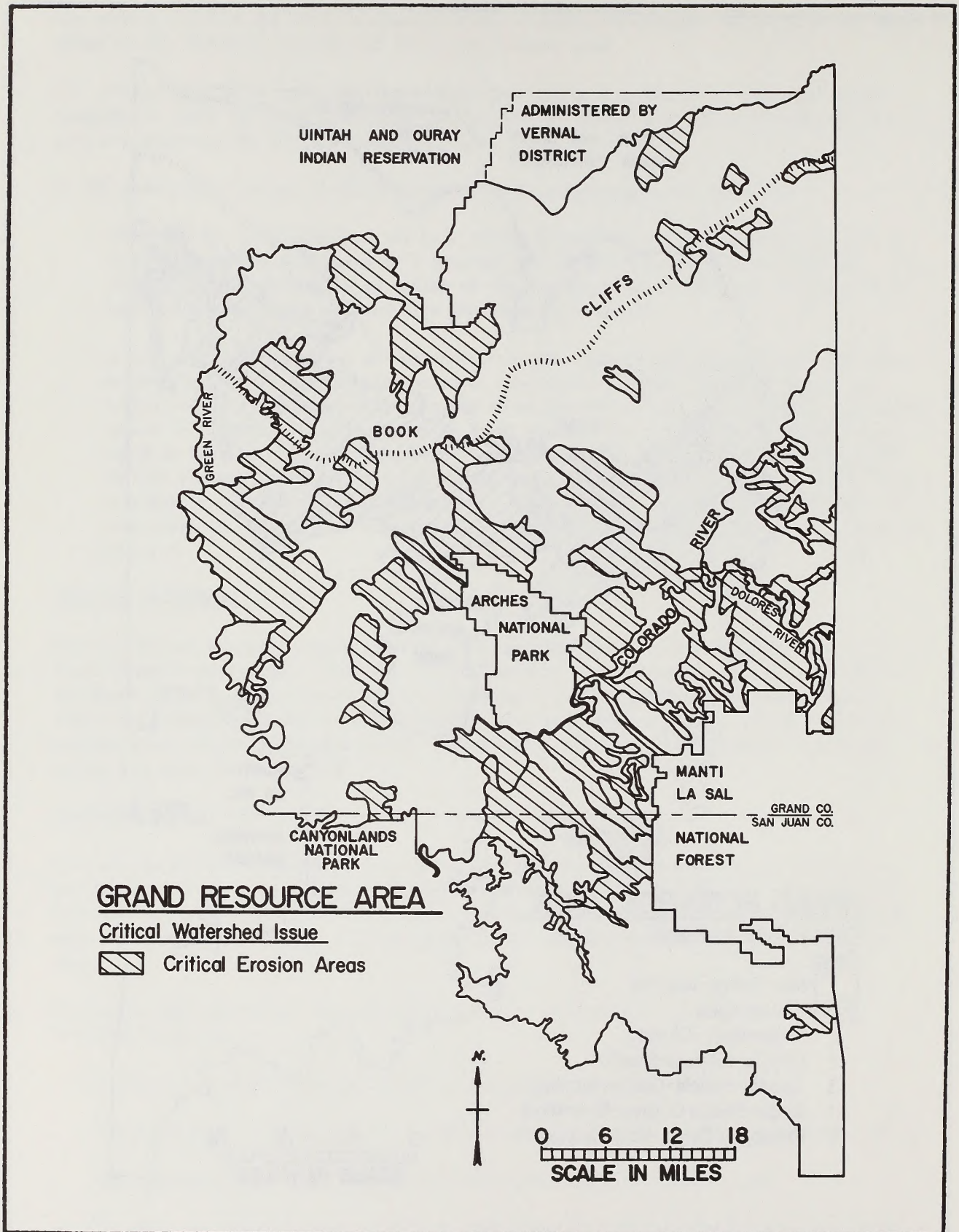


FIGURE 1-3

Critical Erosion Areas

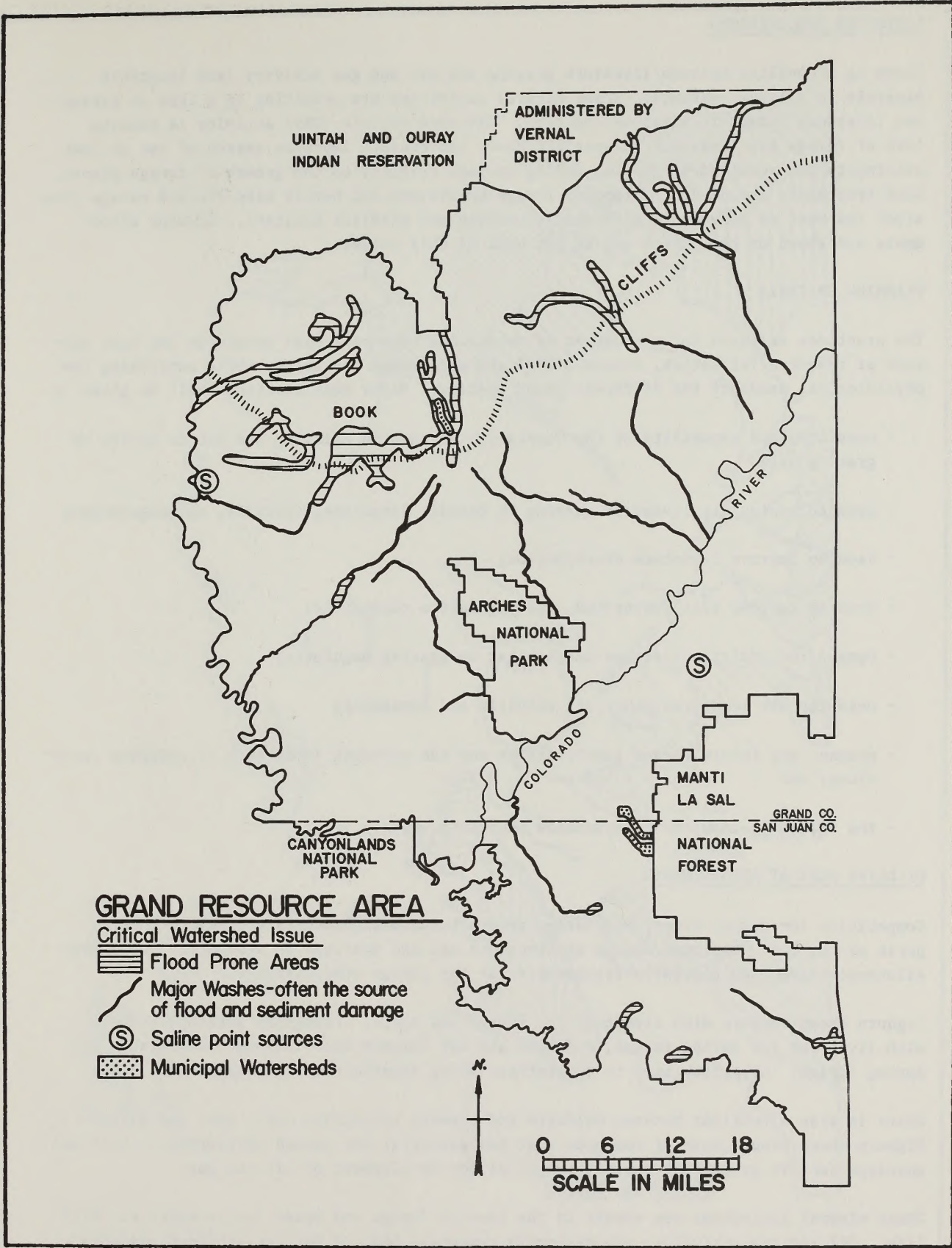


FIGURE 1-4

Floodplains, Salinity Point Sources, and Major Washes

LIVESTOCK REQUIREMENTS

There is a conflict between livestock grazing and oil and gas activity (and locatable minerals to a lesser extent). These mineral activities are resulting in a loss of forage for livestock (domestic sheep and cattle). Off-road vehicle (ORV) activity is causing loss of forage for livestock in specific heavy use areas. Improper season of use on some allotments has resulted in grazing during periods critical to the growth of forage plants. Land treatments are needed to improve forage conditions and better disperse and manage livestock (as well as to enhance watershed condition and wildlife habitat). Grazing allotments are shown on the pocket map at the back of this volume.

PLANNING CRITERIA

The practices selected for management of vegetation resources must result in the best balance of resource (livestock, mineral, ORV) use and forage production while satisfying the physiological needs of the different plant species. Major consideration shall be given to:

- condition and capability of the vegetation to sustain existing and future levels of grazing use;
- need to manipulate livestock grazing to benefit livestock, wildlife, and vegetation;
- need to improve livestock distribution;
- need to improve soil, watershed, and vegetation conditions;
- demand for additional forage and habitat by grazing ungulates;
- need for new land treatments for wildlife and livestock;
- present and future demand for livestock and the economic importance of ranching operations; and
- the livestock industry's dependence on public lands.

WILDLIFE HABITAT REQUIREMENTS

Competition for space, water, and forage occurs between livestock and wildlife in some parts of the GRA. Improper season of livestock use and overlaps in season of use on some allotments have been partially responsible for the forage competition.

Bighorn sheep compete with livestock for forage and space. Pronghorn antelope compete with livestock for spring forage, and deer and elk compete with livestock for winter and spring forage. Livestock tend to concentrate along aquatic and riparian habitat areas.

There is also a conflict between wildlife and mineral activities (oil, gas, and potash). Bighorn sheep occupy much of the area that has potential for potash development. Deer and antelope inhabit areas that exhibit potential for development of oil and gas.

These mineral activities can result in the loss of forage and space requirements for wildlife. Oil and gas activities are presently causing a loss of habitat for deer and antelope. Recreational activities, such as ORV travel in portions of the GRA, may also be conflicting with wildlife. Wildlife issue areas are shown in Figure 1-5.

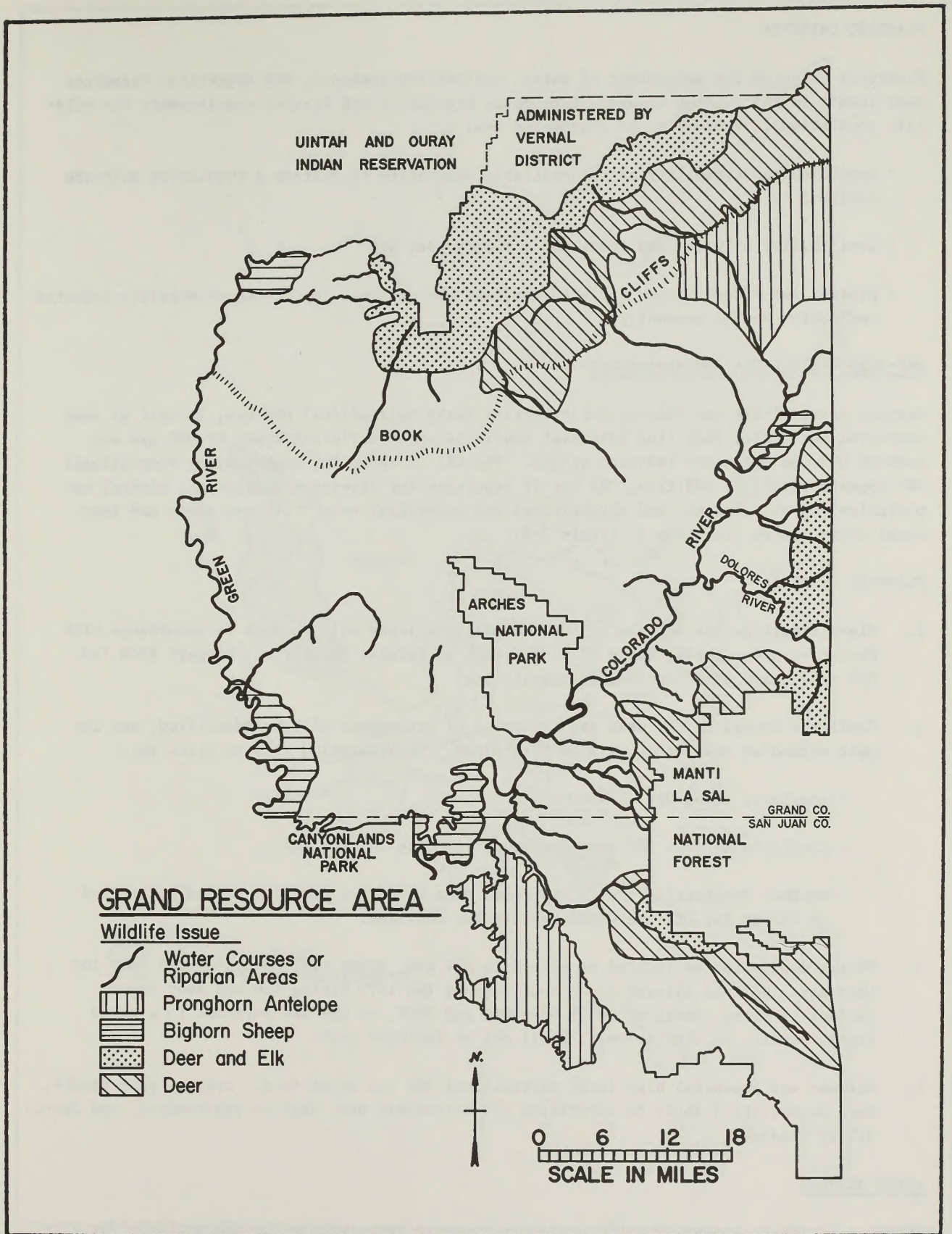


FIGURE 1-5

Wildlife Habitat Issue Areas

PLANNING CRITERIA

Practices selected for management of water, spatial requirements, and vegetation resources must result in the optimum balance of resource protection and habitat requirements for wild-life populations. Factors to be considered are:

- condition and capability of the available vegetation to sustain a productive wildlife habitat;
- availability of water and space for wildlife use; and
- present and future demand for wildlife, and the economic importance of wildlife oriented recreation to the community.

OFF-ROAD VEHICLE USE AND MANAGEMENT

Certain areas within the GRA currently receive heavy recreational ORV use, as well as some nonrecreational use, resulting potential conflicts among different types of ORV use and between ORV use and other resource values. The GRA is known for high quality recreational ORV opportunities; in addition, ORV use is important for livestock management, mineral exploration and development, and agricultural and commercial uses. ORV use areas and four-wheel drive routes are shown in Figure 1-6.

PLANNING CRITERIA

1. Classifications for ORV use on BLM administered lands will be made in accordance with Executive Order 11644, Title 43 of the Code of Federal Regulations Subpart 8340 (43 CFR 8340), and other applicable regulations.
2. Conflicts caused by ORV uses and the areas of occurrence will be identified, and the best method of resolution will be determined. Consideration will be given to:
 - conflicts among ORV uses;
 - conflicts between ORV uses and other resource values; and
 - whether designating the geographical area where the conflict occurs as limited or closed for ORV use would resolve the conflict.
3. Unless designated as limited or closed to ORV use, areas will be designated open for this use. ORV use allowed under such laws as the 1872 Mining Law and such regulations as those contained in 43 CFR 3802 and 3809, or ORV use pursuant to a valid lease, permit, or right-of-way, shall not be impinged upon.
4. Current and potential high level recreational ORV use areas (e.g., trails, race tracks, dune areas, etc.) shall be identified via historical use, visitor preferences, and feasibility studies.

LANDS ACTIONS

There are current requests for BLM to identify public lands within the GRA suitable for disposal. There is also a need to guarantee continued public access for whitewater rafting and to protect scenic qualities near the Colorado and Dolores Rivers. Figure 1-7 shows

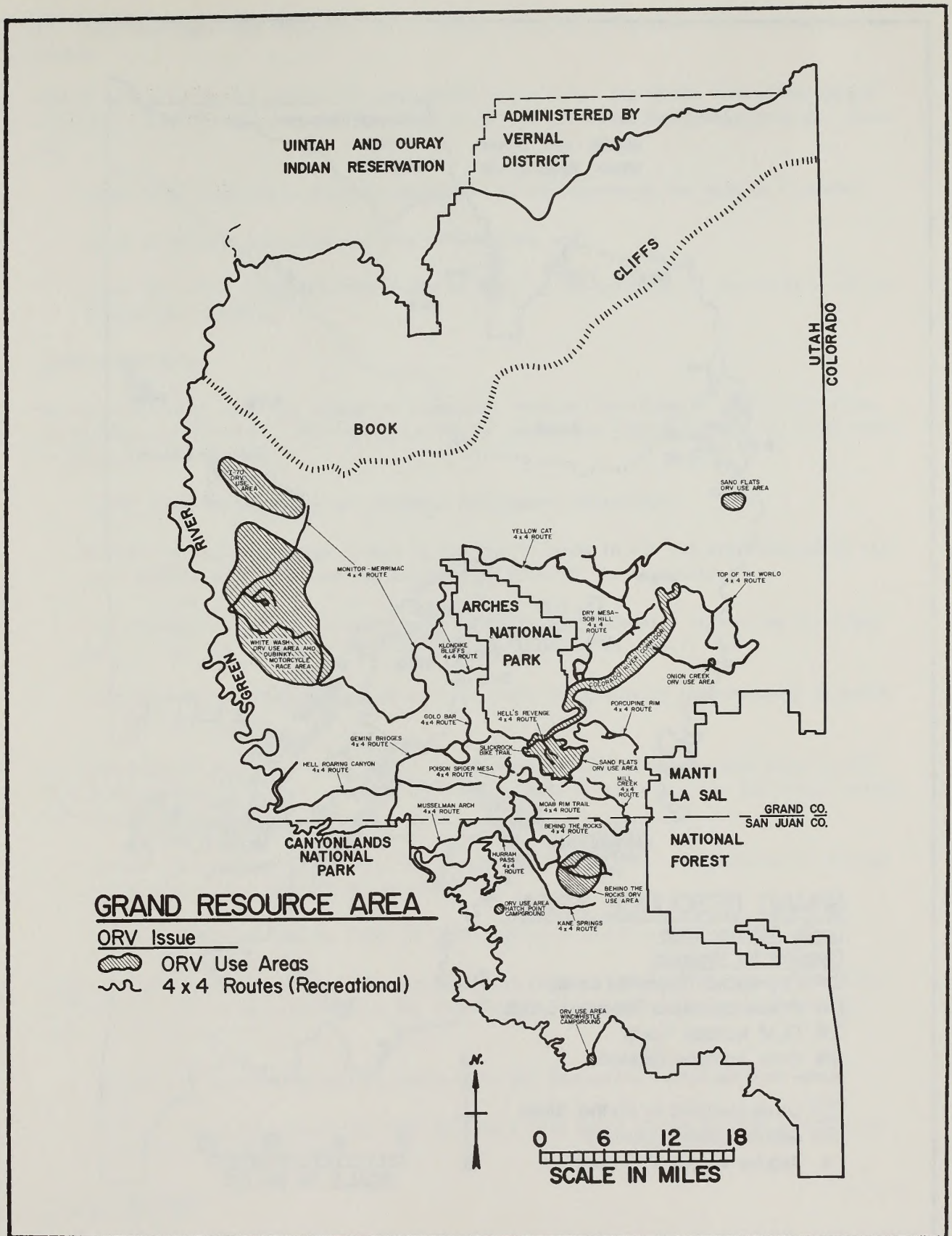


FIGURE 1-6

Off-Road Vehicle Use Areas and Four-Wheel Drive Routes

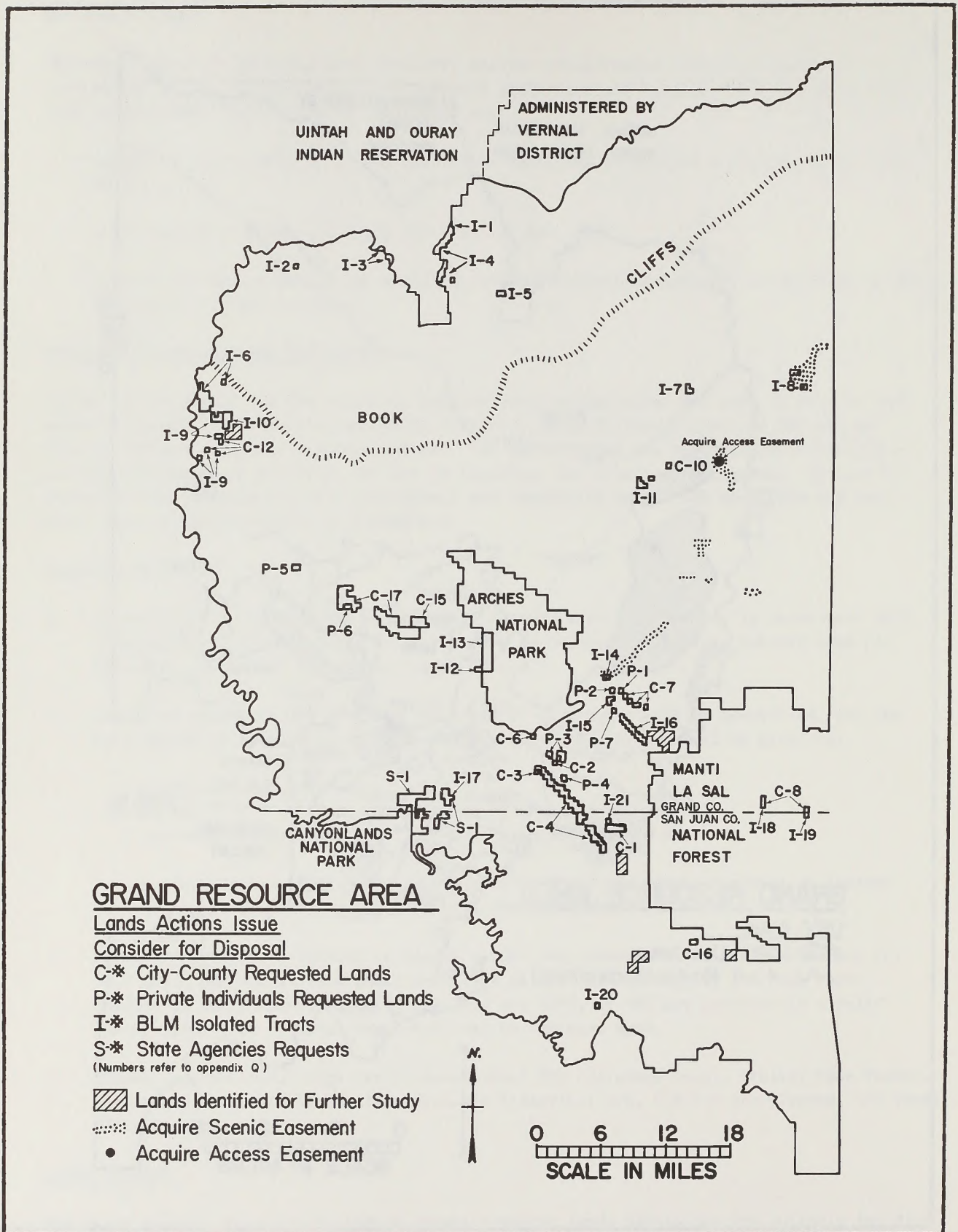


FIGURE 1-7

Lands Actions Issue Areas

the lands that have been requested for disposal, along with the areas where easements are needed.

BLM is currently in the process of identifying public lands for future management considerations. Three categories were developed as part of the Asset Management Program. These are:

- lands to be retained in Federal ownership and not considered for sale or transfer;
- lands to be made available for sale or transfer; and
- lands that will require further study in order to determine their suitability for retention or transfer.

PLANNING CRITERIA

The designation of lands for community expansion, economic development, and other public and private use via sales, exchanges, recreation and public purpose leases, or other forms of disposal shall consider:

- local community expansion and economic development objectives;
- whether the physical capabilities of the public lands in the GRA are adequate to support actions needed to meet the stated objectives of the community;
- the consequences of BLM actions needed to assist the community in meeting its objectives (e.g., socioeconomic impacts, impacts on resources, etc.); and
- the potential of other public and private lands for assisting the community in meeting its objectives.

In determining which public lands should be retained by BLM and which lands require further study to determine their suitability for retention or transfer, the following factors will be considered:

- whether the lands are being actively managed by BLM and are of importance to current or future resource management programs; and
- the location of the public lands in relationship to local communities.

Efforts to guarantee access to river use areas and to protect the scenic qualities along the Colorado and Dolores rivers from any developments that might take place on private lands shall consider:

- meeting the resource objectives outlined in the Recreation issue; and
- whether other public lands can meet the goals that would be met through easement acquisition or other actions.

UTILITY CORRIDORS

Increased energy developments within the GRA and the Western States present great demands

for rights-of-way to accommodate roads, pipelines, and utility lines. Also passing through the area are many long-distance rights-of-way for transportation, power and communication lines, and energy pipelines (see Figure 1-8). Because of the topography in some areas, existing and proposed easements are creating congestion. The opportunity exists for formal designation of utility corridors under the authority of Section 503 of the Federal Land Policy and Management Act of 1976 (FLPMA). Such designation could serve to minimize width requirements for rights-of-way and maximize multiple occupancy.

PLANNING CRITERIA

Selection of lands for formal designation as utility and transportation corridors will be based on:

- present and potential demand for various kinds of rights-of-way;
- compatibility of various kinds of rights-of-way;
- environmental impacts on natural resources, including soil, air, water, fish, wildlife, and vegetation and on cultural and visual resources;
- economic efficiency of placing a right-of-way within a corridor, considering cost of construction, operation, and maintenance, as well as cost of modifying or relocating existing facilities into a proposed corridor;
- social and economic impacts of such facilities on public land users, adjacent land owners, and other individuals or groups, including health and safety hazards imposed by the designation and use of utility corridors; and
- possibility of designing corridors that would reduce proliferation of rights-of-way.

Selection of those lands that will be considered unsuitable for utility corridors (Figure 1-9) will be based on:

- legal exclusion areas such as WSAs, where new facility development that would degrade existing wilderness values is prohibited; and
- areas where facility development would conflict with critical resource values or current management programs, such as critical wildlife areas, scenic areas, or WSAs.

MINERALS

Development of locatable (uranium and placer gold), leasable (oil, gas, and potash) and salable (sand, gravel, and humates) minerals is necessary to meet National, regional and local demand and to provide increased employment and an expanded tax base for local communities. The Federal Mining and Minerals Policy Act of 1970 declared that the Federal Government shall foster and encourage mineral development. However, in some areas, mineral activity and associated road building are causing destruction of vegetation, loss of forage, decreased wildlife habitat, increased erosion, and damage to watersheds (i.e., increased sedimentation).

Minerals are categorized according to the laws that govern their means of disposal. The

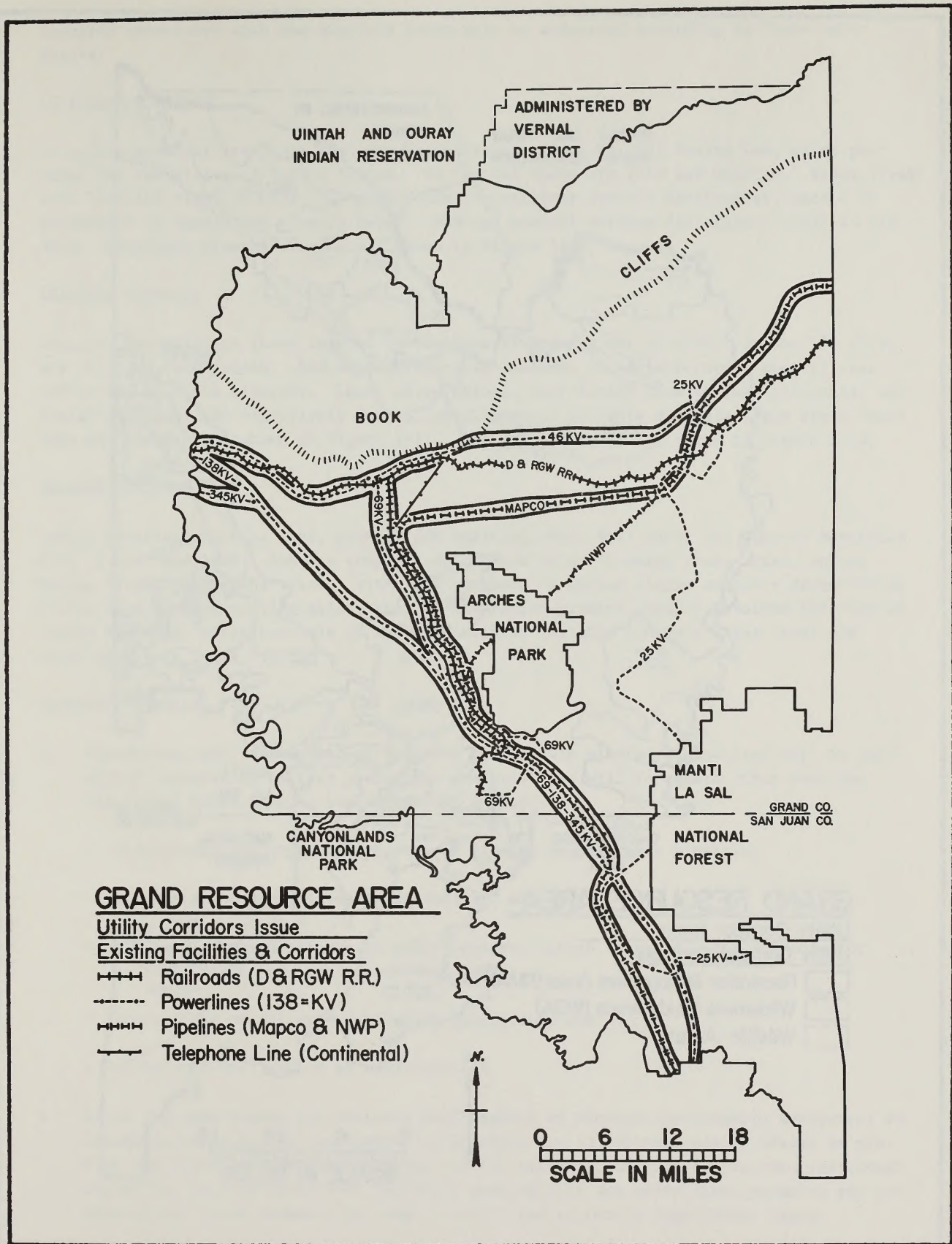


FIGURE 1-8

Existing Utility Facilities and De Facto Corridors

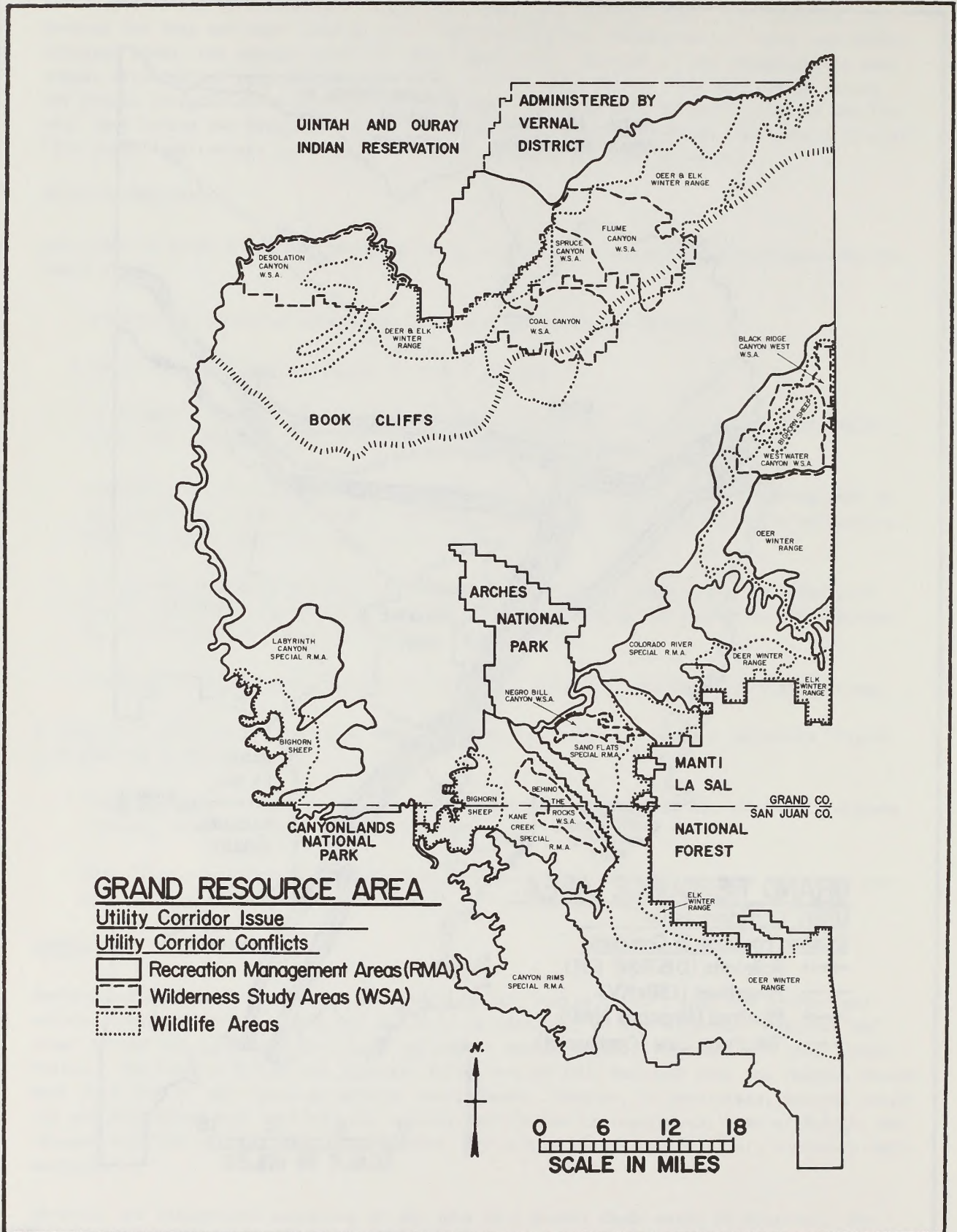


FIGURE 1-9

Utility Corridor Avoidance and Exclusion Areas

concerns associated with the Minerals issue will be addressed according to these categories:

LOCATABLE MINERALS

Locatable minerals are those that can be developed under the 1872 Mining Law, which provides for the filing of mining claims. In the GRA these are gold and uranium. Since claimants have the right to mine, BLM cannot administratively control development, except by withdrawal of lands from mineral entry. BLM can control surface disturbance under 43 CFR 3809. Locatable mineral issue areas shown in Figure 1-10.

LEASABLE MINERALS

Leasable minerals are those covered by the Mineral Leasing Act of 1920. In the GRA these are oil, gas, and potash. BLM has considerable latitude in administrative control over extraction of these minerals. Lease stipulations, restriction from surface occupancy, and denial of leases can effectively control development. Leasable minerals issue areas other than oil and gas are shown in Figure 1-11. Oil and gas areas are shown in Figure 1-12.

SALABLE MINERALS

Common materials such as sand, gravel, and building stone fall under the Mineral Materials Acts of 1947 and 1955. BLM has complete discretion on designating these sites, unless mining claims occupy the sites. Since the presence of mining claims commonly disqualifies a site from further consideration, the administrative problem usually involves location of enough favorable sites for sale of these materials. Salable minerals issue areas are shown in Figure 1-12.

PLANNING CRITERIA

1. Exploration and development of leasable and salable mineral commodities will be permitted, subject to surface protection measures that will safeguard other resource values and users. Major considerations include:
 - occurrence, quality, and quantity of salable and leasable minerals;
 - present and potential public demands for minerals;
 - potential adverse effects to other resource values on public land and adjacent private, State and local government lands;
 - application of oil and gas leasing categories; and
 - ability of the land to be rehabilitated.
2. Since the 1872 Mining Law protects many aspects of mineral development, management of locatable minerals will be limited to planning for (1) withdrawals of tracts to prevent the filing of new mining claims and (2) validity contests to overturn individual claims for lack of discovery. Validity examinations are quite time consuming and expensive and would probably be used in only a few extremely significant cases.

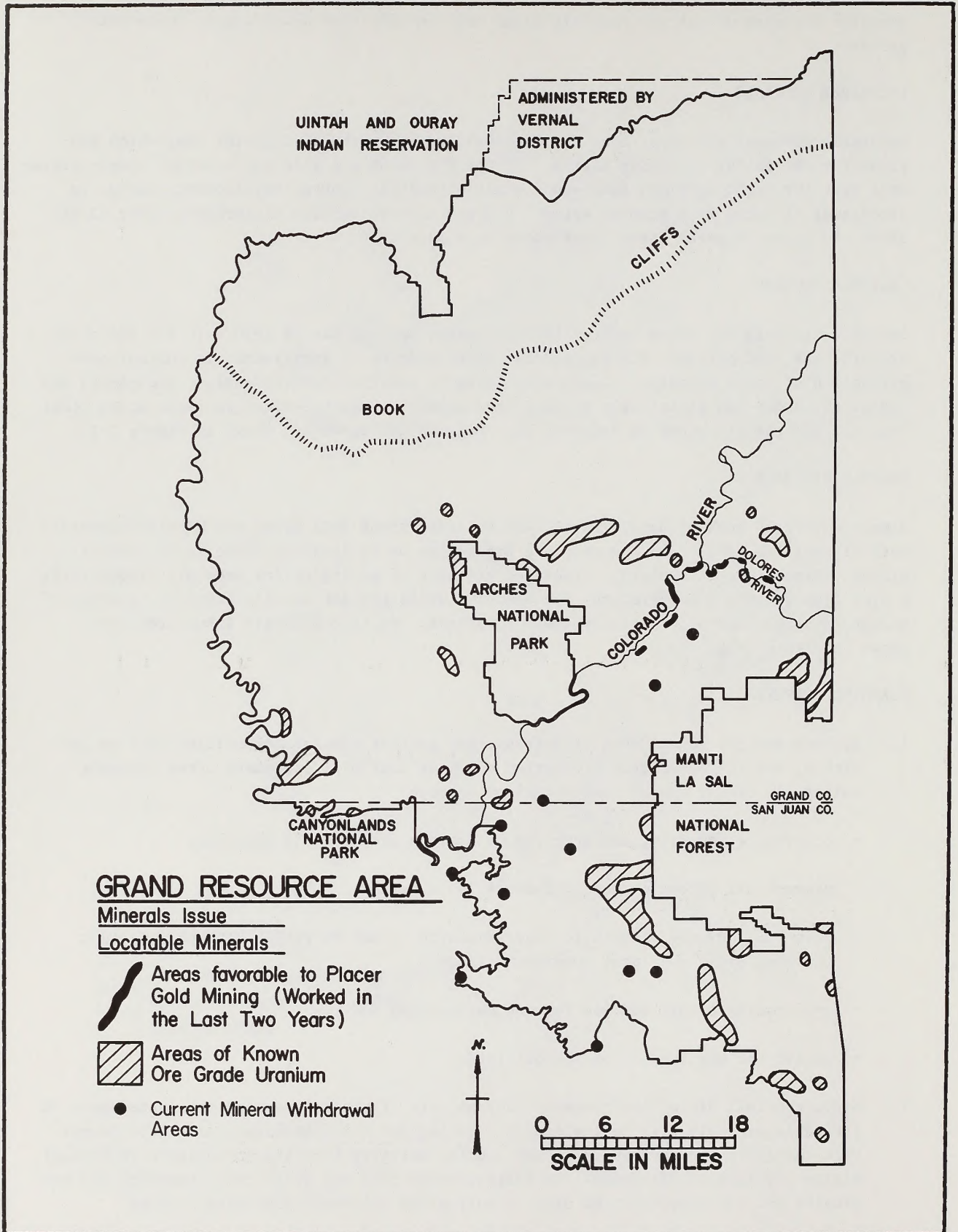


FIGURE 1-10

Locatable Minerals Issue Areas

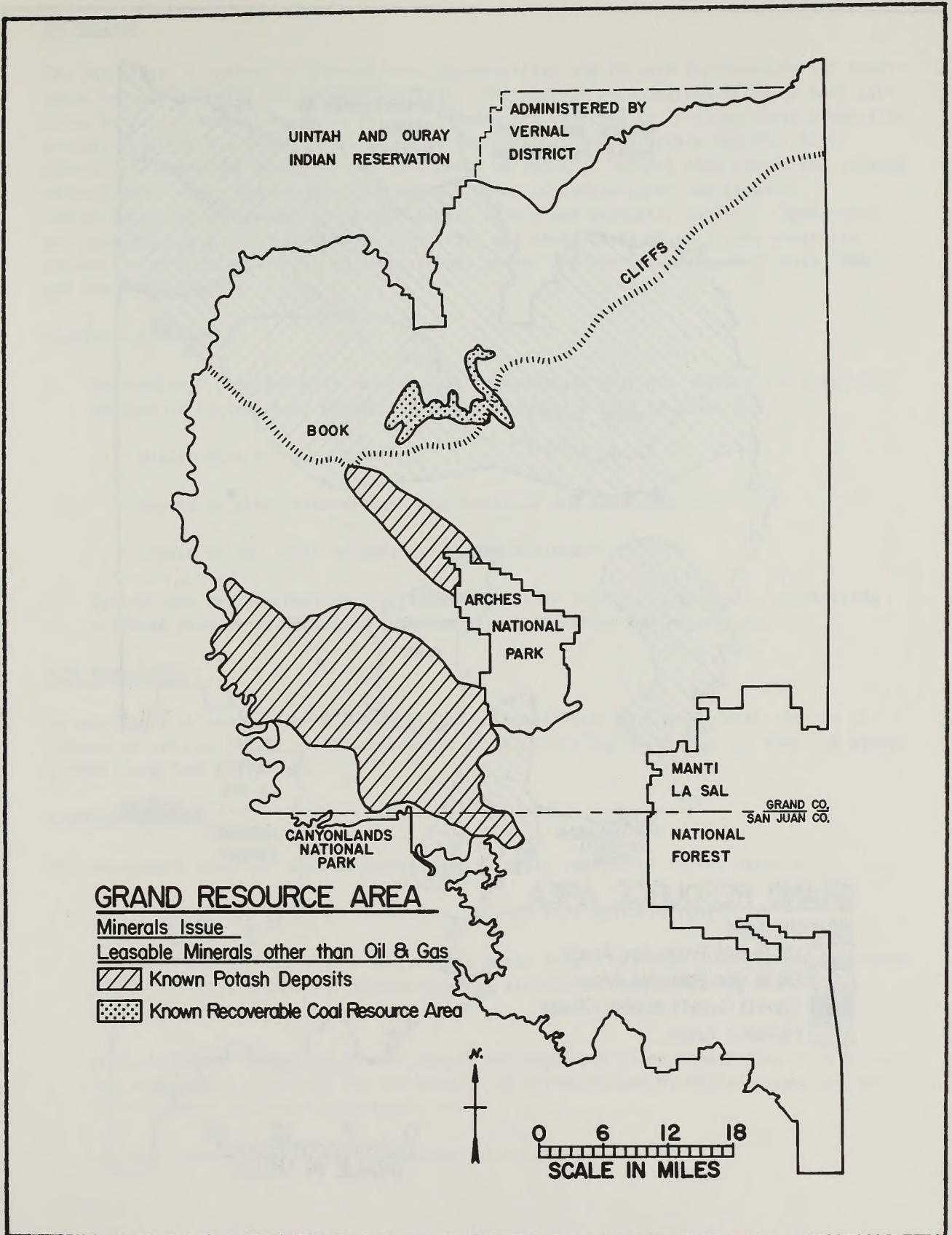


FIGURE 1-11

Leasable Minerals Other than Oil and Gas

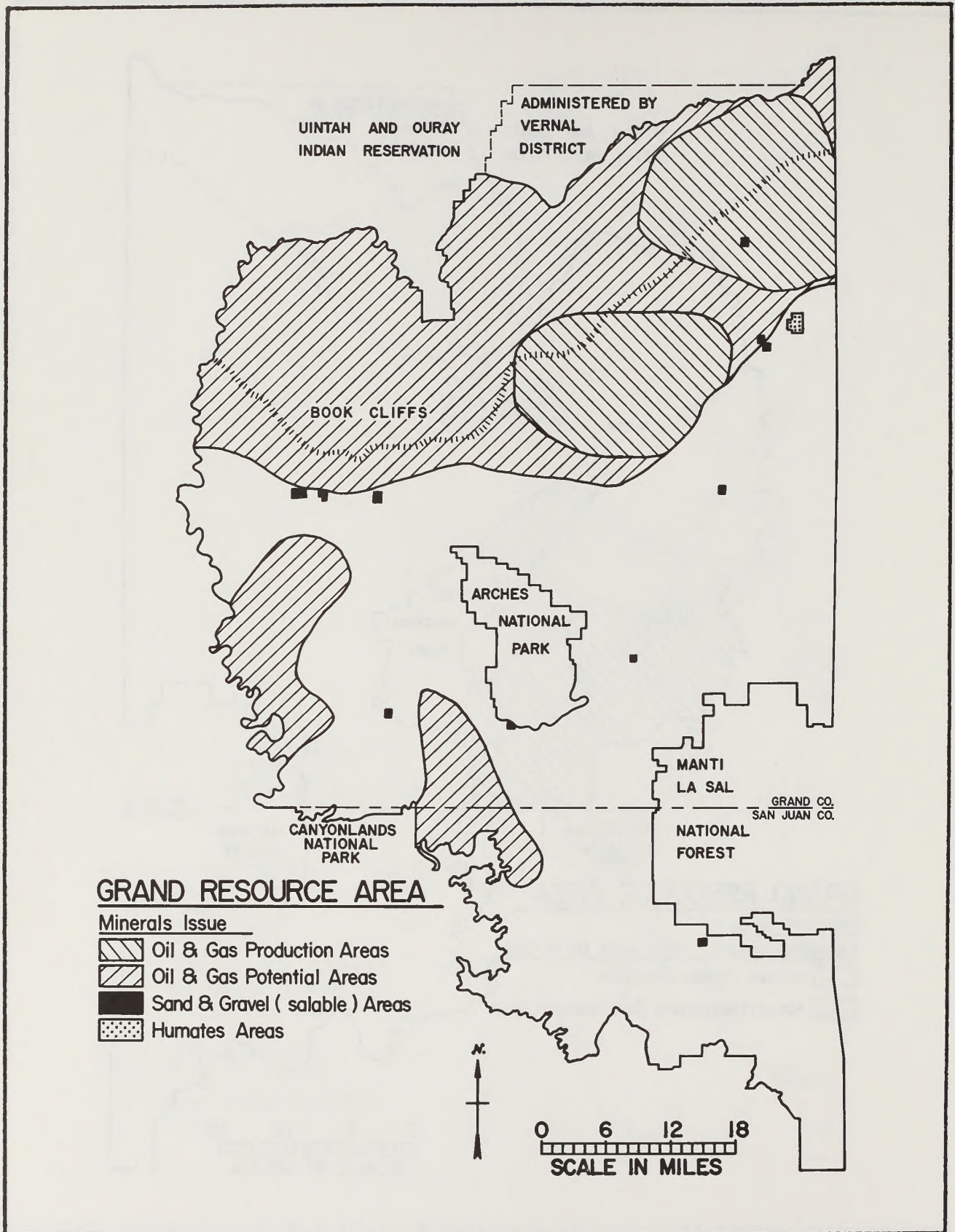


FIGURE 1-12

Oil and Gas, Sand and Gravel, and Humates Issue Areas

RECREATION

The GRA offers a variety of recreational opportunities and is used increasingly for recreation by both domestic and foreign tourists. The nearest metropolitan areas of Salt Lake City, Denver, Albuquerque, Santa Fe, and Phoenix are expected to continue their population growth, creating the potential for greater recreational demand within the GRA. With greater use comes the potential for impairment of resource values; high demand has already necessitated permit systems for some areas. Areas of concentrated use require surveillance and maintenance to ensure public safety and aesthetic quality. Some areas are experiencing a conflict between recreation and other types of use; some areas are attractive to divergent types of recreational users. Recreation management areas (RMAs) are shown in Figure 1-13.

PLANNING CRITERIA

1. Recreational programs will be provided, commensurate with the present and potential demands of various user groups. Major consideration will be given to:
 - public safety;
 - impact on other recreational opportunities and land uses; and
 - impact on the local economy and social structure.
2. Special use designations will be suggested either to protect seriously conflicting resource uses or to highlight exceptional opportunities for recreation.

FIRE MANAGEMENT

Certain lands should be identified as having potential for improvement with the use of induced or natural fires. Full suppression of all fires can be costly and does not always benefit rangeland resources.

PLANNING CRITERIA

Fire management shall be used to improve and maintain vegetation types, based on:

- capability of the land for improvement through fire manipulation;
- protection of certain public and private lands (e.g., critical wildlife and watershed areas, cultural resources, privately owned structures such as homes, oil and gas pumping stations, etc.);
- need to change designated pinyon-juniper and sagebrush plant communities to a subclimax vegetation, primarily for the benefit of livestock and wildlife forage, as well as to improve watershed conditions; and
- economic impacts of any fire management alternatives.

WILDERNESS

Section 603 of FLPMA directs the Secretary of the Interior to review roadless areas of

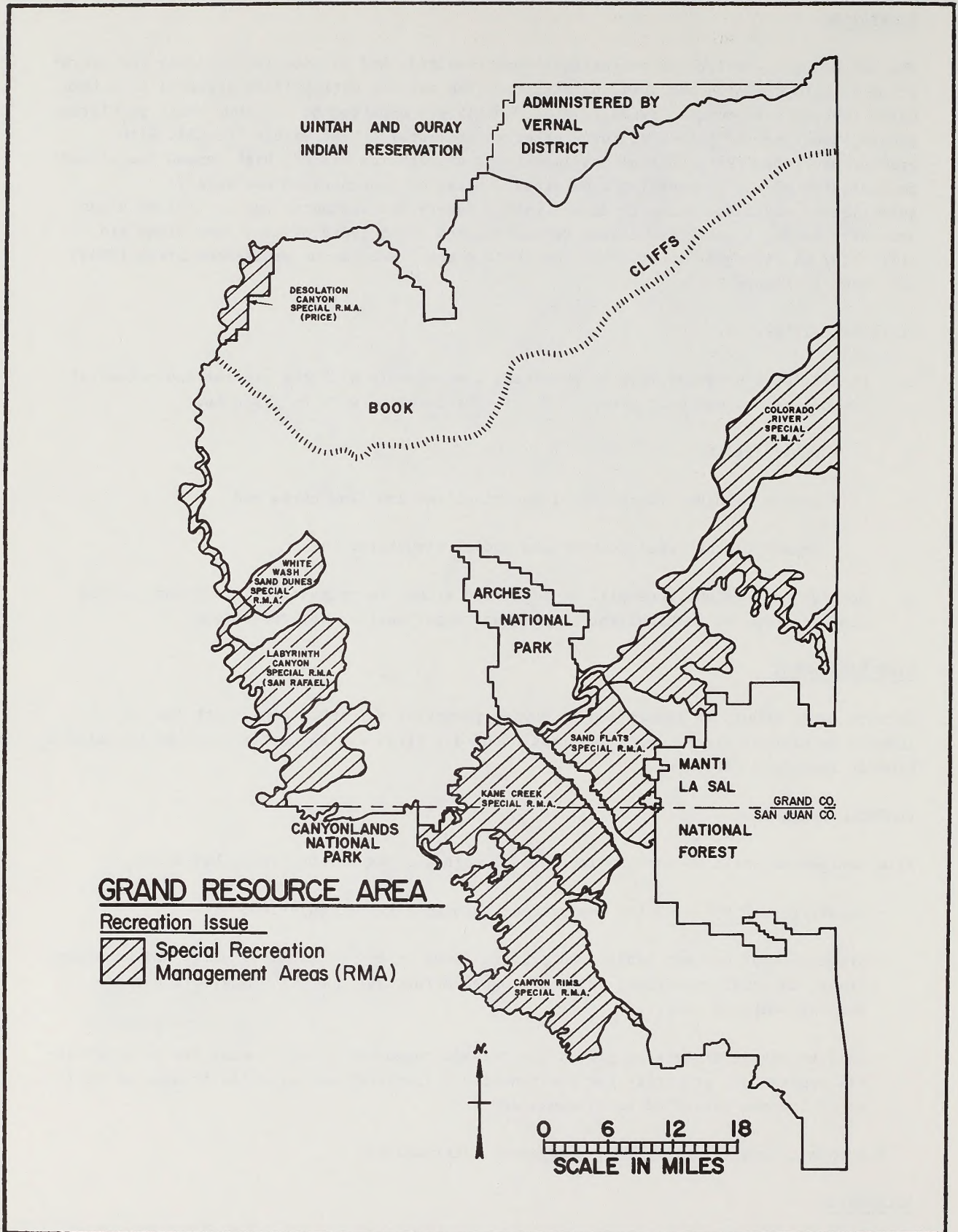


FIGURE 1-13

Special Recreation Management Areas

5,000 acres or more identified as having wilderness characteristics, and to report to the President on their suitability or nonsuitability for wilderness designation. The Secretary is also directed to cause mineral surveys to be conducted by the U.S. Department of the Interior, Geological Survey (USGS) and the Bureau of Mines to determine the mineral values, if any, in suitable areas. The Secretary is further directed to manage lands under review in a manner that will not impair their suitability for wilderness designation. Wilderness study areas (WSAs) are shown in Figure 1-14.

PLANNING CRITERIA

1. The study of WSAs shall follow the study guidelines and policies set forth in the Wilderness Study Policy: Policies, Criteria, and Guidelines for Conducting Wilderness Studies on Public Lands (appearing in the Federal Register, Volume 47 No. 23, Wednesday, February 3, 1982). Evaluations will be made on the basis of the criteria set forth in the Wilderness Study Policy. The two primary criteria are (1) evaluation of wilderness values and (2) manageability.
2. BLM WSAs extending beyond the boundaries of the GRA (inventory units UT-060-068A and UT-060-116/117) will be studied jointly by the two affected resource areas. The BLM office with the greater acreage will have the lead and will be responsible for the final suitability or nonsuitability report. Each office will conduct field inventories, site-specific data collections, and analyses.
3. The study of a WSA that is contiguous to a proposed WSA of another agency shall be coordinated with that agency.

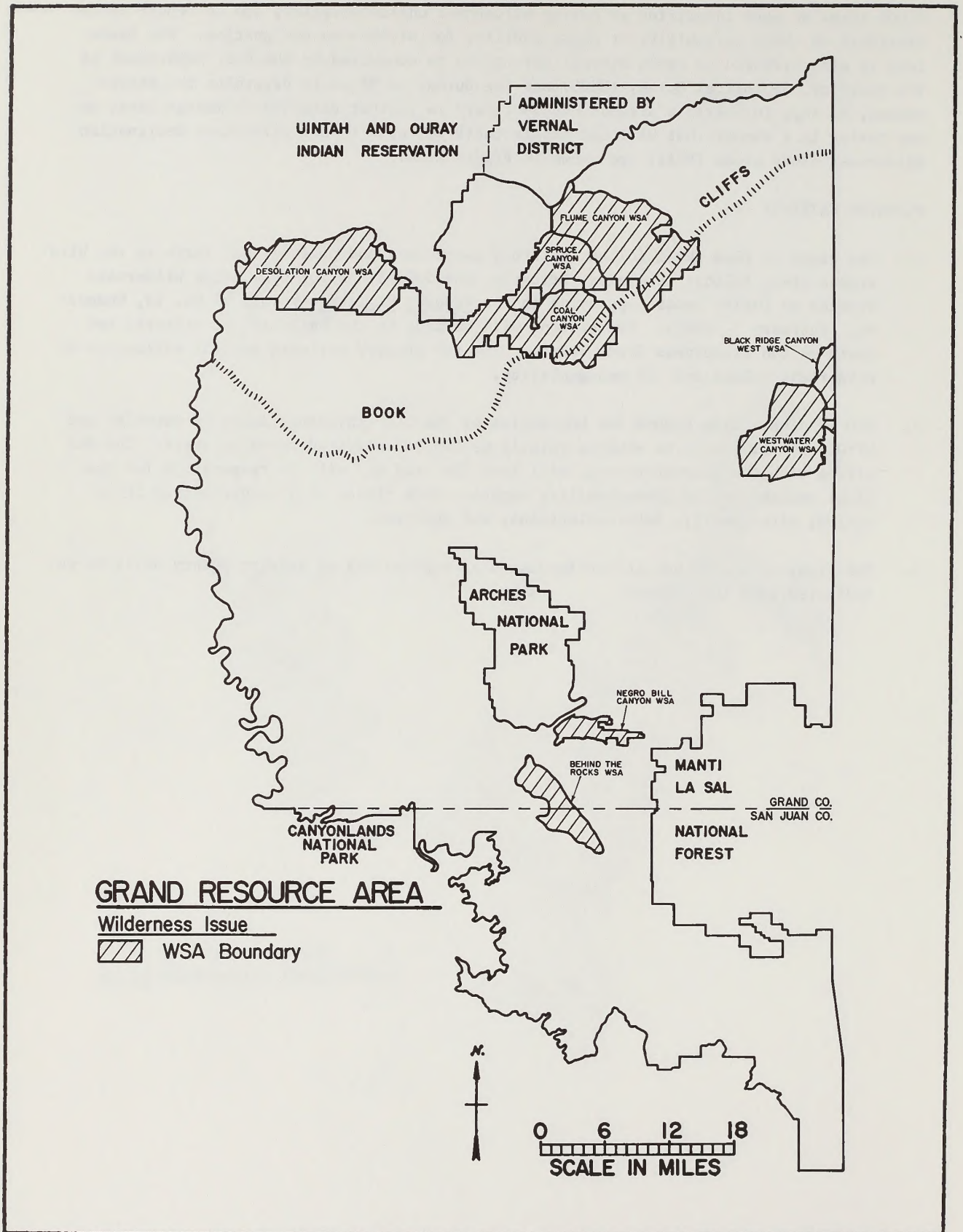


FIGURE 1-14

Wilderness Study Areas

CHAPTER 2

Plan Alternatives, Including the Preferred Alternative/Proposed Resource Management Plan

INTRODUCTION

The formulation of alternatives for the Grand Resource Area (GRA) Resource Management Plan/Environmental Impact Statement (RMP/EIS) was a critical part of the planning and EIS process. It drew from the Management Situation Analysis (MSA), the soil and vegetation inventory, comments (public, other agency, and BLM staff), and the interdisciplinary process. The team decided that four alternatives ranging in orientation from production to protection would be appropriate. As finally labeled these are Alternative A, No Action; Alternative B, Production; Alternative C, Limited Protection; and Alternative D Protection. Following is a description of the alternative development process:

Broad, conceptual goals were developed for each of the four alternatives. Based on the planning issues, the team then developed management objectives for each alternative. These goals and objectives are described in Table 2-1.

Management actions to meet these objectives were described. Table 2-2 presents a summary of the alternatives listing the management actions that would be implemented under each alternative to resolve the planning issues. The proposed management actions are numbered for future reference to avoid unnecessary repetition.

The management actions proposed to resolve planning issues under each of the alternatives are subject to mitigating measures where needed. These mitigating measures are listed by planning issue in Appendix A.

Tables 2-1 and 2-2 begin on the next page. Following them is additional information on the alternatives for each planning issue, including:

- description of the problems to be resolved;
- the management actions proposed under each alternative for that particular planning issue;
- management actions proposed under each alternative for other planning issues that would contribute to solving the problem; and
- the differences among the four alternatives as they apply to that particular planning issue.

ALTERNATIVES CONSIDERED BUT NOT ANALYZED

Two other alternatives were considered for resolution of the Livestock Requirements issue, but both of these were dropped because they did not meet the planning criteria. These alternatives were (1) No Grazing and (2) Grazing at Full Preference.

Planning Issue	Alternative A No Action	Alternative B Production	Alternative C Limited Protection	Alternative D Protection
	<p><u>Goal:</u> To continue present levels of resource use.</p>	<p><u>Goal:</u> To implement a resource management plan that obtains the highest degree of consumptive use and commodity production allowable, considering legal constraints (environmental protection requirements, multiple use mandates, etc.).</p>	<p><u>Goal:</u> To implement a resource management plan that provides a variety of uses within the sustained yield capability of the resource. It represents a balancing of conflicts between renewable and nonrenewable resources for the optimum multiple use mix, incorporating the necessary constraints for protecting resources from irreversible decline.</p>	<p><u>Goal:</u> To implement a resource management plan that is oriented toward protection and enhancement of the natural values while allowing use and production only at levels that do not risk diminishing such values as wildlife habitat, watersheds, primitive recreation opportunities, and wilderness qualities.</p>
	<p>Trade-offs would emphasize consumptive uses over nonconsumptive uses (emphasize energy related mineral production, grazing, and development of commercial recreation, including off-road vehicle (ORV) use.</p>	<p>Trade-offs would safeguard wildlife habitat, critical watersheds, wilderness values, and nonORV recreation, while accommodating production of minerals, livestock grazing, ORV recreation, and other commodities.</p>	<p>Trade-offs would favor protection of the resource over use phase protection of wildlife habitat, critical watersheds, primitive recreation opportunities, and wilderness qualities.</p>	<p>Trade-offs would favor protection of the resource over use phase protection of wildlife habitat, critical watersheds, primitive recreation opportunities, and wilderness qualities.</p>
	<p>Objectives</p>	<p>Objectives</p>	<p>Objectives</p>	<p>Objectives</p>
1. Critical Watersheds	<p>Provide mitigation to ensure protection of critical watersheds where disturbance takes place, while allowing some land treatments that would benefit both commodity resources and critical watersheds.</p>	<p>Improve and maintain vegetative conditions to accommodate other uses and watershed protection, while permitting land treatments that would benefit commodity resources as well as critical watersheds.</p>	<p>Restrict or eliminate surface disturbing activities on critical watersheds, while enhancing water quality and protecting such sensitive areas as saline-alkali soils, riparian areas, floodplains, and municipal watersheds.</p>	<p>Restrict or eliminate primary surface disturbance in critical watersheds, and allow land treatments that would benefit critical watersheds.</p>
2. Livestock Requirements	<p>Maintain vegetative conditions to benefit livestock; maintain existing allotment management plans (AMPs).</p>	<p>Improve and maintain vegetative conditions, and use all management tools available (e.g., livestock manipulation techniques, range improvements, etc.) to maximize livestock forage production.</p>	<p>Manage to emphasize livestock use balanced with other resources, while improving and maintaining vegetative conditions to benefit both livestock and wildlife.</p>	<p>Allow acceptable range improvements and manage livestock to maintain and enhance natural systems.</p>

TABLE 2-1
Goals and Objectives of the Alternatives

3. Wildlife Habitat Requirements	Manage habitat to favor a diversity of wildlife with a variety of big game, upland game, waterfowl, and game fish, and to support current big game populations.	Manage habitat to favor big game, upland game, waterfowl, and game fish, and to support current big game populations.	Manage habitat to favor a diversity of game and nongame wildlife species, and to support prior stable big game numbers (except bighorn sheep), while protecting riparian areas and safeguarding those that are important to wildlife (including raptors and other nongame birds and game fish).	Manage habitat to favor primarily the forage and space needs of wildlife and to support prior stable big game numbers, while preserving habitats in optimum condition.
4. Off-Road Vehicle Use and Management	Allow continued ORV use.	Allow continued ORV use.	Protect high priority sensitive areas and resources from impacts of ORV use.	Protect sensitive areas from ORV use through closure, except where access is mandated under the 1872 Mining Law or other legal authority.
5. Lands Actions	Manage the lands disposal program with overall emphasis on retention of public lands; process disposal actions individually.	Ensure that certain lands needed for State and private uses, community expansion, and economic development, are made available. Retain all other public lands. Ensure continued public access to recreation use areas.	Manage the lands disposal program with a high priority on disposal actions that would benefit community expansion/economic development while protecting critical resource management programs. Retain all other public lands. Ensure continued public access to recreation use areas.	Manage the lands disposal program with emphasis on retention of public lands. Dispose of unneeded isolated tracts. Ensure continued public access to recreation use areas and protect scenic qualities of river corridors from developments that might occur on private lands.
6. Utility Corridors	Continue handling major right-of-way applications individually; emphasize routing in existing corridors.	Ensure that public lands are available for right-of-way systems and utility corridors. Designate de facto utility corridors to expedite the environmental assessment (EA)/EIS process for permitting the siting of proposed systems.	Provide some designated corridors for future utility systems, thus expediting the EA/EIS requirements for locating such facilities, while designing exclusion or avoidance areas to protect the natural environment and other resource programs.	Exclude major right-of-way systems from areas where they would cause unacceptable impacts on sensitive resources.
7. Minerals	Keep public lands open for exploration, development, and collection of mineral resources.	Encourage production of mineral resources in every way possible within appropriate laws and regulations.	Keep public lands open for exploration, development, and production of mineral resources with emphasis on protection of sensitive areas.	Manage for protection of the environment, allowing minerals production activities that are compatible with this objective.

TABLE 2-1 (Continued)
Goals and Objectives of the Alternatives

Planning Issue	Alternative A No Action	Alternative B Production	Alternative C Limited Protection	Alternative D Protection
8. Recreation	Manage for increased recreational activity.	Manage for increased recreational activity.	Identify areas of intensified recreational use and reduce the impacts on recreation.	Provide opportunities for more dispersed, less intensive recreation.
9. Fire Management	Suppress all fires.	Implement a limited suppression policy on all suitable areas; initiate prescribed fires on all feasible areas.	Implement a limited suppression policy. Initiate prescribed fires where treatment by fire would increase productivity, while safeguarding aesthetics and other natural values.	Implement a limited suppression policy on all suitable areas.
10. Wilderness	Continue management of wilderness study areas (WSAs) under present levels of resource use.	Recommend no WSAs as suitable wilderness designation.	Recommend some WSAs and parts of others as suitable for wilderness designation.	Recommend all WSAs as suitable for wilderness designation.

TABLE 2-1 (Concluded)

Goals and Objectives of the Alternatives

Planning Issues	Alternative A No. Action	Alternative B Production	Alternative C Limited Protection	Alternative D Protection
1. Critical Watersheds	(A-1) Install instream drop structures in 8 streams (about 3,500 acres, 8 allotments) to decrease sedimentation and improve water quality.	(B-1) Same as A-1.	(C-1) Same as A-1. (C-2) Implement salinity control treatments (gully plugs, contour furrows, retention dams) on 41,000 acres (10 allotments) to reduce salinity contribution to the Colorado River system by about 5,000 tons annually. (C-3) Divert and evaporate water from Stinking Spring to reduce salinity contribution to the Colorado River system by 3,100 tons annually.	(D-1) Same as A-1. (D-2) Implement salinity control treatments (gully plugs, contour furrows, retention dams) on 93,000 acres (20 allotments) to reduce salinity contribution to the Colorado River system by about 12,000 tons annually. (D-3) Same as C-3.
2. Livestock Requirements (See Appendix K for allotments where these would apply)	(A-2) Continue present management on 1,348,527 acres (61 allotments) to benefit livestock by maintaining present medium to high ecological condition.	(B-2) Continue present management on 986,898 acres (45 allotments) to benefit livestock by maintaining and improving present medium to high ecological condition.	(C-4) Manipulate vegetation and initiate land and watershed treatments on 3 critical watershed subbasins (313,800 acres) to improve poor watershed conditions. (C-5) Continue present management on 833,545 acres (37 allotments) to benefit livestock and wildlife by maintaining and improving present medium to high ecological condition.	(D-4) Manipulate vegetation and initiate land and watershed treatments on 3 critical watershed subbasins (630,200 acres) to improve poor watershed conditions. (D-5) Continue present management on 827,850 acres (34 allotments) to maintain and improve present medium to high ecological condition, and to protect other resource values.

TABLE 2-2
Management Actions for the Alternatives

Planning Issues	Alternative A No Action	Alternative B Production	Alternative C Limited Protection	Alternative D Protection
2. Livestock Requirements (continued)	(A-3) Continue the 6 existing allotment management plans (403,655 acres) to maintain and improve present medium to high ecological condition.	(B-3) Implement livestock manipulation techniques (fences, water developments, rotation of grazing use areas) to benefit livestock by improving present low ecological condition in heavy use areas and by maintaining and improving present medium to high ecological condition on 765,284 acres (22 allotments).	(C-6) Implement livestock manipulation techniques (fences, water developments, rotation of grazing use areas) to benefit livestock and wildlife by improving present low ecological condition in heavy use areas and by maintaining and improving present medium to high ecological condition on 488,636 acres (15 allotments).	(D-6) Implement livestock manipulation techniques (fences, water developments, rotation of grazing use areas) to maintain and improve wildlife habitat by improving present low ecological condition in heavy use areas and by maintaining and improving present medium to high ecological condition on 382,429 acres (11 allotments).
	(A-4) Maintain existing land treatments to provide livestock and wildlife forage (11 allotments). These are: (a) 25,766 chained acres, (b) 25,198 plowed acres, and (c) 1,025 sprayed acres.	(B-4) Same as A-4.	(C-7) Same as A-4.	(D-7) Same as A-4.
		(B-5) Implement land treatments on 70,705 acres (13 allotments) to increase available livestock and wildlife forage by 8,839 animal unit months (AUMs), to improve livestock and wildlife production. Two-thirds the increase in AUMs, would be given to livestock and one-third to wildlife where both are present.	(C-8) Implement land treatments on 68,105 acres (13 allotments) to increase available forage by 8,514 AUMs, to allow increase use by livestock and wildlife. The increase in AUMs would be split evenly between livestock and wildlife where both are present.	(D-8) Implement land treatments on 66,105 acres (13 allotments) to increase available livestock and wildlife forage by 8,514 AUMs to improve wildlife habitat and allow use by livestock. Two-thirds of the increase would be given to wildlife and one-third to livestock where both are present.
		(a) plow & seed 29,640 acres (b) chain & seed 34,760 acre (c) drill seed 6,305 acres	(a) plow & seed 29,640 acres (b) chain & seed 32,160 acre (c) drill seed 6,305 acres	(a) plow & seed 29,640 acres (b) chain & seed 32,160 acre (c) drill seed 6,305 acres

TABLE 2-2 (Continued)
Management Actions for the Alternatives

<p>(A-5) Authorize all grazing use at present levels (average of past 5 years' licensed use is 72,236 AUMs; 11,314 AUMs are presently available for wildlife) to maintain and improve present ecological conditions. Monitoring studies (see Appendix L) will show changes in condition that will determine whether stocking rates should be adjusted.</p>	<p>(B-6) Authorize all grazing use at present levels (average of past 5 years' licensed use is 72,236 AUMs; 11,314 AUMs are presently available for wildlife) to maintain and improve present ecological conditions. Monitoring studies (see Appendix L) will show changes in condition that will determine whether stocking rates should be adjusted.</p>	<p>(C-9) Authorize all grazing use at present levels (average of past 5 years' licensed use is 72,236 AUMs; 11,314 AUMs are presently available for wildlife) to maintain and improve present ecological conditions. Monitoring studies (see Appendix L) will show changes in condition that will determine whether stocking rates should be adjusted.</p>	<p>(D-9) Authorize all grazing use at present levels (average of past 5 years' licensed use is 72,236 AUMs; 11,314 AUMs are presently available for wildlife) to maintain and improve present ecological conditions. Monitoring studies (see Appendix L) will show changes in condition that will determine whether stocking rates should be adjusted.</p>
<p>Estimated future AUMs for this alternative are 79,096 for livestock and 14,418 for wildlife. See Appendix K for AUMs by allotment.</p>	<p>Estimated future AUMs for this alternative are 77,296 for livestock and 16,016 for wildlife. See Appendix K for AUMs by allotment.</p>	<p>Estimated future AUMs for this alternative are 73,874 for livestock and 17,303 for wildlife. See Appendix K for AUMs by allotment.</p>	<p>Estimated future AUMs for this alternative are 73,874 for livestock and 17,303 for wildlife. See Appendix K for AUMs by allotment.</p>
<p>(C-10) Change season of use on 358,775 acres (13 allotments) to (a) provide for growth requirements of perennial plants, (b) restrict use of spring forbs by livestock in critical wildlife areas, and (c) protect soils in critical watershed areas.</p>	<p>(C-11) Change class of livestock on 69,042 acres (1 allotment) to reduce competition between livestock and wildlife.</p>	<p>(D-11) Change class of livestock on 154,215 acres (2 allotments) to reduce competition between livestock and wildlife.</p>	<p>(D-12) Manage 2 miles of perennial streams (2 allotments by fencing and rotation of grazing use areas to restore 2 riparian areas for improved wildlife habitat.</p>
<p>(C-12) Manage 3 miles of perennial streams (3 allotments by fencing and rotation of grazing use areas to restore 3 riparian areas for improved wildlife habitat.</p>	<p>(D-12) Manage 2 miles of perennial streams (2 allotments by fencing and rotation of grazing use areas to restore 2 riparian areas for improved wildlife habitat.</p>	<p>(D-12) Manage 2 miles of perennial streams (2 allotments by fencing and rotation of grazing use areas to restore 2 riparian areas for improved wildlife habitat.</p>	<p>(D-12) Manage 2 miles of perennial streams (2 allotments by fencing and rotation of grazing use areas to restore 2 riparian areas for improved wildlife habitat.</p>

TABLE 2-2 (Continued)
Management Actions for the Alternatives

Planning Issues	Alternative A No Action	Alternative B Production	Alternative C Limited Protection	Alternative D Protection
2. Livestock Requirements (continued)			(C-13) Restrict livestock grazing from 27,000 acres (portions of 10 allotments; 558 AUMs) to lessen impact on highly saline soils and reduce salinity in the Colorado River drainage.	(D-13) Restrict livestock grazing from 50,000 acres (portions of 19 allotments; 1,099 AUMs) to lessen impact on highly saline soils and reduce salinity in the Colorado River drainage. (D-14) Restrict livestock grazing from 3 riparian areas (3 allotments; 3 AUMs; 1 mile of perennial stream) to allow recovery of riparian vegetation to benefit watershed and wildlife. (D-15) Eliminate livestock grazing on 33,489 acres (4 allotments; 638 AUMs) to reserve forage and space for bighorn sheep on 3 allotments and to protect fisheries on 1 allotment. (D-16) Restrict livestock grazing on 700 acres (portion of 1 allotment; 32 AUMs) to provide for spatial requirements and protect bighorn sheep from diseases that can be transmitted by domestic sheep.
3. Wildlife Habitat Requirements	(A-6) Maintain existing wildlife waters. Under Alternative A, existing habitat conditions would be maintained in support of current big game populations (11,433 deer; 747 elk; 259	(B-7) Same as A-6. Under Alternative B, existing habitat conditions would be maintained in support of current big game populations (11,433 deer; 747 elk; 259	(C-14) Same as A-6. (C-15) Reserve all forage and space on the following areas for deer and elk winter use:	(D-17) Same as A-6. (D-18) Same as C-15. Under Alternative D, wildlife habitat would be managed in support of estimated prior

TABLE 2-2 (Continued)
Management Actions for the Alternatives

(11,433 deer; 747 elk; 259 bighorn; and 229 antelope). This would be accomplished through Management Action A-6 above and the following actions listed for Planning Issue No. 2, Livestock Requirements and No. 7, Minerals: A-3, A-4, A-5, and A-12.

Under Alternative C, wildlife habitat would be managed in support of current bighorn population (259) and estimated prior stable numbers of other big game (22,250 deer; 2,300 elk, and 887 antelope). This would be accomplished through Management Actions C-14 and C-15 and above the following actions listed under Planning Issue No. 2, Livestock Requirements; No. 6, Utility Corridors; No. 7, Minerals; No. 8, Recreation; No. 9, Fire Management; and No. 10, Wilderness: C-6, C-7, C-8, C-9, C-10, C-11, C-12, C-13, C-17, C-22, C-25, C-37, C-38, C-39, and C-40.

Pear Park, 14,720 acres Spring Creek, 924 acres Castle Valley, 6,400 acres

Under Alternative C, wildlife habitat would be managed in support of current bighorn population (259) and estimated prior stable numbers of other big game (22,250 deer; 2,300 elk, and 887 antelope). This would be accomplished through Management Actions C-14 and C-15 and above the following actions listed under Planning Issue No. 2, Livestock Requirements; No. 6, Utility Corridors; No. 7, Minerals; No. 8, Recreation; No. 9, Fire Management; and No. 10, Wilderness: C-6, C-7, C-8, C-9, C-10, C-11, C-12, C-13, C-17, C-22, C-25, C-37, C-38, C-39, and C-40.

stable big game populations (22,250 deer; 2,300 elk; 1,216 bighorn; and 887 antelope). This would be accomplished through Management Actions D-17 and D-18 above and the following actions listed under Planning Issues No. 2, Livestock Requirements; No. 4, ORVs; No. 6, Utility Corridors; No. 7, Minerals; No. 9, Fire Management; and No. 10, Wilderness: D-6, D-7, D-8, D-9, D-10, D-11, D-12, D-13, D-14, D-15, D-16, D-21, D-27, D-30, D-42 and D-43.

(D-19) Same as C-16.

TABLE 2-2 (Continued)

Management Actions for the Alternatives

4. Off-Road Vehicle Use and Management

(A-7) Maintain the entire GRA (1.8 million acres) as open for ORVs. This action represents the present management practice and is consistent with present levels of recreational vehicle use and with ranching and development activities.

(B-8) Designate the entire GRA (1.8 million acres) as open for ORVs to provide for existing and future demands associated with recreation, minerals, livestock grazing, and other commodity production activities.

(C-16) Designate 596,234 acres (Mancos Shale areas and Colorado, Green, and Dolores river corridors, Canyon Rims Recreation Area, and Dead Horse Point State Park viewshed) as limited to existing roads and trails, to protect highly erodible Mancos Shale soils, watershed and scenic values. This would help to reduce the annual introduction of 12,000 to 18,000 tons of sediment and 363 to 548 tons of salt into the Colorado River drainage.

Continued

Planning Issues	Alternative A No Action	Alternative B Production	Alternative C Limited Protection	Alternative D Protection
4. Off-Road Vehicle Use and Management (continued)			<p>(C-17) Designate 24,454 acres (Behind the Rocks, Negro Bill Canyon, Westwater Canyon, Windwhistle and Hatch Point campgrounds, Canyonlands, Needles and Anticline overlooks, and Onion Creek sensitive plant site) as closed to ORVs, to protect scenic and recreational values. The Onion Creek site enclosure would also provide protection to a sensitive plant. This action would be taken to reduce soil erosion and the annual introduction of 100 tons of sediment into Colorado River drainage.</p>	<p>(D-20) Limit ORV use to existing roads and trails in the floodplains of 150 miles of streams (10 floodplains) and on 250 miles of stream channel (10 major washes), to reduce the introduction of sediment and salinity in- to the Colorado River drainage. In previously undisturbed areas, soil loss from erosion may double or triple as a result of ORV use.</p> <p>(D-21) Same as C-17.</p>
			<p>(C-18) Designate 15,206 acres (Mill Creek area) as limited to designated roads and trails. As a result of this action, 7 miles of duplicate roads would be</p>	<p>(D-22) Same as C-18.</p>

TABLE 2-2 (Continued)
Management Actions for the Alternatives

closed. The purpose of this designation would be to provide for ORV use while reducing annual soil erosion in this area by 200 tons. This would also protect scenic values and eliminate excessive roads.

5. Lands				
Actions	(A-8) Continue to process lands disposal requests individually. Disposal of lands would be accomplished only where such action would not jeopardize existing resource management programs.	(B-9) Retain 1,790,549 acres of public land to protect environmental and/or economic assets.	(C-19) Retain 1,801,331 acres of public land to protect environmental and/or economic assets.	(D-23) Retain 1,806,318 acres of public land to protect environmental and/or economic assets.
		(B-10) Acquire an access easement on 6 acres of private land at the Cisco boat launch area for the purpose of providing public access to Westwater Canyon for recreational boating.	(C-20) Same as B-10.	(D-24) Same as B-10.

TABLE 2-2 (Continued)
Management Actions for the Alternatives

Planning Issues	Alternative A No Action	Alternative B Production	Alternative C Limited Protection	Alternative D Protection
6. Utility Corridors	(A-9) Continue to handle all major right-of-way requests individually. Consider siting new facilities within existing de facto corridors. Such designations could serve to minimize both the adverse environmental impacts and the proliferation of separate rights-of-way. They may also help minimize width requirements and maximize multiple occupancy.	(B-11) Consider designating approximately 140 miles (16,000 acres) of de facto corridors as official utility corridors. Such designation could serve to minimize both the adverse environmental impacts and the proliferation of separate rights-of-way. They may also help minimize width requirements and maximize multiple occupancy.	(C-21) Same as B-11.	(D-26) Same as B-11.
7. Minerals	(A-10) Leave the entire CRA (1.8 million acres) open to mining claims for locatable minerals under the 1872 Mining Law, with the exception of 1,850 acres of widely scattered campgrounds and scenic sites under existing mineral withdrawals.	(B-12) Avoid situating major rights-of-way within 48,245 acres in resource conflict areas. Exclusion of these areas would protect critical bighorn sheep habitat.	(C-22) Avoid situating major rights-of-way within 130,164 acres in resource conflict areas. Exclusion of these areas would protect both bighorn sheep habitat and wilderness study areas.	(D-27) Avoid situating major rights-of-way within 282,350 acres of exclusion areas and 563,190 acres of avoidance areas. This would protect deer and elk wintering areas, critical bighorn sheep habitat, recreation management areas (RMAs), and wilderness study areas (WSAs).
			(C-23) Withdraw 32,000 acres along the Colorado River mineral entry to protect scenic values. This action would leave 1.77 million acres open to mining claims under the 1872 Mining Law.	(D-28) Withdraw 47,000 acres along the Colorado and Dolores rivers from mineral entry to protect scenic values. This action would leave 1.75 million acres open to mining claims under the 1872 Mining Law.
			Existing mineral withdrawals of 1,850 acres of widely scattered campgrounds and scenic sites would be maintained.	Existing mineral withdrawals of 1,850 acres of widely scattered campgrounds and scenic sites would be maintained.

TABLE 2-2 (Continued)
Management Actions for the Alternatives

7. Minerals
(continued)

(A-11) Maintain existing potash leases on approximately 4,600 acres. Allow potash prospecting (with potential of production) on approximately 150,000 acres, to encourage production of fertilizer for domestic use and for export.

(B-14) Same as A-11.

(C-24) Same as A-11.

(D-29) Same as A-11.

(A-12) Continue present management for oil and gas under the category system described in Appendix R.

(B-15) Classify the entire GRA as Category 1 for oil and gas, to encourage employment and economic development and to expedite production of minerals.

(C-25) Adopt the oil and gas category system below, which would protect critical wildlife habitat, watersheds, and recreational use along the Colorado River.

(D-30) Adopt the oil and gas category system below, which would place 275,000 acres of saline soils in Category 2 to prevent unnecessary introduction of salinity into watercourses and to protect wildlife habitat and scenic areas.

1. 1,682,762 acres
2. 58,221 acres
3. 70,401 acres
4. 8,170 acres

1. 1,156,560 acres
2. 563,808 acres
3. 70,274 acres
4. 28,912 acres

1. 744,262 acres
2. 776,359 acres
3. 53,815 acres
4. 245,118 acres

(A-13) Continue to allow sales of common varieties of minerals (sand and gravel) on 6,000 acres free of mining claims, to provide materials for road construction, which could be an important factor in development of other resources.

(B-16) Same as A-13.

(C-26) Same as A-13.

(D-31) Same as A-13.

(A-14) Continue contract for sale of humates on 250 acres to provide material for use as a soil conditioner.

(B-17) Same as A-14.

(C-27) Same as A-14.

(D-32) Same as A-14.

(B-18) Allow sales of humates on approximately 1,500 additional acres free of mining claims to provide material for use as a soil conditioner.

TABLE 2-2 (Continued)
Management Actions for the Alternatives

Planning Issues	Alternative A No Action	Alternative B Production	Alternative C Limited Protection	Alternative D Protection
8. Recreation	(A-15) Maintain 2 developed campgrounds (30 acres), 5 developed picnic areas (28 acres), and 3 developed scenic overlooks (1,120 acres) to provide public outdoor recreational opportunities.	(B-19) Same as A-15.	(C-29) Same as A-15.	(D-33) Same as A-15.
		(B-20) Construct rest rooms at seven heavily used recreation sites along the Colorado River to reduce sanitation problems.	(C-29) Same as B-20.	(D-34) Same as B-20.
	(A-16) Continue to issue recreation use permits (four-wheel drive vehicle tours, horseback trips, bear hunting camps, survival school, etc.) to enhance outdoor recreational opportunities and provide business opportunities for private enterprise.	(B-21) Same as A-16.	(C-30) Same as A-16.	(D-35) Same as A-16.
	(A-17) Maintain 5 miles of developed trails to provide outdoor hiking opportunities.	(B-22) Same as A-17.	(C-31) Same as A-17.	(D-36) Same as A-17.
	(A-18) Continue to permit competitive and noncompetitive ORV events.	(B-23) Same as A-18.	(C-32) Same as A-18.	(D-37) Same as A-18.

TABLE 2-2 (Continued)
Management Actions for the Alternatives

8. Recreation (continued)	(A-19) Maintain 10 miles of developed motorcycle trails to provide opportunities for recreational ORV motorcycle use.	(C-33) Same as A-19.	(D-38) Same as A-19.
	(A-20) Maintain 27 miles of developed scenic road system to provide access to sightseeing opportunities.	(C-34) Same as A-20.	(D-39) Same as A-20.
	(A-21) Continue the existing river management program on the Colorado and Dolores rivers (24,000 passenger days per year; 30 commercial outfitters) to provide for the safe and enjoyable long-term use of the river resource.	(C-35) Same as A-21.	(D-40) Same as A-21.
	(A-22) Continue to manage 65 miles of the Colorado and Dolores river study corridors as required under the Wild and Scenic Rivers Act. (These rivers were studied and recommended for designation under this act and will be managed to prevent changes in their character until Congress acts on the recommendation.)	(C-36) Same as A-22.	(D-41) Same as A-22.
	(C-37) Designate 1,375 acres in Negro Bill Canyon as an Outstanding Natural Area (ONA) to protect scenic recreational values, the sensitive plant <i>Cycladenia humilis</i> var. <i>ionesi</i> , and the riparian area along the perennial stream.		

TABLE 2-2 (Continued)
Management Actions for the Alternatives

Planning Issues	Alternative A No Action	Alternative B Production	Alternative C Limited Protection	Alternative D Protection
9. Fire Management	(A-23) Continue to suppress all fires on public lands.	(B-28) Implement a limited suppression policy on the entire GRA (1.8 million acres) which would allow fires to burn under initial monitoring on plant communities that are capable of burning in order to create a diversity of vegetation and increase AUMs for both livestock and wildlife while reducing present fire suppression costs.	(C-38) Same as B-28.	(D-42) Same as B-29.
		(B-29) Initiate prescribed fire and seeding on approximately 14,149 acres (11 allotments), thereby increasing AUMs by approximately 1,770 acres for livestock and wildlife. (This figure was added into the future AUMs shown in Appendix K. Appendix K shows the identified allotments and acreages.)	(C-39) Same as B-29.	
10. Wilderness	(A-24) Recommend no WSAs as suitable for wilderness designation. Continue present levels of resource management.	(B-30) Recommend no WSAs as suitable for wilderness designation to encourage resource production activities.	(C-40) Follow the preliminary suitability recommendations (summarized in Appendix U) contained in the draft site-specific analyses (SSAs) for the seven WSAs. They recommend 26,000 acres of Westwater Canyon WSA's 31,160 acres; the entire 12,635 acre Behind the Rocks WSA; and the 50,820 acres of Desolation Canyon WSA's 51,250 acres as suitable for wilderness designation. Also recommended is 124,925	(D-43) Recommend 219,480 acres (all eight WSAs) for wilderness designation to ensure maximum protection of these areas.

TABLE 2-2 (Continued)
Management Actions for the Alternatives

acres of Flume, Spruce, Coal, Westwater, Negro Hill, and Desolation canyons as non-suitable for wilderness designation. As a subalter-native for the Desolation Canyon WSA 1,780 acres of 51,250 acres is recommended as suitable for wilderness. Under this subalternative, 168,565 acres of Flume, Spruce, Coal, Westwater, Negro Hill, and Desolation Canyon is recommended as nonsuitable for wilderness designation.

(These recommendations may be changed before the final recommendations are made to Congress.

TABLE 2-2 (Concluded)

Management Actions for the Alternatives

PREFERRED ALTERNATIVE/PROPOSED ACTION

Alternative C, Limited Protection, is the agency's preferred alternative for all planning issues. It is also the proposed action for all issues except Livestock Requirements, for which Alternative A, No Action, is the proposed action. The 5-year monitoring period will allow determination of grazing capacity to be based upon evaluation of ongoing studies of actual use, utilization, trend, and climate.

The preferred alternative and proposed action were selected on the basis of (1) the planning criteria, (2) the environmental consequences, and (3) policy directions specified for the grazing portion of this document.

CRITICAL WATERSHEDS

The Critical Watersheds issue focuses on the control of salinity and sedimentation of the Colorado River from public lands. The critical watershed designation is used to identify some primary sources of salinity to the Colorado River from public lands. Critical watersheds include (1) municipal watersheds, (2) floodplains and wetlands, (3) accelerated erosion areas, and (4) saline-alkali soils. These terms are defined in the Glossary. Most of the discussion about erosion is keyed to salinity because of its economic significance and National interest. The increase in salt load to the Colorado River from lands in the GRA exceeds one quarter of a million tons per year.

The control of salinity as reflected in the management actions involves two options: (1) the use of mechanical treatments to restore degraded areas and control runoff and sediment, and (2) management of resource activities that disturb the soil surface. The specific watershed protection actions for these activities are found under the issue covering the particular activity that causes the surface disturbance, rather than under the watershed issue itself (see Table 2-2). Appendix A describes mitigating measures that are required, and Appendix B shows the general implementation schedule for proposed management actions.

The major activities impacting watersheds and causing conflicts are grazing, ORVs, mining, and exploration for oil and gas. A number of management actions can be taken to reduce impacts and aid in resolving conflicts caused by these three types of land use. Briefly summarized they are:

- (1) Grazing management options that could be used to reduce salinity and sedimentation are new grazing systems, changes in season of use, and elimination of grazing in some areas. These grazing management actions are proposed in Alternatives C and D. The recommended management practices for livestock grazing on saline-alkali soils have been outlined in the 1977 Salinity Status Report (BLM, 1977c) and the 1978-79 Salinity Status Report (BLM, 1980a). Appendix C lists comparative erosion estimates for saline-alkali soils in the GRA for different ecological condition classes. Appendix D displays existing runoff, sediment, and salt yields from allotments with grazing conflicts.
- (2) Limiting ORVs to existing roads and trails (Alternatives C and D) would help to reduce surface disturbance and salinity and protect municipal watersheds.
- (3) Oil and gas impacts on critical watershed values would be controlled under Category 2

in the oil and gas categories to minimize watershed impacts without precluding development. Areas of excessive erosion (e.g., the Book Cliffs, selected floodplains, and saline soils), as well as municipal watersheds, would be protected under Alternatives C and D.

Appendixes E and F contain breakdowns by allotment of the salinity treatments proposed in Management Actions C-2 and D-2, respectively, along with the acreages that would be treated and the anticipated reduction in salinity.

There is a large portion of the GRA that is not covered by the Critical Watersheds issue. These areas can be sources of sedimentation caused by geologic erosion. Although they are not directly related to salinity, these areas are additional management concerns, and they must be managed on a sustained yield basis. Watershed values must be considered, especially in areas where low ecological or watershed conditions adversely affect site productivity.

LAND TREATMENTS FOR CRITICAL WATERSHEDS

Structures can be employed to help reduce salt and sediment delivery from diffuse rangeland sources. The main purpose of these structures is to stop saline runoff and sediment short of a perennial stream or ephemeral watercourse. Common land treatment alternatives for stabilization of watersheds on saline-alkali soils are gully plugs; detention-retention dams; ripping, pitting and contour furrows; and instream drop structures. These terms are defined in the Glossary.

In addition to these general treatments, management actions (C-3 and D-3) are proposed in Alternatives C and D to control a specific salinity point source, Stinking Spring. Methodology for this action can be found in the 1978-79 Salinity Report (BLM, 1980a). Watershed actions proposed are shown in Figures 2-1 (Alternatives A and B), 2-2 (Alternative C), and 2-3 (Alternative D).

LIVESTOCK REQUIREMENTS

The livestock grazing program is described in Chapter 3, Affected Environment. For an understanding of the alternatives, it is important to know that a major conflict caused by other land uses is loss of forage through mineral and ORV activities. Through management actions that would be implemented under these other issues in the four alternatives, the vegetative resource would be protected and the impact on the livestock program lessened.

An inherent problem in the livestock program itself is improper season of use authorized on some of the allotments. Changing the season of use is a management action that would be implemented to protect the forage resource under Alternatives C and D.

An opportunity exists under Alternatives B, C, and D to conduct land treatments that would benefit the livestock program by increasing available AUMs of forage.

These actions (season of use changes and land treatments) would also benefit other programs such as watershed and wildlife. Additional management actions are shown under the livestock section, but are actually proposed to help rectify problems caused to other programs. These actions include livestock restrictions and elimination of grazing in some areas.

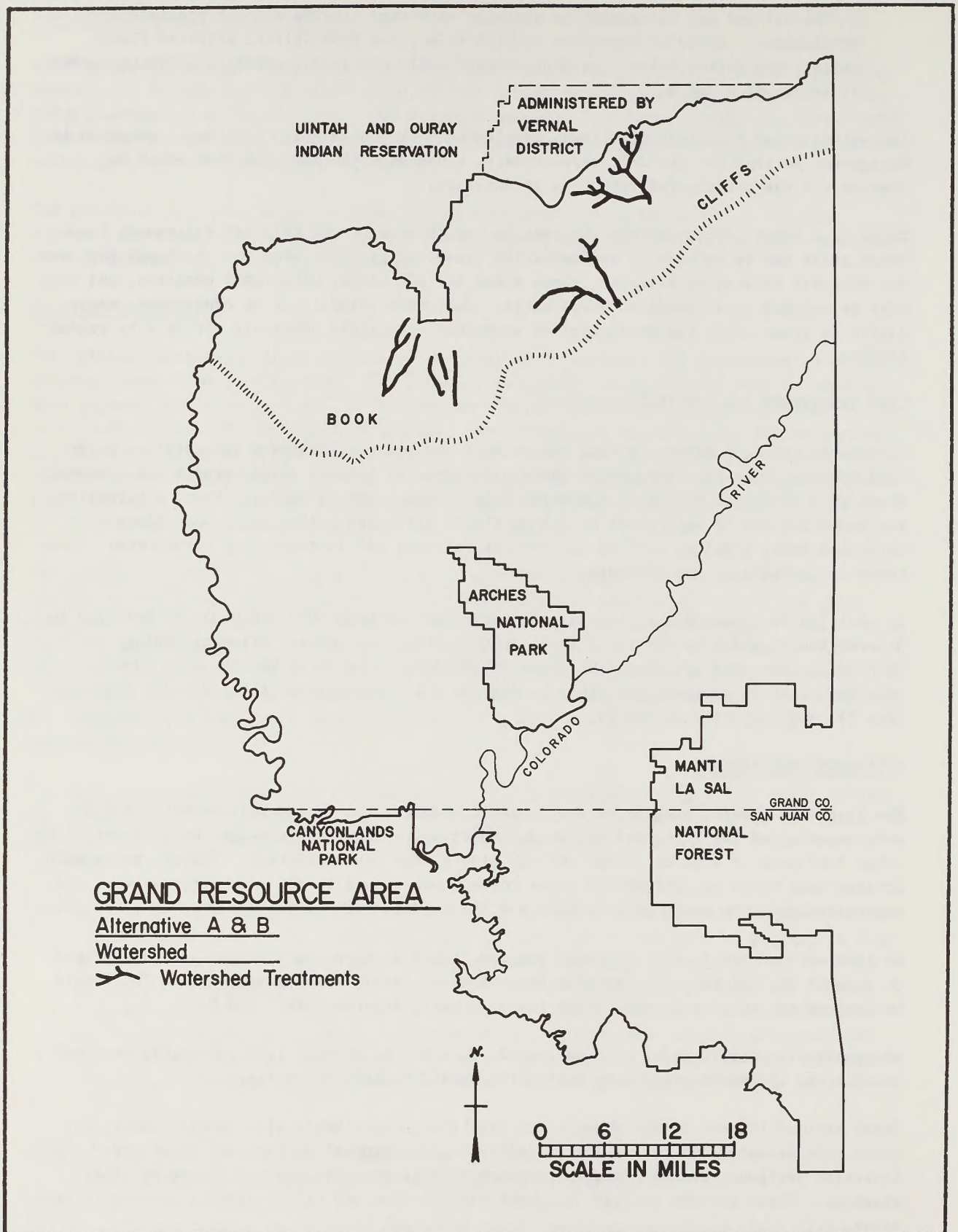


FIGURE 2-1

Management of Critical Watersheds Under Alternatives A and B

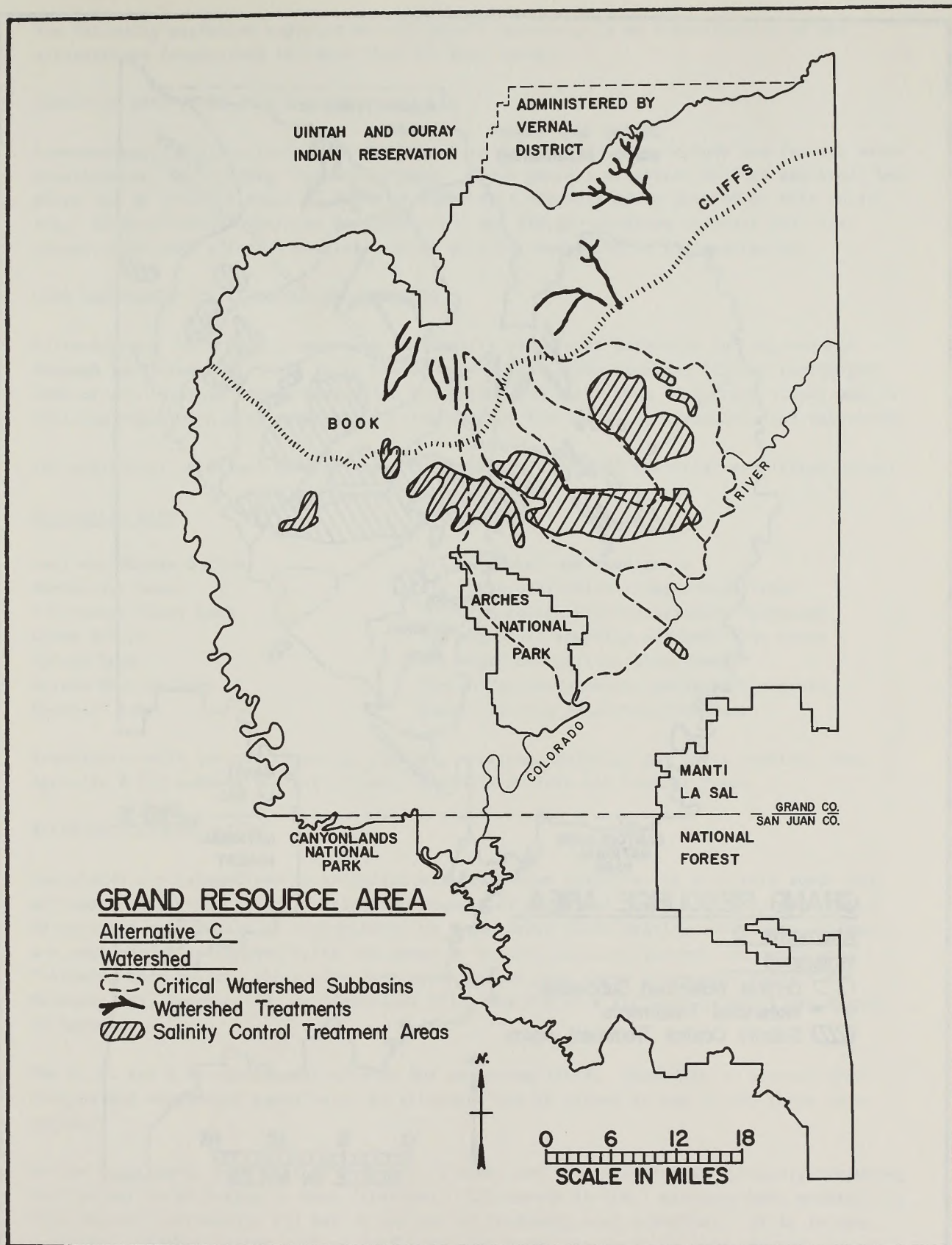


FIGURE 2-2

Management of Critical Watersheds Under Alternative C

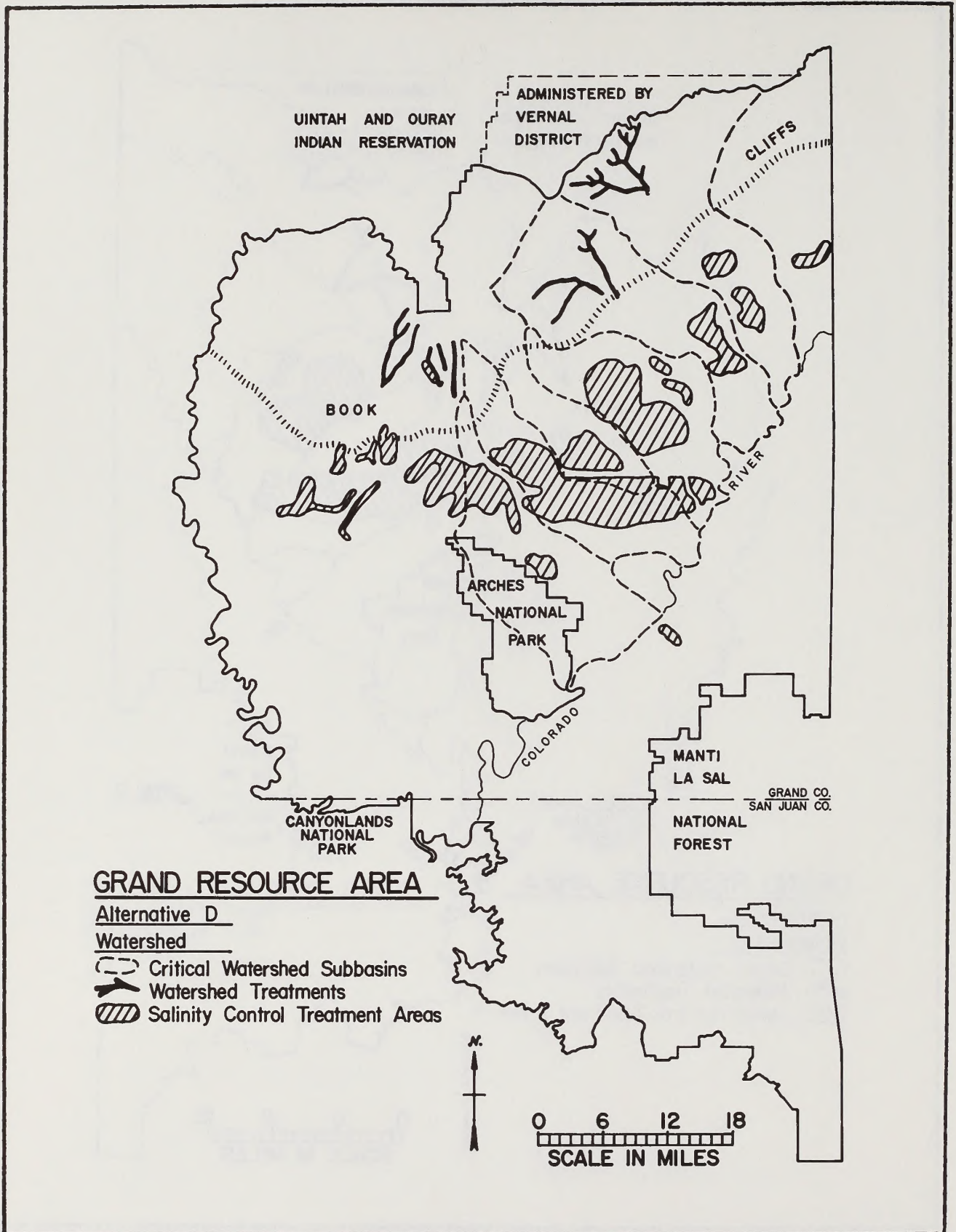


FIGURE 2-3

Management of Critical Watersheds Under Alternative D

The following narrative explains several points necessary to an understanding of the alternatives (summarized in Table 2-2) for this issue.

LIVESTOCK MANIPULATION TECHNIQUES

Livestock manipulation techniques considered in the alternatives include new fences, water developments, and grazing rotation schemes. These general practices will be analyzed, but there are no specific miles of fence or numbers of projects to be covered in this analysis. These practices would be designed after the EIS and decision document and after consultation with affected parties. An EA will be done prior to implementation.

LAND TREATMENTS FOR LIVESTOCK REQUIREMENTS

Following are the criteria developed to identify areas with potential for improvement through land treatments: (1) 10 inches or more annual precipitation; (2) 650 pounds per acre or more average annual vegetation production; (3) less than 20 percent slope; and (4) existing vegetation with potential for improvement for wildlife, livestock, and watershed.

The ecological sites and habitat types that exhibit treatment potential are listed below:

<u>Ecological Site</u>	<u>Habitat Type</u>
Semi-wet Stream Bottom	Willow/gambel oak/reed grass
Semidesert Loam	Big sagebrush/Indian ricegrass/galleta
Semidesert Sandy Loam	Fourwing saltbush/galleta/Indian ricegrass
Loamy Bottom	Big sagebrush/fourwing saltbush/blue grama
Upland Loam	Big sagebrush/galleta/blue grama
Upland Shallow Loam	Pinyon-juniper/mountain mahogany/bluegrass
Mountain Loam	Gambel oak/big sagebrush/bluegrass

Treatments would include chaining, plowing, spraying, burning, and drill seeding. See Appendix A for methods and mitigation. Appendix J lists all habitat types.

ALLOTMENT CATEGORIZATION

Rangelands are categorized to establish priorities for distributing available funds and personnel to achieve cost-effective improvement of rangeland condition and production. Efforts and money would be concentrated in those areas where grazing management actions are most needed to improve basic resources or resolve serious resource-use conflicts. Following this policy, allotments have been grouped into three management categories: Maintain (M), Improve (I), and Custodial (C). The criteria for each category are listed in Appendix H.

The M, I, and C categories all provide for sustained yield. Depending on present conditions and management potentials, an allotment may be placed in any of the three categories.

In the M category, potential is moderate to high, and the allotment is currently producing near potential or moving in that direction. Allotments in the I category have moderate to high resource potential, and may or may not be producing near potential. If it is near potential, another factor such as conflicts with other resources or poor present manage-

ment may put it in the I category. In the C category, allotments have low production potential and are currently producing near their potential.

An allotment may change from one category to another if circumstances change (e.g., potential met through land treatment or management, conflicts resolved, or change in percentage of land ownership). Eight allotments are currently in the M category, 48 in the I category, and 11 in the C category. Appendix I shows the present category, ecological condition, and use for each allotment.

Various management actions are proposed in an attempt to resolve some of the existing conflicts that have caused certain allotments to be in the I category.

Under Alternative A, livestock grazing would continue to conflict with wildlife on 26 allotments even after all proposed management actions were taken. Concerns for critical watersheds would continue on 22 allotments, ORV use would be a conflict in portions of seven allotments, and oil and gas conflicts would be concentrated on eight allotments. There would be some overlap; for example, wildlife and watershed could each show a conflict on one allotment. Table 2-3 lists the allotments where these conflicts occur.

Some allotments are in the I category simply because of the potential for land treatments or opportunity to improve management.

Existing conflicts with wildlife would continue on 14 allotments under Alternative B, on nine allotments under Alternative C, and on six allotments under Alternative D (see Table 2-3).

The same 22 allotments listed as having conflicts with watershed under Alternative A would continue in conflict under Alternative B; 12 of these allotments would still have conflicts after implementation of all management actions proposed under Alternative C, and the watershed conflicts would continue on three allotments under Alternative D.

The conflict caused by ORV activity would continue on all seven allotments under all of the alternatives, as would the oil and gas conflict on eight allotments.

IMPLEMENTATION SCHEDULE AND AUTHORIZATION OF GRAZING USE

Appendix B diagrams the general implementation schedule. The schedule for obtaining agreements or issuing decisions following the EIS is shown below. Some changes (e.g., season of use) would be implemented the first grazing year following the issuance of a decision. Changes in initial stocking rate or allowable AUMs, would be implemented over a 5-year period unless the permittee agrees to adjust prior to that time. Adjustments would generally occur in the first, third, and fifth years. During this period, monitoring will be done to determine whether a downward adjustment or increase in allowable AUMs is warranted.

In the summers of 1981 and 1982, new monitoring studies were established in many allotments. These areas will be evaluated over the 5 years following the EIS to determine trend in the vegetation resource. Adjustments in livestock numbers will be based on these studies (see Appendix L for details of the studies technique). It should be noted (see Appendix I) that the last 5 years' use on most allotments has been much less than allowable use (preference). In fact, over this period, licensed use has been only 57 percent

TABLE 2-3

Allotments in the Improve Category Because of Conflicts
with Wildlife, Watershed, Off-Road Vehicles, and Oil and Gas

Allotment Name	Conflicts with Livestock Grazing			
	Wildlife	Watershed	ORV	Oil and Gas
Agate		X		
Arth's Pasture	X			
Athena		X		
Barley Flat-Ronzio		X		
Bar X	X			X
Big Flat-Ten Mile	X	X	X	
Blue Hill	X		X	
Buckhorn			X	
Cisco Mesa	X	X		X
Cisco Springs Wash	X	X		X
Corral Wash	X	X		X
Cottonwood	X	X		
Crescent Canyon		X		
Crescent Junction		X		
Diamond	X	X		
Floy Creek		X		
Granite Creek	X			
Harley Dome	X	X		
Hatch Point	X			
Highlands		X		
Kane Springs	X			
Lisbon	X			
Little Hole	X			
Middle Canyon				X
Mineral Point	X			
Monument Wash		X		X
Nash Wash		X		
North Sand Flats			X	
Pipeline	X	X		
Potash	X			
Rattlesnake (Grand Co.)	X			
Ruby Ranch			X	
San Arroyo	X			X
Showerbath Springs	X	X		
South Sand Flats			X	
Spring Canyon Bottom	X			
Steamboat Mesa	X			
Sulphur Canyon	X	X		X
Taylor		X		
Ten Mile Point	X		X	
Thompson Canyon		X		
Whipsaw Flats		X		
Windwhistle	X			

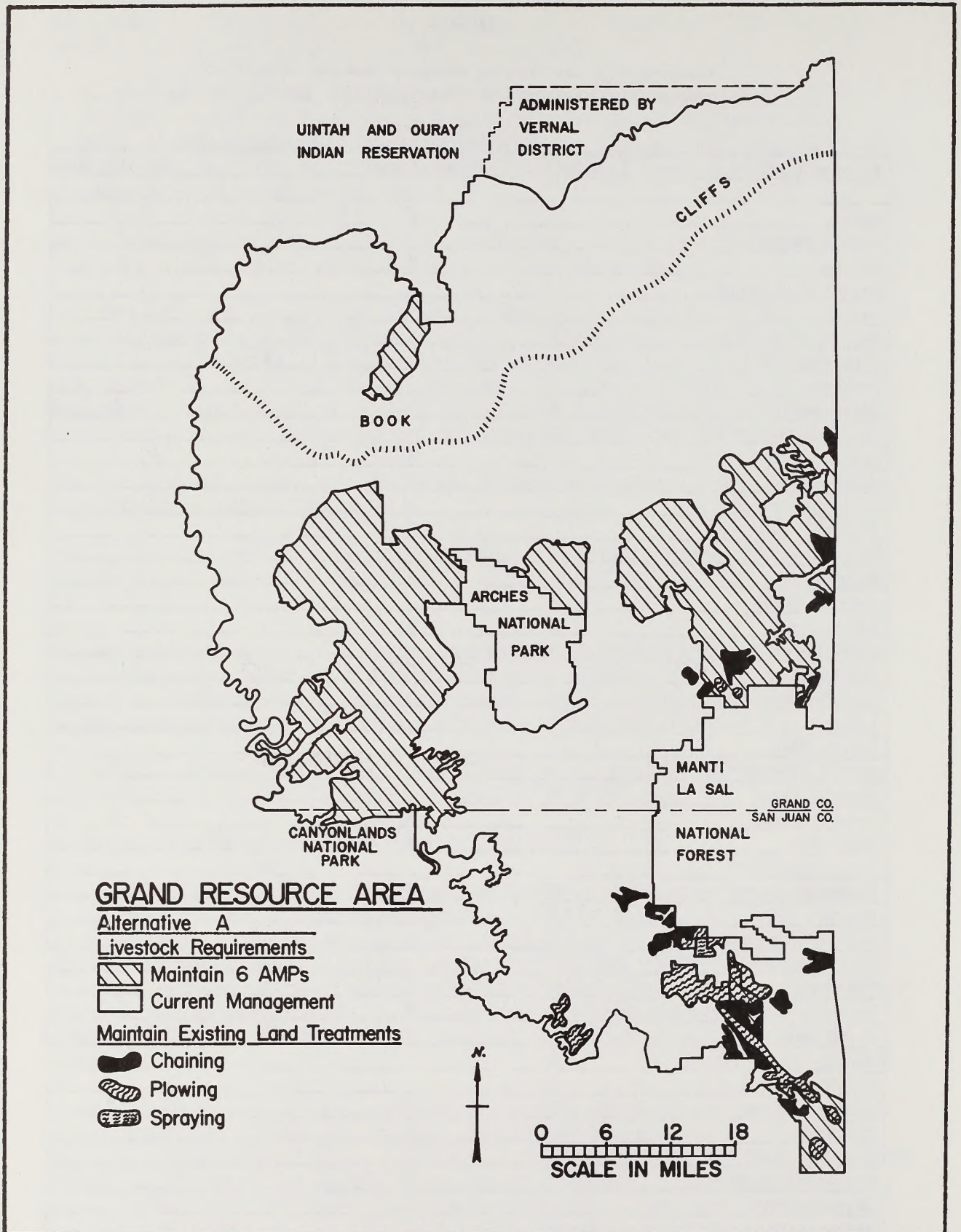


FIGURE 2-4

Management of Livestock Grazing Under Alternative A

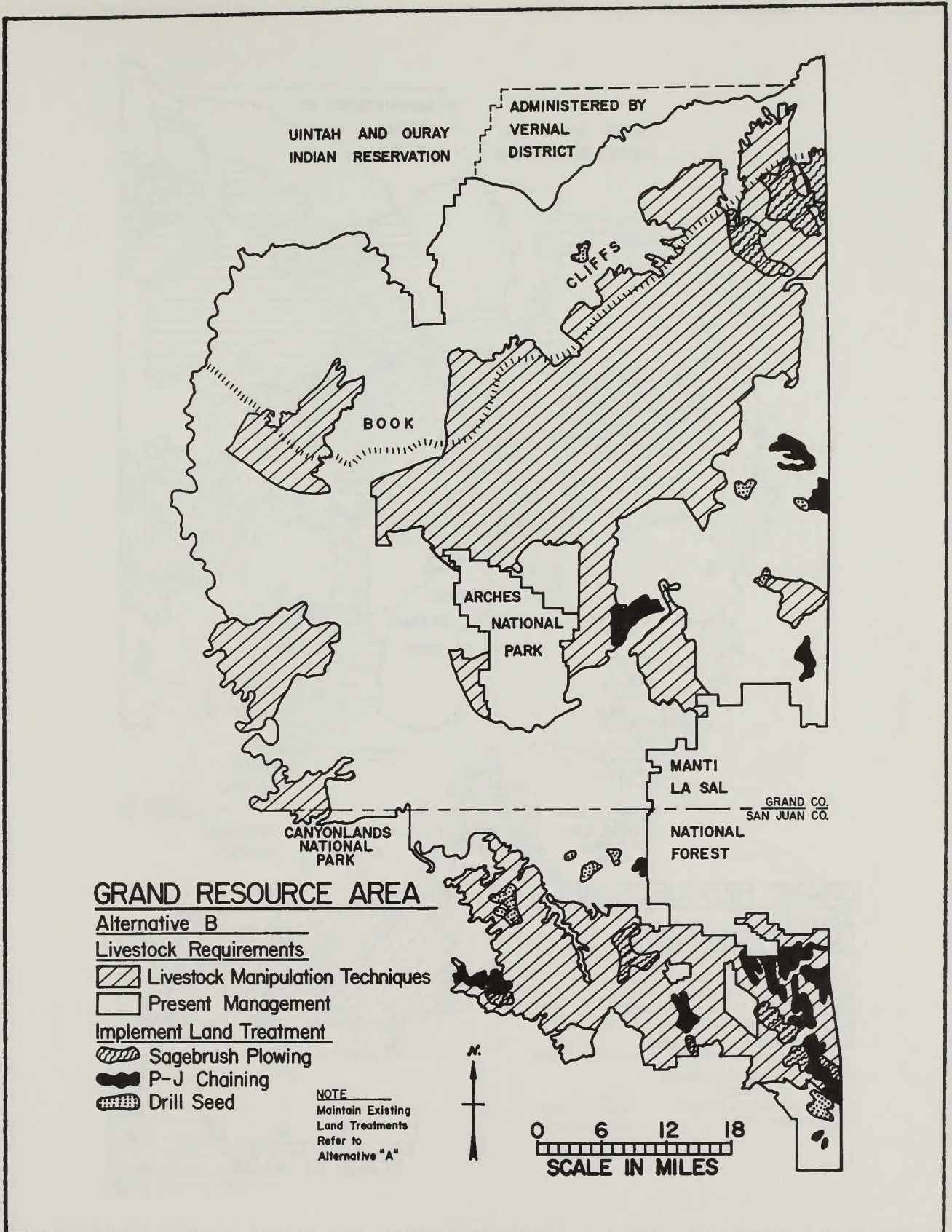


FIGURE 2-5

Management of Livestock Grazing Under Alternative B

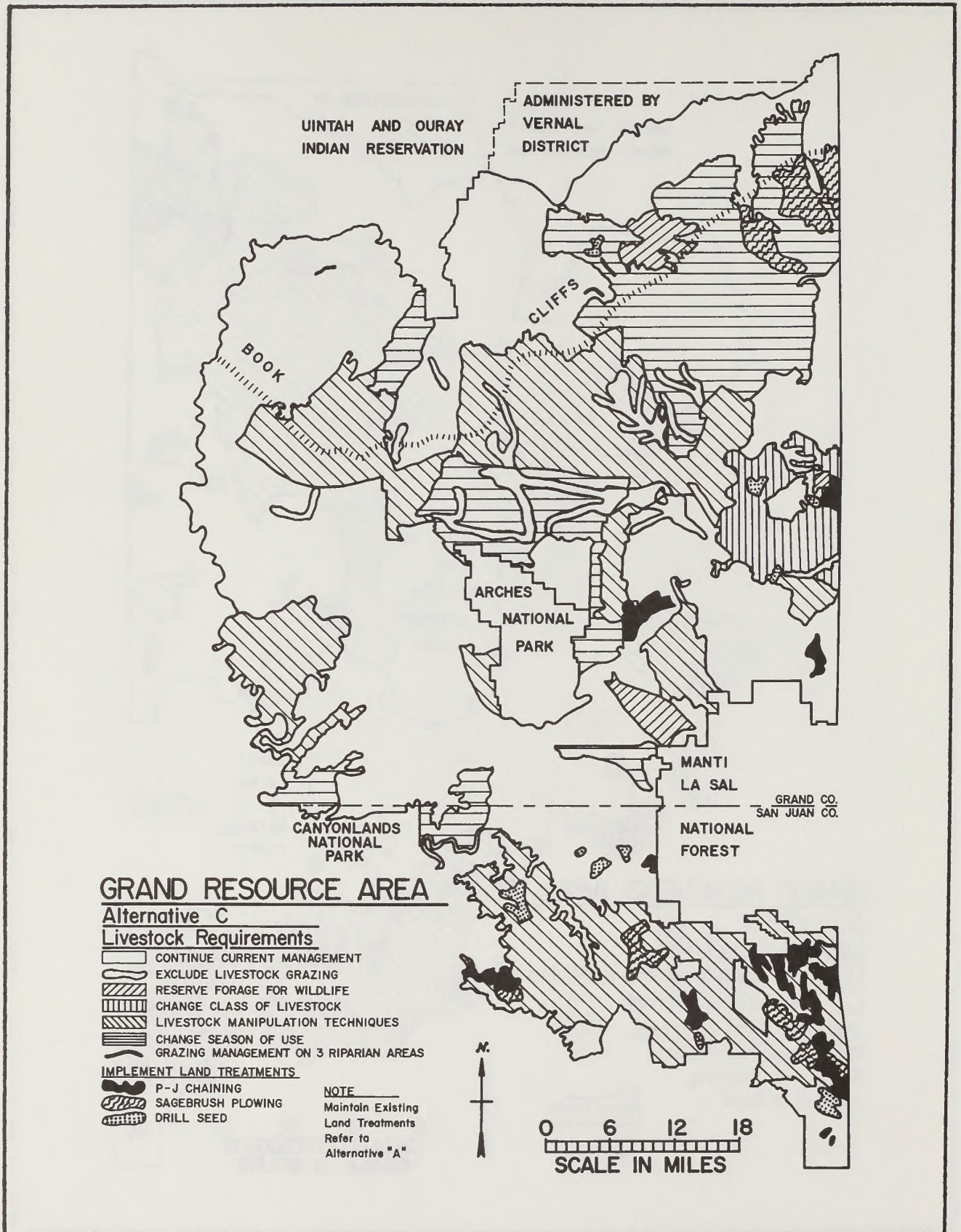


FIGURE 2-6

Management of Livestock Grazing Under Alternative C

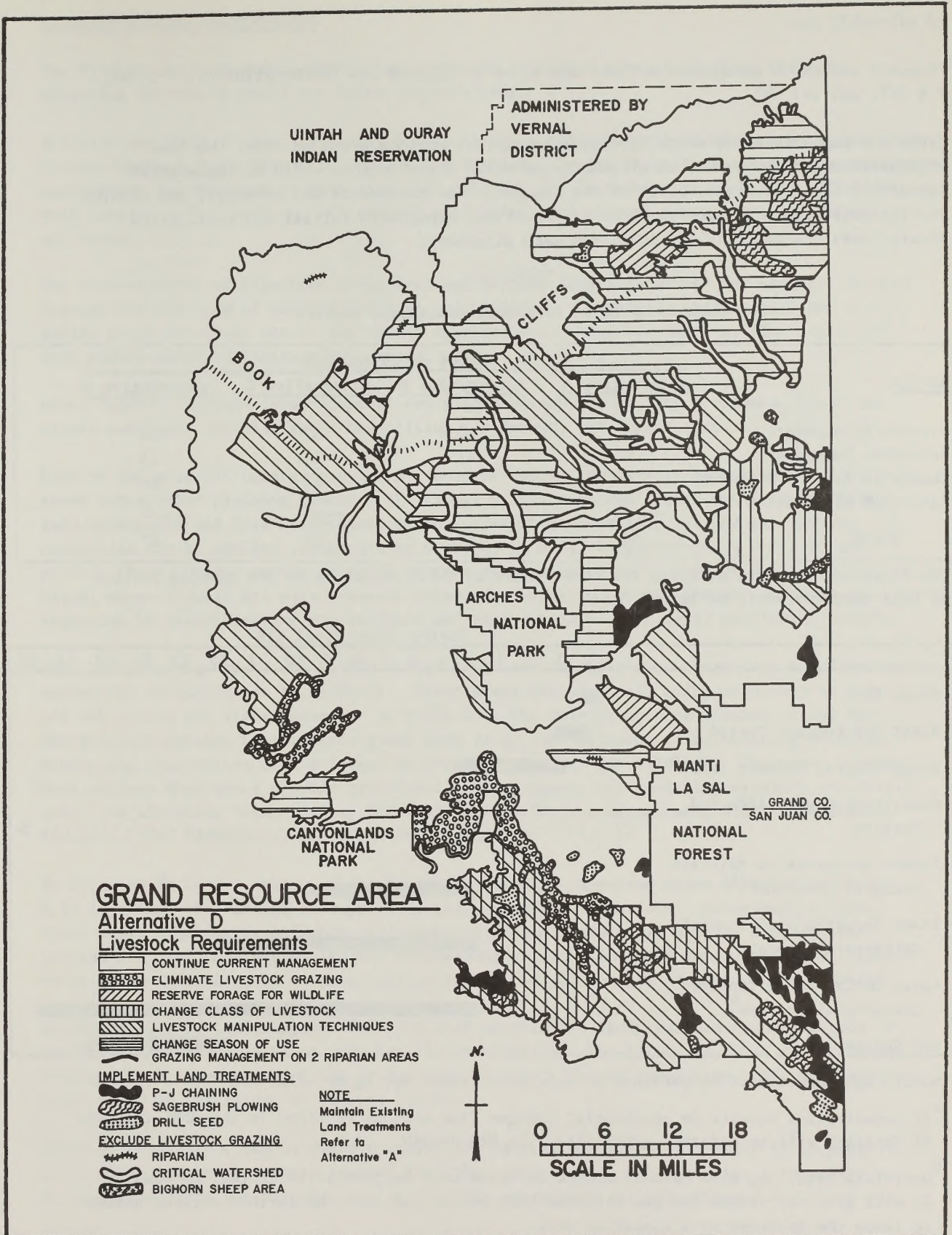


FIGURE 2-7

Management of Livestock Grazing Under Alternative D

of allowable use.

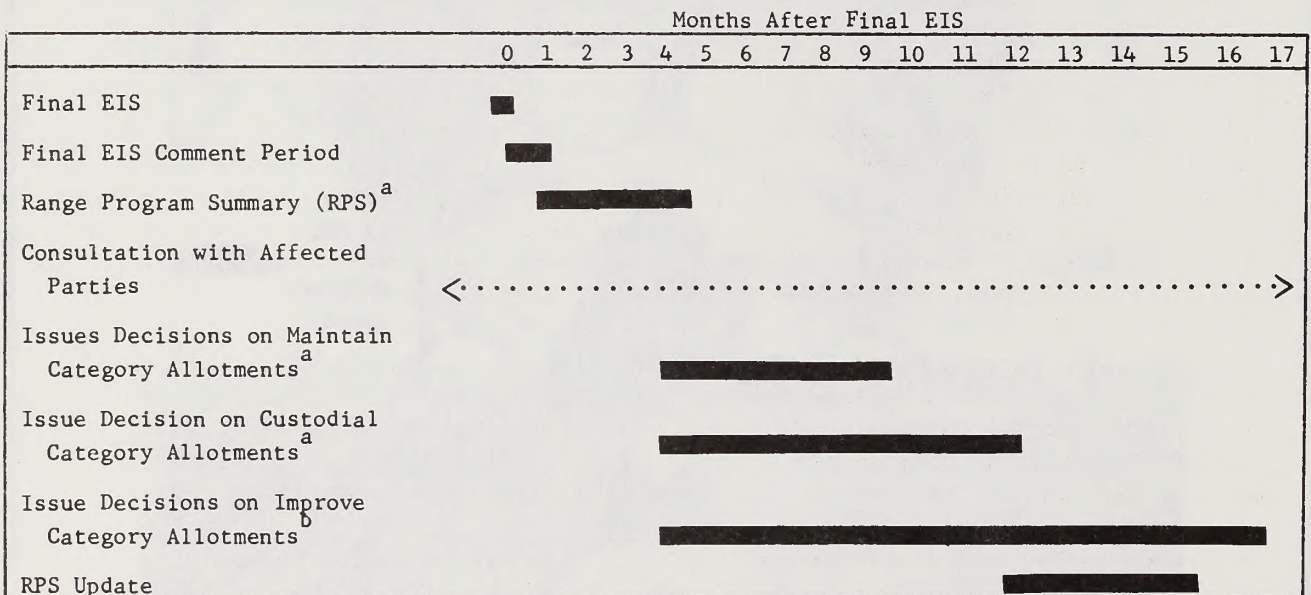
Proposed livestock management actions are shown in Figures 2-4 (Alternative A), 2-5 (B), 2-6 (C), and 2-7 (D).

Table 2-4 summarizes the major livestock management actions proposed under the four alternatives and the number of allotments on which these actions would be implemented. Appendix K lists specific season of use changes, land treatments and acreages, and grazing restrictions proposed under the four alternatives, along with initial and anticipated future livestock and wildlife AUMs, for each allotment.

TABLE 2-4
Summary of Major Livestock Management Actions

Action	Number of Allotments			
	Alternative A	Alternative B	Alternative C	Alternative D
Present Management	67	45	37	34
Intensive Management	0	22	18	13
Change in Season of Use	0	0	12	16
Livestock Elimination	0	0	0	4
TOTAL	67	67	67	67

The following schedule portrays the time frames in which decisions on the grazing portion of this document would be issued.



NOTE: Agreements will be obtained or decisions issued during or after RPS.

^a If consultation results in substantial changes from actions outlined in the RPS, issuance of decision will be deferred until after the RPS update.

^b Decisions requiring more than 17 months to issue will be identified in the RPS update. It will give the reason for the extended time period and describe further actions needed to issue the decision by a specified date.

WILDLIFE HABITAT REQUIREMENTS

The Wildlife Habitat Requirements planning issue clarified several problems that are occurring between wildlife and other resource uses.

Wildlife and their habitat generally do not tolerate human activities without incurring population losses or some degree of habitat degradation. In the GRA, livestock grazing and mineral exploration and development have displaced wildlife and degraded their habitat. Wildlife must compete with livestock, oil and gas activities, and mineral exploration for forage and space.

The concentration of livestock along drainage bottoms (riparian areas) has resulted in the degradation and loss of habitat for fish and wildlife. Livestock normally seek out riparian areas for food, water, and cooler temperatures during hot weather. The conflicts that result cause competition for forage, water, and space.

Other concerns include lands disposal and rights-of-way for utility corridors, which can create conflicts and also cause competition for forage, water, and space.

Most of the wildlife habitat management concerns can be resolved by management actions proposed under other planning issues. Additional wildlife forage (AUMs) would result from land treatments and fire management actions. The more protective oil and gas leasing categories can be applied (Alternatives C and D) to avoid displacement of wildlife and protect their habitat during critical periods such as birthing seasons or during the winter when wildlife are most severely stressed. Wildlife habitat protection would be augmented by identification of avoidance and exclusion areas for major utility corridors.

Pear Park, Spring Creek, and Castle Valley have been identified as areas that could be reserved for exclusive use by wildlife. These areas are presently being used only by deer and elk during the winter season. In Table 2-2, the only management actions listed for the Wildlife Habitat Requirements issue have to do with maintenance of existing wildlife waters and reservation of the forage in these three areas for wildlife. The other management actions that would provide additional forage, space, and cover for wildlife are listed under the Livestock Requirements, Off-Road Vehicle Use and Management, Utility Corridors, Minerals, Fire Management, and Wilderness issues.

As noted in Table 2-1, the wildlife habitat management objective under Alternatives A and B is to manage the habitat to support current big game populations. Management actions found under Alternative A (Table 2-2) that would help to maintain habitat adequate for current big game populations include maintaining current livestock management on all allotments and maintaining the current application of the oil and gas leasing category system.

In Alternative B, the management actions that propose new land treatments and rotation of grazing use areas would be of some benefit to wildlife. The intent of these actions under Alternative B, however, would be to maximize livestock forage production. Big game populations would be maintained at current levels.

Under Alternatives C and D, where the wildlife habitat management objective is to support prior stable big game numbers (except that the bighorn sheep objective for Alternative C is to support only the current population), the management actions proposed for the Live-

stock Requirements issue would again be the primary contributors to meeting the wildlife objectives. This would be achieved mostly through rotation of grazing among use areas, implementation of new land treatments, changes in livestock seasons of use, changes in class of livestock, management of riparian areas, restriction of livestock from specific wildlife areas, and elimination of livestock grazing from some areas. Applications of the oil and gas leasing category system proposed under Alternatives C and D would also contribute to protection of wildlife and their habitat during critical periods.

Alternatives A and B are intended to provide only for current big game populations. Alternatives C and D are intended to favor wildlife and wildlife habitat. Both of these alternatives are designed to increase current populations. Their goals are to attain prior stable big game numbers while preserving habitats in optimum condition.

Current and prior Stable Big Game Populations

<u>Species</u>	<u>Current</u>	<u>Prior Stable</u>
Deer	11,433	22,250
Elk	747	2,300
Bighorn Sheep	259	1,126
Antelope	229	887

Since the basic unit for measuring forage is the cattle AUM, conversion factors were used to figure the apparent capacity of the wildlife habitat under each alternative. The numbers of wildlife ungulates that can be supported on a cattle AUM of forage are 5.8 deer, 5.6 bighorn sheep, 9.6 antelope, and 1.9 elk. These conversion factors and the population estimates above (current and prior stable) were provided by the Utah Division of Wildlife Resources (UDWR, 1980).

OFF-ROAD VEHICLE USE AND MANAGEMENT

Some areas currently receive heavy recreational ORV use, as well as some nonrecreational use, resulting in potential conflicts.

Recreational use can be found in organized events and activities, as well as in the spontaneous uses that occur in the course of sightseeing, hunting, fishing, and other recreational activities. Nonrecreational use is associated with grazing, agriculture, mineral exploration and development, and other industrial and commercial uses.

Conflicts between ORV use and critical watersheds, minerals, and nonmotorized recreation activities can be mitigated through the application of ORV designations. The possible designations were presented and defined in Executive Order 11644 and are listed in Appendix M. Briefly, they include restriction of vehicles to existing roads and trails, restriction of vehicles to designated roads and trails, and designation of certain areas as closed to ORV use.

ORV designations have been recommended under Alternatives B, C, and D (See Table 2-2), based on the degree of conflict resolution needed. Under Alternative B, the entire GRA would be designated as open to ORV use. Designations proposed in Alternative C are shown in Figure 2-8, and those proposed under Alternative D are shown in Figure 2-9. These designations are defined in Appendix M.

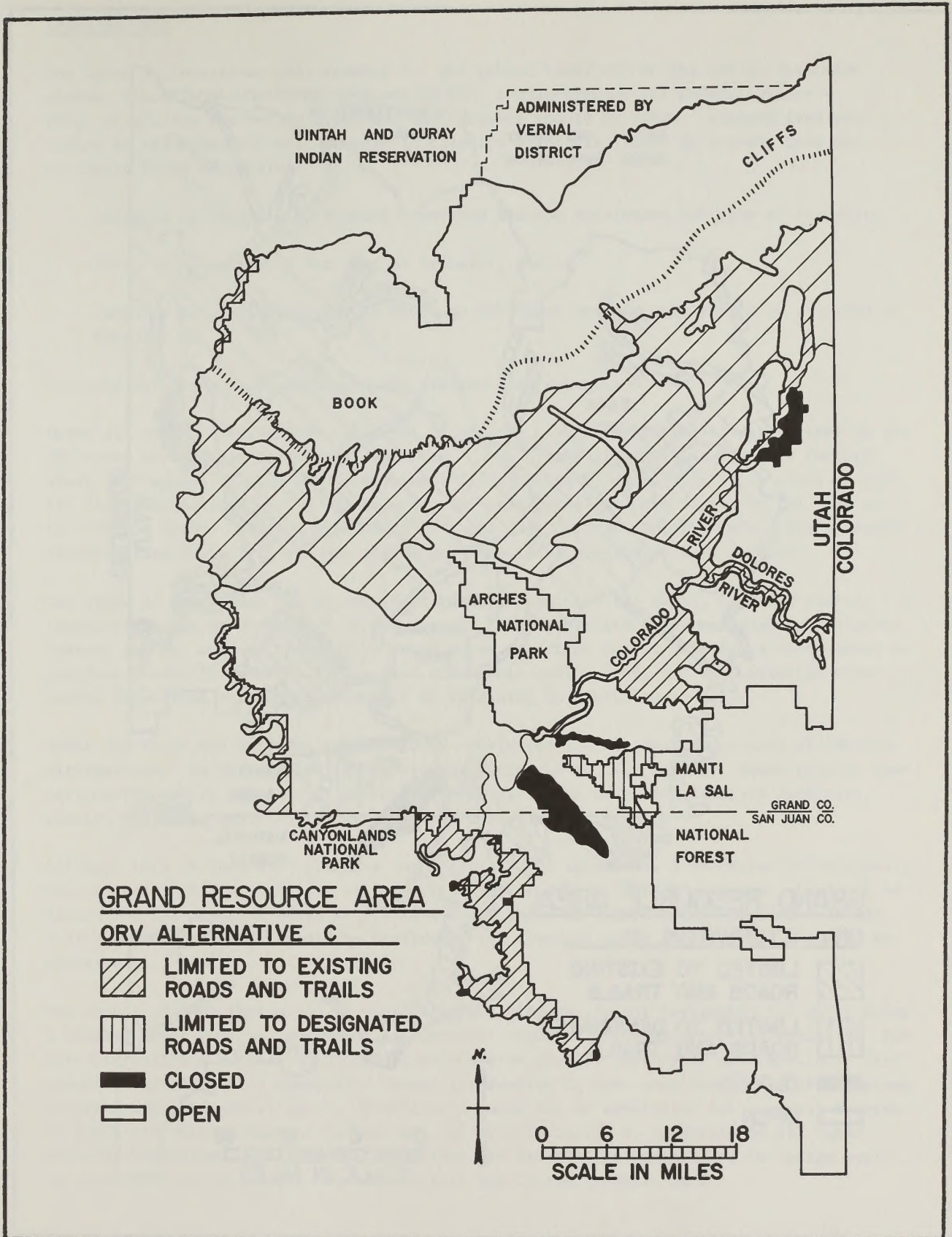


FIGURE 2-8

Management of Off-Road Vehicle Use Under Alternative C

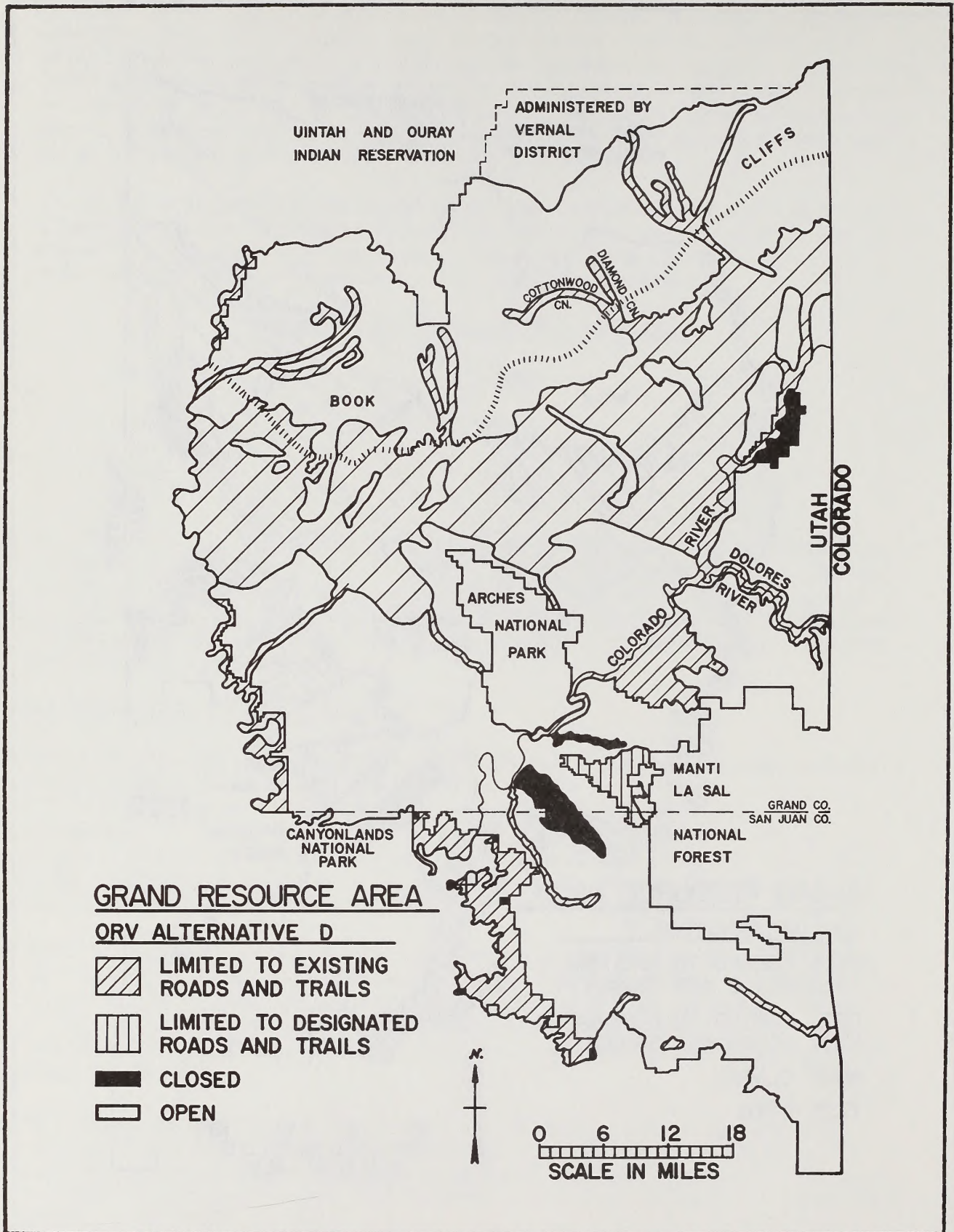


FIGURE 2-9

Management of Off-Road Vehicle Use Under Alternative D

LANDS ACTIONS

The Lands Actions issue will examine all the public lands within the GRA to determine whether these lands should be retained by BLM, transferred out of Federal ownership, or studied further to ascertain what actions should be taken. Alternatives presented in this document will propose to classify all public lands in the GRA into the following three categories:

- lands to be retained in Federal ownership and not considered for sale or transfer;
- lands to be available for sale or transfer; and
- lands to be studied further in order to determine whether they should be retained or disposed of.

Criteria for these classifications are presented in Appendix N.

Under all of the alternatives, at least 98 percent of the public lands administered by the GRA would be retained in Federal ownership. None of the alternatives proposes further study or disposal of more than 1.6 percent (Alternative B) of the 1,819,554 acres of public land administered by the GRA into the two categories that would provide for sale or for further study. It should be noted that the 33,331 acres administered by BLM's Vernal District (see Table I-1) are not included in the lands portion of this document.

The types of lands that can be considered for disposal are (1) small, isolated tracts; (2) tracts difficult or uneconomic to manage; (3) tracts unsuitable for management by another Federal agency; and (4) tracts that would serve important public objectives that cannot be achieved prudently and feasibly on land other than public land, and that outweigh other public objectives that would be served by retaining in public ownership.

Table 2-5 lists the acreages that would be considered for disposal under each of the four alternatives. In this table, tracts are designated by request number. These request numbers correspond to Appendix Q, which lists requests that have been received from city, county, and State agencies, as well as from private individuals.

Although this is only a preliminary identification of lands with a potential for disposal, many of the land use conflicts will be resolved through the RMP/EIS process. Lands to be considered for disposal under Alternative B are shown in Figure 2-10. Figures 2-11 and 2-12 show the lands that would be considered for disposal under Alternatives C and D, respectively.

The amount of land that would be considered for disposal is not designated for Alternative A because under current management all disposal requests are considered individually. Under Alternative B a total of 29,065 acres would be studied further or made available for transfer out of Federal ownership. Under Alternative C, more consideration would be given to protecting the public lands. Some tracts would not be considered for disposal because of conflicts with management objectives. Under Alternative D, retention of all lands would be emphasized. Only those tracts that are isolated and uneconomic to manage would be considered for disposal. Isolated tracts are listed in Appendix P.

<u>Alternative A</u> <u>No Action</u>	<u>Alternative B</u> <u>Production</u>	<u>Alternative C</u> <u>Limited Protection</u>	<u>Alternative D</u> <u>Protection</u>	<u>Acres</u>	<u>Acres</u>	<u>Acres</u>
All lands disposal requests are considered individually.	All City-County Requests	City-County Requests (Nos. 1 thru 14, 16)	Isolated Tracts Nos. 6, 7, and 9 thru 21).	9,703	4,842	6,642
	All State Requests	Private Requests (Nos. 1 thru 5, 7)		4,400	145	
	All Private Requests	Isolated Tracts (Nos. 6, 7, and 9 thru 21).		225	<u>6,642</u>	
	All isolated Tract			<u>8,083</u>		
TOTAL ACRES				22,411	11,629	6,642

NOTE: Request numbers refer to specific city-county, State, and private requests listed in Appendix Q.

TABLE 2-5

Lands to be Considered for Disposal Under Each of the Four Alternatives

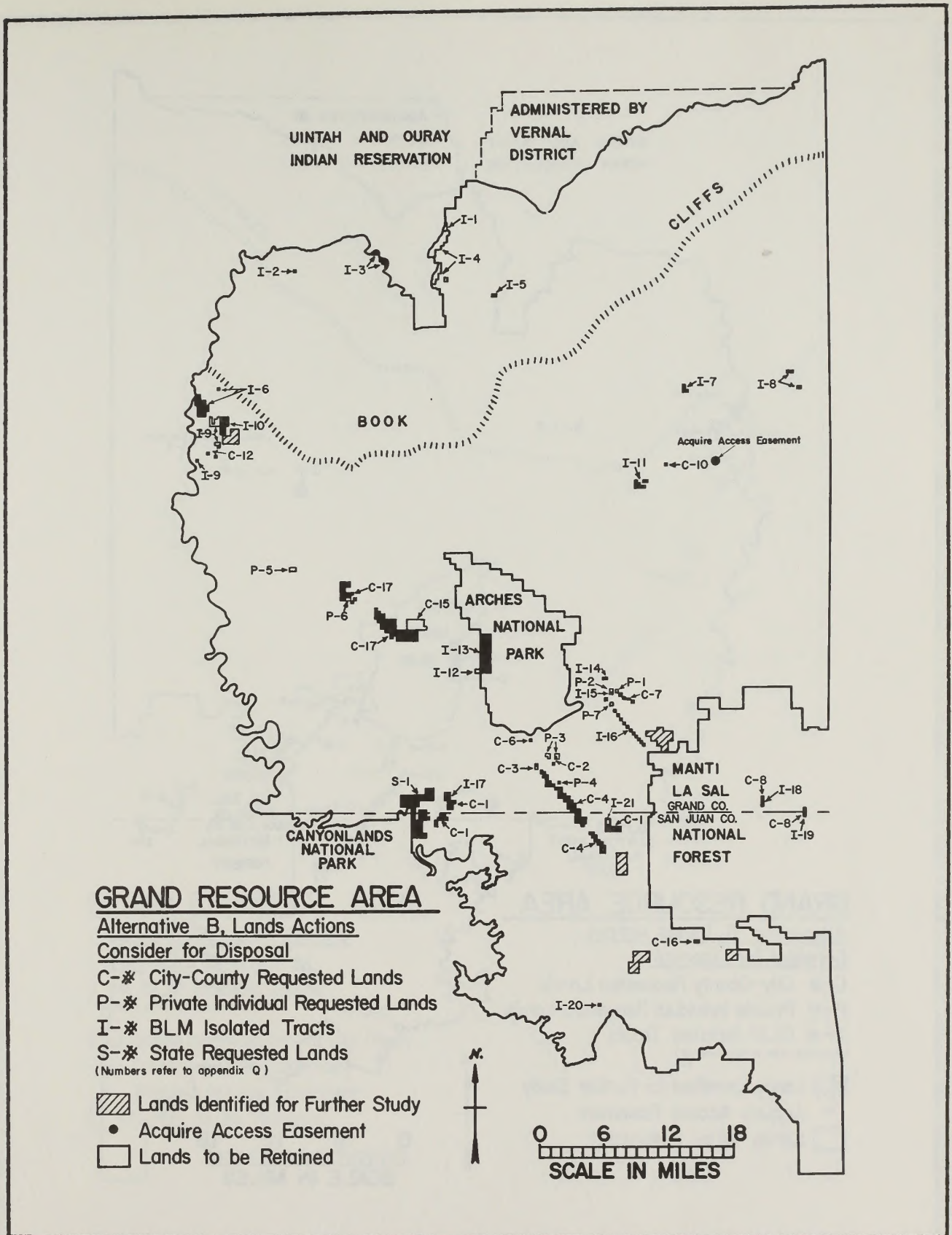


FIGURE 2-10

Lands Actions Under Alternative B

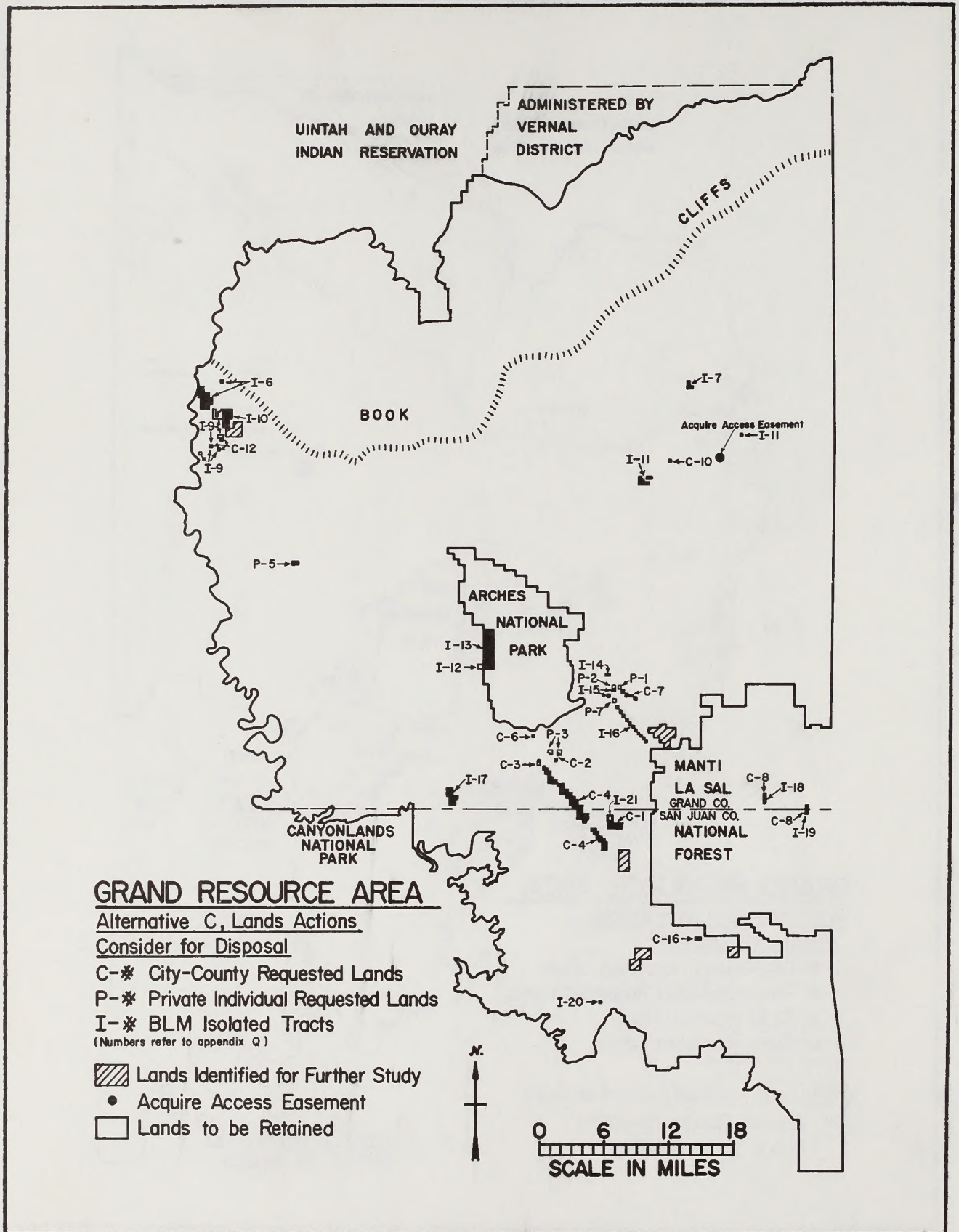


FIGURE 2-11

Lands Actions Under Alternative C

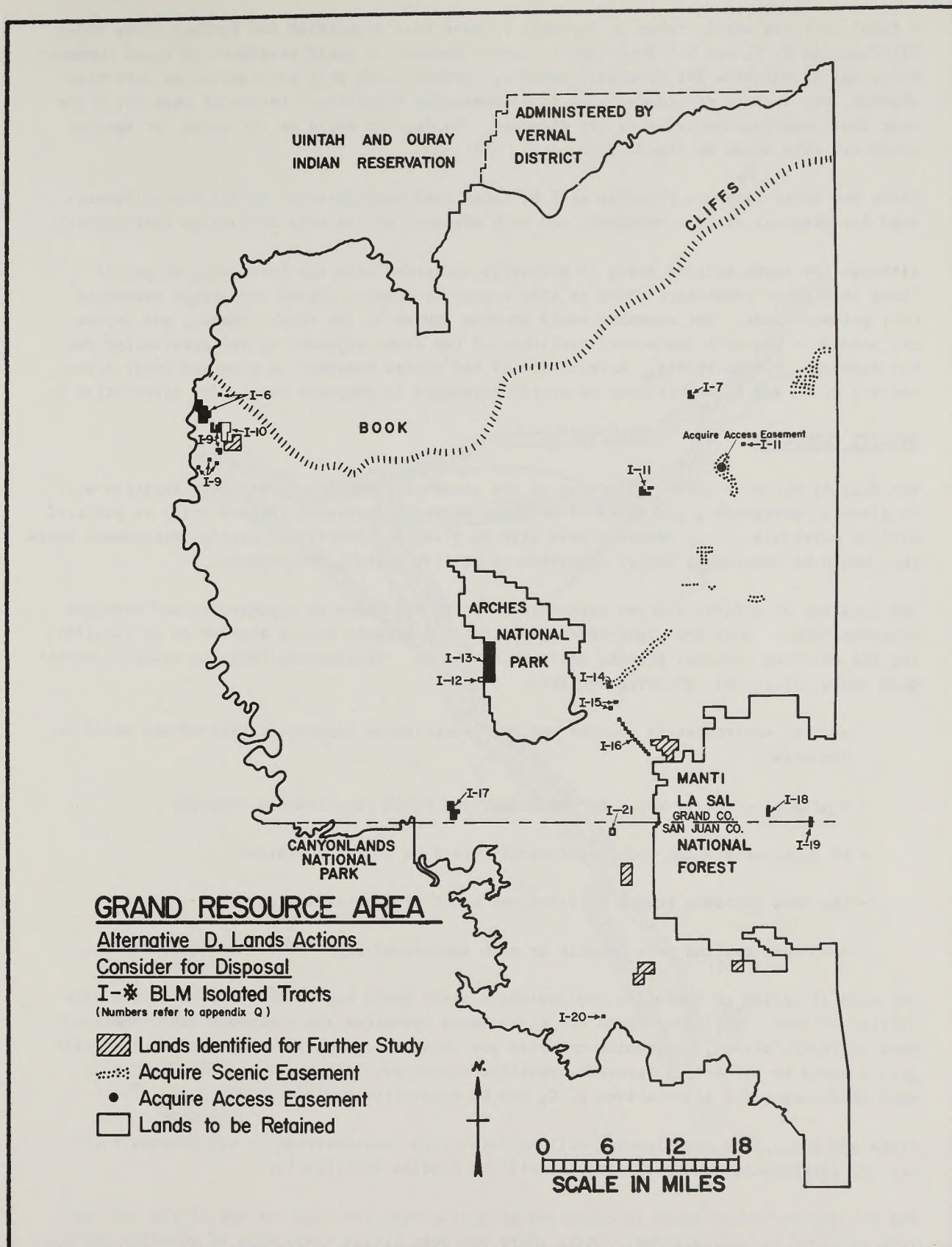


FIGURE 2-12

Lands Actions Under Alternative D

A total of 6,594 acres (refer to Appendix O) have been identified for further study under Alternatives B, C, and D. These public lands, because of their proximity to local communities, may be suitable for disposal; however, further study will be required to determine whether they contain environmentally or economically significant resources that would prevent their meeting the criteria for disposal. Lands that would be set aside for further study are also shown in Figure 2-10, 2-11, and 2-12.

State and local land use planning will be taken into consideration on all tracts identified for disposal in this document, and each disposal action will be handled individually.

Although the Lands Actions issue is primarily concerned with the conveyance of public lands into other ownership, there is also a need to acquire access and scenic easements over private lands. One easement would provide access to the Cisco takeout, and others are needed to preserve the scenic qualities of the areas adjacent to and paralleling the Colorado and Dolores rivers. Acquisition of the access easement is proposed under Alternatives B, C, and D; acquisition of scenic easements is proposed only under Alternative D.

UTILITY CORRIDORS

The Utility Corridor issue will focus on two areas of concern. First, consideration will be given to designating 140 miles of existing de facto corridors (Figure 2-13) as official utility corridors. Consideration will also be given to identifying special management areas that would be unsuitable for or sensitive to utility systems development.

The location of utility systems currently in place was based on topographic and economic considerations. Most new right-of-way applications propose routes similar to or paralleling the existing systems, forming de facto corridors. Designating these as official corridors would effect the following benefits:

- adverse environmental impacts and proliferation of separate rights-of-way would be minimized;
- multiple occupancy would be maximized, and width requirements reduced;
- EA requirements for each right-of-way would be cut to a minimum;
- the most suitable routes or locations would be identified; and
- BLM could respond more quickly to each individual right-of-way request.

The identification of exclusion and avoidance areas would reduce resource conflicts with utility systems. Exclusion areas are those where resources are protected from such land uses as rights-of-way, and avoidance areas are those where special stipulations and mitigation would be required to protect sensitive resources. Figures 2-14, 2-15, and 2-16 show these areas for Alternatives B, C, and D, respectively.

State and local land use planning will be taken into consideration on all proposals for utility development, and each proposal will be handled individually.

The Utility Corridors issue is concerned primarily with planning for the siting and location of major utility systems. While there has been little discussion of planning for mi-

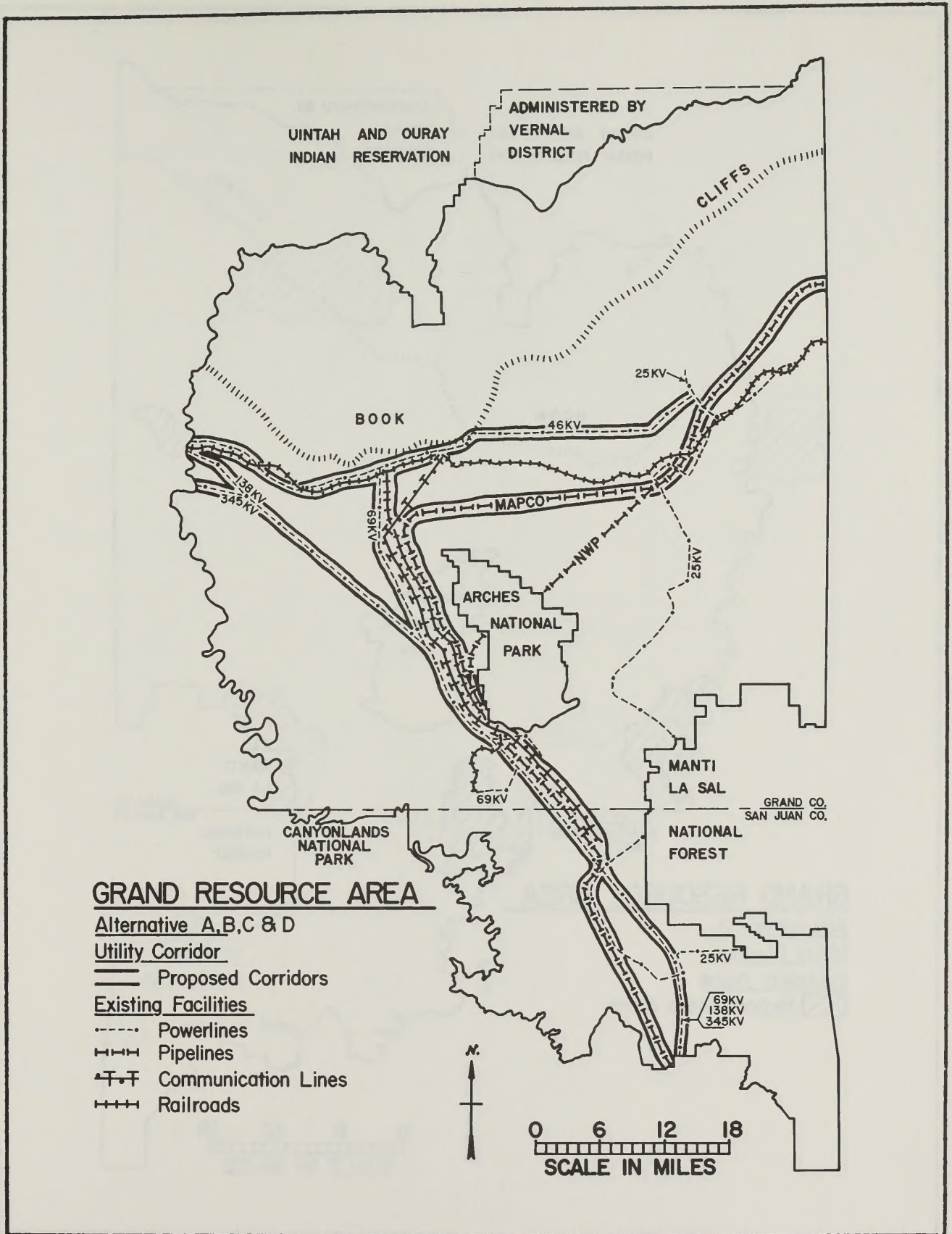


FIGURE 2-13

Existing and Proposed Utility Corridors

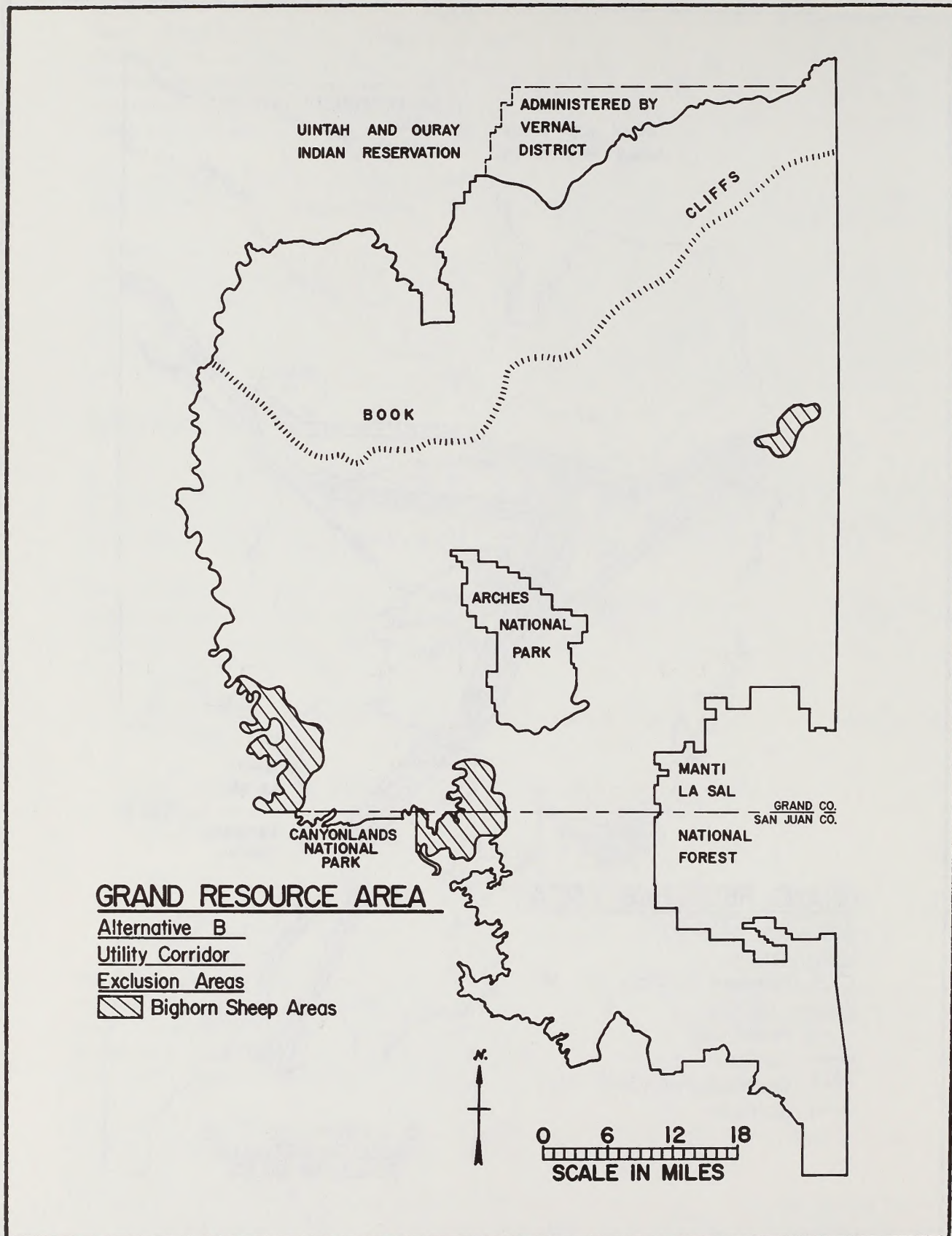


FIGURE 2-14

Utility Corridor Exclusion Areas Under Alternative B

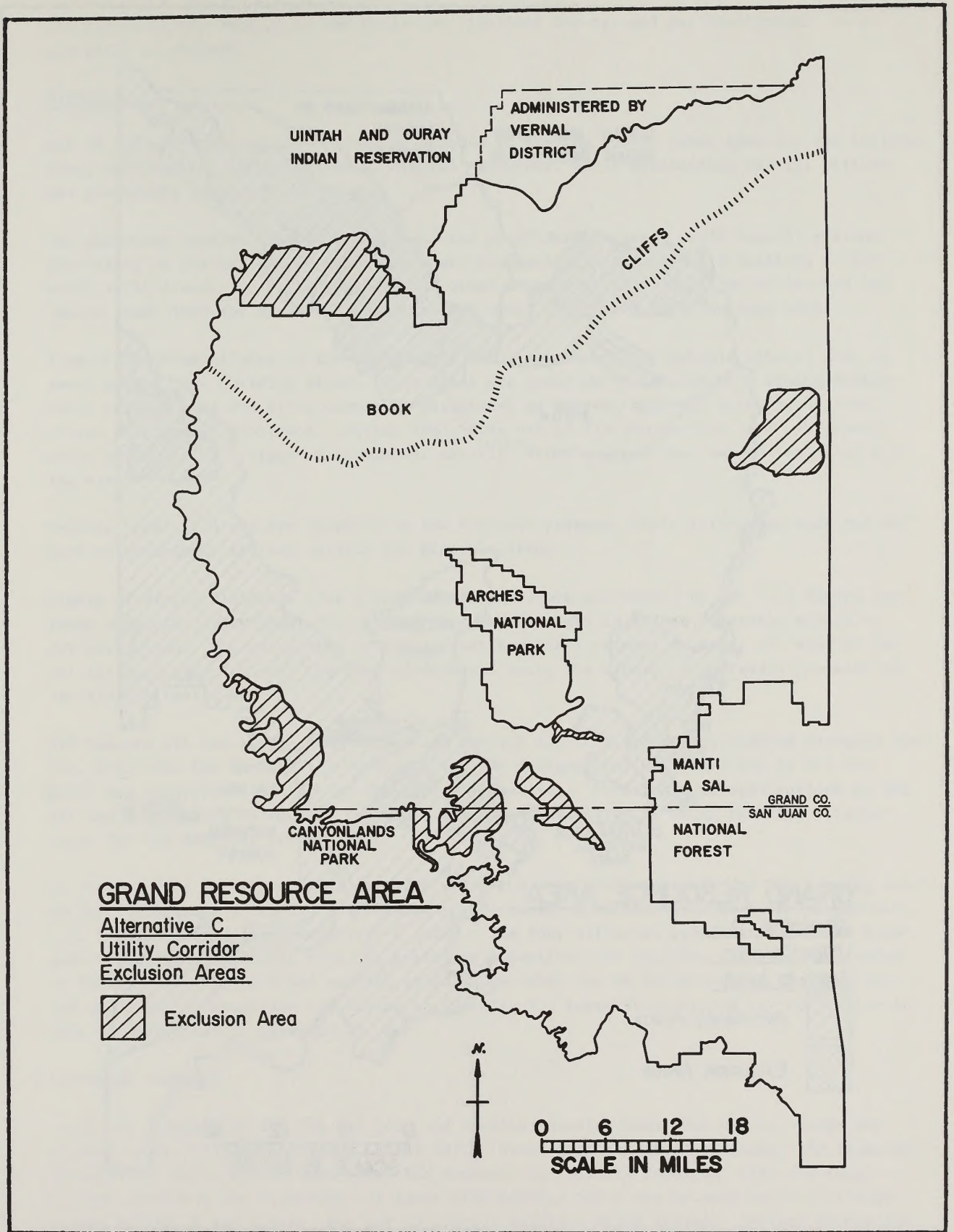


FIGURE 2-15

Utility Corridor Exclusion Areas Under Alternative C

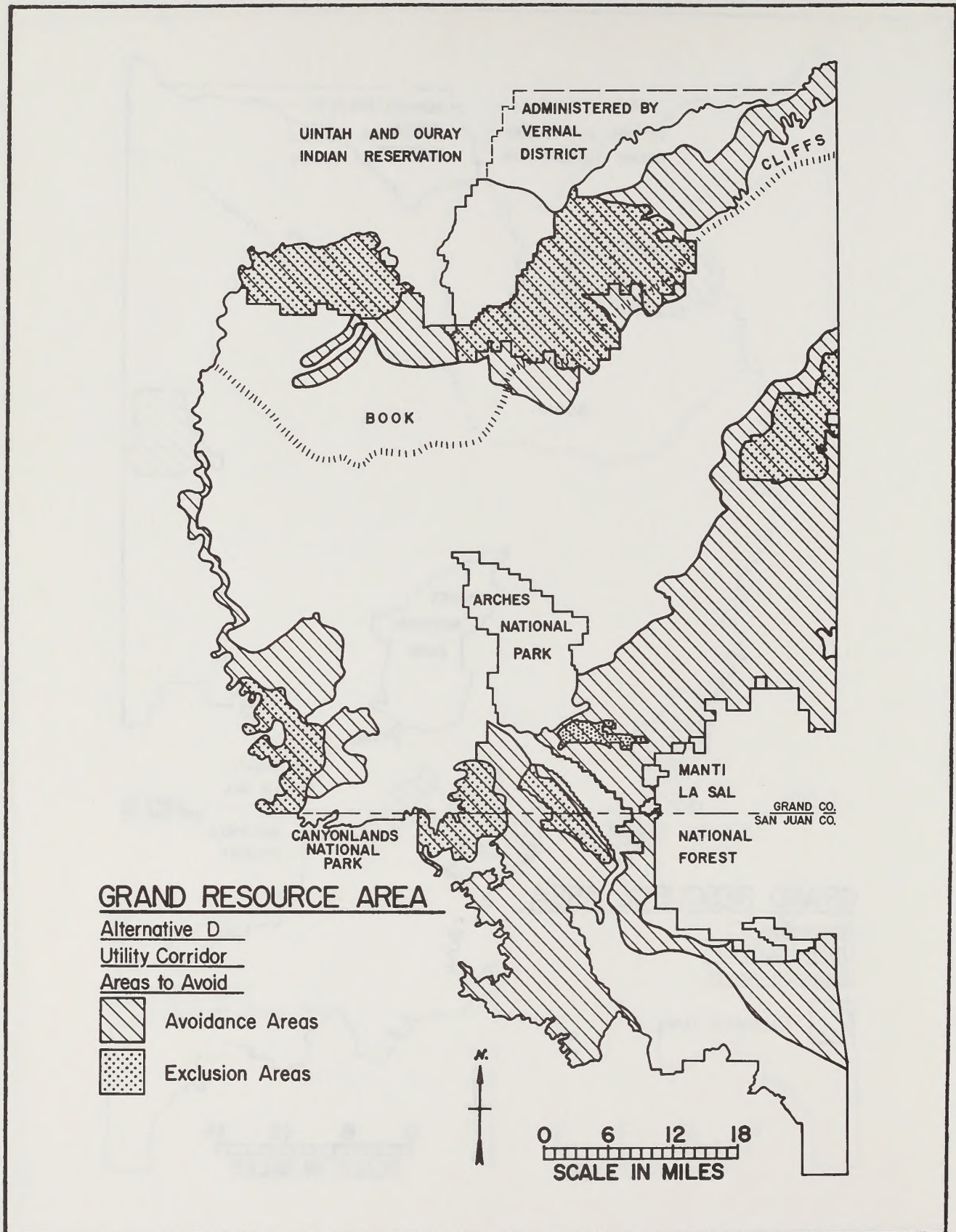


FIGURE 2-16

Utility Corridor Avoidance and Exclusion Areas Under Alternative D

nor rights-of-way such as access roads and pipelines for oil and gas development, these are still of concern.

MINERALS

All of the alternatives have a similar purpose in keeping public lands open for the exploration, development, or collection of mineral resources, while maintaining natural systems and protecting sensitive resources.

One potential problem is that the designation of wilderness areas would legally prevent the filing of new mining claims within their boundaries, although valid existing claims would still stand. No management actions other than those allowed by the Wilderness Act can be prescribed for mineral activities that would take place in wilderness areas.

A second problem relates to the locating of sites for removal of salable mineral such as sand, gravel, and building stone. Such sites are quite often covered with mining claims. Under current laws the sites cannot be designated as mineral material sites unless the claims are legally abolished. During 1982, five out of six prospective sand and gravel sites could not be designated as mineral material sites because they were occupied by mining claims.

Because these problems are internal to the minerals program, their resolution does not depend on management actions outside the Minerals issue.

Rights of mining claimants (for locatable minerals) are guaranteed by the 1872 Mining Law. These explicit rights limit the actions that BLM can take to manage locatable minerals. For this reason, the management actions prescribed for locatable minerals are similar under all four alternatives, the only differences being the mineral withdrawals proposed under Alternatives C and D.

BLM manages oil and gas leasing activities through applications of the leasing category system, which has the flexibility to permit various designations of categories to fit the goals and objectives for each of the four alternatives. These various applications of the oil and gas leasing categories represent the primary differences among the four alternatives for the Minerals issue.

In Table 2-2 it is evident that acreages under the more protective oil and gas leasing categories (Categories 2, 3, and 4) increase appropriately with the level of resource protection to be provided in Alternatives C and D. The four different applications of the category system are consistent with the goals and objectives for the four alternatives (refer to Table 2-1). Standard and special stipulations that can be imposed under the four oil and gas leasing categories are listed in Appendix R. Lease stipulations for activities in WSAs are presented in Appendix S.

LOCATABLE MINERALS

Locatable minerals in the GRA are gold and uranium/vanadium ores that can be staked and claimed under the General Mining Law of 1872. Since this law gives claimants the right to file mining claims and to work them, BLM controls are severely limited. Even the legal process involving the withdrawal of lands from mineral entry can be used only to prevent future filing of new claims, but not to control existing valid claims. Surface protection

can be maintained under regulations in 43 CFR 3809, which BLM has the responsibility to enforce. There are over 20,000 mining claims; however, the exact number being worked is uncertain because of continuous new filings and abandonment of old claims. Withdrawals and wilderness designations (see Figures 2-17 and 2-18) can interfere with the right to file mining claims granted under the 1872 mining law. Areas presently closed to locatable minerals development are shown in Figures 2-17 and 2-18.

LEASABLE MINERALS

Leases, unlike mining claims, are granted at the discretion of BLM. Oil, gas, coal, sodium, potassium, and geothermal resources are covered by the Mineral Leasing Act of 1920. Of these, oil, gas, and potash are currently under lease in the GRA. The coal unsuitability criteria were not applied because the Thompson Known Recoverable Coal Resource Area shown in Figure 1-11 will appear in the schedule for the fourth round of leasing, planned for 1985. The length of time from now until the consideration date forces the RMP team to defer this issue. An amendment to the RMP will eventually be necessary in order to accommodate this process. Potash areas are also shown in Figure 2-19.

For a number of years the Moab District has used the oil and gas leasing category system developed by BLM in Utah. By prior identification and mapping of resources requiring various levels of protection, and assigning categories with provisions to provide these levels of protection, a high degree of consistency has been attained in the Utah BLM oil and gas leasing program. These categories have been standardized and are described as follows:

- Category 1: open to leasing with a set of standard stipulations.
- Category 2: open to leasing with a choice of special stipulations to fit protection needs.
- Category 3: open to leasing, but with no surface occupancy (directional drilling from outside the area is required).
- Category 4: leasing suspended; no leasing is allowed.

A detailed discussion of these categories and the standard and special stipulations that apply is presented in Appendix R.

Each alternative in this document contains an application of the oil and gas category system appropriate to the goals and objectives for that alternative. The application presented in Alternative A (Figure 2-20) represents current management and was taken from the 1975 Oil and Gas EA which was signed by the Utah State Director.

The proposed action analyzed in the 1975 Oil and Gas EA was the leasing of National resource lands and other lands (including lands in the GRA), where BLM has mineral estate, for oil and gas. Individual lease proposals subsequent to the EA are analyzed and documented to determine whether the potential impacts were adequately described in the EA.

The 1975 Oil and Gas EA acknowledged that, while the National average of productive oil and gas leases is about 10 percent, and while the GRA averages about 5 percent productive wells, any single lease is potentially productive. The EA assumed the possibility of full production on each lease.

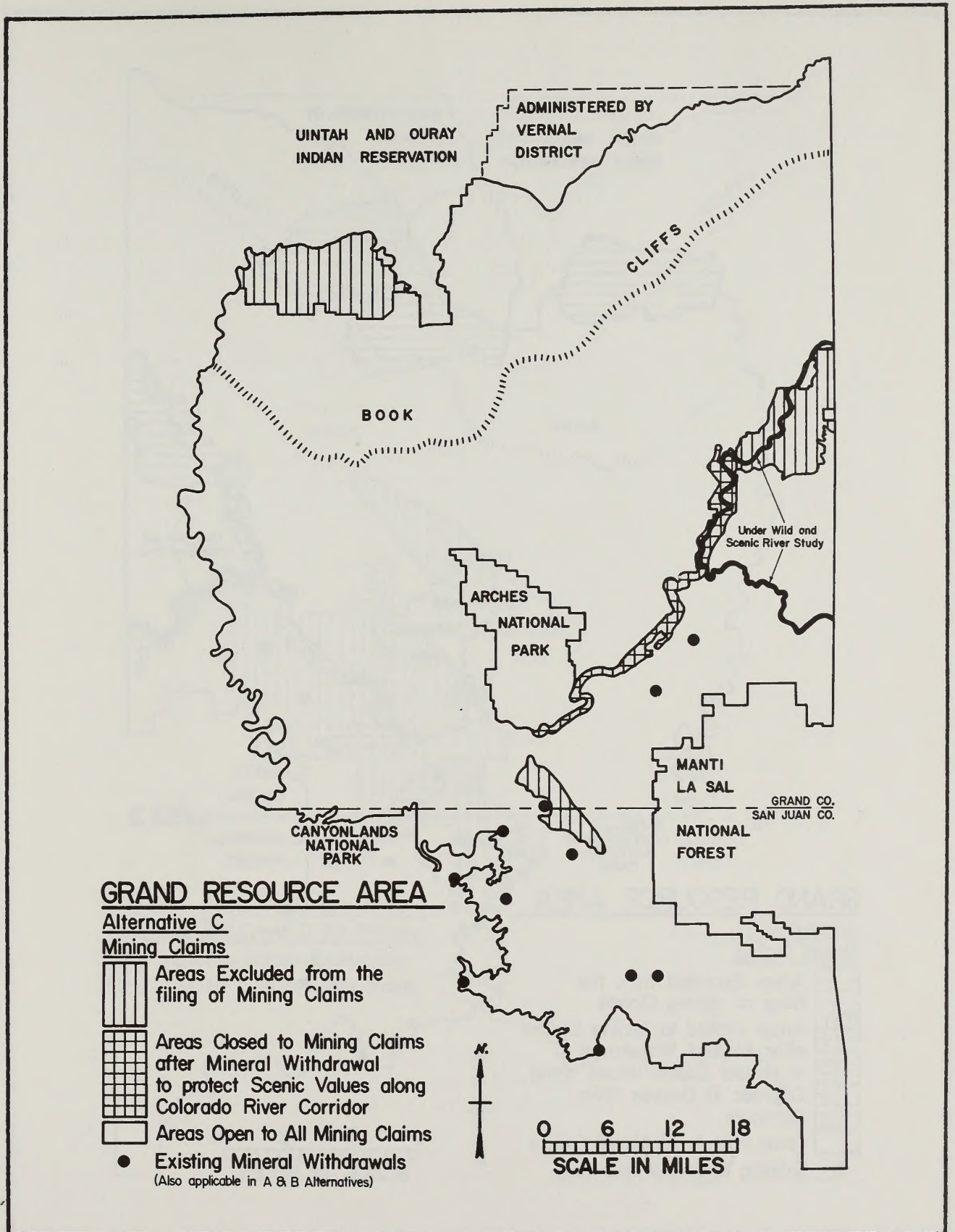


FIGURE 2-17

Areas Closed to Mining Claims Under Alternative C

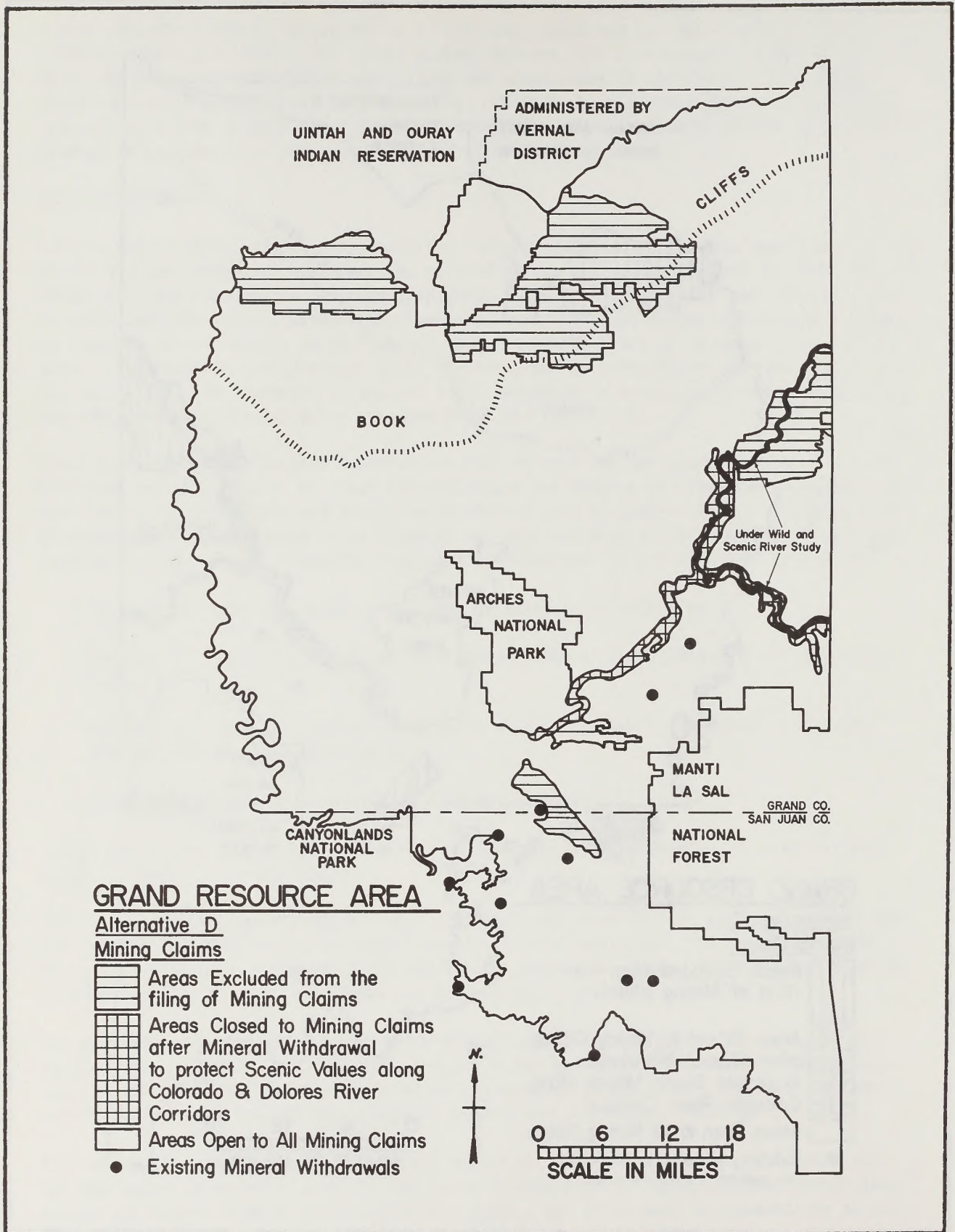


FIGURE 2-18

Area Closed to Mining Claims Under Alternative D

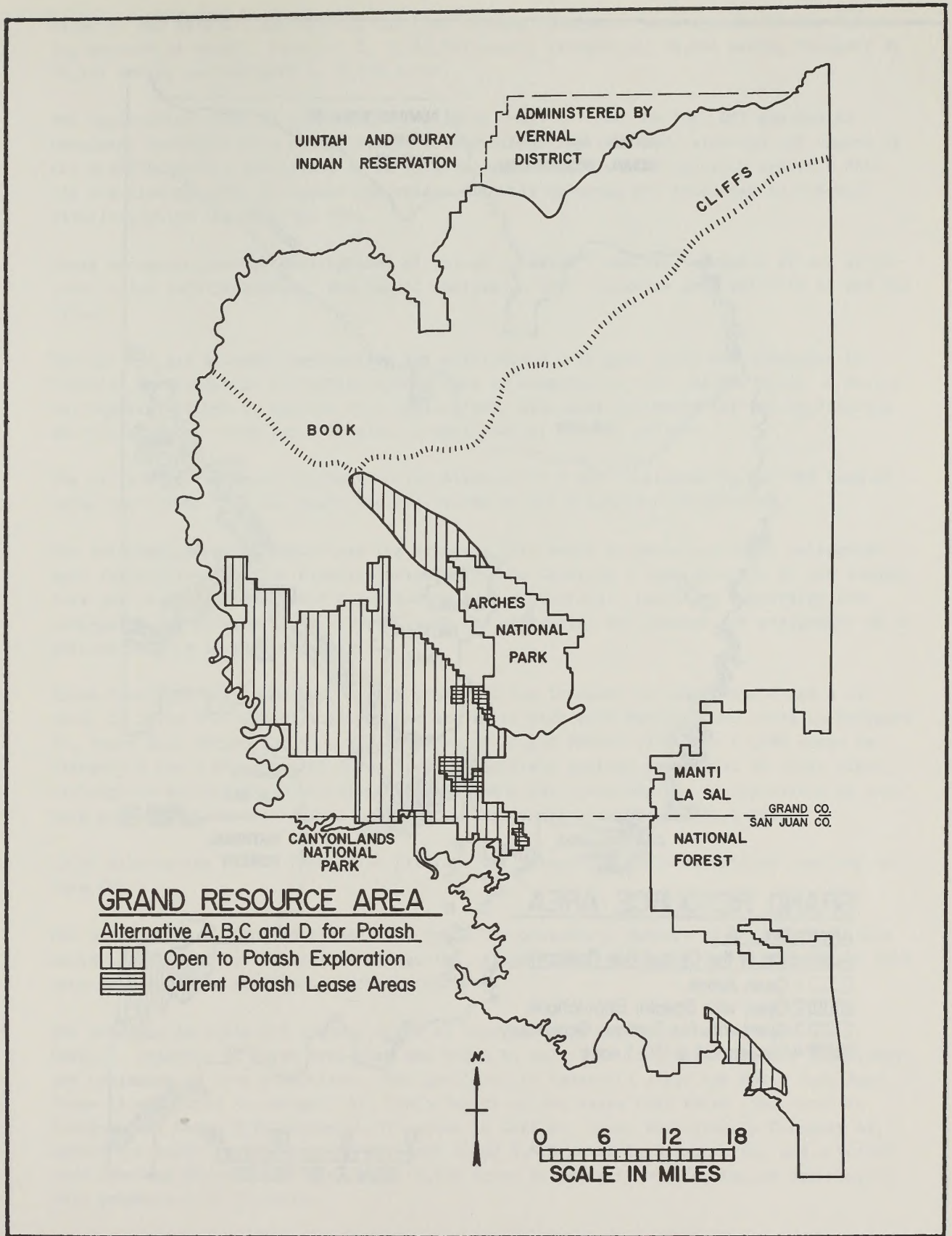


FIGURE 2-19

Current and Proposed Potash Leasing Areas

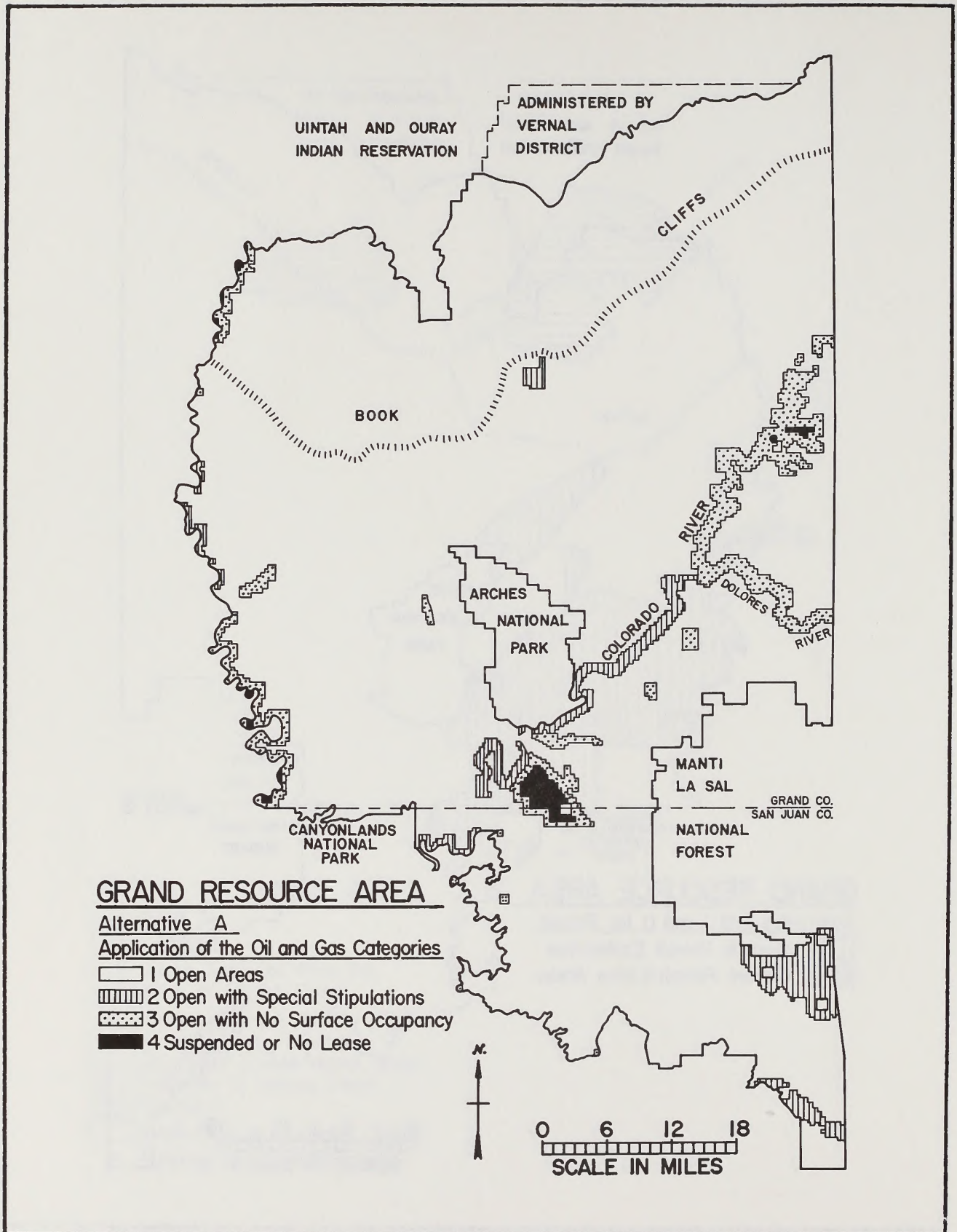


FIGURE 2-20

Current Application of Oil and Gas Leasing Categories

Based on the 1975 Oil and Gas EA, the four leasing categories were applied to the following numbers of acres: Category 1, 1,682,762 acres; Category 2, 58,221 acres; Category 3, 70,401 acres; and Category 4, 8,170 acres.

The application shown in Alternative C (Figure 2-21) is from the 1981 Oil and Gas EA Amendment developed by a Moab District interdisciplinary team and, although not signed by the State Director, sanctioned as an optional application of the category system. Both EAs are site-specific in nature and relate directly to areas and resources in the Moab District, which includes the GRA.

These documents contain descriptions of resources being protected, purposes of and stipulations for such protection, and impact analyses. Both documents are available at the GRA office.

The oil and gas category application for Alternative D (Figure 2-22) was developed by District environmental protection specialists in cooperation with the RMP team. A Technical Report, written to support this application, discusses rationale for the application and the affected resources. It also is available at the GRA office.

The oil and gas category application for Alternative B was considered by the RMP team as being consistent with the goals and objectives of the Production Alternative.

The following material summarizes the acreages that would be protected under categories more restrictive than the standard stipulations in Category 1 (see Appendix R) and identifies the resources that would benefit from such protection. Table 2-6 summarizes the acreages under Alternative A, showing both the categories and reasons for assignment of a particular area to that category.

Three locations with some hydrocarbon potential are included in Categories 3 and 4 as shown in Table 2-6. Specifically these are White Wash Sand Dunes (1,480 acres in Category 3), Negro Bill Canyon (3,763 acres in Category 3) and Behind the Rocks (7,290 acres in Category 3 and 5,824 acres in Category 4). Favorable geology does exist in these areas, although no hydrocarbon production has been recorded; therefore, it is impossible to estimate any production that may be lost through application of Categories 3 and 4.

Under Alternative B, the Production Alternative, Category 1 would be applied over the entire GRA.

For Alternative C, Limited Protection, Table 2-7 presents a summary of the acreages that would be assigned to the various categories, along with the reasons for assignment of each area to one of the more restrictive categories.

The acreages in Table 2-7 include areas of some geologic potential for oil and gas. However, reserves in these areas are not known to exist, so it is not feasible to attempt any estimates of lost production. The geologically favorable areas are White Wash Sand Dunes (1,480 acres in Category 3), Cisco Desert golden eagle nest sites (960 acres in Category 3), Negro Bill Canyon (2,907 acres in Category 3 and 860 acres in Category 4), Behind the Rocks (9,649 acres in Category 3 and 5,825 acres in Category 4), and a buffer zone for Dead Horse Point State Park (3,630 acres in Category 3). Again, no estimate of lost production is feasible.

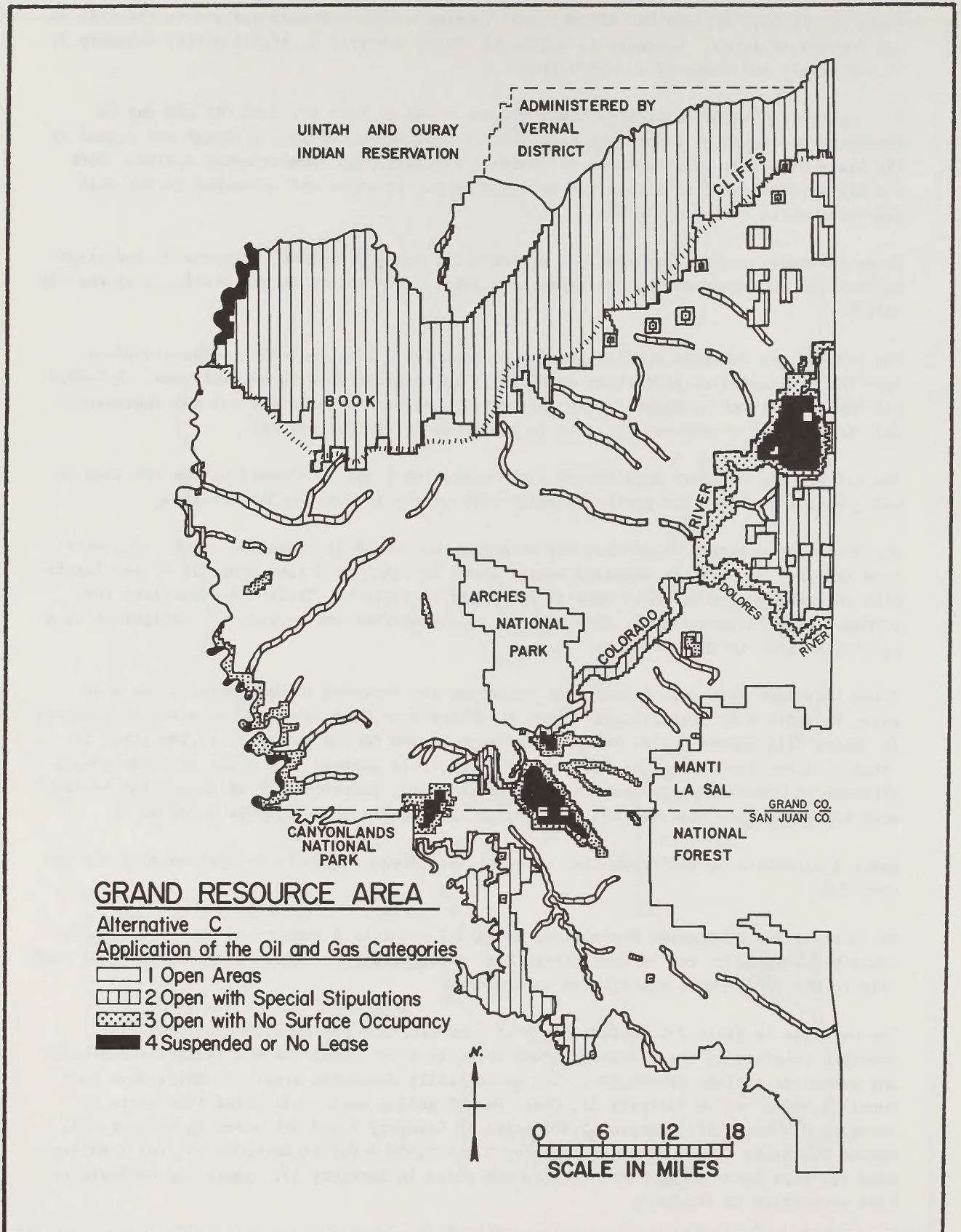


FIGURE 2-21

Application of Oil and Gas Leasing Categories Under Alternative C

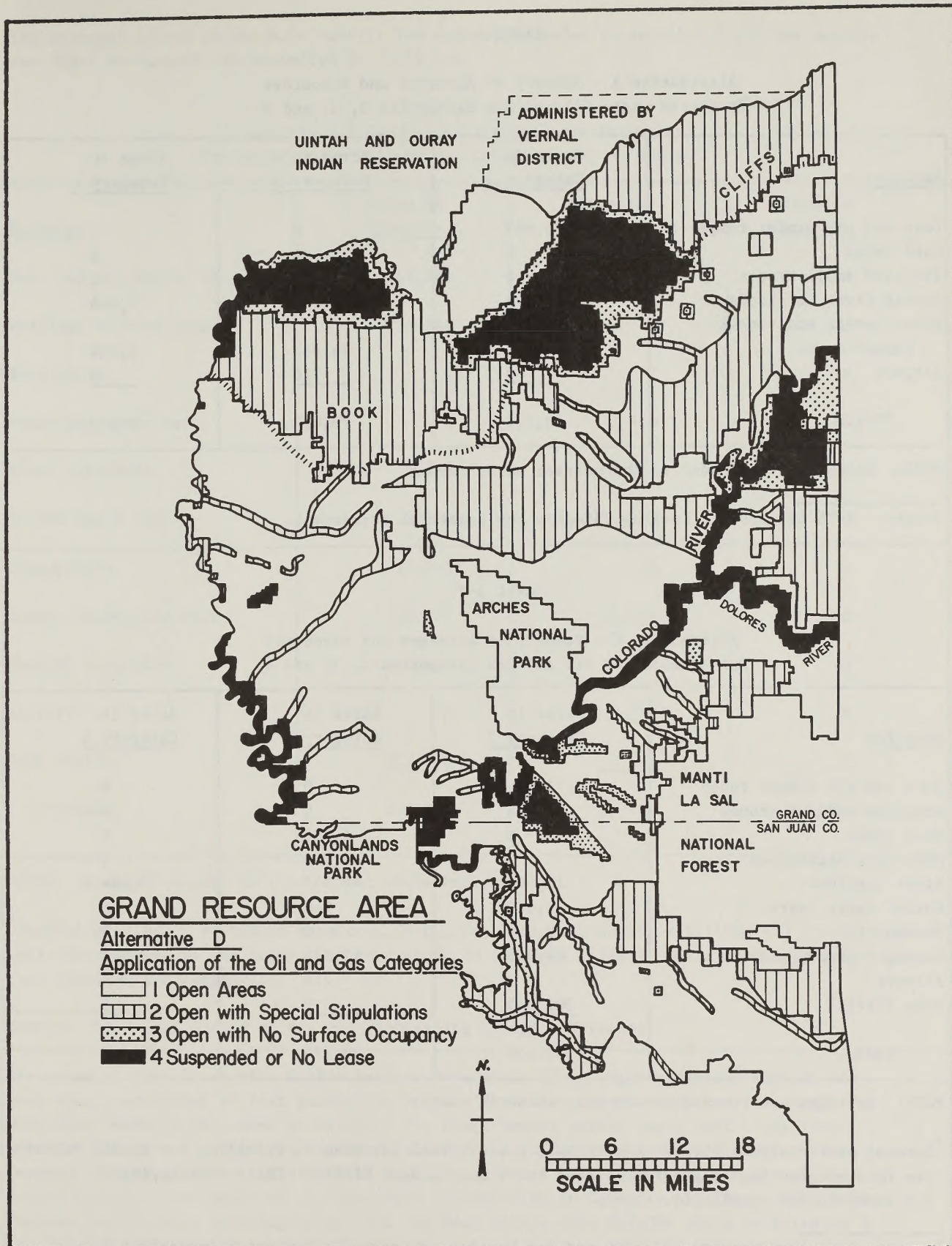


FIGURE 2-22

Application of Oil and Gas Leasing Categories Under Alternative D

TABLE 2-6

Alternative A - Summary of Acreages and Resources
Protected under Oil and Gas Categories 2, 3, and 4

<u>Resource</u>	<u>Acres in Category 2</u>	<u>Acres in Category 3</u>	<u>Acres in Category 4</u>
Deer and elk winter range	40,883	0	0
Sand Dunes	0	1,480	0
Isolated small tracts	0	1,098	0
Scenic river corridors	17,338	52,744	2,346
Other scenic and recrea- tional areas	0	14,363	5,824
Airport	<u>0</u>	<u>716</u>	<u>0</u>
TOTALS	58,221	70,401	8,170

NOTE: Acreages are rounded to the nearest whole number.

Source: 1975 Oil and Gas Leasing Category Environmental Assessment.

TABLE 2-7

Alternative C - Summary of Acreages and Resources
Protected under Oil and Gas Categories 2, 3, and 4

<u>Resource</u>	<u>Acres in Category 2</u>	<u>Acres in Category 3</u>	<u>Acres in Category 4</u>
Deer and elk winter range	75,280	0	0
Antelope kidding ground	25,168	0	0
Sand Dunes	0	1,480	0
Municipal Watersheds	0	2,920	0
River corridors	15,604	42,917	16,466
Golden eagle nests	2,880	960	0
Floodplains	19,040	0	0
Scenic recreation areas	44,743	21,281	12,446
Airport	0	716	0
Book Cliffs ^a	<u>381,093</u>	<u>0</u>	<u>0</u>
TOTALS	563,808	70,274	28,912

NOTE: Acreages are rounded to the nearest whole number.

^a Several previously mentioned resources (e.g., critical watersheds, wildlife, and scenic values) are intermingled in the geographic area known as the Book Cliffs. Their overlapping acreages are combined for simplicity.

Source: 1981 Amendment to 1975 Oil and Gas Leasing Category Environmental Assessment.

The acreages placed in the more restrictive categories under Alternative D and the reasons for their assignment are presented in Table 2-8.

TABLE 2-8
Alternative D - Summary of Acreages and Resources
Protected under Oil and Gas Categories 2, 3, and 4

<u>Resource</u>	<u>Acres in Category 2</u>	<u>Acres in Category 3</u>	<u>Acres in Category 4</u>
Deer and elk winter range	149,503	0	0
Antelope kidding ground	25,168	0	0
Sand Dunes	0	0	1,480
Municipal Watershed	0	2,920	0
River corridors	800	10,240	48,258
Golden eagle nests	2,880	960	0
Floodplains	19,040	0	0
Scenic recreation areas	40,920	38,979	195,380
Special watershed	320,470	0	0
Airport	0	716	0
Book Cliffs ^a	<u>217,578</u>	<u>0</u>	<u>0</u>
TOTALS	776,359	53,815	245,118

NOTE: Acreages rounded to the nearest whole number

^aSeveral previously mentioned resources (e.g., critical watersheds, wildlife, and scenic values) are intermingled in the geographic area known as the Book Cliffs. Their overlapping acreages are combined for simplicity.

Source: Technical Report on Oil and Gas Leasing Category Revision.

The acreages for Alternative D also include some areas of geologic potential for oil and gas; again, estimates of lost production are not feasible. The favorable areas are White Wash Sand Dunes (1,480 acres in Category 4), Cisco Desert golden eagle nest sites (960 acres in Category 3), Negro Bill Canyon (2,907 acres in Category 3 and 860 acres in Category 4), Behind the Rocks (9,649 acres in Category 3 and 5,825 acres in Category 4), a buffer zone for Dead Horse Point State Park (3,630 acres in Category 4), Canyon Rims Recreation (3,920 acres in Category 3), and the Book Cliffs WSAs (16,000 acres in Category 3 and 147,515 acres in Category 4).

A second leasable mineral present in the GRA is potash. Three leases currently exist in the area, and others are possible, but potash is geologically much more restricted than oil and gas. Further, none of the leases on BLM land has been developed, although there is current production on State lands. Only a few locations are technologically feasible, even at the experimental stage. These conditions do not indicate the need for a leasing category system such as that used for oil and gas leasing.

SALABLE MINERALS

Salable minerals include common varieties of sand, gravel, stone, pumice, cinders, and clay. BLM may sell or allow free use of these materials, depending upon the applicant (private or government agency) and the purpose for which they are requested. The primary use of salable minerals in the GRA is public road construction and maintenance. The same withdrawals that affect locatable minerals also apply to salable minerals. Further, mineral sales cannot be made from areas covered by mining claims. Figure 2-23 shows the areas that would be open for salable minerals development under the four alternatives.

RECREATION

The many recreational opportunities in the GRA, along with the facilities available in each recreation management area (RMA), their cost, and estimated annual use, are described in Chapter 3. The RMAs were shown in Figure 1-13.

The Colorado River Special RMA covers 101,760 acres and includes the Colorado and Dolores river corridors. It borders Colorado's Ruby Canyon RMA. A portion of this RMA, (the Colorado River, from the state line to its confluence with the Dolores River, and the Dolores River from the state line to the confluence) has been studied for inclusion in the Wild and Scenic River system. Westwater Canyon, also within this RMA, is the location of the Country's leading white water float trips. An active river management program has been developed to manage the Colorado and Dolores Rivers. Increased use of the river has intensified the need for sanitation facilities at heavily used points. The need for improvements in boater access is another concern.

Throughout the remainder of the GRA, recreational opportunities are abundant. Management decisions must reflect the importance of the recreational resource. Actions recommended under each of the four alternatives (see Figures 2-24 and 2-25) are based on the degree of conflict resolution needed to fulfill the overall goals and management objectives.

Application of the oil and gas category system affects recreational opportunities in the GRA because it determines what protective measures will be implemented with regard to oil and gas leasing. Table 2-9 lists the areas of scenic recreational opportunities and the degree of protection that would be provided (either standard stipulations under Category 1 or additional stipulations under Categories 2, 3, and 4) under each of the alternatives. The standard and special stipulations are listed in Appendix R.

The Recreation issue is related to a number of other programs, principally minerals, lands, ORV, and wildlife. In the minerals program, activities associated with locatable minerals (primarily uranium) and leasable minerals (mainly oil and gas) impact recreational opportunities. ORV use, both recreational and nonrecreational, impacts other types of recreation. Mineral activities and ORV activities both cause changes in landscapes. The

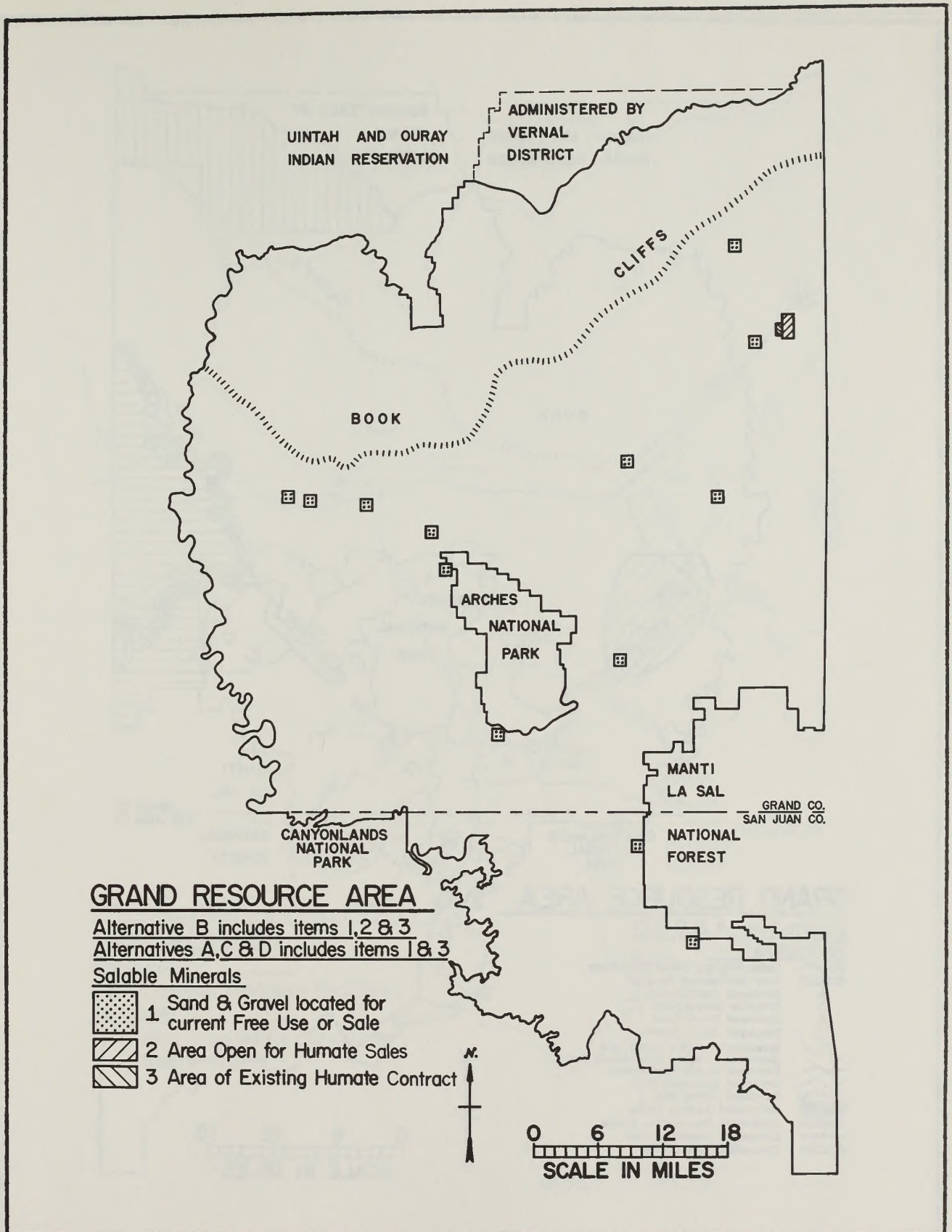


FIGURE 2-23

Salable Minerals Areas Under Alternatives A, B, C, and D

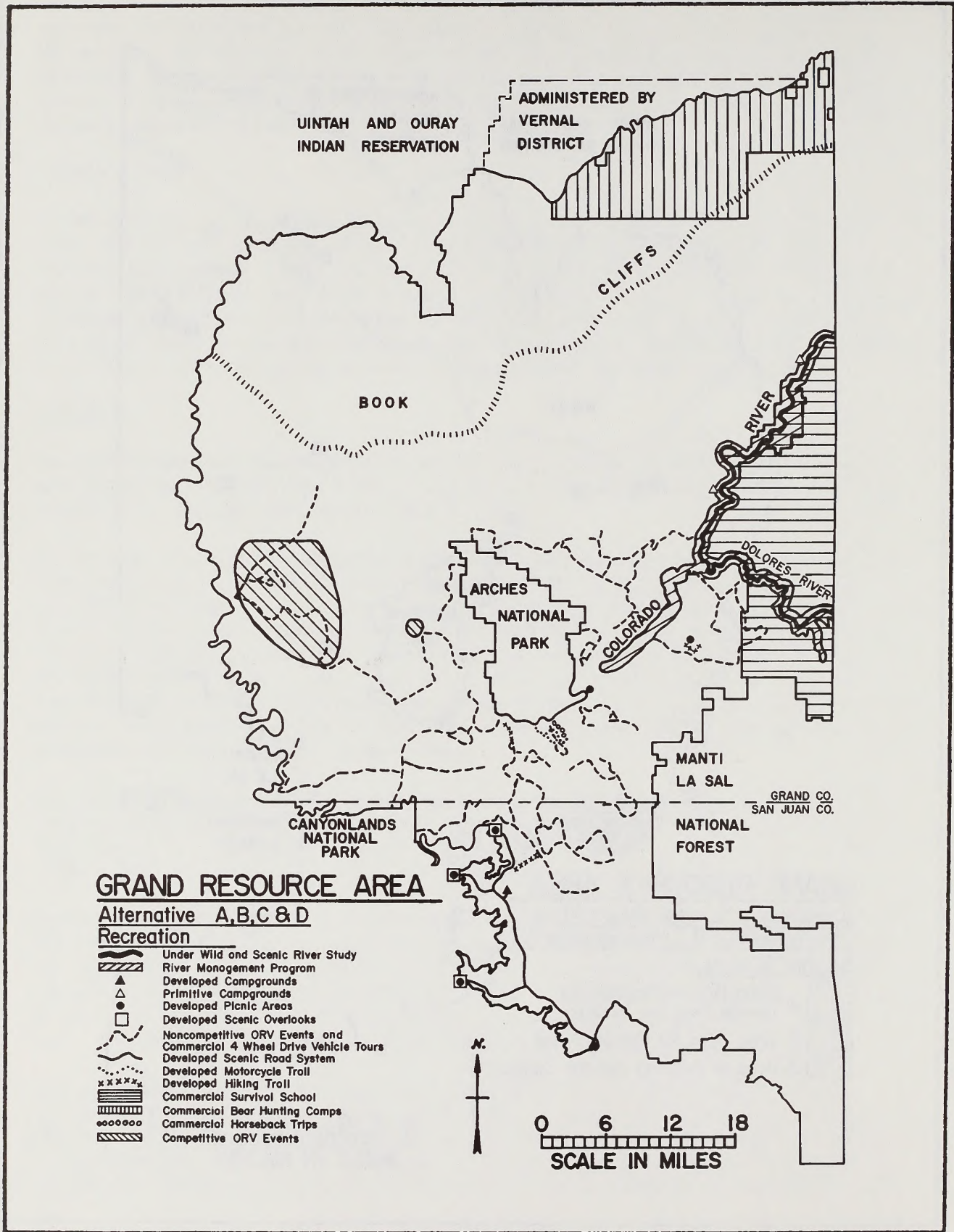


FIGURE 2-24

Existing Recreation Management Program

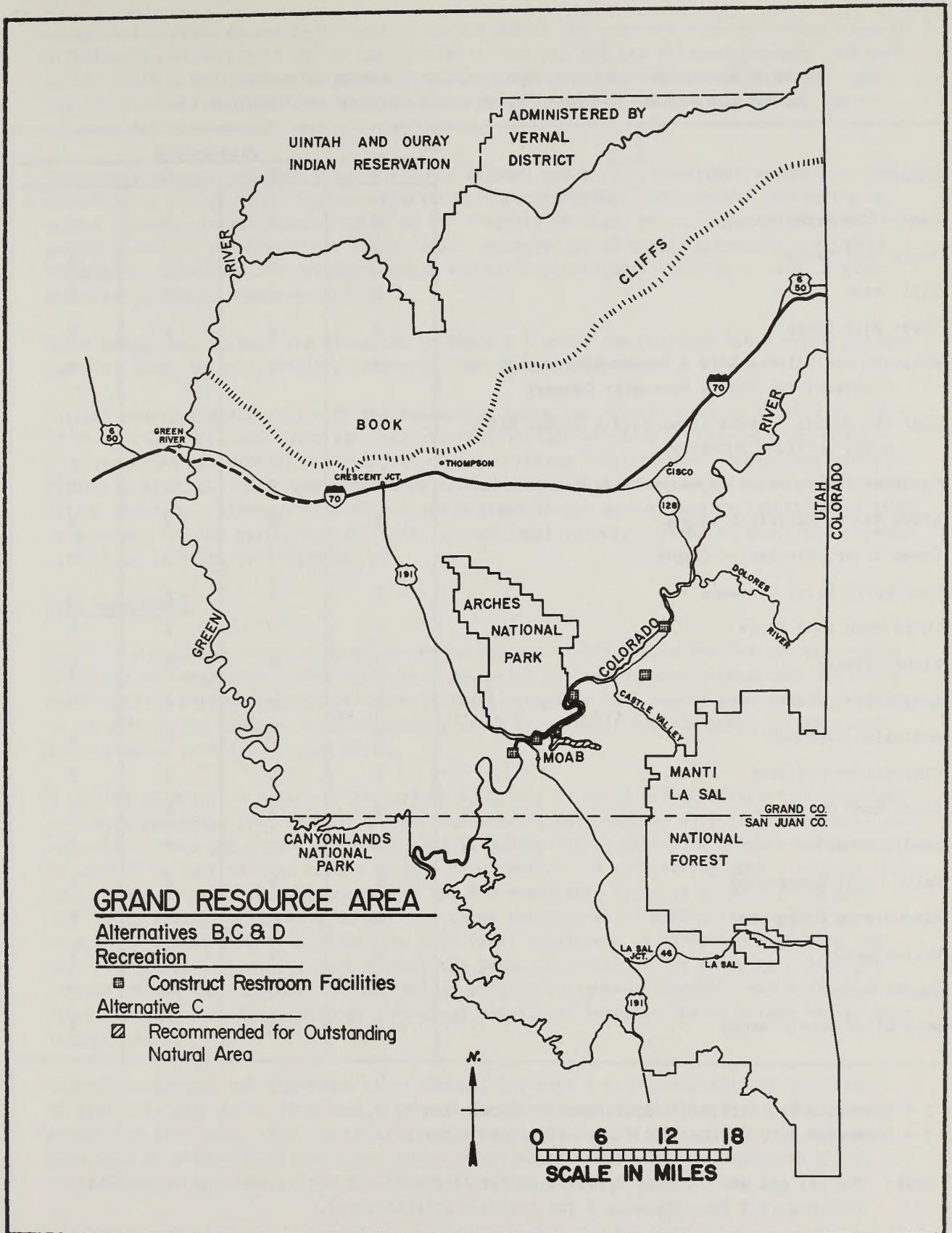


FIGURE 2-25

Recreation Management Under Alternatives B, C, and D

TABLE 2-9

Areas of Scenic Recreational Opportunities affected by Application
of the Oil and Gas Category System under the Four Alternatives

Area	Alternative			
	A	B	C	D
Behind the Rocks	X	0	X	X
Negro Bill Canyon	X	0	X	X
Mill Creek	0	0	X	X
Upper Mill Creek	0	0	X	X
Colorado and Dolores Wild & Scenic River study corridors (including Westwater Canyon)	X	0	X	X
Star and Marble canyons (from Wild & Scenic River study corridor boundary)	X	0	X	X
Colorado River, Dewey to Canyonlands National Park	X	0	X	X
Green River, Labyrinth Canyon	X	0	X	X
Green River, Desolation Canyon	X	0	X	X
Dead Horse Point Viewshed	0	0	X	X
White Wash Sand Dunes	X	0	X	X
Fisher Towers	X	0	X	X
Canyon Rims Scenic Road	0	0	X	X
Anticline Overlook	X	0	X	X
Canyonlands Overlook	X	0	X	X
Round Rock Overlook	0	0	X	X
Needles Overlook	X	0	X	X
Hatch Point Campground	X	0	X	X
Windwhistle Campground	X	0	X	X
Wilson Arch	0	0	X	X
Castle Rock	X	0	0	0
Book Cliff Scenic Areas	0	0	X	X

X = Protected by Additional Stipulations in Categories 2, 3, and 4.
0 = Protected only by Standard Stipulations in Category 1.

NOTE: The oil and gas category application for Alternative B would place the entire GRA in Category 1 (see Appendix R for standard stipulations).

management actions needed to alleviate conflicts with the minerals program include mineral withdrawals and revisions in the application of the oil and gas category system. ORV conflicts could be resolved through restrictions of ORV use. Any management actions resulting in increased wildlife populations would also provide additional recreational opportunities for hunters and other recreationists.

Management actions proposed under the Lands Actions and Utility Corridors issues have the potential to safeguard or improve recreational opportunities. For example, obtaining an access easement across private lands in the vicinity of Cisco would safeguard continued public access to the Cisco boat launch area. Acquisition of scenic easements and identification of exclusion and avoidance areas for utility corridors would also help to safeguard recreational opportunities.

These management actions are presented in Table 2-2 under the Off-Road Vehicle Use and Management, Lands Actions, Utility Corridors, and Minerals issues.

Actions associated directly with the Recreation issue can also be seen in Table 2-2. Most of the actions proposed under all four alternatives are designed to maintain the recreation resources and provide for the presently increasing level of use. Exceptions occur in Alternatives B, C, and D where rest room facilities would be constructed to rectify sanitation problems. Under Alternative C the designation of an Outstanding Natural Area (ONA) is proposed for the protection of scenic recreational values, a riparian area, and a sensitive plant in Negro Bill Canyon.

FIRE MANAGEMENT

The Fire Management issue is based on the proven philosophy that wildfires and prescribed fires can be beneficial. Some lands have potential for improvement through the use of induced fires. Current management (Alternative A) requires full suppression, which is costly because of the expense of extinguishing all fires without consideration for the possible resource benefits of some fires.

A limited suppression policy (Alternatives B, C, and D) would effect a structured approach to fire suppression that considers other resource values, such as wildlife, livestock, and watershed. This policy would include initial monitoring to determine whether a fire can be allowed to burn without hazard to life or property. In considering such a policy, it should be understood that 85 percent of the GRA vegetation cover is about 5 to 20 percent, much of it small, low-growing shrubs with large interspaces of bare ground. This combination prevents fire from traveling, even under conditions of extremely high fire danger. The plant communities that exhibit the greatest potential for carrying a fire are pinyon-juniper (upland shallow loam ecological site), sagebrush (upland loam ecological site), Douglas fir (mountain loam ecological site), and tamarisk (salty stream bottom ecological site).

The pinyon-juniper and sagebrush plant communities have a high potential for an increase in available AUMs of wildlife and livestock forage through prescribed fire. The potential prescribed fire areas (see Figure 2-26 and Appendix T) have little or no slope and are populated at a density of more than 300 pinyon-juniper trees or 2,000 sagebrush plants per acre. Mitigating measures for prescribed fires are listed in Appendix A.

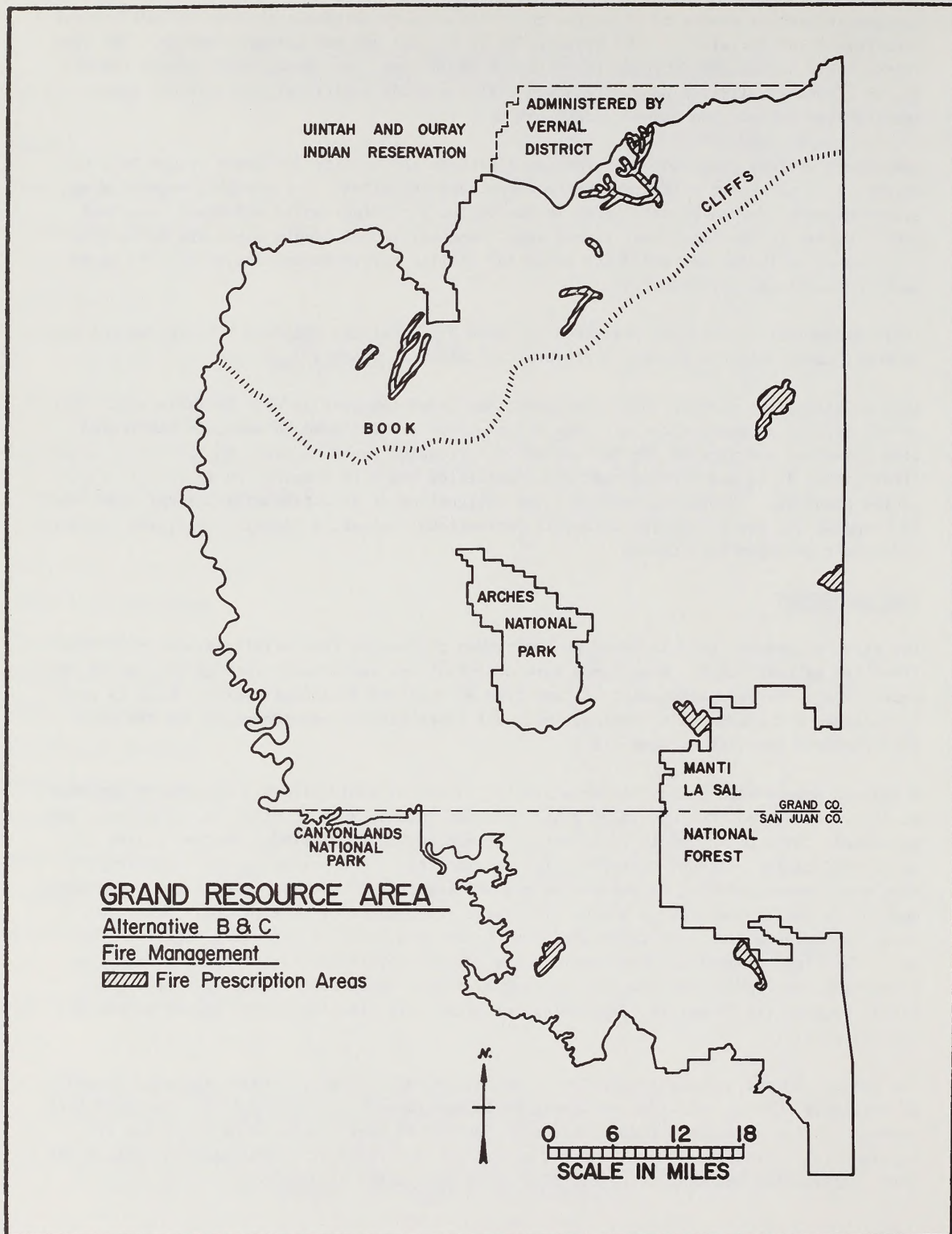


FIGURE 2-26

Potential Prescribed Fire Areas Under Alternatives B and C

The Fire Management issue does not involve any resource conflicts, nor does its resolution depend on management actions under other issues. Cost savings would be realized under Alternatives B, C, and D, while AUMs for livestock and wildlife would be increased under Alternatives B and C.

WILDERNESS

In the GRA the wilderness study process involves eight WSAs. To date, seven of them have been evaluated and recommendations made as to wilderness suitability (see Appendix U). Westwater Canyon and Desolation Canyon WSAs were recommended as partially suitable, and all of Behind the Rocks WSA as suitable for wilderness designation. The remaining four WSAs that have been studied were recommended as nonsuitable for wilderness designation. Although the GRA contains portions of the Black Ridge Canyon West WSA, which is under the study jurisdiction of the Grand Junction BLM office, their study deadline is later than the GRA deadline. Therefore, no study recommendations can be made at this time for the WSA. The studies of GRA WSAs were completed by a team composed of resource specialists from the district and area offices.

The No Wilderness alternative for the site-specific analyses (SSAs) was developed by the RMP/EIS team, and the prescribed actions for the seven SSAs were incorporated into the RMP/EIS alternatives.

WSAs in the GRA will be included in the statewide Final Wilderness EIS, and the final recommendation will be formulated by the State Wilderness EIS team.

The planning issues that would be affected by wilderness designation include Livestock Requirements, Off-Road Vehicle Use and Management, Lands Actions, Utility Corridors, Minerals, and Fire Management.

Wilderness designation would restrict activities associated with these issues. The restrictions are contained in Wilderness Management Policy, U.S. Department of the Interior, Bureau of Land Management, September 1981. This document is based on the Wilderness Act (Public Law 88-577) and is available in BLM offices. Under this policy, wilderness areas will be managed so as to be affected primarily by the forces of nature, with the imprint of human work substantially unnoticeable. Allowed levels of activities in wilderness areas will be based on this policy. Exceptions will be nonconforming uses based on valid existing rights and those associated with protection of the resource and of human life. Examples of use levels permitted are those existing as of the date an area was designated as wilderness, mineral activities associated with valid mining claims, and grazing.

Some activities would be eliminated after an area is designated as wilderness. An example of this is mineral prospecting and exploration work under the mining laws in wilderness areas after December 31, 1983 (refer to Figures 2-17 and 2-18).

Activities presently occurring within WSAs are governed by BLM's Interim Management Policy (BLM, 1979b).

Alternatives A and B propose to recommend no lands within the GRA as suitable for wilderness designation. Alternative C proposes to recommend the Behind the Rocks WSA and parts of Westwater Canyon and Desolation Canyon WSAs as suitable. In Alternative D, the proposal is to recommend all eight WSAs as suitable for wilderness designation.

Although wilderness recommendations are discussed in all alternatives, Alternative C (see Figure 2-27) reflects the preliminary suitability recommendations contained in the SSA for the seven WSAs. Areas that would be recommended as suitable for wilderness designation under Alternative D are shown in Figure 2-28.

For analysis purposes, however, all WSAs shown on the maps for Alternatives C and D are to be considered as actual wilderness areas. This is for analysis purposes only and does not imply that decisions for designation have been made or that Congressional mandates have been foregone.

Recommendations on the Black Ridge Canyon West WSA will be deferred until the study has been completed.

Although four alternatives are discussed for wilderness recommendations, Alternative C (see Figure 2-27) reflects the preliminary suitability recommendations contained in the SSAs for the seven WSAs.

SUPPORT REQUIREMENTS

Table 2-10 shows the additional project layout, implementation, and monitoring costs, that would be necessary to implement management actions proposed under the four alternatives to resolve each of the planning issues.

SUMMARY OF ACTIONS AND IMPACTS

Impacts of the management actions proposed under the four alternatives were analyzed on the basis of 15 environmental components and land uses, commonly referred to as indicators. These indicators are soils, water quality, air quality, vegetation, livestock grazing, wildlife, mineral resources, mineral rights, transportation, cultural resources, visual resources, special designation areas, recreation, economic conditions, and social conditions.

Impacts on two other indicators (topography and paleontology) were analyzed initially, but these indicators were dropped when no significant impacts were identified from any of the proposed management actions.

Cultural resources is included as an indicator, although these values are protected from destruction by the archaeological clearance that is required before any surface disturbing action can take place. In an onsite inspection, a qualified archaeologist describes the cultural resources present and identifies appropriate mitigating measures to be imposed.

Table 2-11 displays the major actions and impacts that would take place under the four alternatives. The indicators are fully described in Chapter 3, Affected Environment. In Chapter 4, Environmental Consequences, the impacts are analyzed in detail where possible.

UNRESOLVED CONFLICTS

Although the intent of this plan is to resolve as many of the identified conflicts as possible, some cannot be resolved at the present time. Resolution of these is handicapped by several circumstances. One is lack of data. Another is that technology in some cases

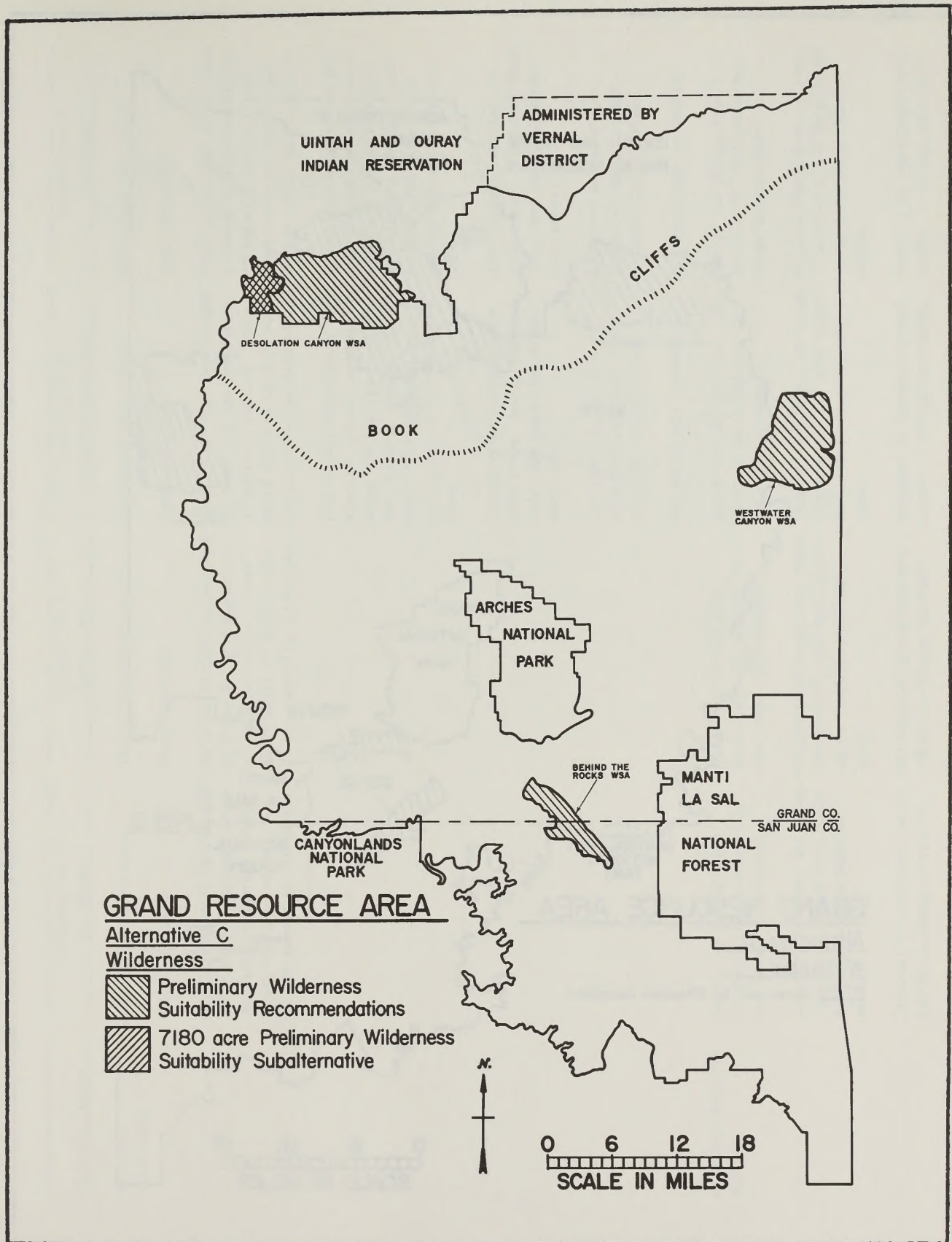


FIGURE 2-27

Areas Recommended as Suitable for Wilderness Designation Under Alternative C

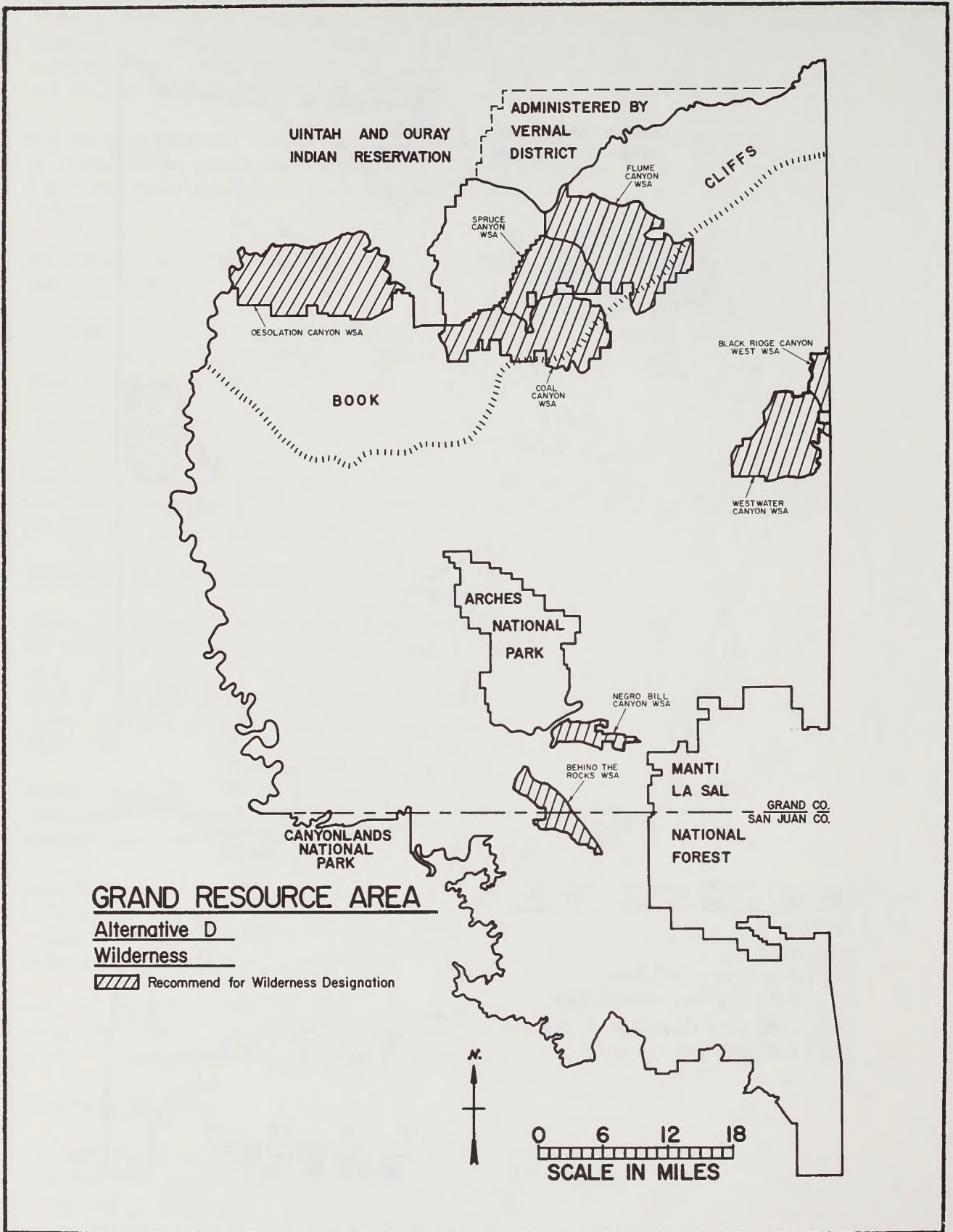


FIGURE 2-28

Areas Recommended as Suitable for Wilderness Designation Under Alternative D

Planning Issues	Alternative A No Action	Alternative B Production	Alternative C Limited Protection	Alternative D Protection
Critical Watersheds	Two summer temporaries Water inventory	Two summer temporaries Water inventory	Two summer temporaries Water inventory	Two summer temporaries Water inventory
	Anticipated that an increase in funds for implementation of salinity control treatments would be needed, but as yet cannot be determined.	Anticipated that an increase in funds for implementation of salinity control treatments would be needed, but as yet cannot be determined.	Anticipated that an increase in funds for implementation of salinity control treatments would be needed, but as yet cannot be determined.	Anticipated that an increase in funds for implementation of salinity control treatments would be needed, but as yet cannot be determined.
Livestock Requirements	Survey and design from Division of Operations for new range improvements.	Survey and design from Division of Operations for new range improvements.	Survey and design from Division of Operations for range improvements.	Survey and design from Division of Operations for range improvements.
	Unquantified money for range improvements and land treatments (including maintenance).	Unquantified money for range improvements and land treatments (including maintenance).	Unquantified money for range improvements and land treatments (including maintenance).	Unquantified money for range improvements and land treatments (including maintenance).
	Division of Operations work months to manage contracts.	Division of Operations work months to manage contracts.	Division of Operations work months to manage contracts.	Division of Operations work months to manage contracts.
	One hydrologic technician	One hydrologic technician	One hydrologic technician	One hydrologic technician
	Inventories of critical erosion areas, designated channels, and potential treatment areas.	Inventories of critical erosion areas, designated channels, and potential treatment areas.	Inventories of critical erosion areas, designated channels, and potential treatment areas.	Inventories of critical erosion areas, designated channels, and potential treatment areas.
	Low level aerial photography of subbasins and salinity project areas.	Low level aerial photography of subbasins and salinity project areas.	Low level aerial photography of subbasins and salinity project areas.	Low level aerial photography of subbasins and salinity project areas.
	Preliminary engineering design and updated cost estimates and analysis needed for Stinking Spring. This would include input from appropriate staff specialists.	Preliminary engineering design and updated cost estimates and analysis needed for Stinking Spring. This would include input from appropriate staff specialists.	Preliminary engineering design and updated cost estimates and analysis needed for Stinking Spring. This would include input from appropriate staff specialists.	Preliminary engineering design and updated cost estimates and analysis needed for Stinking Spring. This would include input from appropriate staff specialists.

TABLE 2-10
Support Requirements

Planning Issues	Alternative A No Action	Alternative B Production	Alternative C Limited Protection	Alternative D Protection
	Three seasonal temporaries.	One additional permanent position and three seasonal temporaries.	One additional permanent positions and three seasonal temporaries.	One additional permanent positions and three seasonal temporaries.
Wildlife Habitat Requirements	Support requirements would come from the actions of the other issues. - Survey and design from Division of Operations for associated wildlife projects. - Wildlife Biologist temporary to aid in conducting monitoring studies. Additional signing program is needed.	Support requirements would come from the actions of the other issues. - Survey and design from Division of Operations for associated wildlife projects. - Wildlife Biologist temporary to aid in conducting monitoring studies. Additional signing program is needed.	Support requirements would come from the actions of the other issues. - Survey and design from Division of Operations for associated wildlife projects. - Wildlife Biologist temporary to aid in conducting monitoring studies. Additional signing program is needed.	Support requirements would come from the actions of the other issues. - Survey and design from Division of Operations for associated wildlife projects. - Wildlife Biologist temporary to aid in conducting monitoring studies. Additional signing program is needed.
Off-Road Vehicle Use and Management	Additional signing program is needed.	Additional signing program is needed.	Additional signing program is needed.	Additional signing program is needed.
Lands Actions	(1) Cadastral survey (2) Land appraisal (3) Mineral evaluation (4) Mining claim validation (5) Coordination with other resource specialists in preparation of EA and land report.	(1) Cadastral survey (2) Land appraisal (3) Mineral evaluation (4) Mining claim validation (5) Coordination with other resource specialists in preparation of EA and land report.	(1) Cadastral survey (2) Land appraisal (3) Mineral evaluation (4) Mining claim validation (5) Coordination with other resource specialists in preparation of EA and land report.	(1) Cadastral survey (2) Land appraisal (3) Mineral evaluation (4) Mining claim validation (5) Coordination with other resource specialists in preparation of EA and land report.
Utility Corridors	Coordination with following programs in developing EA for designating corridors: wilderness, wildlife, water resources, soils, recreation and visual resource management (VRM).	Coordination with following programs in developing EA for designating corridors: wilderness, wildlife, water resources, soils, recreation and VRM.	Coordination with following programs in developing EA for designating corridors: wilderness, wildlife, water resources, soil, recreation and VRM.	Coordination with following programs in developing EA for designating corridors: wilderness, wildlife, water resources, soil, recreation and VRM.

TABLE 2-10 (Continued)
Support Requirements

	Engineering support needed (either inhouse or industry related) to develop alternative routing.	Engineering support needed (either inhouse or industry related) to develop alternative routing.	Engineering support needed (either inhouse or industry related) to develop alternative routing.
Minerals	Two geologists to write reports and EAs and monitor use of mining claims.	Two geologists to write reports and EAs and monitor use of mining claims.	Two geologists to write reports and EAs and monitor use of mining claims.
	Two surface protection specialists to monitor oil and gas development.	Two surface protection specialists to monitor oil and gas development.	Two surface protection specialists to monitor oil and gas development.
	Two realty specialists to approve right-of-way access.	Two realty specialists to approve right-of-way access.	Two realty specialists to approve right-of-way access.
	Two or three secretaries.	Two or three secretaries.	Two or three secretaries.
	One range conservationist and one wildlife biologist for input on EAs.	One range conservationist and one wildlife biologist for input on EAs.	One range conservationist and one wildlife biologist for input on EAs.
Recreation	Three recreation site cleanup contracts.	Three recreation site cleanup contracts.	Three recreation site cleanup contracts.
	Two seasonal river rangers.	Two seasonal river rangers.	Two seasonal river rangers.
	One water hauling contract.	One water hauling contract.	One water hauling contract.
Fire Management	Standby fire crew for prescribed fires.	Standby fire crew for prescribed fires.	Standby fire crew for prescribed fires.
	Monitoring studies before and after prescribed fire.	Monitoring studies before and after prescribed fire.	Monitoring studies before and after prescribed fire.
Wilderness	Recreation technicians required to monitor wilderness areas.	Recreation technicians required to monitor wilderness areas.	Recreation technicians required to monitor wilderness areas.
	Additional signing program needed.	Additional signing program needed.	Additional signing program needed.

TABLE 2-10 (Concluded)
Support Requirements

Alternative A No Action	Alternative B Production	Alternative C Limited Protection	Alternative D Protection
<p>Soils-Installation of instream drop structures would reduce soil erosion in channels and provide potential for stabilization of channel banks and reestablishment of vegetation. Short-term increases in erosion would result from maintenance of land treatments. Increased ground cover in the long term would reduce erosion rates from existing conditions. Surface disturbing activities such as oil and gas development and mining activities would also increase soil loss until suitable reclamation and revegetation has taken place. ORV use would increase soil erosion and result in loss of site productivity in the long term.</p>	<p>Soils-Installation of instream drop structures would reduce soil erosion in channels and provide potential for stabilization of channel banks and reestablishment of vegetation. Short-term increases in erosion would result from vegetative manipulation. Increased ground cover would reduce erosion rates from existing conditions. Surface disturbing activities such as oil and gas development and mining activities would also increase soil loss until suitable reclamation and revegetation has taken place. ORV use would increase soil erosion and result in loss of site productivity in the long term.</p>	<p>Soils-Installation of instream drop structures would reduce soil erosion in channels and provide potential for stabilization of channel banks and reestablishment of vegetation. Short-term increases in erosion would result from vegetative manipulation. Increased ground cover would reduce erosion rates from existing conditions. Additional mitigation of oil and gas activity would minimize soil losses as a result of surface disturbing activities. Restriction of ORV use and livestock grazing on soils derived from Mancos Shale and designated municipal watersheds would improve water infiltration, minimize soil compaction, and result in a decrease in soil loss and an increase in productivity.</p>	<p>Soils-Installation of instream drop structures would reduce soil erosion in channels and provide potential for stabilization of channel banks and reestablishment of vegetation. Short-term increases in erosion would result from vegetative manipulation. Increased ground cover would reduce erosion rates from existing conditions. Additional mitigation of oil and gas activity on saline-alkali soils, ORV use in floodplains and watercourses, and livestock grazing would protect the soil resource and retain onsite soil productivity. Restriction of ORV use and livestock grazing on soils derived from Mancos Shale and designated municipal watersheds would improve water infiltration, minimize soil compaction, and result in a decrease in soil loss and an increase in productivity.</p>
<p>Water Quality-Installation of instream drop structures would increase water storage upstream from the structures, and improve the overall water quality of targeted drainages. Existing water quality would be maintained by inclusion of mitigating measures in project designs and special measures incorporated into other activity programs. No improvements would occur in areas with existing water quality problems. Vegetation manipulation by range and wildlife programs would cause in-</p>	<p>Water Quality-Installation of instream drop structures would increase water storage upstream from the structures, and improve the overall water quality of targeted drainages. Existing water quality would be maintained by inclusion of mitigating measures in project designs and special measures incorporated into other activity programs. No improvements would occur in areas with existing water quality problems. Vegetation manipulation by range and wildlife programs would cause in-</p>	<p>Water Quality-Installation of instream drop structures would increase water storage upstream from the structures, and improve the overall water quality of targeted drainages. Existing water quality would be improved through reduction of 8,100 tons of salt and sedimentation to the Colorado River. Water yield would be reduced because of the control of 670 acre-feet of saline runoff and saline springs through salinity control projects on a total of 41,000 acres. Changing the season</p>	<p>Water Quality-Installation of instream drop structures would increase water storage upstream from the structures, and improve the overall water quality of targeted drainages. Existing water quality would be improved through reduction of 15,100 tons of salt and sedimentation to the Colorado River. Water yield would be reduced because of the control of 1,094 acre-feet of saline runoff and saline springs through salinity control projects on a total of 93,000 acres. Changing the season</p>

TABLE 2-11
Comparative Summary of Management Actions and Impacts

<p>significant short-term increases in sediment and salinity. Road construction and mineral development would also result in some increased sediment and salinity until reclaimed or stabilized. Long-term reductions in sediment yield and salinity in vegetation manipulation areas would result from increased ground cover. Long-term adverse impacts on water quality would be expected from sediment and salinity increases resulting from ORV use in high erosion areas.</p>	<p>significant short-term increases in sediment and salinity. Road construction and mineral development would also result in some increased sediment and salinity until reclaimed or stabilized. Long-term reductions in sediment yield and salinity in vegetation manipulation areas would result from increased ground cover. Long-term adverse impacts on water quality would be expected from sediment and salinity increases resulting from ORV use in highly erodible soils.</p>	<p>of use on allotments that have a majority of soils derived from Mancos Shale and restricting livestock on 27,000 acres of highly saline soils would reduce salt by 187,640 tons and runoff by 2,305 acre-feet. Control of ORV use and oil and gas development could result in an additional reduction of 500 tons in the amount of salt introduced into the Colorado River, as well as protection of municipal watersheds, such as Mill Creek.</p>
<p><u>Air Quality</u>-No significant impact would occur to air quality.</p>	<p><u>Air Quality</u>-Some significant short-term impacts on air quality could occur under a limited fire suppression policy or during prescribed fires.</p>	<p><u>Air Quality</u>-Some significant short-term impacts on air quality could occur under a limited fire suppression policy.</p>
<p><u>Vegetation-Riparian vegetation</u> would increase around instream structures. Overall vigor would be maintained or may improve on 403,655 acres on allotments under AMPs. Vegetation composition would be changed from pinyon-juniper and sagebrush to grass species through maintenance of land treatments (52,000 acres). Generally, vegetation conditions would be maintained throughout most of the CRA through authorization of grazing use at present levels. Maintenance of existing waters would prevent improvement of vegetation around these waters. There would be a slight decrease in vegetation through continued ORV use. Vegetation would decrease on 30 acres per year because of development of mining claims. An estimated 350-500 acres of vegetation would be disturbed annually through oil</p>	<p><u>Vegetation-Riparian vegetation</u> would increase around instream structures. Present livestock management at the level of the past 5 years' licensed use would maintain ecological conditions in most instances. Overall vigor would be maintained or may improve (403,655 acres) on allotments presently under AMPs. Vegetation composition would be changed from pinyon-juniper and sagebrush to grass species through maintenance of land treatments (52,000 acres). In vegetation, there would be a decrease</p>	<p><u>Vegetation-Riparian vegetation</u> would increase around instream structures. There would be a slight increase in vegetation around salinity control treatments. Seventy acres (2 AUMs) of vegetation would be lost through the construction of an evaporation pond. Vegetation would increase over the long term wherever watershed treatments are initiated. Present livestock management at the level of the past 5 years' licensed use would maintain ecological condition in most instances. Overall vigor would be maintained or may improve on allotments presently under AMPs (403,655 acres). Vegetation composition would be changed from pinyon-juniper and sagebrush to grass species through maintenance of land treatments (52,000 acres). Perennial forage plants would be</p>

Continued

TABLE 2-11 (Continued)

Comparative Summary of Management Actions and Impacts

Alternative A No. Action	Alternative B Production	Alternative C Limited Protection	Alternative D Protection
<p>and gas activities. The 250 acres under contract for humate development would be subject to disturbance. The present loss of vegetation through activities under recreation use permits would continue. Construction of new facilities would cause some loss of vegetation if all WSAs are recommended as unsuitable for wilderness designation. Vegetation on an undetermined number of acres would be lost to BLM management through lands disposal. There would be a slight decrease in vegetation over the entire acreage open to sales of common minerals and a total loss of vegetation at each individual site.</p>	<p>decrease on 30 acres per year because of development of mining claims. Vegetation would be disturbed on 400 to 550 acres per year through oil and gas activities. The 250 acres under contract and an additional 1,500 acres would be subject to disturbance under humate sales. The present loss of vegetation through activities under recreation use permits would continue. There would be a long-term loss of pinyon-juniper and sagebrush vegetation of undetermined amount under a limited fire suppression policy. Sagebrush and pinyon-juniper communities would be changed to grass and browse through land treatments on 70,705 acres and through prescribed burning on 14,149 acres. Vegetation on 22,411 acres would be lost to BLM management through disposal. There would be a slight decrease in vegetation over the entire acreage open to common minerals and a total loss of vegetation at each individual site. Ecological condition would be maintained or improved on 765,284 acres through livestock manipulation techniques.</p>	<p>protected during critical growth periods through change in season of use for livestock grazing (358,775 acres). A change in class of livestock would increase vigor and production of browse species (69,042 acres). Resting 3 miles of perennial streams from grazing would improve the condition of desirable vegetation. Ecological condition would improve through restriction of grazing on saline soils (27,000 acres). Maintenance of existing waters would prevent improvement of vegetation around the waters. There would be some protection afforded to vegetation through restriction of ORV use. There would be an estimated 5 percent increase in vegetation, and a sensitive plant would be protected through closing certain areas to ORV use. Vegetation would be maintained on 32,000 acres presently open to mining claims; 300 to 400 acres would be altered yearly through oil and gas activity. The 250 acres under contract for humate development would be subject to disturbance. The present loss of vegetation through activities under recreation use permits would continue. There would be a long-term loss of pinyon-juniper and sagebrush vegetation of undetermined amount under a limited fire suppression policy. Sagebrush and pinyon-juniper communities would be changed to grass and browse on 68,105 acres through land treatments and on 14,149 acres through</p>	<p>protected during critical growth periods through change in season of use for livestock grazing (478,478 acres). A change in class of livestock would increase vigor and production of browse species (154,215 acres). Resting 2 miles of perennial stream from grazing would improve the condition of desirable vegetation. Ecological condition would improve through restriction of grazing (50,000 acres) on saline soils. Elimination of livestock grazing on 34,189 acres would cause ecological condition to improve. Maintenance of existing waters would prevent improvement of vegetation around the waters. There would be some protection afforded to vegetation through closing certain areas to ORV use. Vegetation would be maintained on 47,000 acres presently open to mining claims; 250 acres would be latered yearly through oil and gas activity. The 250 acres under contract for humate development would be subject to disturbance. The present loss of vegetation through activities under recreation use permits would continue. There would be a long-term loss</p>

TABLE 2-11 (Continued)

Comparative Summary of Management Actions and Impacts

of pinyon-juniper and sagebrush vegetation of undetermined amount under a limited fire suppression policy. Sagebrush and pinyon-juniper communities would be changed to grass and browse on 68,105 acres through land treatments. Vegetation on 6,642 acres would be lost to BLM management through lands disposal. There would be a slight decrease in vegetation over the entire acreage open to sales of common minerals and a total loss of vegetation at each individual site. Ecological condition would be maintained or improved on 382,429 acres through livestock manipulation techniques.

prescribed fires. Vegetation on 11,629 acres would be lost to BLM management through lands disposal. There would be a slight decrease in vegetation over the entire acreage open to sales of common minerals and a total loss of vegetation at each individual site. Ecological condition would be maintained or improved on 488,636 through livestock manipulation techniques.

Livestock-Initial Livestock AUMs would be limited to 66 percent of active preference. Monitoring studies would determine allowable use. Livestock would be slightly disturbed by other ongoing re-source uses (ORV, recreation use, oil and gas and other mineral activities). An undetermined loss of AUMs would occur through disposal. All allotments would remain under present management.

Livestock-Initial Livestock AUMs would be limited to 66 percent of active preference. Monitoring studies would determine allowable use. Livestock would be slightly disturbed by other ongoing re-source uses (ORV, recreation use, oil and gas and other mineral activities). Land treatments would provide an additional 6,222 AUMs. About 644 AUMs would be lost through lands disposal. Up to 200,000 acres not open to surface occupancy under oil and gas leasing would be impacted through permitted activity, resulting in an undetermined loss of AUMs. Under prescribed burning, an increase of 1,282 AUMs is expected.

Livestock-Initial Livestock AUMs would be limited to 66 percent of active preference. Monitoring studies would determine allowable use. Livestock would be slightly disturbed by other ongoing re-source uses (ORV, recreation use, oil and gas and other mineral activities). Land treatments would provide an additional 6,222 AUMs. About 644 AUMs would be lost through lands disposal. Up to 200,000 acres not open to surface occupancy under oil and gas leasing would be impacted through permitted activity, resulting in an undetermined loss of AUMs. Under prescribed burning, an increase of 1,282 AUMs is expected.

Livestock-Initial Livestock AUMs would be limited to 66 percent of active preference. Monitoring studies would determine allowable use. Livestock would be slightly disturbed by other ongoing re-source uses (ORV, recreation use, oil and gas and other mineral activities). Construction of an evaporation pond would result in a loss of 2 AUMs. Land treatments would provide an additional 3,503 AUMs. A total of 4,374 sheep AUMs would be converted to cattle AUMs. Use would be reduced by 1,099 AUMs on highly saline soils. About 91 AUMs would be lost through lands disposal. Fencing of riparian areas would reduce AUMs by 3, and 638 AUMs would be lost through elimination of livestock grazing on 4 allotments. Restricting livestock from 700 acres would reduce available forage by 32 AUMs.

Livestock-Initial Livestock AUMs would be limited to 66 percent of active preference. Monitoring studies would determine allowable use. Livestock would be slightly disturbed by other ongoing re-source uses (ORV, recreation use, oil and gas and other mineral activities). Construction of an evaporation pond would result in a loss of 2 AUMs. Land treatments would provide an additional 3,503 AUMs. A total of 4,374 sheep AUMs would be converted to cattle AUMs. Use would be reduced by 1,099 AUMs on highly saline soils. About 91 AUMs would be lost through lands disposal. Fencing of riparian areas would reduce AUMs by 3, and 638 AUMs would be lost through elimination of livestock grazing on 4 allotments. Restricting livestock from 700 acres would reduce available forage by 32 AUMs.

Livestock-Initial Livestock AUMs would be limited to 66 percent of active preference. Monitoring studies would determine allowable use. Livestock would be slightly disturbed by other ongoing re-source uses (ORV, recreation use, oil and gas and other mineral activities). Construction of an evaporation pond would result in a loss of 2 AUMs. Land treatments would provide an additional 4,734 AUMs. A total of 1,497 sheep AUMs would be converted to cattle AUMs. Use would be reduced by 588 AUMs on highly saline soils. About 153 AUMs would be lost through lands disposal. An increase of 1,309 AUMs through prescribed fire is expected.

Livestock-Initial Livestock AUMs would be limited to 66 percent of active preference. Monitoring studies would determine allowable use. Livestock would be slightly disturbed by other ongoing re-source uses (ORV, recreation use, oil and gas and other mineral activities). Land treatments would provide an additional 6,222 AUMs. About 644 AUMs would be lost through lands disposal. Up to 200,000 acres not open to surface occupancy under oil and gas leasing would be impacted through permitted activity, resulting in an undetermined loss of AUMs. Under prescribed burning, an increase of 1,282 AUMs is expected.

Livestock-Initial Livestock AUMs would be limited to 66 percent of active preference. Monitoring studies would determine allowable use. Livestock would be slightly disturbed by other ongoing re-source uses (ORV, recreation use, oil and gas and other mineral activities). Land treatments would provide an additional 6,222 AUMs. About 644 AUMs would be lost through lands disposal. Up to 200,000 acres not open to surface occupancy under oil and gas leasing would be impacted through permitted activity, resulting in an undetermined loss of AUMs. Under prescribed burning, an increase of 1,282 AUMs is expected.

Continued

TABLE 2-11 (Continued)

Comparative Summary of Management Actions and Impacts

Alternative A No Action	Alternative B Production	Alternative C Limited Protection	Alternative D Protection
<p>Wildlife-Continued present live-stock management would result in a loss of wildlife habitat productivity on 26 allotments. Bighorn sheep, antelope, deer, and elk would continue to compete with livestock for forage and space on 22 of these allotments. Aquatic and riparian habitat would continue to decrease in ecological condition on four allotments. Habitat productivity for deer, elk, and bighorn sheep would decrease under two AMPs. One riparian area would continue to decrease in ecological condition under one AMP. Impacts of any land disposal action would be analyzed during consideration of the disposal request. Under present oil and gas categories, 99 percent of the deer and elk winter range in Herd Unit 28-B is open to year-round exploration and development activities. Approximately 56 percent of the desert bighorn sheep habitat within the Mineral Bottom area, 100 percent of the Rattlesnake area, and 68 percent of the Potash area is open to year-round oil and gas exploration and development activities.</p>	<p>Wildlife-Continued present live-stock management would result in a loss of wildlife habitat productivity on 14 allotments. Bighorn sheep, antelope, deer, and elk would continue to compete with livestock for forage and space on 10 of these allotments. Aquatic and riparian habitat would continue to decrease in ecological condition on four allotments. The implementation of livestock manipulation techniques would improve water, cover, and reduce spatial competition for wildlife ungulates on 22 allotments. The avoidance of locating right-of-way within 48,245 acres of critical bighorn habitat (Mineral Bottom, Potash, and Westwater areas) would ensure habitat protection. Land treatments would provide an additional 2,617 AUMs of winter/spring forage for deer, elk, and antelope. Potash development could result in a loss of 50 percent (13,507 acres) of bighorn sheep habitat located within existing and potential leasing areas. The disposal of 80-acre parcels along the Colorado River near Westwater and of isolated tracts in the Book Cliffs and near Dead Horse Point could result in a loss of habitat for deer, elk, bighorn, waterfowl, great blue heron, bald eagle, and peregrine falcon.</p>	<p>Wildlife-Continued present live-stock management would result in a loss of habitat productivity on 9 allotments. Bighorn sheep, antelope, deer, and elk would continue to compete with livestock for forage and space on 8 allotments. Aquatic and riparian habitat would continue to decrease on one allotment. The implementation of livestock manipulation techniques would improve water, cover, and reduce spatial competition for wildlife ungulates on 15 allotments. Land treatments would provide an additional 4,155 AUMs of winter/spring forage for deer, elk, and antelope. Changing the season of use would reduce competition for bighorn on three allotments, antelope on four allotments, and elk on four allotments. A change in season of use would help to improve aquatic/riparian habitat toward a climax ecological condition on one allotment. Changing the class of vegetation ecological condition on one allotment. Changing the class of livestock would reduce deer and elk competition for winter/spring forage on one allotment. Management of 3 perennial stream would improve riparian habitat. Restriction of 3 miles of perennial stream would restore and improve riparian and aquatic habitat. Restriction of livestock grazing from 27,000 acres of saline soils would increase forage, water, and cover for nongame species. Reserving all forage on Pear Park, Spring Creek, and Scatle Valley areas for deer and elk would increase winter/spring forage for deer and elk.</p>	<p>Wildlife-Continued present live-stock management would result in a loss of habitat productivity on 6 allotments. Bighorn sheep, antelope, deer and elk would continue to compete with livestock for forage and space on 8 allotments. The implementation of livestock manipulation techniques would improve water, cover, and reduce spatial competition for wildlife ungulates on 2 allotments. Land treatments would provide an additional 5,011 AUMs of winter/spring for deer, elk, and antelope. Changing the season of use would reduce competition for bighorn on two allotments, antelope on eight allotments, and elk on six allotments. A change in season of use would help to improve aquatic/riparian habitat toward a climax ecological condition on one allotment. Changing the class of livestock on two allotments would reduce competition for deer, elk, and antelope. Management of 2 miles of livestock grazing from 50,000 acres of saline soils would increase forage, water, and cover for nongame species. Restricting livestock from three riparian areas within three allotments would restore and improve habitat for fish and nongame birds and mammals. Elimination of livestock grazing on four allotments would provide an additional 599 AUMs of forage for bighorn, 33 AUMs for deer, 6 AUMs for elk and remove spatial competition on these allotments. Riparian and aquatic</p>

TABLE 2-11 (Continued)

Comparative Summary of Management Actions and Impacts

could be open year-round for oil and gas exploration and development activities. Approximately 19 percent (18,128 acres) of antelope kidding habitat within the Cisco Desert and 9 percent (7,040 acres) of Hatch Point herd units could be lost through displacement and surface occupancy. Approximately 75 percent (24,485 acres) of the desert bighorn sheep habitat within the Potash and Mineral Bottom areas, 100 percent (8,911 acres) of the Westwater areas, 100 percent (11,420 acres) of the Rattlesnake area could be open to year-round oil and gas exploration and development activities.	Disturbance of wildlife and their habitat would be reduced by limitation of ORVs to existing roads and trails. The exclusion of right-of-way within 130,164 acres would protect 48,245 acres of critical bighorn sheep habitat (including Mineral Bottom, Potash, and Westwater areas). Potash development could result in a loss of 50 percent (13,567 acres) of bighorn sheep habitat located within existing or potential lease areas. One hundred percent (200,769 acres) of the deer and elk winter range and calving and fawning areas located within Herd Unit 28-B would be protected from oil and gas exploration by Category 2 special stipulations. Nineteen percent (18,391 acres) of the antelope kidding areas in the Cisco desert, 9 percent (7,040 acres) of Hatch Point would be protected from oil and gas exploration by Category 2 stipulations. Thirty-four percent (16,873 acres) of bighorn habitat within Potash, Mineral Bottom, and Westwater would be protected by Categories 3 and 4. Of the remaining areas, 66 percent is designated as Category 1 and bighorn could be lost through stress and displacement. Golden eagle nest sites in the Cisco Desert would be protected on 2,880 acres by Category 2 designation and on 960 acres designated as Category 3. Prescribed fires would increase wildlife forage by 731 AUMs.	habitat would be protected on one allotment. Restriction of domestic sheep from 700 acres of one allotment could eliminate forage and spatial competition for bighorn sheep and provide an additional 32 AUMs of forage for bighorn.
		Reservation of all forage on Pear Park, Spring Creek, and Castle Valley areas for deer and elk would increase winter/spring forage for deer and elk. Disturbance of wildlife and their habitat would be reduced by limitation of ORV travel to existing roads and trails. Potash development could result in a loss of 50 percent (13,567 acres) of bighorn sheep habitat located within existing or potential lease areas. One hundred percent (200,769 acres) of the deer and elk winter range and calving and fawning areas located within Herd Unit 28-B would be protected from oil and gas exploration by Category 2 special stipulations. Nineteen percent (18,391 acres) of the antelope kidding areas in the Cisco Desert and 9 percent (7,040 acres) of Hatch Point would be protected from year-round oil and gas exploration and development. Thirty-four percent (16,873 acres) of bighorn habitat within Potash, Mineral Bottom, and Westwater would be protected by Category 3 and 4. Of the remaining areas, 66 percent is designated as Category 1 and bighorn could be lost through stress and displacement. One hundred percent (11,420 acres) in the Rattlesnake area would be protected by Category 2 and 3 design-

Continued

TABLE 2-11 (Continued)
Comparative Summary of Management Actions and Impacts

Alternative A No Action	Alternative B Production	Alternative C Limited Protection	Alternative D Protection
<p><u>Mineral Resources</u>-The present oil and gas category system assigns 1,682,762 acres to Category 1; 58,221 acres to Category 2; 70,401 to Category 3; and 8,170 acres to Category 4. As a result of this system, approximately 150 oil and gas wells are drilled annually in the GRA. As a result of drilling approximately 10,000 MCF of natural gas and 50,000 barrels of oil are removed from public lands annually in the GRA. Maintain the policy of selling sand, gravel, and humate materials under contract to private interests and granting them free to local government, from lands free of mining claims on a case-by-case basis. Gravel removal has run as high as 2.5 million tons per year. Humate production is estimated at 50,000 tons per year after the project begins. Maintain three existing potash leases, and continue the policy of leasing additional reserves. Maintain the rights of mining claimants under the Act of 1872. Gold production from mining claims could run as high as 600 ounces per year, depending on mar-</p>	<p><u>Mineral Resources</u>-Initiate an oil and gas category system which assigns all of the GRA's 1,819,554 acres to Category 1. As a result of this system, approximately 155 oil and gas wells would be drilled annually in the resource area. As a result of drilling, approximately 10,000,000 MCF of natural gas and 50,000 barrels of oil would be removed from public lands annually. Maintain the policy of selling sand, gravel, and humate materials under contract to private interests and granting them free to local government, from lands free of mining claims, on a case-by-case basis. Gravel removal has run as high as 2.5 million tons per year. Humate production is estimated at 150,000 tons per year after projects begin. Maintain three existing potash leases, continue the policy of leasing additional potash throughout areas of known reserves. Maintain the rights of mining claimants under the Act of 1872.</p> <p>Gold production from mining claims could run as high as 600 ounces per year depending on market condi-</p>	<p><u>Mineral Resource</u>-Initiate an oil and gas category system which assigns 1,156,560 acres to Category 1; 563,808 acres to Category 2; 70,274 acres to Category 3; and 28,912 acres to Category 4. As a result of this system, about 14.5 oil and gas wells would be drilled annually in the resource area. About 49,500 barrels of oil and 9,560,000 to 9,960,000 MCF of natural gas would be removed from public lands annually in the resource area. Maintain the policy of selling sand, gravel, and humate materials under contract to private interests and granting them free to local government, from lands free of mining claims, on a case-by-case basis. Gravel removal has run as high as 2.5 million tons per year. Humate production is estimated at 50,000 tons per year after the project begins. Maintain three existing potash leases. Continue the policy of leasing additional potash throughout areas of known reserves. Maintain the rights of mining claimants under the Act of 1872. Gold production from mining claims could run as high as 600 ounces per year depending on market considerations. Also</p>	<p>nation. Golden eagle nests sites in the Cisco Desert would be protected by Category 2 (2,880 acres) and 3 (960 acres). Wilderness designation would protect habitat for sensitive species such as big-horn sheep, bald eagle, and peregrine falcon.</p> <p><u>Mineral Resources</u>-Initiate an oil and gas category system which assigns some 774,262 acres to Category 1; 776,359 acres to Category 2; 53,815 acres to Category 3; and 245,118 acres to Category 4. As a result of this system, about 47,500 barrels of oil and 9,480,000 to 9,880,000 MCF of gas would be removed from public lands in the resource area annually. Maintain the policy of selling sand, gravel, and humate materials under contract to private interests and granting them free to local government, from lands free of mining claims, on a case-by-case basis. Gravel removal has run as high as 2.5 million tons per year. Humate production is estimated at 50,000 tons per year after the project potash leases, and continue the policy of leasing additional reserves. Maintain the rights of mining claimants under the Act of 1872. Gold production from mining claims could run as high as 600 ounces per year depending on market considerations. Also</p>

TABLE 2-11 (Continued)
Comparative Summary of Management Actions and Impacts

<p>ket considerations. Also under this action, uranium production could run as high as 1,000,000 pounds of yellowcake per year, depending on market conditions.</p>	<p>tions. Also under this action, uranium production could run as high as 1,000,000 pounds of yellowcake per year, depending on market conditions.</p>	<p>600 ounces per year, depending on market conditions. Also under this action, uranium produced could run as high as 1,000,000 pounds of yellowcake per year, depending on market considerations.</p>	<p>under this action uranium production could run as high as 1,000,000 pounds of yellowcake per year depending on market consideration.</p>
<p><u>Mineral Rights</u>-Under the existing management action the entire GRA is open to mining claims, with the exception of 1,850 acres withdrawn from mineral entry for protection of widely scattered campgrounds and scenic sites. About 20,000 mining claims exist in the resource area; of these about 500 are for placer gold and the balance are for uranium.</p>	<p><u>Mineral Rights</u>-The entire GRA would be open to mining claims with the exception of 1,850 acres withdrawn from mineral entry for widely scattered campgrounds and scenic sites. About 20,000 mining claims would continue to exist in the resource area (500 placer gold, the balance uranium). Lands on which mining claims are abandoned could be restaked.</p>	<p><u>Mineral Rights</u>-The entire GRA would be open to mining claims with the following exceptions: 1,850 acres under existing withdrawal orders for protection of campgrounds and scenic sites; 32,000 acres under new withdrawal orders for protection of scenic lands along the Colorado River. Under the new withdrawal, existing mining claims would still be recognized but lands where claims are abandoned could not be restaked. There is no means of estimating any rate of abandonment under this alternative. A few uranium claims and at least 200 of 500 placer claims in the GRA would fall in the withdrawal area.</p>	<p><u>Mineral Rights</u>-The entire GRA would be open to mining claims with the following exceptions: 1,850 acres under existing withdrawal orders for protection of campgrounds and scenic sites; 47,000 acres under new withdrawal orders for protection of scenic lands along the Colorado and Dolores rivers. Under this withdrawal, existing mining claims that were abandoned could not be restaked. There is no means of estimating any rate of abandonment under this alternative. A few uranium claims and virtually all of the 500 placer gold mining claims in the GRA would fall within the withdrawal area.</p>
<p><u>Transportation</u>-Development of transportation would remain at present levels. Construction or development of new roads would increase as ORV use increased. Allowing mining claims for development of locatable minerals would result in an additional 10 to 15 miles of roads being built each year. Oil and gas development would remain the same, and 75 to 100 miles of roads would be built to accommodate this development.</p>	<p><u>Transportation</u>-This alternative would provide greater access to public lands and expand the existing road transportation network. Better quality roads would result because more maintenance would be required from increased traffic. The entire area would be open to ORVs, increasing the number of roads and trails being established each year and improving access to some of the more isolated areas. Increased oil and gas development would lead to construction of new roads beyond the current rate of 75 to 100 miles per year. Road conditions</p>	<p><u>Transportation</u>-Under this alternative access roads and trails being established each year as a result of ORV use would decrease as 596,234 acres would be limited to existing roads and trails. An additional 24,454 acres would be closed to ORVs, resulting in degeneration of roads and trails in these areas. This could reduce access to portions of the area. The impact on transportation from development of mining claims would be insignificant. Adoption of the proposed oil and gas categories would result in a slight decrease in the number of new roads being</p>	<p><u>Transportation</u>-Under this alternative access roads and trails being established each year would decrease. Closing ORV areas and limiting ORV use would decrease the number of roads and trails being established. Some roads and trails in areas closed to ORV use would degenerate from nonuse and become impassible. Reducing the amount of acreage open to mining claims may slightly decrease the number of new roads below the current level of 10 to 15 miles per year. Increasing the amount of acreage in the restrictive oil and gas categories may</p>

Continued

TABLE 2-11 (Continued)
Comparative Summary of Management Actions and Impacts

Alternative A No Action	Alternative B Production	Alternative C Limited Protection	Alternative D Protection
<p><u>Cultural Resources</u>-No significant impacts could occur to cultural resources because any significant action must be accompanied by an archaeological clearance.</p> <p><u>Visual Resources</u>-Oil, gas, and potash activities could temporarily change the VRM class; however, mitigating measures in lease stipulations and in the surface mining regulations would result in returning the affected areas to their present VRM classes over the long term.</p>	<p>on substandard roads would improve with better maintenance procedures being implemented. Full development of locatable minerals would result in at least 10 to 15 miles of new roads per year. Sales of common materials such as sand and gravel on 7,500 acres would provide needed materials for construction and improvement of roads and trails.</p> <p><u>Cultural Resources</u>-No significant impacts could occur to cultural resources because any significant action must be accompanied by an archaeological clearance.</p> <p><u>Visual Resources</u>-The chaining of pinyon-juniper in land treatment actions would have a short-term effect on the VRM class. The regrowth of vegetation would return the areas to their original VRM class. Oil, gas, and potash activities could temporarily change the VRM class; however, mitigating measures in the lease stipulations and in the surface mining regulations would result in returning the affected areas to their present VRM classes over the long term.</p>	<p>constructed for access. New road construction may fall below the current 75 to 100 miles per year.</p> <p><u>Cultural Resources</u>-No significant impacts could occur to cultural resources because any significant action must be accompanied by an archaeological clearance.</p> <p><u>Visual Resources</u>-The chaining of pinyon-juniper in land treatment actions would have a short-term effect on the VRM class. The regrowth of vegetation would return the areas to their original VRM class. Oil, gas, and potash activities could temporarily change the VRM class; however, mitigating measures in the lease stipulations and in the surface mining regulations would result in returning the affected areas to their present VRM classes over the long term.</p>	<p>inhibit new access. A decrease in the number of new roads below the current 75 to 100 miles per year can be expected. Overall, the impact on the transportation network would be a decrease in new roads and trails, inhibiting access to parts of the GRA.</p> <p><u>Cultural Resources</u>-No significant impacts could occur to cultural resources because any significant action must be accompanied by an archaeological clearance.</p> <p><u>Visual Resources</u>-The chaining of pinyon-juniper in land treatment actions would have a short-term effect on the VRM class. The regrowth of vegetation would return the areas to their original VRM class. Oil, gas, and potash activities could temporarily change the VRM class; however, mitigating measures in the lease stipulations and in the surface mining regulations would result in returning the affected areas to their present VRM classes over the long term.</p>
<p><u>Special Designation Areas</u>. The nondesignation as wilderness of existing WSAs would result in the loss of some of the wilderness values on 219,480 acres. Also leaving the entire GRA open to ORV use could result in the loss of scenic values on 635,894 acres and 250 miles of floodplains.</p>	<p><u>Special Designation Areas</u>-The non-designation as wilderness of existing WSAs would result in the loss of some of the wilderness values on 219,480 acres. Also leaving the entire GRA open to ORV use could result in the loss of scenic values on 635,894 acres and 250 miles of floodplains. Acquisition of an access easement at Cisco</p>	<p><u>Special Designation Areas</u>-The designation of 219,480 acres as wilderness would protect the wilderness values of these areas. The designation of 635,894 acres as restricted to ORV use and 250 miles of stream as restricted ORV use areas would result in the protection of scenic values in these areas. Avoidance of siting rights-of-way within</p>	<p><u>Special Designation Areas</u>-The designation of 219,480 acres as wilderness would protect the wilderness values of these areas. The designation of 635,894 acres and 250 miles of stream as restricted ORV use areas would result in the protection of scenic values in these areas. Avoidance of siting rights-of-way within</p>

TABLE 2-11 (Continued)

Comparative Summary of Management Actions and Impacts

launch would protect recreational values that are significant to potential Wild and Scenic Rivers and/or Wilderness designation.

282,350 acres of avoidance areas would protect the wilderness values on 219,480 acres and on 65 miles of Wild and Scenic River study corridors. Scenic resources would receive additional protection under the oil and gas categories; included in this protection are areas in WSAs and Wild and Scenic River corridors.

protection of wilderness values on 89,455 acres of lands recommended as suitable for wilderness. The application of oil and gas leasing categories proposed would provide protection under Categories 2, 3, and 4 for 22 areas identified as possessing exceptional scenic qualities. Included are 89,455 acres in WSAs recommended for preliminary wilderness suitability and 65 miles of Wild and Scenic River study corridors.

Recreation-Leaving the entire GRA open to ORV use would result in a long-term increase in recreational ORV use on the 70,000 acres now receiving that use. Oil and gas activities allowed under the application of the oil and gas category system proposed for this alternative could cause the loss of resource values in seven of the 22 areas identified as containing exceptional scenic recreational opportunities (see Table 2-9). Maintenance of existing recreational facilities, hiking trails, motorcycle trails, and developed scenic roads would protect the dollar investments in them and ensure that values they provide are not diminished. Protection of Wild and Scenic study corridors would ensure that recreational opportunities associated with the values protected are not diminished.

Recreation-Acquisition of an easement to the Cisco launch area would ensure continued access to the Colorado River for recreationists. Designating the entire GRA as open to ORV use would result in a long-term increase in recreational ORV use on the 70,000 acres now receiving that use. The oil and gas activities allowed under the oil and gas category system application proposed for this alternative could cause the loss of resource values in 22 areas identified as possessing exceptional scenic recreational opportunities. The construction of rest rooms at heavily used recreation sites along the Colorado River would improve recreational opportunities for river users. The initiation of prescribed fires and seeding and the resultant increase in deer population would improve recreational hunting opportunities. Maintenance of existing recreational facilities, hiking trails, motorcycle trails, and developed scenic roads would protect the dollar investments in them and ensure that the recreation-

Recreation-Recreational wildlife observations would increase as a result of livestock being restricted from 700 acres of big-horn sheep habitat. Acquisition of an easement would ensure continued access to the Cisco launch area for Colorado River recreationists. Restrictive designations would decrease opportunities for recreational ORV use. Acquiring scenic easements on 9,990 acres of private land along 80 miles of the Colorado and Dolores rivers would protect scenic recreational qualities. The control of the oil and gas activities allowed under the oil and gas categories system application as proposed for this alternative would provide protection of the scenic values in the 22 areas identified in Table 2-9. Protection of Wild and Scenic river study corridors would ensure that recreational opportunities associated with the values protected are not diminished.

Recreation-Acquisition of an easement would ensure continued access to the Cisco launch area for Colorado River recreationists. Designating 7 miles of duplicate roads as closed would decrease ORV use by less than 1 percent. Control of the oil and gas activities allowed under the oil and gas category system application as proposed for this alternative would provide protection for the scenic values in the 22 areas identified in Table 2-9. Maintenance of existing recreational facilities, hiking trails, motorcycle trails, and developed scenic roads would protect the dollar investments in them and ensure that recreational opportunities associated with the values protected are not diminished.

protection of wilderness values on 89,455 acres of lands recommended as suitable for wilderness. The application of oil and gas leasing categories proposed would provide protection under Categories 2, 3, and 4 for 22 areas identified as possessing exceptional scenic qualities. Included are 89,455 acres in WSAs recommended for preliminary wilderness suitability and 65 miles of Wild and Scenic River study corridors.

TABLE 2-11 (Continued)

Comparative Summary of Management Actions and Impacts

Alternative A No Action	Alternative B Production	Alternative C Limited Protection	Alternative D Protection
<p>Economic Conditions-The reductions from active preference could decrease ranch values by as much as 6 percent. The prices commercial outfitters could charge for their services could be affected in some recreation areas, and commercial use of one area could be discontinued.</p>	<p>tional opportunities that they provide are not diminished. Protection of Wild and Scenic study corridors would ensure that recreational opportunities associated with the values protected are not diminished.</p>	<p>Economic Conditions-Watershed actions that could have quantifiable effects on water yield and salt loading would decrease the annual cost borne by water users in the Lower Colorado River Basin by \$920,000 to \$1,220,000 and result in a loss of value from decreased water yield. Ten of the 45 livestock operators would have less available forage; 18 of the 45 would have more available forage; and 38 of the 45 would receive major exclusions during the spring. Aggregate returns above cash costs would decrease by \$61,000 (-3 percent), which should also decrease ranch values. Reductions from active preference could reduce ranch values by as much as 6 percent. Greater wildlife populations would increase hunter success rates and result in greater hunter pressure, local expenditures, and an added \$190,000 of local income and seven local jobs. Land sales near Castle Valley, Moab, and Span-</p>	<p>Economic Conditions-Watershed actions that could have quantifiable effects on water yield, salt loading, and sedimentation would decrease the annual cost borne by water users in the Lower Colorado River Basin by \$920,000 to \$1,220,000 and result in a loss of value from decreased water yield. Ten of the 45 livestock operators would have less available forage; 18 of the 45 would have more available forage; and 38 of the 45 would receive major exclusions during the spring. Aggregate returns above cash costs would decrease by \$61,000 (-3 percent), which should also decrease ranch values. Reductions from active preference could reduce ranch values by as much as 6 percent. Greater wildlife populations would increase hunter success rates and result in greater hunter pressure, local expenditures, and an added \$190,000 of local income and seven local jobs. Land sales near Castle Valley, Moab, and Span-</p>
<p>Economic Conditions-Twenty-nine of 45 livestock operators would have more available forage. If this forage was grazed, their returns above cash cost would increase by \$162,832 (+8 percent) which should increase their ranch values. However, reduction from active preference could reduce ranch values by as much as 4 percent. Increased production from ranchers residing in the EIS area would increase regional income by \$168,320 (+0.3 percent) and eight jobs (+0.2 percent). Land sales near Moab, Spanish Valley and Castle Valley could have a depressing effect on nearby private land market prices; however, all land sales would increase county revenues. Increased oil and gas drilling and production would eventually result in five to ten added local jobs (+0.1 to +0.2 percent) and \$85,000 to \$170,000 local income. Local units of government would receive increased</p>	<p>Economic Conditions-Twenty-nine of 45 livestock operators would have more available forage. If this forage was grazed, their returns above cash cost would increase by \$162,832 (+8 percent) which should increase their ranch values. However, reduction from active preference could reduce ranch values by as much as 4 percent. Increased production from ranchers residing in the EIS area would increase regional income by \$168,320 (+0.3 percent) and eight jobs (+0.2 percent). Land sales near Moab, Spanish Valley and Castle Valley could have a depressing effect on nearby private land market prices; however, all land sales would increase county revenues. Increased oil and gas drilling and production would eventually result in five to ten added local jobs (+0.1 to +0.2 percent) and \$85,000 to \$170,000 local income. Local units of government would receive increased</p>	<p>Economic Conditions-Watershed actions that could have quantifiable effects on water yield and salt loading would decrease the annual cost borne by water users in the Lower Colorado River Basin by \$535,000 to \$1,700,000 and result in a \$55,000 loss of value from decreased water yield. Two of the 45 livestock operators would have less available forage; 24 of the 45 would have more available forage; and 12 of the 45 would receive major exclusions during the spring. Aggregate returns above cash costs would increase by \$33,573 (+1 percent) which should also increase ranch values. However, the reductions from active preference could reduce ranch values by as much as 5 percent. Greater wildlife populations would increase hunter success rates and result in greater hunter pressure, local expenditures, and an added \$190,000 of local income and seven local jobs. Land sales near Castle Valley, Moab, and Span-</p>	<p>Economic Conditions-Watershed actions that could have quantifiable effects on water yield, salt loading, and sedimentation would decrease the annual cost borne by water users in the Lower Colorado River Basin by \$920,000 to \$1,220,000 and result in a loss of value from decreased water yield. Ten of the 45 livestock operators would have less available forage; 18 of the 45 would have more available forage; and 38 of the 45 would receive major exclusions during the spring. Aggregate returns above cash costs would decrease by \$61,000 (-3 percent), which should also decrease ranch values. Reductions from active preference could reduce ranch values by as much as 6 percent. Greater wildlife populations would increase hunter success rates and result in greater hunter pressure, local expenditures, and an added \$190,000 of local income and seven local jobs. Land sales near Castle Valley, Moab, and Span-</p>

TABLE 2-11 (Continued)

Comparative Summary of Management Actions and Impacts

property tax revenues and indirectly receive increased revenue from increased royalty payments to the State. There may be an unquantifiable reduced increase in tourist visitation and expenditures. The price outfitters charge for their services could be affected in some areas, and existing commercial use in other areas could be discontinued.

ish Valley would have a depressing effect on nearby private land market prices. Decreased oil and gas drilling and production would eventually result in two to five fewer local jobs (-0.1 percent) and less local government revenues from reduced royalty payments to the State. Future gold production and associated employment and income would also be impacted. Primitive nonmotorized recreation use and related local expenditures could be higher than would otherwise be the case. Existing commercial use of recreation areas would be preserved and the potential for commercial use of other areas would increase.

seven local jobs. Land sales near Castle Valley would have a depressing effect on nearby private land market prices. Decreased oil, gas, and uranium activities would eventually result in 65 fewer local jobs (-1.5 percent), less local government revenue from reduced property taxes and indirectly from reduced royalty payments to the State. Future gold production and associated employment and income would also be impacted. Primitive nonmotorized recreation use and related local expenditures could be higher than would otherwise be the case. Existing commercial use of recreational areas and the potential for commercial use of other areas would increase.

Social Conditions-There would be little or no change from the existing environment. Under this alternative, changes in attitudes toward BLM would be affected only by outside factors and the way management actions are implemented.

Social Conditions-Local groups and communities would not be affected to such a degree as to noticeably affect their existing social environment. In general local attitudes toward BLM would improve because restrictions would be reduced and greater local resource use and development would be allowed. These attitudes would vary, however, by those individuals and groups who would gain and those who would lose under this alternative.

Social Conditions-None of the management actions would impact the local groups or communities to such a degree as to affect their existing social environment. However, this alternative would probably be perceived by most residents as having a significant negative impact upon the local community.

Social Conditions-The social well-being of nine of the 45 livestock operators would be significantly affected. Local attitudes toward BLM would worsen because restrictions would be increased, less local resource use and development would be allowed, and this alternative would be perceived to have a significant negative impact on the local economy. These attitudes would vary, however, by those individuals and groups who would gain and those who would lose under this alternative.

TABLE 2-11 (Concluded)

Comparative Summary of Management Actions and Impacts

is not well enough developed. Both of these can be corrected in time by additional monitoring, additional inventories, or research when funding is available. Another aspect of the problem is that the conflict being addressed is a potential conflict and not a current conflict. The following discussion deals with conflicts that were not resolved in the RMP.

Loss of vegetation caused by ORVs in four locations conflicts with livestock use. These locations are the White Wash sand dunes area, Moab sand flats area, North and South Sand Flats Allotments, and the Behind the Rocks area.

Sixty-six percent of the bighorn sheep habitat would be protected only by the stipulations in oil and gas Category 1. The areas involved include the Potash, Mineral Bottom, and Westwater areas. This could result in bighorn sheep losses through stress and displacement if oil and gas development takes place.

Potential exists for conflicts with deer and elk from livestock on the Blue Hill Allotment. Threshold levels, needed to determine the significance of this potential problem are, unknown. Currently, the deer populations are stable to increasing, while elk populations are stable.

MONITORING THE GRAND RESOURCE MANAGEMENT PLAN

The Grand RMP will be monitored to determine whether the prescribed management actions are accomplishing their intended purposes. Monitoring will also be done to assure that the RMP is still consistent with plans adopted by State or local government, other Federal agencies, or Indian tribes. In addition, monitoring will ascertain whether new data is available that would be of significance to the plan. All of this is required in BLM regulations (43 CFR 1601.5-9).

Although the model for the Grand RMP will be the preferred alternative, this does not imply that it will be the final basis for the monitoring plan. The final monitoring plan will have to be based on the plan that is selected by management. In determining accomplishment, progress in meeting management objectives will be measured. Plan monitoring will consist primarily of measuring progress in implementing the prescribed management actions, followed by monitoring the effect of the actions afterward to determine whether the objectives have been reached. The management objectives referred to are the qualified management objectives stated for each management action prescribed in Table 2-2 for Alternative C (preferred alternative). These will serve as parameters for periodic measurement of progress. Table 2-12 outlines the basic monitoring plan that deals with the implementation of management actions.

After implementation of the management actions, monitoring would be conducted to determine whether the management objectives were being attained. Although the monitoring would be conducted at intervals not to exceed 5 years, exact standards for duration of monitoring cannot be readily established because of data gaps and other considerations. For instance, areas of poor watershed condition (within critical watershed issue areas) need to be identified; for other data gaps applicable to monitoring see Data Gaps, page 4-3. Also, it would be more appropriate to develop a more detailed monitoring plan after a final RMP plan is actually selected by management, rather than attempting to do so at the draft stage.

Issue	Objectives and Management Actions	Estimated Year When Management Actions Will be Fully Implemented ^a
Critical Watersheds	Reduce salinity contributions to the Colorado River by 5,000 tons annually through salinity control treatments.	1993
	Reduce salinity contributions to the Colorado River by 3,100 tons annually through the diversion and evaporation of water from Stinking Spring.	1986
	Improve poor watershed conditions by manipulating vegetation and initiating land and watershed treatments on three critical watershed subbasins.	1993
	Protect soils in critical watershed areas by changing season of livestock use on 13 allotments.	1985
	Lessen impact on highly saline soils and reduce salinity in the Colorado River drainage by restricting livestock grazing on 10 allotments (558 AUMs).	1987
	Reduce annual introduction of sediment into the Colorado River by 100 tons through designation of 24,454 acres of public land as closed to ORVs.	1985
	Reduce annual soil erosion by 100 tons through designation of 15,206 acres in the Mill Creek area as limited to existing roads and trails for ORVs.	1985
	Reduce annual introduction of sediment and salt into the Colorado River drainage by designating 596,434 acres of Mancos Shale soils, river corridors, and scenic areas as limited to existing roads and trails for ORVs.	1985
	Protect critical watersheds consisting of 2,920 acres of municipal watersheds, 74,967 acres of river corridors, and 19,040 acres of floodplains through designation under a combination of Categories 2, 3, and 4 in the Oil and Gas Category System.	1984
Livestock Requirements	Maintain and improve medium to high ecological condition by continuing present grazing management on 37 allotments.	current
	Benefit livestock and wildlife by improving present low ecological condition on heavy use areas and by maintaining and improving present medium to high ecological condition on 488,636 acres through implementation of livestock manipulation techniques.	1992
	Increase available forage by 8,514 AUMs to allow increased use by livestock and wildlife (where both are present) by implementing land treatments on 13 allotments.	1992
	Create a diversity of vegetation and increase AUMs for both livestock and wildlife by implementing a limited suppression policy for fire on the entire CRA (1.8 million acres)	1985

Continued

TABLE 2-12
Monitoring the Plan

Estimated Year When Management Actions Will be Fully Implemented^a

Objectives and Management Actions

Issue

Increase AUMs by 1,770 for both livestock and wildlife through the initiation of prescribed fire and seeding on 11 allotments.

1991

Wildlife Habitat Requirements

Manage wildlife habitat in support of current desert bighorn population and prior stable populations of other big game. This would be accomplished through management actions in the wildlife habitat management program and actions in other issue/program areas as follows:

already implemented

1. Maintain existing wildlife waters.

2. Reserve all forage and space on the following areas for deer and elk winter use; Pear Park, 14,720 acres; Spring Creek, 924 acres; and Castle Valley, 6,040 acres.

Other Issue/Program Areas

1. Management action designed to increase forage and space in Livestock Requirements, and Fire Management.

1992

2. Minerals-Protecting wildlife habitat consisting of 75,280 acres of deer and elk winter range, and 25,168 acres of antelope kidding grounds by designation under Category 2 of the Oil and Gas Category System.

1984

3. Utility Corridors-The exclusion of desert bighorn sheep habitat from future utility corridor locations.

1985

4. ORV Use and Management-Designating 24,454 acres of public land as closed to ORVs.

1985

indefinite

5. Wilderness-By designation of 89,455 acres of public land on the GRA as wilderness.

Recreation

Protect recreational use along the Colorado River by (1) withdrawing 32,000 acres of the river corridor from mineral entry, and (2) designating 74,967 acres of the river corridor under a combination of Categories 2, 3, and 4 in the Oil and Gas Category System.

1984

Protect the recreational qualities of 78,470 scenic recreation areas under a combination of Categories 2, 3, and 4 in the Oil and Gas Category System.

1984

Protect scenic recreational values, the sensitive plan *Cycladenia humilis* var. *jonessi*, and the riparian area in Negro Bill Canyon by designating 1,375 acres of the canyon as an ONA.

1985

^a See Appendix B

TABLE 2-12 (Concluded)
Monitoring the Plan

During plan implementation, and afterward, the plan will be monitored for consistency with the plans adopted by State or local governments, other Federal agencies, and Indian tribes on a continuous basis by regular formal and informal contacts with these entities. At 5 year intervals, they will be requested to review the RMP and inform the District Manager whether or not it is consistent with their existing plans. A continuing review of all available plans adopted by these entities will be conducted, and evaluation reports will be prepared at 5 year intervals and made available to the public. These will report on the findings of the monitoring process.

Affected Environment

The 15 indicators (environmental components and land uses that may be impacted by the management actions proposed in the alternatives) are described individually in the sections that follow.

SOILS

Because of the broad range in elevations, rainfall, and temperatures, the Grand Resource Area (GRA) has many diverse and complex soil patterns. Each soil series was formed as a result of different forces that are reflected in soil properties such as texture, degree of development, drainage, and permeability. Much of the GRA is characterized by arid soils and soils with very little development. Soils derived from the Mancos Shale Formation are of primary concern due to the high erodibility and saline-alkali characteristics (refer to Figure 1-2). These soils have a low site productivity, and once they are disturbed the impact is usually long-lasting.

At the other side of the spectrum, soils found in the limited mountainous and forested areas are deep, dark colored, and organically rich. Site productivity of these soils is high.

Soil erosion is the process of soil particle detachment and transportation. The soil particle may be transported offsite by wind or water. Productivity of the eroded site and related quality of the drainage waters may be adversely affected.

Livestock grazing and other surface disturbing activities affect three major soil parameters: compaction, erosion, and productivity. Intense grazing or heavy livestock and off-road vehicle (ORV) use in localized areas affects the density of the soil, decreasing pore space and thus infiltration rates. The decreased infiltration rate causes more water to run off the soil surface, which in turn increases the potential for erosion and loss of topsoil.

Erosion conditions were identified using the soil surface factor (SSF) determined by field observations of soil movement, surface litter, gully erosion and flow patterns. The areas of severe or critical erosion were shown in Figure 1-3. These areas generally correspond with areas of high geological (natural) erosion and extreme (greater than 50 percent) slopes, as in the Book Cliffs. There is no differentiation between these areas of geologic erosion and those where erosion is induced or influenced by man. Additional areas of critical erosion not identified on this map are commonly small, localized areas of intensive surface disturbance or removal of vegetation. Soil loss estimates can be found in Appendix C for identified critical saline-alkali soils in the GRA. Soil loss on Mancos-derived soils under climax potential vegetation may, in fact, exceed the soil loss tolerance value (T value). This happens when the rate of soil loss exceeds the rate of soil development. When this occurs, a more realistic approach for addressing sustained yield is needed. By comparing percent vegetative cover in different ecological condition classes for each ecological site for these critical soils, we can address the impacts of different management actions through the management of vegetative cover and ecological condition on each soil taxonomic unit. Thus, on areas of excessive soil loss, the T value may not be a realistic management goal when considering only improvement of vegetative cover.

Detailed soils information for the GRA can be found in the Canyonlands Area Soil Survey (SCS, 1982) and in the Grand County Area Soil Survey (Hansen, 1982). This information is presently being published, but is available at the Moab office of the Soil Conservation Service (SCS), and at the Moab BLM district and area offices. General soil mapping unit summaries can be found in Appendix G.

WATER QUALITY

SURFACE WATER

The GRA is located in the Upper Colorado River Region. The majority of the area falls into the Upper Colorado River Basin, with other portions located in the Dolores and Green river basins.

Most perennial streams are found in the upper reaches of the Book Cliffs and LaSal Mountain drainages. Thirty perennial streams, water courses, and riparian vegetation communities have been identified in the GRA (see Figure 1-5) for a total of 531 miles.

Water quality is monitored principally by the U.S. Department of the Interior, Geological Survey (USGS) and the Utah State Health Department in cooperation with BLM. Most of the monitoring stations are located on major rivers, such as the Colorado River. Water quality for these stations is available on the computer program STORET through the Environmental Protection Agency (EPA), the Utah State Health Department, or the BLM.

Typically the headwaters of streams in the Book Cliffs meet State Class C water quality standards. The lower reaches often exceed one or more parameters. Parameters typically exceeded are total dissolved solids (TDS) and sodium. Water quality may vary widely from season to season.

Salinity and sediment are the two most serious water quality problems. Average annual salt and water yields at gauging stations on the Colorado River in Utah from 1966 to 1975 indicate a salt load increase of 221,000 tons between the Colorado-Utah state line station and the Colorado River station near Cisco (BLM, 1977c). The average annual salt yield per square mile of drainage area for the Colorado River near Cisco is 171 tons (BLM, 1974).

Salts are yielded from public lands in several ways. The Colorado River Basin Salinity Report (BLM, 1977c) states that, on public lands, the most significant yield of salts comes from diffuse overland sources (i.e., runoff and erosion from soils and geologic formations containing salts). The undivided Mancos and lower and middle members of the Blue Gate Formation are considered to be major contributors of salinity to overland flow. Natural water discharge point sources include springs, seeps, and flowing artesian wells that contribute salt. The GRA has several known saline water point sources, of which Stinking Spring is the most significant. There also are areas where drilling operations have tapped saline artesian aquifers and the wells have been left unplugged to flow at the surface. Salts are yielded from other ground water sources, such as where saline aquifers are intersected by streams. Increased deep drilling and exploration in areas with saline aquifers, along with incomplete capping and plugging, provide an additional concern for aquifer contamination by the interaction of saline and nonsaline underground waters.

Flash flooding often follows the intense summer and fall thunderstorms that occur in the area. Sediment and salts are transported to the Colorado River during these periods of high runoff and intermittent flows. Floodplains and intermittent drainageways are primary sources of sediment and salinity (Figure 1-4).

Surface runoff characteristics and salt and sediment yield for selected allotments that have critical watershed concerns can be found in Appendix D.

GROUND WATER

Ground water has not been extensively inventoried, nor has much information been compiled. Limited information is available from existing wells, exploratory drilling, and general publications. Water quantity and quality are highly variable. The structural complexity and differential recharge of the geology also makes it hard to generalize water quantity and quality for the entire GRA.

Commonly, fresh water is found in the Hermosa Group, the Rico and Cutler formations, the Cedar Mesa Sandstone Member, Organ Rock Tongue and DeChelly Sandstone Member of the Cutler Formation; Chinle Formation, Shinarump Member of the Chinle Formation; Wingate Sandstone; Kayenta Formation; Navajo Sandstone; Carmel Formation; Entrada Sandstone; Morrison Formation; and Dakota Sandstone (Feltis, 1966).

Bedrock aquifers are recharged where permeable formations crop out along the flanks of the LaSal Mountains and in other areas of higher elevations where precipitation is relatively high and the geology is suitable (e.g., in the Roan Cliffs and Book Cliffs). Artesian wells have also been encountered in these areas.

AIR QUALITY

Generally, the GRA meets and exceeds National Ambient Air Quality Standards. Air quality is assumed to be excellent throughout the area and is expected to remain the same, barring any major industrial development or population growth (personal communication, Bill Wagner, Natural Resource Specialist, BLM Utah State Office, October, 1982).

The only area being monitored for air quality is the Moab Valley. Occasionally, inversion conditions exist in the valley, leading to a high particulate buildup. This has been attributed to increased particulates from woodburning stoves and industrial development in the valley.

VEGETATION

Vegetation communities typify a transition zone between the warm Southwest desert region and the cold Great Basin desert region. This area is dominated by ecological sites first in the saltbush zone (5 to 10 inches of annual precipitation); second, in the pinyon-juniper zone (12 to 18 inches of annual precipitation); third, in the sagebrush zone (11 to 16 inches of annual precipitation); and fourth, in the Douglas fir zone (14 to 25 inches of annual precipitation).

A soil and vegetation inventory was initiated in 1980 in cooperation with SCS and a private contractor, Texas Resource Consultants. The survey was completed in 1981 resulting in the ecological condition data summarized in Table 3-1.

Refer to Appendix I for a display of the ecological condition by allotment. Hansen (1982) and SCS (1982) provided most of the information for the classification and discussion of ecological types. Specific, detailed vegetation data for each grazing allotment is filed in the BLM Grand Resource Area Office.

The factors that most influence or determine the ability of ecological condition to improve are weather, predominant soil, the current vegetation on the ecological site, the manner in which livestock and wildlife utilize the vegetation, and the way livestock are managed on the allotment.

TABLE 3-1

Ecological Condition of Public Lands in the Grand Resource Area

<u>BLM Mapped Areas</u>			<u>Areas Mapped Under Private Contract^a</u>		
<u>Condition</u>	<u>Acres</u>	<u>Percent</u>	<u>Condition</u>	<u>Acres</u>	<u>Percent</u>
Rock/Badlands	103,136	8	Rock/Badlands	111,117	24
Low	90,302	7	Low	41,669	9
Medium	504,418	39	Medium	287,053	62
High	503,974	39	High	23,149	5
Climax	<u>90,332</u>	<u>7</u>			
	1,292,162	100		<u>462,988^a</u>	<u>100</u>

Note: Information based on 1980-81 soil and vegetation inventory.

^aRatings based on three classes, which do not coincide with the parameters for condition classes of BLM mapped areas.

SALTBUSH ZONE

This zone makes up 47.36 percent of the GRA or 948,878 acres. Available soil moisture is the overriding limiting factor in the saltbush zone. Topography and soil depth have pronounced influences on vegetation composition and production. Precipitation averages 5 to 10 inches per year. Since most of the annual precipitation occurs during fall through spring, the most active period of growth is spring. Elevation ranges from 4,000 to 5,400 feet. Thirty-three plant communities make up this zone, and it covers a major portion of the GRA. Climax dominants are shadscale, greasewood, buckwheat, blackbrush, salt cedar, fourwing saltbush, nuttall saltbush, mat saltbush, spiny hopsage, salina wildrye, and willow (Appendix J).

PINYON-JUNIPER ZONE

This zone makes up 28.58 percent of the GRA or 572,772 acres. About 60 percent of the available soil moisture is utilized by the pinyon and juniper trees, limiting the amount of understory vegetation and overall production. Sixteen plant communities occupy this zone, which can be found on level to extremely steep (80 percent) slopes. Elevation ranges from 4,700 to 8,600 feet. Like the sagebrush zone, many of the plant communities

that make up this zone are monotypic, with annual precipitation ranging 12 to 18 inches, most of which falls during the winter months. The climax community dominants are pinyon, juniper, salina wildrye, mormon tea, and black sagebrush (Appendix J). Two of the 16 plant communities are seedings dominated by crested wheatgrass and are recognized as part of the ecosystem.

SAGEBRUSH ZONE

This vegetative zone makes up 6.81 percent of the GRA or 136,581 acres. Seven plant communities make up this zone, with the climax dominants being big sagebrush and Wyoming sagebrush (see Appendix J). This zone is usually found in moderately deep soils with annual precipitation ranging from 11 to 16 inches. These areas have little relief, and the plant communities are often monotypic in makeup, offering good potential for land treatment. Elevation varies from 5,500 feet to 7,300 feet with 75 percent of the precipitation occurring from September through May. One of the seven plant communities is a seeding dominated by crested wheatgrass and is recognized as part of the ecosystem in the GRA.

DOUGLAS FIR ZONE

This zone comprises 4.37 percent of the GRA or 87,256 acres. Six plant communities make up this zone, with the climax dominants being mountain sagebrush, manzanita, Douglas fir, and gambel oak (Appendix J). This zone is found on some gentle slopes but mostly on extremely steep (more than 50 percent) slopes. The soil is some of the most fertile in the GRA, but sites are limited to wildlife use because of the steep topography. Elevation varies from 6,000 to 9,000 feet with 75 percent of the precipitation occurring during September through May and amounts varying from 14 to 25 inches annually.

ROCK OUTCROP/BADLANDS

The remaining 12.88 percent of the GRA (258,059 acres) is comprised of rock outcrop and badlands.

Appendix J shows the acreages covered by the various vegetation zones, ecological sites, and habitat types found in the GRA.

THREATENED OR ENDANGERED PLANTS

There are no officially recognized threatened or endangered plant species in the GRA; however, some plants have been recognized as sensitive.

The species listed as sensitive are: Asclepias cutleri, Astragalus iselyi, Astragalus sabulosus, Atriplex welshii, Cryptantha elata, Cycladenia humilis var. jonesii, Gaillardia flava, Lomatium latilobum, Phacelia howelliana.

Echinocereus triglochidatus var. inermis is an endangered plant which may exist on public lands in the area, but has been located only on nearby Forest Service lands.

NOXIOUS AND POISONOUS PLANTS

Several noxious and poisonous plant species are found in the GRA. These species do not pose a major problem, although livestock operators have occasionally reported livestock

losses that are significant to individual operations. The reason that there are not more livestock losses is that ranges infested with poisonous plants (principally Halogeton and locoweed) either are not used or are used after these plants are cured out. Locoweed cures out in June and Halogeton in mid-August. Both of these plants affect domestic sheep more than they do cattle.

Some of the other noxious or poisonous plants that occasionally appear in the GRA but are not a problem are: timber milkvetch, rubberweed, gambel oak, milkweed, lupine, little-leaf horsebrush, death camas, and copperweed.

LIVESTOCK GRAZING

Livestock (cattle and sheep) have been in the GRA since the mid-1800s. Early settlers brought their personal stock, but it was not until the mid-1870s that big herds of cattle were brought in (Peterson, 1975). In the 1890s, these same cattle outfits began diversifying to sheep (Peterson, 1975; Tanner, 1976). In the 1920s, Colorado stockmen began to winter their sheep in Grand County. By the time of the passage of the Taylor Grazing Act in 1934, the sheepmen had established enough priority grazing rights to be issued much of the grazing privileges in the County (The Times-Independent, 1950). Presently 55 percent of the livestock privileges in the GRA are allocated to cattle, and 45 percent to sheep.

The GRA administers 67 grazing allotments. Portions of three of these allotments lie in Colorado but are administered (grazing only) by this office because of location. In turn, eight allotments which have portions in Utah are administered by the Grand Junction, Colorado district of the BLM (BLM, 1977b). The Vernal District (Utah) administers grazing, along with the other land uses and resources, at the top of the Book Cliffs in the GRA (BLM, 1976). The grazing EISs for these two offices (Grand Junction and Vernal) will cover the affected allotments in the GRA.

Portions of some allotments within the GRA are within the Forest Service boundaries and are administered by BLM under a memorandum of understanding (FS-BLM, 1968), and the Forest Service administers some BLM land. This agreement pertains only to grazing. These Forest Service allotments that contain BLM land are listed at the end of Appendix I, and can also be located on the pocket map in the back of this document.

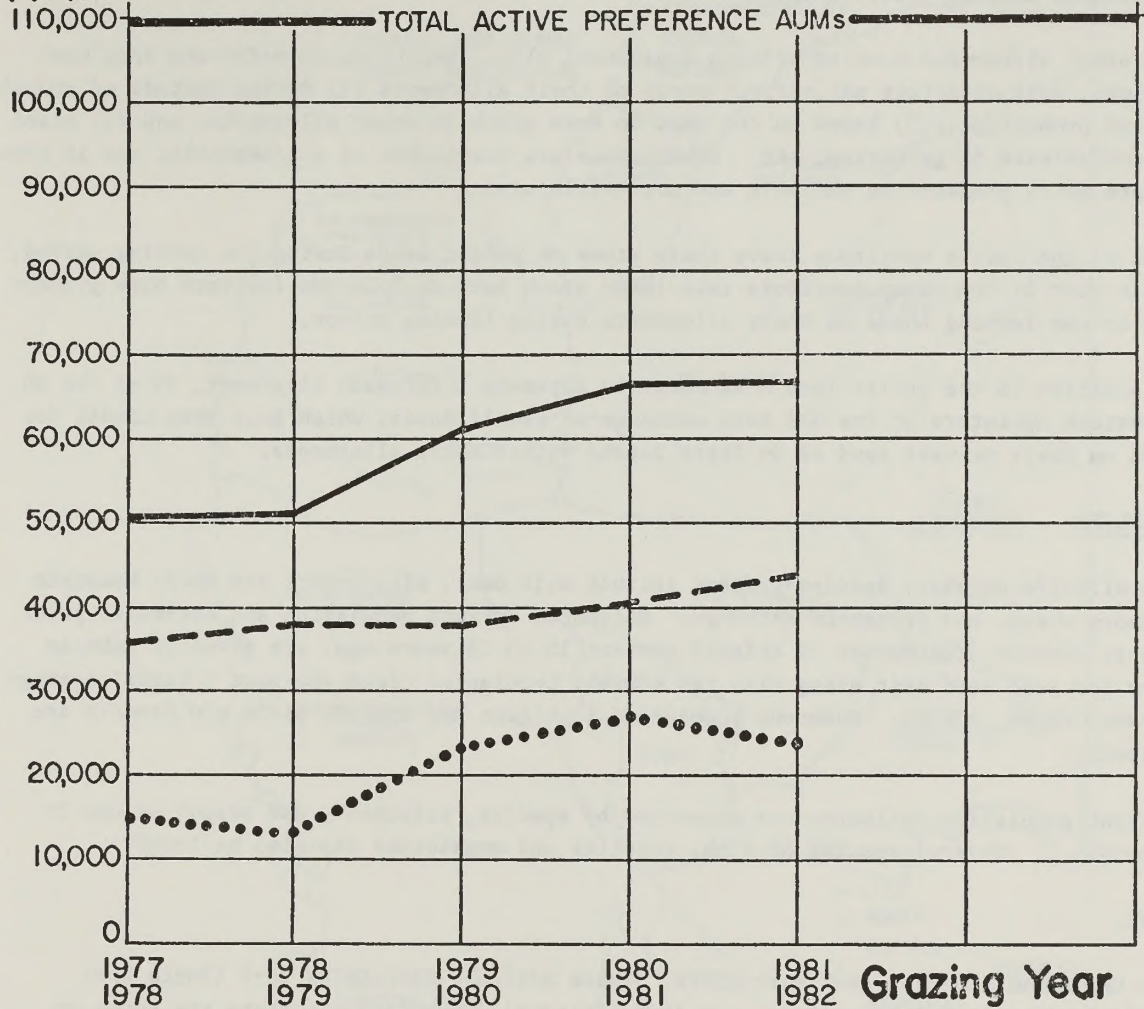
Forty-eight livestock operators have one or more allotments, and some allotments have up to three or four operators.

Use periods vary from 1 to 8 months per allotment. All the sheep grazing is done within the winter-spring period (November through May), and most of the cattle grazing is also done during this time. Ten allotments have summer cattle grazing. See Appendix I for specific livestock numbers and seasons of use by allotment.

Over the last 5 grazing years (March 1 through February 28), licensed sheep use has averaged 40 percent of preference animal unit months (AUMs). This means that of the total use that could be made by sheep under the operators' grazing privileges, 40 percent was made. For cattle the figure was 65 percent. Figure 3-1 shows total use and use for each class of livestock for each of the five years.

At present, six allotment management plans (AMPs) are in effect (see Appendix K). These allotments are divided into pastures, and the livestock are rotated from pasture to

AUMs



SHEEP
 SHEEP-Total 49,649
 Active Preference AUMs

CATTLE
 CATTLE-Total 60,058
 Active Preference AUMs

TOTAL ACTIVE
 PREFERENCE AUMs
 109,707

CATTLE and SHEEP LICENSED AUMs

- TOTAL ANNUAL
- - - - - CATTLE ANNUAL
- SHEEP ANNUAL

FIGURE 3-1

Active Preference and Past 5 Years' Average Use

pasture at different times of the year, generally on a predetermined date, with a flexibility period of 15 days. Two of the AMPs are for summer cattle allotments; two are for winter-spring allotments used by both sheep and cattle; and two are for winter-spring allotments used by cattle only.

The other allotments have no written management plan. Depending on water and snow conditions, most operators use various areas of their allotments (1) during periods of annual forage production, (2) based on the need to move stock to other allotments, and (3) based on convenience in gathering, etc. Other areas are unsuitable or inaccessible, and in turn create extra pressure on suitable and accessible areas.

Most of the cattle operators leave their stock on public lands during the calving period, while most of the sheep operators take their stock back to Colorado (private base property) or use lambing sheds on their allotments during lambing season.

In addition to the public land AUMs shown in Appendix I for each allotment, 29 of the 50 livestock operators in the GRA have exchange-of-use licenses, which give them credit for AUMs on their private land or on State leases within their allotments.

WILDLIFE

The wildlife ungulate species present include mule deer, elk, desert and Rocky Mountain bighorn sheep, and pronghorn antelope. Estimated current population and estimated prior stable numbers (the number of animals present 15 to 20 years ago) are given in tabular form for each herd unit along with the current population trend and past 5 years' average harvest (UDWR, 1981b). Numerous species of both game and nongame birds and mammals are present.

Current population estimates are presented by species, allotment, and season of use in Appendix I. Several species of fish, reptiles and amphibians can also be found.

DEER

The GRA contains three deer herd units. These are Deer Herd Units 28-B (South Book Cliffs), 30-A (LaSal Mountains), and 30-B (Dolores). Population numbers are shown in Table 3-2. Figure 3-2 shows the herd unit boundaries.

Herd Unit 28-B occupies a total of 590,379 acres, of which 75,295 acres is summer range and 125,474 acres is winter range. BLM administers 39 percent of the summer range and 41 percent of the winter range.

For Herd Unit 30-A, BLM administers 59 percent of the 450,300 acres of winter range. Most of the summer range is administered by the Forest Service.

Drought and severe winter weather have been responsible for reducing the LaSal Mountain (30-A) deer herd. Either-sex hunting seasons and predation have also reduced the herd size. The severe winter weather of 1978-1979 resulted in 76 percent fawn mortality and 26 percent doe mortality.

Fewer doe and fawn losses occur during mild winters. Less severe winter weather in 1979-1980 resulted in 43 percent fawn mortality and 13 percent doe mortality. During the

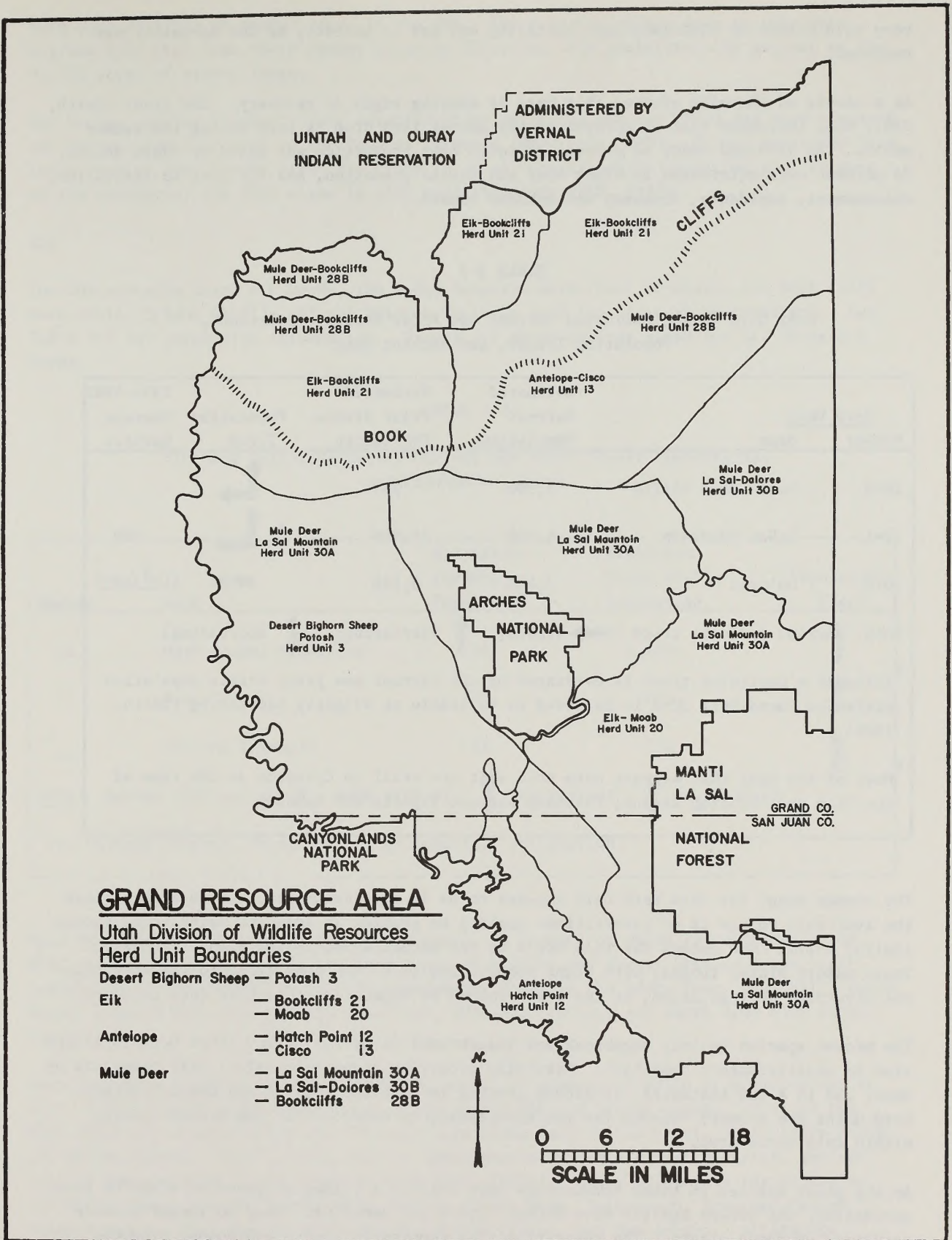


FIGURE 3-2

Deer, Elk, Bighorn Sheep, and Antelope Herd Unit Boundaries

very mild winter of 1980-1981 fawn mortality was 11 percent; no doe mortality was recorded.

As a result of the mild winter, this herd is showing signs of recovery. The study (Smith, 1982) also indicated that 41 percent of the annual fawn crop is lost during the summer months. In 1979 and 1980, 66 percent of total fawn production was lost; of these deaths, 73 percent were attributed to black bear and coyote predation, and the rest to starvation, abandonment, accidents, disease, and unknown causes.

TABLE 3-2

Deer Herd Units, Estimated Current and Prior Stable Populations, Population Trends, and Harvest Data

Herd Unit		Estimated	Estimated	Population	1976-1981
Number	Name	Current	Prior Stable	Trend	Average
		Population	Population		Harvest
28-B	South Book Cliffs	1,500	749	↘	
30-A	LaSal Mountain	4,700	15,900	^a ↘	569
30-B	Dolores	3,465	3,850	→	^b 107

NOTE: Arrows indicate trend (→ stable; ↑ increasing; ↓ decreasing).

^a Although a declining trend is evidenced by the current and prior stable population estimates, Herd Unit 30-A is believed to be stable to slightly increasing (Smith, 1982).

^b Most of the deer that migrate onto this unit are still in Colorado at the time of the Utah deer hunting season; Colorado harvest figures are unknown.

The summer range for this herd unit appears to be in good condition, but on winter range the available forage is of insufficient quality to provide an adequate maintenance ration (Smith, 1982). One reason for this could be the naturally occurring plant succession. These mature winter ranges, with plant communities in climax condition, no longer produce the diversity of vegetation, or the great volume of vegetation that they once produced.

The browse species (mainly sagebrush and blackbrush) in Castle Valley (Herd Unit 30-A) are also in unsatisfactory condition. Naturally occurring plant succession, past heavy use by deer, and in a few instances, livestock grazing in both the Dolores and LaSal Mountain herd units are primary reasons for the unsatisfactory condition of the browse species within this issue area.

As the plant species in these communities have reached a climax or advanced stage of plant succession, the browse species have become mature and decadent. They no longer produce seedlings or young plants. The vegetation that remains is coarse and woody, produces fewer pounds of forage annually, and is less palatable to wildlife.

Herd Unit 30-B has no summer range in the GRA. The majority of the deer in this unit migrate into Utah from their summer range in Colorado. BLM administers 88 percent of the 94,100 acres of winter range.

Key browse species transects were established to determine the age class and form class of the browse plants present in the Dolores Triangle (Herd Unit 30-B). It was concluded from these studies that browse plant age class is in an unsatisfactory condition and, on most of the transects, the form class is also unsatisfactory (BLM, 1977a).

ELK

The GRA contains three elk herds, the LaSal Mountain herd (Unit 20-Moab), the Book Cliff herd (Unit 21-Book Cliff), and the Dolores Triangle herd (no official designation). See Table 3-3 for population information. Figure 3-2 shows habitat areas for all three elk herds.

TABLE 3-3

Elk Herd Units, Estimated Current and Prior Stable Populations, and Population Trends

Herd Unit		Estimated	Estimated	Population
Number	Name	Current	Prior Stable	Trend
		Population	Population	
20	Moab (LaSal Mountains)	480	1,200	↑
21	Book Cliffs	425	850	↑
^a —	Dolores Triangle	125	250	↑
NOTE: Arrows indicate trend (→ stable; ↑ increasing; ↓ decreasing).				
^a The Dolores Triangle herd unit has no numerical designation.				

Herd Unit 20 occupies a total of 416,000 acres, 36 percent of which is administered by BLM. A major portion of this elk herd stays on private and Forest Service lands year-round; however, BLM lands do provide some winter range on the Adobe Mesa, Blue Hill, Hatch Point, Lisbon, Mill Creek, North Sand Flat, Professor Valley, and South Sand Flat allotments.

Herd Unit 21 occupies a total of 1,921,280 acres, 77 percent of which is administered by BLM. A major portion of this unit is north of the GRA, in Uintah County. Most of the Book Cliff elk winter in the Ten Mile drainage along East Willow Creek, West Willow Creek, and in She Canyon. Part of this area is administered by BLM's Vernal District, and the rest is administered by the State of Utah (BLM, 1977d). Other allotments identified as elk winter range include Barley Flat, Bar-X, Corral Wash, Cottonwood, Crescent Canyon, Diamond Canyon, Floy Canyon, Main Canyon, Middle Canyon, and San Arroyo. Allotments identified as yearlong elk range include Rattlesnake and Showerbath Springs.

The Dolores Triangle herd occupies a total of 94,100 acres, 88 percent of which is administered by BLM. The Dolores Triangle provides winter range for the elk, which migrate from Colorado to the Buckhorn, Granite Creek, and Steamboat Mesa allotments. The number of elk within the Dolores Triangle varies from year to year, depending on the severity of the winter; during mild winters, relatively few elk migrate into this area.

Elk are intolerant of constant and regular human activities such as roads, camping, livestock grazing, and industry. Therefore, it is possible for habitat to become unavailable to elk as a result of continuous disturbance by man and animal. Elk management can, however, be compatible with the cattle industry when there is an adequate food supply. Studies have shown that elk prefer to be at least one-half mile away from human activities such as camping, picnicking, and timber harvesting. It has also been documented that roads with light traffic have little effect on the activity of elk beyond 300 yards; however, the elk prefer not to cross the roads. Road design, terrain, and vegetative cover are important factors determining the use of surrounding habitat by elk (BLM 1977a).

BIGHORN SHEEP

The GRA contains three herds of bighorn sheep, found in the areas of Westwater, Potash-Mineral Bottom, and the South Book Cliffs. Population data for all three herds are shown in Table 3-4. Herd unit boundaries are shown in Figure 3-2.

Desert bighorn were reintroduced into the Westwater area in December 1978 with an initial release of seven bighorn. In the 4 years since their reestablishment, the population has tripled.

The small herd of Rocky Mountain bighorn sheep present in the South Book Cliffs resulted from two Rocky Mountain bighorn transplants that were made on the Ute Indian Reservation in the 1970s.

ANTELOPE

There are two antelope herd units within the GRA, the Hatch Point herd (Unit 12-Hatch Point), and the Cisco Desert herd (Unit 13-Cisco). Population data are given for both herd units in Table 3-5, and Figure 3-2 shows the herd unit boundaries.

In 1971, 172 antelope were reintroduced into the Hatch Point area. The population appeared to increase for the first 3 years following their introduction, but has declined since about 1975, probably because of drought, severe winter weather, and predation. This herd unit occupies a total of 244,480 acres, 81 percent of which is administered by BLM.

The Cisco herd originated from an antelope transplant made in Colorado near the state line. This herd has apparently recovered from the drought conditions that existed for 3 spring-summer seasons in the middle and late 1970s, and the present population appears to be stable. The herd unit occupies a total of 604,000 acres, 87 percent of which is administered by BLM. Seasonal migration patterns are not well defined for either of the antelope herds.

THREATENED OR ENDANGERED ANIMAL SPECIES

Five wildlife species found in the GRA have been listed for protection under the Endangered Species Act of 1973. The peregrine falcon, bald eagle, black-footed ferret, Colo-

TABLE 3-4

Bighorn Sheep Herd Units, Estimated Current and Prior Stable Populations, and Population Trends

Herd Unit	Estimated Current Population	Estimated Prior Stable Population	Population Trend
Westwater	24	^a 229	↑
Confluence (Potash-Mineral Bottom)	81	1,037	↑
South Book Cliffs	25	98	↑
<p><u>NOTE:</u> Arrows indicate trend (→ stable; ↑ increasing; ↓ decreasing)</p>			
<p>^aUDWR long-range goal.</p>			

TABLE 3-5

Antelope Herd Units, Estimated Current and Prior Stable Populations, and Population Trends

Herd Unit	Estimated Current Population	Estimated Prior Stable Population	Population Trend
12 Hatch Point	93	^a 309	↓
13 Cisco	87	578	→
<p><u>NOTE:</u> Arrows indicate trend (→ stable; ↑ increasing; ↓ decreasing)</p>			
<p>^aUDWR long-range goal.</p>			

rado squawfish, and humpback chub have all been classified as endangered species. In addition, the razorback (humpback) sucker has been proposed for Federal protection as a threatened species, and the bonytail chub has been proposed for Federal protection as an endangered species.

Most bald eagle sightings occur along the Green and Colorado rivers during the winter, but at least one bald eagle is a summer resident in an area near the mouth of Westwater Canyon. Winter roosting areas along the Colorado River have been identified within the cottonwood groves at May Flat, Westwater, and McGraw Bottom, but no nest sites have been located.

The peregrine falcon is a yearlong resident of the GRA. There is also evidence that migrant birds inhabit the area during the fall and spring. The GRA has great potential as peregrine habitat and, based on the sighting of an immature bird in midsummer, it is thought that there may be an active eyrie. The Dolores Triangle and the Colorado River from the state line to the confluence with the Green River are probably the most likely places for peregrine habitation. More investigation is needed to determine whether nesting peregrines are present.

Several unconfirmed black-footed ferret sightings have been reported. Prairie dog habitat is also black-footed ferret habitat, and prairie dog colonies are scattered throughout much of the Cisco Desert, Salt Valley, Long Valley, Lisbon Valley and are evident near Thompson, Cisco, LaSal, Crescent Junction and the Moab airport. More investigation is needed to confirm the presence of the black-footed ferret.

The Colorado squawfish, humpback chub, razorback squawfish and bonytail chub are present in the Colorado, Green, and Dolores rivers.

In its natural condition, the Colorado River system is a harsh environment for fish, because flow levels and temperatures fluctuate widely, both on a yearly cycle and during short periods of intense precipitation. Current trends are for native fish populations to remain static or decline as introduced fish increase in number of species and in number of individuals.

RIPARIAN AND AQUATIC HABITATS

The riparian and aquatic areas provide habitat for a variety of game and nongame species. Birds, mammals, fish, reptiles and amphibians can all be found within this typically narrow (20 to 200 feet) and elongated area. Livestock also seek out riparian areas for food, water, cooler temperatures during hot weather, and thermal cover during the winter.

As two plant communities meet, they intergrade; the zone of intergradation is called an ecotone. Sometimes these zones of intergradation are very abrupt, as in riparian and aquatic habitats, because of a sudden discontinuity in environmental conditions. The riparian and aquatic habitats in the GRA provide good ecotones for wildlife because of the irregular and meandering pattern created by the riparian vegetation and the rapid transition from an aquatic environment to the drier adjacent plant communities. Wildlife in general inhabit these areas, and the areas become more significant to wildlife depending on the size and shape of the ecotones.

The vegetation found within these areas consists of Fremont cottonwood, tamarisk, narrow-leaf cottonwood, water birch, willow, sedges, rushes, and varieties of perennial grasses and forbs.

There is a total of 531 miles of streams, water courses, and major rivers in the GRA. The Colorado and Green rivers account for 193 miles of this total (see Figure 1-5). These rivers are major aquatic and riparian habitat areas which support both native and introduced species of fish. Some of the introduced species include carp, channel catfish, black bullhead, white sucker, largemouth bass, bluegill sunfish, and green sunfish. These were introduced for sport purposes. Others, such as the red shiner, sand shiner, fathead minnow, and killifish were probably introduced when people dumped bait fish into the river. The native fish populations present include roundtail chub, bonytail chub, humpback chub, Colorado squawfish, speckled dace, flannelmouth sucker, bluehead sucker, and humpback sucker.

Granite Creek (Granite Creek allotment), Beaver Creek (Taylor Allotment), and Mill Creek (South Sand Flats allotment) support trout fisheries as well as several species of nongame fish. Other riparian and aquatic areas (Figure 1-3) support a variety of nongame fish species such as dace, shiners, suckers, carp, and killifish.

MINERAL RESOURCES

LOCATABLE MINERALS

Placer gold is found primarily along the Colorado and Dolores rivers in the eastern part of the GRA. Uranium is found throughout the southern two-thirds of the GRA, and commercial production comes from several major miners in the Lisbon Valley. Production has varied widely because of economic fluctuation; however, about 1,000,000 pounds of yellowcake were produced in 1980.

LEASABLE MINERALS

Oil and gas wells are present over much of the GRA, with major production occurring in the eastern Cisco Desert. Production in 1981 was approximately 10 million MCF (thousand cubic feet) or 10 trillion cubic feet of natural gas and 50,000 barrels of oil. Known oil and gas fields cover 588,000 acres, or nearly 32 percent of the GRA.

Potash is present at depth in several areas (anticlines) through the central and southern portions of the GRA, and potash leases are in effect. There is current production from adjacent State lands, but no potash is produced on BLM lands.

Oil shale is present in the GRA, but administrative responsibility lies with BLM's Vernal District. A memorandum of understanding between the two districts for management of oil shale resources is being prepared.

SALABLE MINERALS

Scattered sites provide sand and gravel, especially for road construction. About 1,000,000 cubic yards were used in 1981.

One site is under contract for sale of humate materials, to be used as a fertilizer. The contract specifies removal of 1,120,000 tons of humates.

MINERAL RIGHTS

According to the General Mining Law of 1872, individuals have the right, subject to a

valid discovery of mineral materials, to file mining claims and to work them on any public lands that are not specifically withdrawn. Almost the entire GRA is open to mining claims, except for 1,850 acres of scattered withdrawals (e.g., recreation sites). Claims for placer gold are clustered along the Colorado and Dolores rivers. Uranium claims are clustered in areas where host rocks are present, such as in the Salt Wash member of the Chinle Formation, and at the top of the Cutler Formation. Some speculative claims are present in other areas. Most of the area's 25,000 mining claims were filed for uranium; only a few hundred are claims for placer gold.

TRANSPORTATION

Topographic limitations have forced the location of eight major rights-of-way (refer to Figure 1-8) in the narrow Moab Canyon. The canyon has become established as a de facto utility corridor over the years as more and more major rights-of-way were required. The canyon now contains roads, railroads, pipelines, powerlines, and communication lines. Many of these facilities have boundaries that already overlap, and there is uncertainty as to how many more rights-of-way the Moab Canyon can accommodate.

HIGHWAYS AND ROADS

The main transportation routes providing access to the GRA are Interstate 70 (I-70), U.S. Highway 191 (163) and State Highway 128. U.S. Highway 191 travels north from Arizona, runs through Moab, Utah and ends at Crescent Junction, Utah where it intersects with I-70. U.S. Highway 191 also passes through the de facto Moab Canyon corridor.

I-70 is the only interstate highway in southeastern Utah, and it travels east-west. It accesses Grand Junction, Colorado to the east and Emery County, Utah to the west. State Highway 128 runs north-south along the Colorado River and intersects I-70 near Cisco, Utah. These main routes are paved, for the most part, and are open year-round, except when heavy snows cause closures for short periods of time. Old U.S. Highways 6 and 50, paralleling I-70 for much of its length, still provide access to the northern half of the GRA. (These are easily seen on the General Location Map (Figure I-1).

The existing secondary road network is adequate for transportation needs within the GRA. The development of these secondary routes has been in response to increases in oil and gas development, ORV use, mineral development, and other land uses. In the past year, most road construction has been performed in accordance with the East Book Mountain Transportation Plan, which set standards for roads constructed or upgraded on public lands. Three classes of road standards were developed to ensure that proper design and drainage techniques were utilized on all types of road construction. Implementation of the plan has led to roads that are better located, designed, and constructed.

Grand County proposes the future development of a highway connection between Grand County and the Uintah Basin. The proposed highway would provide a link between the major energy resource centers of the State by extending State Highway 88 south beyond Ouray to I-70.

RAILROADS

The Denver and Rio Grande Western Railroad is the primary rail service in the area. The railroad offers passenger service three times a week from Thompson, Utah to points east and west. The main rail line runs in an east-west orientation, following I-70 for a

portion of its route. A feeder line runs from I-70 to Potash, Utah providing freight service to the Texas Gulf potash plant near Moab. This section of rail passes through the Moab Canyon corridor.

AIRPORT SERVICE

Canyonlands Airport, located 17 miles north of Moab, provides commercial air service to the area. There are numerous airfields within the GRA which provide for private air service.

UTILITIES

Many major utility systems affect the GRA. Utah Power and Light Company (UP&L) operates three major electric transmission lines (345 kilovolt (kv), 138 kv, and 69 kv) which are located within existing de facto transportation and utility corridors (see Figure 2-13). The GRA also contains two smaller lines, a 46 kv and a 25 kv line.

Two large gas pipelines are operated by Northwest Pipeline Corporation and Mid-American Pipeline Company. These large pipelines are also shown in Figure 2-13. Both of these gas lines pass through the Moab Canyon corridor.

CULTURAL RESOURCES

Cultural sites represent prehistoric remains of the Anasazi and Fremont Indian Cultures, as well as later historic sites. Approximately 1,063 prehistoric and historic sites have been documented in the GRA. These sites range in significance from low to high, and they are scattered throughout the region. Cultural sites are continually being discovered as new archaeological clearances are performed. The new sites are documented and added to the present record of sites.

Prior to any proposed action (such as road building, oil and gas development, etc.) an archaeological clearance is performed. A clearance requires an actual onsite inspection by a qualified archaeologist, followed by a detailed written report describing any cultural findings and discussion, where necessary, of appropriate mitigating measures for the site. Cultural values such as Anasazi structures and historic roads, railroad grades, and buildings are protected from potential destruction by this process.

VISUAL RESOURCES

Visual resources are the combinations of landform, water, color, cultural and vegetative features and other landscape characteristics. To determine how the visual resources should be managed, the Bureau has developed a system for classifying and managing these landscape characteristics. The system, explained in Bureau Manual 8400, places landscape units into visual resource management (VRM) classes that indicate the overall significance of the visual environment and establish management objectives for determining the degree of acceptable visual change. The VRM classes are defined, and the steps involved in the classification process are detailed in Appendix W.

The system provides for identification of changes in major features (land, water surface, vegetation, and structures) in terms of contrast changes in four basic elements (form, line, color, and texture).

An area can be assigned a VRM Class of I to V, depending upon the amount of contrast change that can be allowed to occur in the four basic elements.

VRM classes established for the GRA are shown in Figure 3-3. Table 3-6 summarizes the approximate acreages found within each VRM class.

TABLE 3-6
Visual Resource Management Classes

<u>Class</u>	<u>Acres</u> ^a
Class I	0
Class II	787,000
Class III	791,000
Class IV	834,000
Class V	10,000

^a Acreage figures were rounded to the nearest thousand.

The Colorado and Dolores river corridors are prime examples of areas of high visual sensitivity. In portions of these areas, lowering the established VRM class, even temporarily, would have serious effects on the associated scenic and recreational values. In addition to these corridors, the 21 other areas of scenic recreational opportunities shown in Table 2-9 are considered sensitive to changes in VRM class.

SPECIAL DESIGNATION AREAS

WILDERNESS

In the Wilderness Act of September 3, 1964 Congress defined wilderness and directed that each wilderness area be managed to preserve its wilderness character. The act directed the Secretaries of Agriculture and Interior to conduct a wilderness review on National Forest and Park Service lands. BLM lands were omitted from the Act. It was not until passage of FLPMA 1976 that the BLM was directed to conduct a wilderness review.

As a result of this wilderness review, eight wilderness study areas (WSAs) were designated within the GRA (see Table 3-7).

TABLE 3-7
Wilderness Study Areas within the Grand Resource Area

<u>NUMBER</u>	<u>NAME</u>	<u>LOCATION</u>	<u>ACRES</u>
UT-060-068A	Desolation Canyon	Book Cliffs/Green River	51,250
UT-060-100B	Flume Canyon	Book Cliffs	47,550
UT-060-100C	Spruce Canyon	Book Cliffs	20,350
UT-060-100C	Coal Canyon	Book Cliffs	43,815
UT-060-116/117	Black Ridge Canyon West	Colorado State Line	5,100
UT-060-118	Westwater Canyon	Colorado River	31,160
UT-060-140A	Behind the Rocks	Moab Rim	12,635
UT-060-138	Negro Bill Canyon	Colorado River	7,620
TOTAL ACRES			219,480

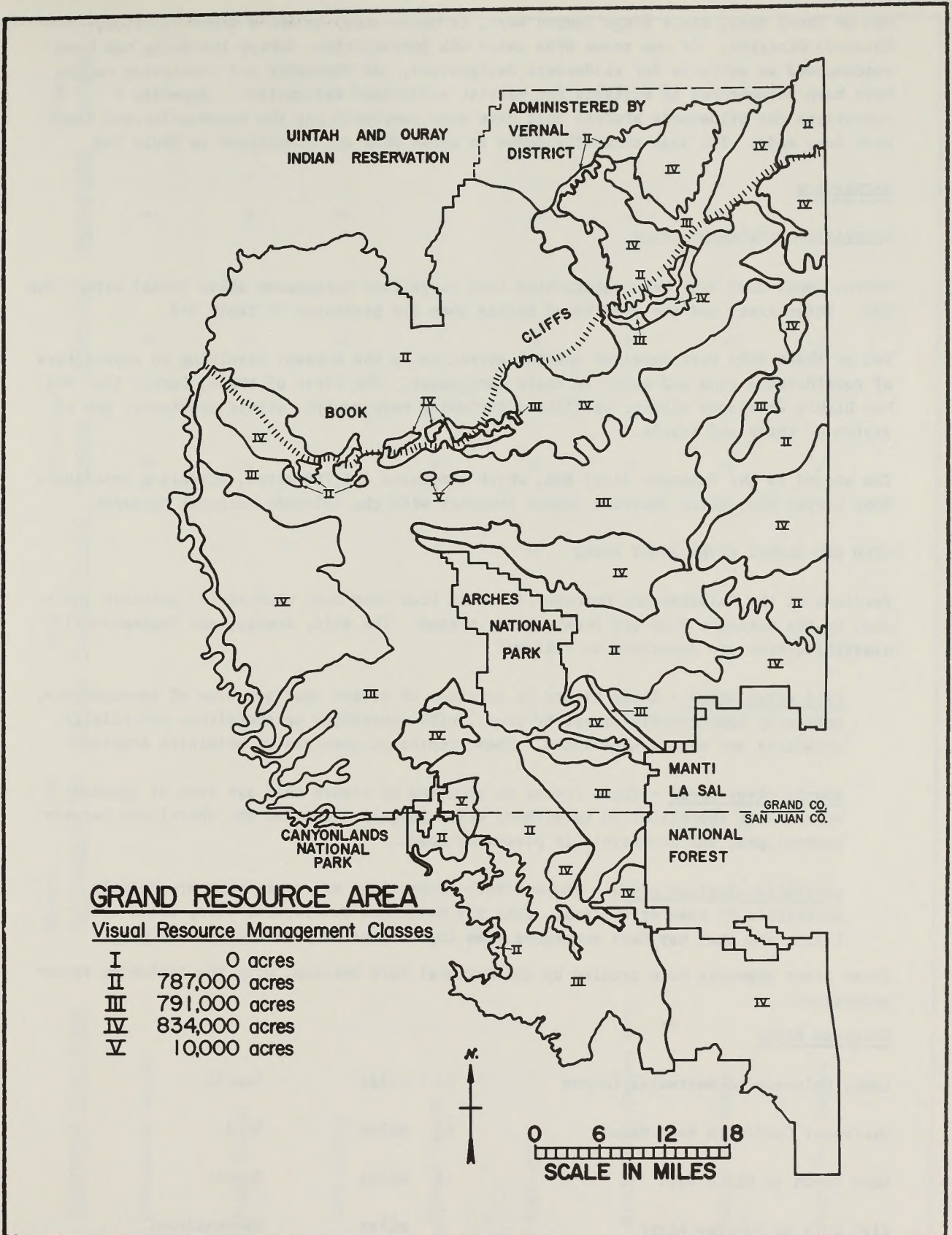


FIGURE 3-3

Visual Resource Management Classes

One of these WSAs, Black Ridge Canyon West, is under study by BLM's Grand Junction, Colorado District. Of the seven WSAs under GRA jurisdiction, Behind the Rocks has been recommended as suitable for wilderness designation, and Westwater and Desolation canyon have been recommended as suitable for partial wilderness designation. Appendix U summarizes the wilderness studies that have been completed and the recommendations that have been made. The uses currently found in these WSAs are summarized in Table 3-8.

RECREATION

RECREATION MANAGEMENT AREAS

Recreational uses have been categorized into recreation management areas (RMAs) within the GRA. These areas and the uses found within them are presented in Table 3-9.

Two of these RMAs have received special attention by the Bureau, resulting in expenditure of considerable time and money in their management. The first of these, Canyon Rims RMA, has highly developed visitor facilities including campgrounds, scenic overlooks, and a system of roads and trails.

The second is the Colorado River RMA, which comprises 101,760 acres, bordering Colorado's Ruby Canyon RMA, which shares a common boundary with the Colorado National Monument.

WILD AND SCENIC RIVER STUDY AREAS

Portions of the Colorado and Dolores rivers in Utah have been studied for possible inclusion in the Nation's Wild and Scenic River system. The wild, scenic, and recreational classifications are described as follows:

wild river areas - Those rivers or sections of rivers that are free of impoundments, generally inaccessible except by trail, with watersheds or shorelines essentially primitive and waters unpolluted. These represent vestiges of primitive America.

scenic river areas - Those rivers or sections of rivers that are free of impoundments, with shorelines or watersheds still largely primitive and shorelines largely undeveloped, but accessible in places by roads.

recreational river areas - Those rivers or sections of rivers that are readily accessible by road or railroad, that may have some development along their shorelines, and that may have undergone some impoundment or diversion in the past.

These river segments were studied by the National Park Service, with the following recommendations:

Colorado River

Loma, Colorado to Westwater Canyon	27.7 miles	Scenic
Westwater Canyon to Rose Ranch	13 miles	Wild
Rose Ranch to Cisco Wash	11 miles	Scenic
Fish Ford to Dolores River	4 miles	Recreational

<u>Wilderness Study Areas</u>	<u>Mineral Exploration</u>	<u>ORV Use</u>	<u>Grazing</u>	<u>Rock Hunting</u>	<u>Fishing</u>	<u>Hiking and Camping</u>	<u>Collecting</u>	<u>Photography</u>	<u>Float Boating</u>
Desolation Canyon	X		X	X		X	X	X	X
Flume Canyon	X		X	X		X	X	X	
Coal Canyon	X		X	X		X	X	X	
Spruce Canyon	X		X	X		X	X	X	
Westwater	X	X	X	X	X	X	X	X	X
Black Ridge Canyon West	X		X	X		X	X	X	
Behind the Rocks	X	X	X	X		X	X	X	
Negro Bill Canyon	X	X	X	X		X	X	X	

TABLE 3-8
Uses Currently Found in Wilderness Study Areas

Dolores River

Gateway, Colorado to Fisher Creek	14 miles	Scenic
Beaver Creek to Bridge Canyon	6 miles	Wild
Bridge Canyon to Colorado River	11 miles	Scenic

Segments within the wild and scenic categories are considered to be sensitive areas. It is important to note that the scenic quality in parts of the river corridors is very important to the recreational experience.

RIVER RECREATION MANAGEMENT

From the Colorado state line to Westwater, permits are not required. This segment of the river receives increasing use originating in Loma, Colorado. The majority of this 22-mile float trip is in Colorado, so any management decisions affecting the river upstream from Westwater would have to be made in coordination with the Grand Junction BLM District.

Permits are required for private and commercial use in Westwater Canyon on the Colorado River and on the Dolores River in Utah. Permits are also required for commercial river use from the Cisco launch area to Castle Creek on the Colorado River.

Westwater Canyon provides some of the most challenging whitewater on the Colorado River. An added attraction is that the 17-mile Westwater trip can easily be run in a day. Its proximity to the population centers of Grand Junction and Denver, Colorado and Salt Lake City, Utah increases demand for use of this river segment.

The Westwater use allocation has been established at 14,000 passenger days annually between May 1 and September 30. Visitor use facilities include the Westwater primitive campground and the Cisco landing, where most river parties complete their trips. The takeout location is privately owned, a condition that could present future use conflicts. BLM does maintain two rest rooms at this site, but much-needed boat ramp maintenance has not been performed because of the ownership issue. The next nearest suitable boat takeout location is 4.5 flat water miles downstream at Fish Ford. The additional float time required to reach Fish Ford would increase the length of the Westwater trip from 1 to 2 days. This change would also increase visitor impacts on the canyon. Because of these concerns, it is important that BLM acquire permanent river access rights to the Cisco takeout location.

Visitor safety is also a matter of continual concern. To cope with the immediate visitor management issues, a ranger station is maintained at Westwater, staffed by two professional river personnel during the 6-month use season. They patrol the canyon, clean up campsites, and check river permits for those groups launching at Westwater. There have been several instances where rangers have rescued boaters stranded or injured in the canyon. The safety inspections performed at the launch point have undoubtedly saved lives.

Other developments that have been constructed or are maintained along the Colorado River corridor include Big Bend, Hittle Bottom, Sandy Beach, Fisher Towers, and Jaycee Park (refer to Table 3-9). These sites are maintained under contract.

River use from Castle Creek south to Canyonlands National Park is managed by the State of Utah. A State Park ranger is assigned to that area during the summer months. Above Castle Creek, commercial permits are required, but private river use does not require a permit.

Increased use along the Colorado River poses health and sanitation problems, due to a lack of rest room facilities. Common river use areas with presently inadequate facilities are Fish Ford, Dewey, Hittle Bottom, and Sandy Beach.

The Dolores River is also managed for its recreational opportunities. As previously indicated, permits are required for private and commercial use on the Dolores between the Utah-Colorado state line and the confluence with the Colorado River. The traditional launch point is just below the highway bridge near Gateway, Colorado. The most frequently used takeout point is just below the Dewey Bridge on the Colorado River.

The Dolores River use season is at best a 2-month period. Some years, water levels are so low that this river cannot be run. Upstream reservoir construction near Cahone, Colorado is expected to alter the present season and patterns of use.

The Sand Flats Special Recreation Management Area (SRMA) has an unusual variety of recreational opportunities. The popular Moab Slickrock Bike Trail attracts not only considerable ORV use from nearby Moab, but also visitors from all over the Country. Views from the bike trail overlook Arches National Park, the Colorado River, the Moab Valley, and scenic Negro Bill Canyon.

Negro Bill Canyon, also within the SRMA, is itself a popular local recreation area that is used by hikers, backpackers, and sightseers. A perennial stream flows through the canyon, providing a popular attraction. A sensitive plant, smallflower columbine, is found in the hanging gardens of Negro Bill Canyon. Ecological relationships in the area are frequently studied by the local academic community. Commercial horseback trips are conducted to Morning Glory Natural Bridge. Mineral exploration and ORV use conflict with the scenic recreational qualities of the area.

RECREATIONAL ORV USE

Approximately 70,000 public land acres in the planning area presently show increasing trends in ORV use. Exact use figures to substantiate this observation are unavailable, but vehicle tracks and general evidence of use confirm that ORV use is increasing. Use areas have been identified on the recreational ORV use map (Figure 1-6).

Participation in some ORV uses, such as the annual Jeep Safari, has leveled off or shown a temporary decline, probably because of energy costs, economic conditions, or the lack of promotional emphasis.

Remote areas such as those found in the Book Cliffs and in Westwater Canyon WSA have not experienced increased ORV use, and it is difficult to project future trends in these areas. Other areas, such as Behind the Rocks and Negro Bill Canyon WSAs are showing some signs of increased ORV use, as evidenced by vehicle tracks in the area.

OTHER RECREATIONAL USES

Dispersed recreational use occurs on the remainder of public lands within the GRA. Although such uses are important, the difficulty of surveying the large expanse of land has prevented collection of data about these uses.

ECONOMIC CONDITIONS

The format for this section includes an overview of the affected area, followed by a more detailed discussion of the economic considerations that pertain to each of the ten planning issues. The methodologies and computations that were used for the affected environment are discussed in Appendix V.

The region that would be affected depends upon the management action. Grand county would be the primary impact region. Impacts from some management actions would spread to other areas in western Colorado and southeastern Utah, particularly to San Juan County. Because runoff originating in GRA's critical watershed areas affects downstream water users, the affected area for this issue includes the Lower Colorado River Basin.

This section focuses on Grand County because the northern section of San Juan County is sparsely populated with only one small community (LaSal, which has a population of between 250 and 500 and depends upon Grand County for goods and services) and because many economic and demographic statistics are available only by county.

HISTORY

High beef prices due to the mining boom in Colorado brought livestock operators into the area by the late 1800s, forming the region's first base industry. By the early 1900s the region became well known for its fruit. Remoteness and residential growth contributed to a later decline in these industries. Also at this time there was vanadium mining, sporadic gold mining, and oil and gas development. In the early 1950s the mineral industry caused dramatic population growth and comprised a significant proportion of the region's economy (see Figure 3-4). The establishment of a large potash mine in the early 1960s and later growth in the Federal government sector, tourist industry, and oil and gas industry all significantly affected the local economy.

POPULATION, EMPLOYMENT, AND INCOME

The 1981 Grand County population was 8,400. The majority of the county is unpopulated, with 97 percent of the settlement concentrated in the Moab area. About 65 percent of the county's population live in Moab, and 32 percent live in Spanish Valley, which is adjacent to and southeast of Moab (USDC, 1981a). Grand County comprises 3,615 square miles (about three times the size of Rhode Island). About 80 percent of the land in the county is managed by the Federal government, 15.5 percent by the State, and 4.5 percent by private land owners (University of Utah, 1979). This distribution has affected county residents' perception of Federal lands and agencies.

Recent statistics (see Table 3-10) show that 99 percent of local wage and salary employment is nonfarm, with about 80 percent employed in private industry and 19 percent employed in Federal, State and local governments (Federal employees account for somewhat less than half of this). Mining and tourism are the most important private industries in

TABLE 3-10

1979 Personal Income and Employment, Grand and San Juan Counties

	GRAND COUNTY		SAN JUAN COUNTY	
	<u>Income</u> (Percent)	<u>Employment</u> (Percent)	<u>Income</u> (Percent)	<u>Employment</u> (Percent)
Agriculture	1	1	4	4
TOTAL AGRICULTURAL	1	1	4	4
Mining	30	22	49	33
Construction	15	11	7	4
Manufacturing	1	2	4	5
Transportation and Public Utilities	9	7	5	5
Wholesale Trade	8	7	^a --	2
Retail Trade	9	17	5	8
Finance, Insurance, and Real Estate Services	3	3	^a --	1
Other	--	--	^a --	<u>2</u>
<u>Total Private Industry</u>	84	18	17	76
Federal Government	7	8	2	4
State and Local Government	<u>7</u>	<u>10</u>	<u>15</u>	<u>22</u>
Total Government	14	18	17	26
TOTAL NONAGRICULTURAL	99	99	96	96
Unemployment (3rd Quarter, 1982)		11.7		9.8
	(Dollars)	(Jobs)	(Dollars)	(Jobs)
Total Employment and Income	\$54,026,000	3,796	\$57,596,000	3,995
NOTE: Because of rounding, numbers are not additive.				
Total and percentage income figures include wage, salary, and proprietors' income. Total employment figures include wage, salary and proprietors' employment, whereas the employment percentage figures include only wage and salary employment. The relative importance of farm employment is therefore underrated.				
^a Information undisclosed.				
Sources: BEA, 1981a; UDES, 1982.				

Grand County. Mining directly accounts for 22 percent of local employment; however, recent uranium mining and milling layoffs may reduce mining's local importance. Tourism directly accounts for approximately 12 percent of local employment.

The mining and tourist industries purchase some of their supplies locally, and those who work in these industries spend part of their income locally. This circulation of money from export industries contributes to local income and employment. Including these multiplier effects, mining and tourism account for 35 to 45 percent and 17 to 25 percent of local employment, respectively. Unemployment in the county is among the highest rates in the State, with third quarter 1982 figures of 11.7 percent. This is primarily due to large mine layoffs, and the resulting downturn through the local economy.

San Juan County had a 1981 population of 12,700, not quite 1 percent of the State population. The county has two service centers. Monticello, the county seat, had a 1980 population of 1,930; Blanding, about 20 miles south, had a 1980 population of 3,120. San Juan County is one of the largest in Utah, comprising 7,885 square miles (about the size of New Jersey). About 85 percent of the land in the county is managed by the Federal government, 6.5 percent by the State, and 8.5 percent by private land owners.

Recent statistics indicate that mining directly accounts for 33 percent of the employment and almost half of the personal income earned in the county. Government and tourism are San Juan County's next most important sources of employment and income.

The State of Utah has projected slow employment and population growth for the next 20 years in Grand County (see Figure 3-4 and Table 3-11) (SAM, 1982). The agricultural sector is projected to remain static (see Table 3-11) (personal communication with Brad Barber, Utah State Planning Office, September, 1982). After initial declines in 1981, 1982, and 1983, the uranium market is projected to remain static. Moderate growth of the oil and gas industry and other basic industries, including tourism, are also expected, which would induce further growth in the retail and service industries. These projections do not include the effects that any one of a number of projects, which may locate to the area, would have on Grand County.

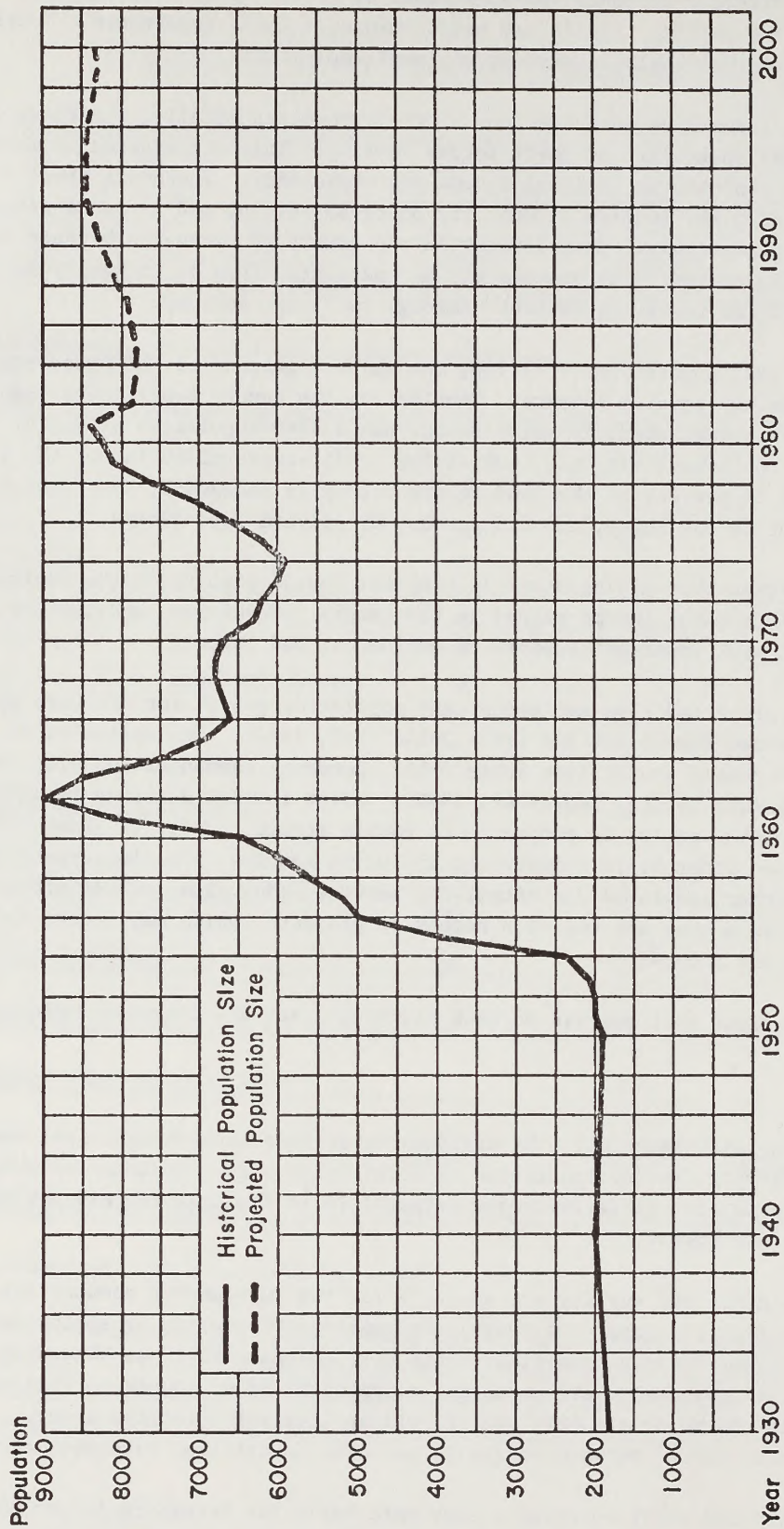
The economic considerations that pertain to each planning issue are discussed below.

CRITICAL WATERSHEDS

Local economic concerns associated with the critical watersheds include municipal water supplies, soil productivity, and sedimentation of local reservoirs. Nonlocal watershed related economic concerns include salinity and water yield in the Colorado River basin and the sedimentation of Lake Powell.

The existing water quantity and quality are adequate for the surrounding communities to require at most a chlorinating water treatment. Decreasing the quality of spring or well water would usually either force communities to use more chlorine to treat the water or, if certain water quality thresholds are exceeded, to find new water sources. Production of livestock forage is the major economic use of soil in critical watershed areas. Rangeland forage values average between \$2 and \$4 per acre in critical watershed areas.

There are approximately 200 small reservoirs that were built for livestock in and downstream from critical watershed areas, representing an investment of \$500,000. About 70



Sources: State, 1982; SAM, 1982; UDES, 1971.

FIGURE 3-4

Historic and Projected Population for Grand County, 1930 to 2000

percent of these reservoirs are usable reservoirs which increase the available livestock forage in these critical watershed areas (typically by 150 to 200 AUMs), have a useful life of at least 4 years, and are considered economically efficient. Reservoirs built in high erosion areas typical of critical watersheds have an expected useful life of 4 to 10 years. The value of increasing the life of these reservoirs by a single year is between \$200 and \$300. Any actions that reduce surface disturbance and improve ecological condition would decrease erosion rates and thereby increase the useful life of these reservoirs (refer to the Soils section of this chapter).

The salt pickup by water or runoff that originates in or passes through critical watersheds in the GRA affects salinity levels in the lower Colorado River. Increasing salinity levels in the lower Colorado River imposes added costs on agricultural, industrial, and municipal water users in the Lower Colorado River Basin.

Downstream saline concentrations can be affected through two processes: (1) salt loading and (2) salt concentration. Salt loading results when runoff and subsurface waters pick up salts and deposit them in the water system. Salt concentration results from decreasing the quantity of water in the water system. Changes in either salt loading or salt concentration would affect levels of TDS at Imperial Dam for which municipal, industrial, and agricultural costs are available (Kleinman and Brown, 1980; BOR, 1982). Since salt concentration decreases water yield, it also results in a loss of value that would have been realized, had the water been available for downstream use.

TABLE 3-11

Grand County Baseline Employment Projections by Industrial Sector
1987, 1990, 1995, and 2000

Sector	Jobs/Year				
	1980	1987	1990	1995	2000
1. Agriculture	75	186	186	188	189
2. Mining	731	574	585	604	626
3. Contract Construction	356	225	218	229	237
4. Manufacturing	70	89	91	93	94
5. Transportation, Communications & Utilities	252	273	279	285	288
6. Wholesale & Retail Trade	809	669	689	704	701
7. Finance, Insurance & Real Estate	90	84	89	92	94
8. Services	425	450	482	499	527
9. Government	608	638	669	681	668
10. Nonfarm Proprietors	377	439	451	460	457
TOTAL	3,793	3,627	3,739	3,835	3,881
Sources: BEA, 1981b; SAM, 1982; Utah, 1982b.					

Sediment that enters the Colorado River from GRA's critical watershed areas eventually settles in Lake Powell. Sediment buildup can affect the electrical, flood control, recre-

TABLE 3-12

Livestock Operations, Feed Sources, and Dependency on Public Lands

<u>Livestock Operators</u>	<u>1-99 Cows</u>	<u>100+ Cows</u>	<u>100+ Cows Yearlong</u>	<u>Sheep All</u>
Number of Operators	15	10	6	14
Average Herd Size	41	500	281	2,300
Aggregate Herd	615	5,000	1,686	32,208
<u>Feed Sources</u>	<u>Percent</u>	<u>Percent</u>	<u>Percent</u>	<u>Percent</u>
Grand Resource Area	28	45	70	39
Forest Service	21	31	--	34
State Lands	--	9	5	4
Deeded	25	3	7	17
Residue	9	6	3	--
Hay	16	5	15	--
Supplement	1	1	1	5
<u>Public Land Dependency by Season</u>	<u>Cows</u>		<u>Sheep</u>	
	<u>Average Use (AUMs)</u>	<u>Percent Dependency</u>	<u>Average Use (AUMs)</u>	<u>Percent Dependency</u>
Spring	14,467	57	10,217	53
Summer	4,004	16	0	0
Fall	8,732	34	2,222	11
Winter	<u>17,542</u>	69	<u>15,052</u>	78
Yearlong	44,745	44	27,491	36

NOTE: Numbers may not be additive because of rounding.

Source: GEE, 1981.

TABLE 3-13

Aggregate Costs and Returns for All
Operators who Use Grand Resource Area Forage

	<u>Cattle</u>	<u>Sheep</u>	<u>Total</u>
Gross Revenues	\$1,962,085	\$2,367,988	4,330,073
Cash Cost	1,038,598	890,974	1,929,572
Returns Above Cash Cost	923,487	1,477,014	2,400,501
Returns to Family Labor and Investment	482,876	1,239,055	1,721,931

Source: Gee, 1981.

TABLE 3-14

Aggregate Costs and Returns for Operators who
use Grand Resource Area Forage and Live in the Grand Resource Area

	<u>Dollars</u>	<u>Jobs</u>
Gross Revenue	1,178,020	--
Cash Cost	757,716	--
Returns Above Cash Cost	420,304	--
Returns to Family Labor and Investment	271,432	--
Hired Labor (income)	40,941	16
Induced and Indirect Effects (income)	453,323	18

Source: Gee, 1981.

ation, and water values generated by Lake Powell. These annual values have been estimated to be \$48,749,000 in 1970 dollars, or \$101,962,000 in 1981 dollars (Workman and Keith, 1971). Some values, such as water storage and recreation, would be impacted gradually through time, while others, such as electrical values, would not be affected until Lake Powell silted in. Reducing sedimentation would therefore increase the annual values and extend the length of time the values would be realized.

Lake Powell's volume is 27,000,000 acre-feet, and approximately 70 billion tons of sediment would fill the reservoir. If the annual values decreased proportionately with volume, then each ton of sediment prevented from entering Lake Powell would increase its net present value by \$0.0051.

LIVESTOCK REQUIREMENTS

There are 48 holders of grazing privileges in the GRA. Several of the permit holders have combined operations, and several permit holders raise both cattle and sheep. In order to apply ranch budget data to operators in the area, combined operations are treated as a single operation, and an operation raising both cattle and sheep is treated as two independent operations. Of the 45 independent operators that have been identified, 31 are cattle operators and 14 are sheep operators. Forty-eight percent of these operators live within the GRA boundaries (41 percent in Grand County and 7 percent in San Juan County). Another 48 percent of the operators live in western Colorado (Mesa, Garfield, Montrose, Delta, and LaPlata counties). The other 4 percent of the operators live outside of these areas.

The GRA forage plays an important role in providing enough winter forage to maintain the cow herds and providing nutritious forage during the spring when cows are calving. Table 3-12 illustrates this forage use and dependency by season, and by typical ranch groupings.

There are few alternative sources of forage available to cattle operators during winter and early fall. Base properties are not producing forage during this period. The most likely alternative sources of forage are either that which is left on private lands in the fall, or stored forage in the form of grain and hay.

Sheep operators' dependency on public lands in the GRA is similar to that of cattle operators. Dependency rates are higher in the winter and lower in the spring because generally sheep are brought back to the base property in April for lambing. Several sheep operators keep their herd on the range during lambing periods.

Livestock operators have been grouped by herd size and season of public rangeland use (see Table 3-12). The budgets suggest that most operators can cover their long-term cost. The returns for smaller operators have generally been too small to be the sole source of their income. Few operators have earned a fair market rate of return for their investments and land.

Aggregate ranch budget statistics are summarized in Table 3-13. For the purposes of regional impact analysis, similar statistics for all operators living within the GRA, along with the estimated induced and indirect effects, are summarized in Table 3-14.

Grazing fees represent a minimum value for public forage; however, the grazing fee is not determined through the market, and it is generally agreed that the fee is lower than its

true economic value (Gardner, 1962; USDA and USDI, 1977). Although the forage quality, season of use, and added services rendered make comparisons between BLM forage and privately leased forage questionable, private lease rates still provide one of the best measures of value. Utah's private lease rate averaged \$7.24 per AUM in 1980 (USDA, 1981). There are a number of other indications that the value of public forage in the GRA is close to the \$7.24 per AUM figure (Gee, 1981; USFS, 1980; USDA and USDI, 1977). Using the \$7.24 figure, the estimated annual value of livestock forage provided by the GRA is \$530,000.

Although BLM does not recognize a capitalized value for grazing preferences, the market does recognize such a capitalized value whenever grazing fees are lower than their true economic value (USDA and USDI, 1977). If a permit's value averages \$60 per AUM, and the entire permit value is capitalized in the ranch's value, then grazing privileges in the GRA account for \$6,409,800 or 17 to 25 percent of the aggregate ranch value of operators using GRA forage.

Most credit institutions base loans on the ability of the ranchers to repay. The repayment ability is usually measured by the rancher's likely future income. Credit institutions also require a security on their loans, which is often based on the base property's appraised value. Grazing privileges on public land often enter into the base property's appraised value calculations. If the ability to repay a loan is adequate, the appraised value could limit the size of the loan. Since grazing privileges on public land can also affect a rancher's likely future income, changes in grazing privileges could also affect ranchers' ability to obtain loans.

WILDLIFE HABITAT REQUIREMENTS

Hunters contribute to the local economy through their hunting related expenditures. The primary game species hunted in the area are mule deer, elk, desert bighorn sheep and antelope. Based upon an average local expenditure of \$22.54 per visitor day for big game hunting, the total direct, indirect, and induced income and employment effects are estimated to be \$130,000 and 5 jobs, respectively (USFS, 1982). These estimates assume that local hunters who hunt in the area would hunt outside the area were it not for the area's wildlife. To the extent that this is not true, the sales, employment, and income figures are overestimated.

Income and employment measures are useful to gauge the regional significance of an activity; however, they are not the appropriate measures of an activity's value. For commodities that are not sold in the marketplace, value is normally defined as the amount an individual, a group of individuals, or a business is willing to pay, over and above the cost incurred, to obtain the commodity. Based upon the U.S. Department of Agriculture, Forest Service (USFS) Resource Planning Act (RPA) values for deer and elk and travel cost derived values for antelope, approximately \$150,000 of value is generated from hunting wildlife in the GRA (USFS, 1980). Wildlife also have aesthetic values that have not been quantified.

OFF-ROAD VEHICLE USE AND MANAGEMENT

Most ORV travel stems from recreation, ranching, and mineral exploration. Local expenditures associated with recreational ORV use contribute to local income and employment. The Moab Jeep Safari alone generates an estimated \$23,000 of local wages, salaries, and proprietors' income. The total local importance of recreational ORV travel cannot be estimated.

Some livestock operators use ORVs for checking and maintaining range developments and livestock. The alternative of using horses is still the most prevalent mode of access.

The mineral industry relies on ORV travel for oil and gas, geophysical, and mining activities. There is also some scattered ORV travel associated with prospecting. The alternative of constructing roads to gain access is often more expensive and could affect the economic feasibility of these activities.

LANDS ACTIONS

Communities in the GRA generally have undeveloped private land available for residential, industrial and infrastructural development and have an unused reserve of existing residential and commercial structures (University of Utah, 1979; The Sun Advocate, 1982; Browne, Bortz, and Coddington, 1982). With the baseline population and employment projections for Grand County given in Table 3-11, this availability of private land should continue into the future. Available private land may not be as suitable for certain uses for which some parcels of public land may be better suited. Also, isolated parcels of public land near communities may constrain the use of adjacent private land. Such a determination can be made only after a detailed site-by-site analysis.

Payments in lieu of taxes (PILT) from entitlement lands in Grand County have amounted to \$327,559 in 1981 and \$325,627 in 1982, which has comprised 13 percent of Grand county's revenues. The payments are now constrained by Grand County's population, and approximately 1,250,000 entitlement acres could be transferred to private ownership before PILT payments would be reduced. Privately owned real estate contributes an average of \$2.30 per acre annually toward local government revenues. Assessed values vary by the use of the land, and mill levy rates vary by geographic location. Generally, residential, commercial, and irrigated farmland contribute significantly more toward county revenue than do PILT payments.

Private land classified as agricultural rangeland contributes approximately \$0.14 per acre annually toward local government revenues, and land classified as desert land contributes approximately \$0.19 per acre. Generally, lands some distance from communities and used only for grazing would fall under either rangeland or desert land categories.

Property taxes are not levied on State lands, which comprise 370,630 acres or 15.6 percent of Grand County's land base.

UTILITY CORRIDORS

Construction of a major right-of-way typically employs 100 to 200 people, 30 to 40 percent of whom are hired locally (BLM, 1979a; BLM, 1980c, and personal communication with Ron Smithrud, Northwest Pipeline EIS Team Leader, U.S Department of Energy, October 1982). These jobs usually last 1 to 2 months. For the most part, Moab can accommodate this typical influx of workers, although some problems may arise if the influx of workers occurs during the height of the tourist season. Residents realize an estimated \$350,000 of wage, salary, and proprietor's income through both the temporary increase in local employment and the expenditures by those who temporarily locate in the area. Some permanent local employment results (5 to 15 employees) when a maintenance crew or a pipeline pumping station is located in the area. Local units of government also derive property tax revenues from these facilities, with little associated cost.

MINERALS

Mining is Grand County's largest base industry, directly accounting for 22 percent of the local employment and 30 percent of local income.

A number of other businesses depend on the mining industries' purchases of their services and products, and many retail and service businesses depend on the workers' local expenditures. Including these indirect and induced effects, approximately 35 to 45 percent of local employment can be attributed to the mining sector. The mining sector is comprised of uranium-vanadium mining and milling, oil and gas extraction, potash mining, and some gold mining and sand and gravel extraction. Employment by activity is broken down in Table 3-15.

Much of the oil and gas drilling activity is with rigs that temporarily work in the area, bringing their own work force. While working in Grand County, most oil and gas employees reside in either Grand County, Utah or Mesa County, Colorado. The oil and gas employment figures in Table 3-15 include both those who temporarily locate in the area during the drilling and those who work in Grand County but live elsewhere. Therefore, the relative importance of oil and gas activities to Grand County is overestimated. Many residents of Grand County work in uranium mines located in San Juan County. Therefore, the relative importance of uranium mining to Grand County is underestimated.

Only one firm is commercially producing potash in the GRA. Nearly all of the employees associated with this operation live in Moab. Another potash operation is in the planning stage. If economically feasible, a commercial plant could be built in 1985, and a sustained employment level of 240 could be reached by 1987.

Gold mining and sand and gravel extraction account for a relatively small proportion of total employment in Grand County's mining sector. There is a proposed humate mining operation which would employ another 10 people for 4 years and could be in operation by 1983.

TABLE 3-15

Grand County's 1981 Mining Employment Breakdown

	<u>Jobs</u>	<u>Percent</u>
Uranium and Vanadium Mining and Milling	376	48
Oil and Gas Extraction	281	36
Potash Mining	100 to 120	13 to 15
Gold, Sand and Gravel and Other	15 to 30	2 to 4
NOTE: This table accounts only for persons working in Grand County.		
Sources: UDES, 1982; Browne, Bortz, and Coddington, 1982.		

Most of the oil and gas and uranium mining activities and one of the two uranium mills in the area are located on public lands. Approximately one-half of the operating gold mines are on public lands. The existing potash operation is located on State lands. Both the proposed potash and humate operations would be located on public lands.

Local units of government receive property tax revenue from mining equipment and facilities which lie within their taxing jurisdiction. Often mining facilities and equipment lie outside the taxing jurisdiction of those local units of government which bear many of the related infrastructure and public service costs.

The State receives an estimated \$3,500,000 from royalties generated by oil and gas activity in the GRA, some of which is allocated back to the local units of government.

RECREATION

A number of local businesses depend upon the expenditures by those who recreate in the GRA (see Table 3-16). In turn, these industries purchase some goods locally, and employees in these industries spend part of their income locally. Including these indirect effects, it is estimated that 700 local jobs (20 percent of local employment), and \$9,500,000 of local wages, salaries and proprietors' income (18 percent of local income) can be attributed to tourism.

Tourism ranks as the second most important commercial industry in the county. The industry forms a fairly stable economic base which has been growing with regional population growth and may increase in relative importance as other industries (such as mining) decline. The industry does experience annual fluctuations and is susceptible to economic recessions; however, these fluctuations are not of the size or duration of mining boom-bust cycles. A larger proportion of temporary jobs with relatively low salary levels are associated with the industry.

The tourist industry depends partially upon the scenic quality and recreation opportunities available on public lands. The local recreation related economic importance is determined by (1) the number of people who visit, (2) the length of their stay, and (3) their expenditure patterns.

TABLE 3-16

1981 Grand County Employment by Industries Most Dependent Upon Tourism

	<u>Number of Jobs</u>	<u>Percent of Total County Employment</u>
Restaurants	259	8
Hotel and Motel	132	4
Commercial Outfitters	53	2
Source: UDES, 1982.		

The GRA's most economically important recreation resource for commercial outfitters is the Colorado River corridor. Other areas also used by local commercial outfitters include the Dolores River, horseback trails through Negro Bill Canyon, and a number of ORV trails.

The Colorado River corridor is also the most economically important recreation resource for noncommercial recreation use. Areas of noticeable but less local importance include several well traveled ORV trails, the Canyon Rims RMA, and the Kane Creek RMA. Several areas are receiving increasing primitive nonmotorized use (e.g., Negro Bill Canyon, Mill Creek Canyon, and the Behind the Rocks area); however, this use is of negligible local economic importance.

Several events dependent upon public lands, such as the Moab Jeep Safari, Dubinky Still Motorcycle Race, and Bartlett Wash Hill Climb, bring money into the local economy.

Boating in Westwater Canyon has been estimated to generate \$500,000 of local wages, salaries, and proprietors' income and 45 local jobs. The Moab Jeep Safari has been estimated to generate \$23,000 of local wages, salaries, and proprietors' income. Data gaps prevent estimation of the local importance of other recreation resources or events.

Income and employment measures are useful to gauge the regional significance of an activity, but they are not the appropriate measure of an activity's value. Using the travel cost technique, the total net value of boating through Westwater Canyon is estimated to be \$20 per passenger, for a total annual value of \$200,000. Data gaps prevent estimation of the value of other recreational resources.

FIRE MANAGEMENT

The Moab District's fire program locally hires a 10-person crew for 4 months. The crew earns an estimated \$40,000, which generates an added \$23,000 of induced wages, salaries, and proprietors' income in the region. Other local purchases by the fire program include gas, food, minor repairs, and aviation services.

WILDERNESS

The activities of possible economic importance now taking place in WSAs include recreation, hunting, livestock grazing, and mineral activities.

Two WSAs, Westwater Canyon and Negro Bill Canyon, receive significant primitive nonmotorized recreation use, and both are used by commercial outfitters. Boating in Westwater Canyon has been estimated to generate \$500,000 of local wages, salaries, and proprietors' income and 45 jobs. Negro Bill Canyon supports one local commercial outfitter whose sales exceed \$4,000. Interest in the Desolation Canyon WSA has been expressed by commercial horseback trip operators, and there is some nonlocal commercial use of the Coal Canyon, Spruce Canyon, and Flume Canyon WSAs for hunting. Desolation and Gray canyons, which receive significant commercial and private boating use and are of local significance to Green River and Moab, Utah, form the 6 to 7 mile western boundary of the Desolation Canyon WSA. Other WSAs receive little private use and are of little local economic significance. Data gaps prevent further quantification.

An estimated 5,773 AUMs of forage are consumed by livestock in the Coal Canyon, Desolation Canyon, Spruce Canyon, Flume Canyon, Negro Bill Canyon, and Westwater Canyon WSAs. This forage contributes \$56,000 in returns above cash cost, of which \$34,000 are returns to

family labor and investments; the forage generates \$45,000 of indirect and induced local income.

There has been sporadic mineral exploration and production in all of the WSAs. So far, these activities have been of short duration and were economically insignificant to the region.

SOCIAL CONDITIONS

The format for this section includes an overview of the affected area, followed by a more detailed discussion of the social concerns that pertain to each of the planning issues.

The region's social characteristics stem from its history and environment. The uranium boom in the early 1950s brought wealth to many property owners. These people have had a strong influence on the region's political and social climate since that time. Their livelihood and success from the use and development of the region's resources, the vast majority of which are in public ownership, continues to influence the community's attitude toward resource use.

The 1960s and 1970s brought increasing economic diversity to the area. Social diversity has been similarly increasing, particularly from the influence of people associated with tourism and government. Increasing diversity and complexity has forced the political process to adopt formalized procedures and hire professional administrators. Increasing diversity and complexity seem to have allowed relative newcomers to attain some degree of local status and power. There is a significant group of local residents who do not necessarily subscribe to the unrestricted resource use and development attitude.

Many of the local social and political characteristics can be explained by the influence of outside entities on nearby communities. The local economy is largely dependent upon the region's natural resources and market forces outside the communities' control. Many of the larger employers have corporate offices outside the community. Resource development decisions are often made by those living outside the community. Tourism depends upon the national economy and the population distribution about the region. Furthermore, 80 percent of the land in Grand County, upon which the local economy is highly dependent, is managed by the Federal government. In response to these outside influences, the local community has developed strong ties to State and Federal agencies; industry and government officials are brought into the local power network, and various pressure groups have been organized.

The degree to which outside entities affect and control the local economy has contributed to the historical desire for increased local government and local control. Although there is a vocal, local public who disagree, there is a prevailing desire for unrestricted resource use, development, and economic progress.

Federal agencies, which have been exerting control over land upon which the local economy depends, are viewed with resentment and distrust. The current economic slump and high rates of unemployment have heightened the local sensitivity over Federal actions which appear to negatively affect the local economy. Of all the outside forces which affect the community, the Federal agencies' management of resources is the one over which the community can exert the most influence.

Unstructured interviews were conducted with community leaders and many who were identified as influential and knowledgeable. The interviews were open-ended and centered on the ten issues identified in the Resource Management Plan (RMP). Precise representation of the community was not possible through this sampling technique; however, a range of social attitudes was obtained for each issue.

The social attitudes that pertain to each of the ten planning issues are discussed below.

CRITICAL WATERSHEDS

There was a general lack of local concern regarding this issue. The interviews elicited comments on water developments and vegetation manipulation projects where protection of critical watersheds would be a side benefit.

LIVESTOCK REQUIREMENTS

There was a popularly expressed sentiment that BLM is cooperating and working better with local stockmen and that the Grazing Advisory Board is effective in representing the local stockmen's views. However, there is a lingering observation that BLM does not appreciate the knowledge and experience of local stockmen. Livestock operators do not recognize many conflicts with other resource uses, and would prefer to resolve most conflicts through more extensive management and range improvements.

The ranch budget data suggests that many livestock operators could earn a greater return on their capital wealth outside of the livestock industry. Expectations for better years, the lack of alternative job skills, the lack of other employment opportunities in the area, and the desire for a certain lifestyle have prevented any further decline in the region's livestock industry. It can be expected that the decisions to remain in the business will not be based solely on economics.

WILDLIFE HABITAT REQUIREMENTS

Hunting is a highly valued local lifestyle, and there appears to be a desire for less hunter pressure from those living outside the area. Competition between livestock and wildlife was not perceived as a problem. It was often noted the predation was the major wildlife problem.

OFF-ROAD VEHICLE USE AND MANAGEMENT

There was a concern with the littering, vandalism, and damage associated with some ORV activity. There was some desire for increased policing activity by BLM, tempered by the desire for less government intervention.

LANDS ACTIONS

Emotions on this issue were mixed and depended upon the land disposal procedure. The blocking of State and Federal lands was viewed with caution. State management of land was not viewed as superior to Federal management, and the blocking process was expected to give added power to both Federal and State agencies.

Public land sales could also transfer ownership to outside interests. Concerns over land disposal's impact on private land values were not raised. Public awareness of the dis-

posal process is low. Since public ownership is usually thought of as hindering local economic progress, a disposal process which eliminates the above concerns would be well received.

UTILITY CORRIDORS

Some concern was expressed about the apparent safety problems with having a de facto utility corridor close to population centers such as Moab. Concerns were also expressed by some on the visual resource degradation by above-ground utility systems in scenic areas. Below-ground utility systems would be generally well received.

MINERALS

Local residents often expressed a degree of fatalism about local mineral development, since major mineral development decisions are rarely made by local interests. Local mineral development is generally thought of as a positive economic gain, but there is a corresponding desire to control mineral development programs, via land use planning, in such a way that local economy boom-bust cycles would possibly not occur. Moab City resident opinions varied per several locally popular social categories (i.e., traditional agriculture-based residents, which are relatively few in number; business interests; oil and gas exploration and development interests; retirees; recreation related interests, etc.). Yet there was a concerted desire to maintain local scenic, recreational, and rural area qualities.

RECREATION

Residents agree that recreational use of public land affords a reliable and sustained source of local revenue. The interviews brought forth comments that the BLM should increase public awareness of the availability of recreation opportunities in the area, and develop recreation sites in areas of high use.

FIRE MANAGEMENT

Most comments on this topic were made by livestock operators. Most are now aware of the potential range values of prescribed fires.

WILDERNESS

Wilderness was a highly emotional issue. Opinions varied widely between several local social groups. Generally, the wilderness designation process is viewed as further frustrating local resource control and is feared for its possible consequences to future economic progress in the region. Local misconceptions and insufficient information concerning wilderness have added to the negative perceptions. Despite the prevalence of these negative perceptions, the wilderness issue is polarized with a vocal, local public on both sides of the issue.

CHAPTER 4

Environmental Consequences

INTRODUCTION

The environmental impact analyses for the alternatives in this document are affected by several factors outside those usually associated with the issue-driven environmental impact statement (EIS) process. Principal among these is the wilderness study project and its accompanying EIS.

As already discussed in Chapter 2, the site-specific analyses (SSAs) were done primarily by an interdisciplinary team separate from the resource management plan (RMP) team.

The impact analyses for several of the wilderness study areas (WSAs) have already been completed and reported in the SSAs. These will serve as the impact analyses for wilderness management actions and will be combined with the rest of the environmental analyses in the RMP/EIS.

The final EIS for all of the Utah BLM WSAs will be written as one combined effort by another interdisciplinary EIS team. The final EIS for the Grand Resource Area (GRA) WSAs will be included in the statewide document, which is scheduled for completion about a year after the Grand RMP/EIS.

The conflicting time frames have presented some difficulty in clarifying the wilderness portion of the RMP/EIS. As can be seen, the wilderness review program is not a completely integrated planning issue for the RMP, but was included as such because wilderness recommendations would affect the actions that might be taken to resolve other issues.

Another such issue is Livestock Requirements. The requirements for the court-mandated grazing EIS were integrated into the alternatives proposed for resolution of the Livestock Requirements issue, and into the impact analyses for those alternatives.

IMPACT ANALYSIS METHODOLOGY

In order to analyze objectively the management actions proposed under the four alternatives, the team employed a method developed in the Bureau to facilitate objective analysis. Actions that cause changes (change agents) and entities that are changed (indicators) were identified. Changes were specified in terms of an increase or decrease. Judgments as to whether a change might be beneficial or detrimental were not made.

The method also required the team to quantify changes, estimate the duration of the change, and identify the full context, both for the indicators and for the change agents. The interdisciplinary approach was essential to the initial diagramming of the impacts of each management action.

ASSUMPTIONS AND ANALYSIS GUIDELINES

ASSUMPTIONS

Certain basic assumptions were made to facilitate impact analyses and to gauge the effects

of management actions in the alternatives.

- (1) The prescribed management actions were analyzed under the assumption that all would be fully implemented.
- (2) It was assumed that BLM would have the funding and work force to implement the management actions prescribed in the alternatives (management actions would be implemented as time and money are available).
- (3) It was assumed that the management action would not involve any direct BLM control over State or private lands that are intermixed within the grazing allotments where exchange-of-use agreements do not exist.
- (4) It was assumed that the mitigating measures contained in Appendix A would be carried out.
- (5) Areas recommended as suitable for wilderness designation were considered as wilderness areas.
- (6) It was assumed that the vegetation monitoring studies for livestock grazing would be completed.
- (7) Because of the difficulty of predicting future livestock market conditions, an assumption that current market conditions would prevail is necessary for socio-economic analysis. Any future changes in livestock market conditions would result from variables outside the proposed action discussed in this document.
- (8) Consideration of lands disposal actions would not take place in a WSA until Congress made the final decision.

ANALYSIS GUIDELINES

Analysis guidelines have been established and are given here to aid the reader in understanding the impact analysis. These guidelines limit the scope of some of the analyses and describe the standards upon which some of the management actions are based.

- (1) Only significant changes or impacts will be analyzed.
- (2) Changes or impacts described and analyzed are long-term unless otherwise stated;
- (3) Changes or impacts described and analyzed here can be traced directly to management actions prescribed in the alternatives.
- (4) Effective with EISs completed in fiscal year 1982, grazing preference adjustments, either upward or downward, following the grazing EIS shall not be based solely on one-time vegetation production surveys, but shall be based on a 5-year monitoring period during which actual use data, utilization data, trend data, and climate data will be gathered and evaluated in order to determine grazing capacity.

- (5) The Wilderness issue will be retained in the RMP/EIS process until the preferred alternative is identified, and will then become part of the statewide EIS, which will analyze impacts on both the regional and National levels.
- (6) The impact analyses for wilderness, having already been carried out as part of the wilderness study process, will be limited to that contained in the SSAs.
- (7) Changes in visual quality are measured in terms of change in visual resource management (VRM) classes. Changes are considered insignificant unless there would be a change in the VRM class.

DATA GAPS

CRITICAL WATERSHEDS

Cumulative soil erosion estimates for the GRA need to be documented.

Areas of poor watershed condition (within critical watershed issue areas) need to be identified.

Actual comprehensive salt and sediment contribution estimates are needed for the entire GRA, including major intermittent washes.

Watershed monitoring is needed to determine sustained yield, estimate soil loss, and identify water quality (including ground water) changes as they relate to management actions.

A ground water inventory is needed.

WILDLIFE HABITAT REQUIREMENTS

Impacts to peregrine falcon, bald eagle, other raptors, and bighorn sheep from white water rafting in Westwater area need to be identified and documented.

An inventory of black-footed ferret populations in the Cisco Desert and near LaSal, Utah is also needed.

MINERALS

Estimates of potash production potential are unavailable.

Data that would be acquired in the application of the coal unsuitability criteria are lacking.

RECREATION

Available visitor use figures for recreation use along the Colorado River corridor adjacent to State Highway 128 are incomplete.

WILDERNESS

No final recommendations on wilderness are available until the final statewide EIS is completed.

COMPARATIVE ANALYSIS

A summary of comparative analyses of the impacts of the alternatives was presented at the end of Chapter 2 in Table 2-11.

ORGANIZATION OF THE IMPACT ANALYSIS

The analyses are presented by alternative for all the indicators. Refer to Chapter 3, Affected Environment, for a detailed description of the indicators.

As already seen in Chapter 2, Description of Alternatives, all of the prescribed management actions are identified by the letter of the alternative and a number which indicates the order of their appearance in Table 2-2. These numbers are used in this chapter to identify the management actions being analyzed. The reader should refer to Chapter 2 for the details of any management action; no restatement of these will be provided.

At the end of the analysis of each alternative is a section titled Economic Impacts where all the economic impacts of that alternative are discussed. Within this section, the analyses are arranged by planning issue. Wherever possible, management actions that would have similar economic impacts are grouped for analysis.

ENVIRONMENTAL IMPACTS OF ALTERNATIVE A, NO ACTION

A-1

Soils and Water Quality. Installation of instream drop structures would reduce soil erosion in channels and provide potential for stabilization of channel banks and reestablishment of vegetation. Water storage above the structures would be increased, but cannot be quantified because the amount of water stored would depend on the sizes and locations of the structures. The target impacts are (1) to maintain or improve channel conditions, (2) to reduce sediment yield, flood peaks, and susceptibility to flash floods, and thereby (3) to improve the overall water quality of drainages in Cottonwood, Diamond, Thompson Canyon, Crescent Canyon, Floy Creek, Floy Canyon, Middle Canyon, Main Canyon, Corral Wash, Cisco Mesa, and Barley Flat-Ronzio allotments.

Vegetation. Riparian vegetation along the stream banks within 10 to 20 yards upstream from the structures would increase. An additional impact, which would occur if the structures bring about the raising of the water table, would be a change in vegetation from sagebrush to a more varied composition of perennial grasses (e.g., needlegrass, bluegrass, mountain brome) throughout the affected stream floodplain.

Livestock Grazing. There would be a substantial but unquantifiable increase in available forage if the water table is raised sufficiently to change the vegetation beyond the immediate vicinity of the structures.

Soils and Water Quality. Continuation of present livestock management practices on 61 allotments would impact soil through surface disturbance, soil compaction and water infiltration, and changes in ground cover. Since these factors influence the erosion rate and sediment yield, erosion rates and trends would continue at present levels. Decreases in soil erosion generally follow increases in production of vegetation and improvement in ecological condition, although soil changes lag behind plant changes (USDA, 1976). Maintaining the present medium to high ecological condition would allow soil loss values to remain at or below the soil loss tolerance value (T value). Areas of high geologic erosion are generally in critical erosion condition. These soils occur on slopes greater than 50 percent and are in medium or high ecological condition.

Since the present medium to high ecological condition on these allotments would continue under current management, runoff and sediment would also remain the same. Coliform bacterial pollution of streams would be unchanged because of the level of livestock and wildlife use. Vegetation increases stabilize the soil and provide more aerial cover to intercept and dissipate the erosive energy of raindrops, thus decreasing sediment.

Vegetation. Much of the area that is not grazed during critical growing periods is in high or climax condition at present. These sites would continue in high or climax condition. On other sites, since present ecological condition results partly from past livestock use, present management at the level of the past 5 years' average use (see Management Action A-5) would maintain ecological condition in most instances. Some sites that receive substantial livestock use would decline in ecological condition as desirable forage plants are replaced by undesirables that are not components of the site in upper seral stages. See Appendix I for present ecological condition of each allotment, and Appendix K for listing of specific allotments that would continue under present management.

Livestock Grazing. Maintaining the present ecological condition would maintain the present forage yield and enable livestock grazing to continue at current levels.

Wildlife. Continuation of present livestock management on 61 allotments (see Appendix K) would not affect wildlife ungulates on 40 allotments because

- livestock and wildlife use different portions of the allotments;
- the allotments do not contain suitable habitat to support wildlife ungulates; or
- wildlife ungulates are present only in small numbers (see Appendix I for wildlife numbers by allotment).

Concerns for wildlife ungulates on the remaining 21 allotments are detailed below.

Under current livestock management, deer populations are stable to increasing on the Blue Hill and Hatch Point allotments and are stable on the Steamboat Mesa Allotment. Blue Hill, Hatch Point, and Steamboat Mesa allotments have been identified as areas where potential exists for competition (see Appendix I for seasons of use). Since reproductive success and fawn or calf survival depend largely on the condition of the female animal

when she leaves the winter/spring range, forage quality and quantity must be sufficient to support these herds through the winter and spring (Wallmo, 1981; Kerr, 1979).

Elk populations are increasing on the Blue Hill, Hatch Point, and Steamboat Mesa allotments. Threshold levels for livestock and elk competition problems are unknown.

Desert and Rocky Mountain bighorn sheep (Rocky Mountain bighorn were originally introduced on the Ute Indian Reservation and are gradually becoming established on public lands) compete with domestic sheep and cattle for forage and space on nine allotments.

Since bighorn sheep are socially intolerant of cattle, their use is limited to areas that are isolated from livestock grazing or where the topography blocks cattle access.

There is potential for competition to occur between livestock and bighorn sheep (primarily in the winter and early spring) on the following allotments: Arth's Pasture, Kane Springs, Little Hole, Mineral Point, Potash, Rattlesnake, Spring Canyon Bottom, Ten Mile Point and Hatch Point. On the three allotments that are grazed concurrently by bighorn and domestic sheep, domestic sheep could transmit parasites and disease (BLM, 1981c) to bighorn (see Appendix I for season of use and species conflicts).

The threshold levels for livestock and bighorn sheep competition and disease or parasite problems are unknown. Bighorn sheep populations are continuing to increase under current livestock management, and would continue to increase until threshold levels are reached. Current population estimates and trends are given in Chapter 3, Table 3-4.

Under current management, antelope populations are remaining stable on eight allotments and decreasing on three allotments (Hatch Point, Lisbon, and Windwhistle allotments in Herd Unit 12). Drought, severe winter weather, predation, and marginal or unsuitable habitat conditions have influenced this declining antelope population.

Lisbon and Hatch Point allotments are also currently grazed by cattle, which compete for the same spring forage used by antelope during an 8-week period from April 1 to May 31.

The Hatch Point allotment has authorized domestic sheep grazing; if this use is activated, there could be strong and direct competition for forage (see Appendix I) on this allotment.

For Herd Unit 13, which covers eight allotments (Bar-X, Cisco Mesa, Cisco Springs Wash, Corral Wash, Harley Dome, Pipeline, Sulfur Canyon, and San Arroyo), the population trend is stable. Competition for spring forbs is apparent on seven of these allotments because of direct overlap of seasons of use. The Bar-X allotment does not have a season of use problem. Drought, severe winter weather, predation, and marginal or unsuitable habitat conditions have prevented antelope populations from increasing.

Under current livestock management on 61 allotments, four aquatic and riparian habitats would continue to decrease in ecological condition. Cottonwood, Diamond, Granite Creek, and Showerbath Springs allotments all have aquatic and riparian habitat that shows evidence of past concentration of livestock along these drainage bottoms. Granite Creek is one of three creeks in the GRA that are presently supporting trout fisheries.

The ecological conditions of the riparian and aquatic habitats are a reliable measure of their quality. Ecological conditions (BLM, 1981a) are shown below for these four allotments:

Allotment	Total Riparian Habitat Acres	Ecological Condition (Percent)			
		Low	Med	High	Climax
Cottonwood	1,981	36	50	11	3
Diamond	885	34	63	3	0
Showerbath Springs	20	100	0	0	0
Granite Creek	278	50	0	50	0

A-3

Soils and Water Quality. The allotment management plans (AMPs) have been in operation for 10 years (see Appendix K for covered allotments). During that time, ecological condition has stabilized, and it is assumed that the soil resource has also stabilized somewhat. Sediment production has not been monitored in these areas, but it is assumed that sediment production, runoff, and salinity from pinyon-juniper, big sagebrush, shadscale, and greasewood vegetative sites could be reduced up to 15 percent after 15 years (BLM, 1977c).

Vegetation. Some areas within the allotments should improve in condition as rest is provided to the desirable forage species. Overall vegetative vigor would be maintained and might improve.

A plant's health and survival depend on its abilities to synthesize and store food, form vegetative structures for renewal of top growth, maintain a healthy root system, and develop reproductive organs (Stoddart, et al., 1975). Grazing, through removal of photosynthetic leaf tissue, interferes with these processes. Systematic grazing management is designed to offset these impacts by providing rest.

The existing AMPs are generally maintaining or improving ecological condition throughout the allotments. The impact of this action would be to ensure that rest is given to forage plants, thus prolonging or increasing the grazing capacity on these allotments.

Wildlife. Riparian areas and capability of the habitat to support wildlife ungulates would be affected on three of the AMP allotments (Big Flat-Ten Mile, Buckhorn, and Floy Canyon) under continuation of current management. On the remaining three AMP allotments (Taylor, East Coyote, and Lower Lisbon) wildlife ungulates would not be affected, because cattle, deer, and elk use different portions of the allotments at different seasons.

Under the current AMP on the Buckhorn Allotment, deer populations are remaining stable or slightly increasing, although there is a habitat problem. About 63 percent of the deer in the Dolores Triangle herd unit winter in this allotment. Wintering deer have overutilized much of the sagebrush/mountain brush communities.

Since reproductive success and fawn or calf survival depend largely on the condition of the female animal when she leaves the winter/spring range, forage quality and quantity must be sufficient to support these herds through the winter and spring. Buckhorn allotment has authorized domestic sheep grazing. If this use is activated, there could be direct competition for winter forage between deer and domestic sheep.

Elk populations are increasing on the Buckhorn allotment. Threshold levels for livestock and elk competition problems are unknown.

On the Big Flat-Ten Mile AMP allotment, there is a potential for competition between cattle, domestic sheep, and bighorn sheep, primarily during the winter and early spring (see Appendix I). Bighorn sheep are socially intolerant of livestock; because of this, the bighorn stay in areas that are isolated from livestock grazing and where steep or rough topography prohibits livestock access. Domestic sheep also transmit parasites and disease to bighorn sheep (BLM, 1981c).

The threshold levels for livestock and bighorn competition and parasite or disease transmission are unknown. The bighorn populations are increasing under the current AMP and would continue to increase until the threshold levels are reached.

The riparian habitat on 784 acres in the Floy Canyon AMP allotment has an ecological condition of low (1 percent) to medium (99 percent). This is a direct measure of its quality. Under the current AMP, the riparian areas would not increase to a high or climax ecological condition.

A-4

Soils and Water Quality. Any form of land treatment maintenance other than aerial spraying would result in some surface disturbance, and would therefore cause a short-term increase in erosion, runoff, and sediment. The loss of vegetative cover would double or triple the soil's susceptibility to erosion. However, if debris is left in place, sediment yields would be minimized because the cover provided by the debris would intercept and dissipate the erosive action of raindrops, decreasing onsite erosion. Once grass species become established, they would hold the soil in place and increase water infiltration, thereby decreasing the solids suspended in stream water. Erosion would decrease as the ground cover increased.

Vegetation. The basic impact to vegetation would be no change from what now exists or has existed as a result of the initial land treatment. As treated areas need maintenance, practices would be done to maintain the desired vegetation. Although an area may have been previously treated by spraying, plowing, or chaining, followup treatments to maintain forage for livestock and wildlife would not be limited to the original method. Separate EAs will be prepared before any projects are initiated. The analysis of Management Action B-5 (see Alternative B) describes the impact on vegetation from plowing, chaining, and drill seeding. Refer to Alternative B, Management Action B-29, for an analysis of the impacts of prescribed fire. The impacts of spraying are analyzed here.

Presently available information indicates that 2,4-D is the herbicide of choice for aerial spraying. It would degrade in 2 to 6 weeks, not accumulating in the soil nor entering the stream system. Spraying 2,4-D can reduce big sagebrush from 67 to 100 percent (Blaisdell and Mueggler, 1956), releasing moisture and nutrients for other types of vegetation. Composition could be expected to change from dominant sagebrush to 10 percent sagebrush with more grasses and browse species within 2 to 3 years. The land should produce a greater variety of species than before treatment, although reinvasion would occur. Research in northern Utah showed an average increase in herbaceous forage yield of 166 percent after spraying (Cook, 1963). Note that this discussion is for areas that have

previously been seeded. No new seeding would take place. (See Appendix A for an explanation of standard mitigating measures for spraying.)

Spraying herbicides is likely to be used in the future because of its predictability and relatively low cost, and because there is considerable practical experience with the technique. While 2,4-D does not harm grasses, Keith, et al. (1959) reported an 83 percent reduction in perennial forbs the year after the spray project. Laycock (1979) reported that forbs returned to their former abundance, and sometimes increased in abundance, within 5 to 19 years after the spraying.

In general, the main impact of this and other maintenance treatments would be to change composition from pinyon-juniper and sagebrush to grass species. An impact to vegetation in other areas may occur if those areas are grazed more heavily while treatment areas are being rested.

Livestock Grazing. Initial disturbance from maintenance of existing land treatments would change the vegetation to such a degree that livestock could not graze the area for approximately 2 years, until the vegetation becomes reestablished. This time frame would vary, depending on the treatment. In areas where the forage species are still abundant, the rest period would be much shorter than in areas where the vegetation has to become established.

Wildlife. Maintenance actions would result in a long-term increase in the quality of forage over what the condition would have been, had the initial treatment been allowed to deteriorate. However, this would not result in an increase in animal unit months (AUMs), since the AUMs were allocated previously, after the initial treatment. Forage for deer and elk would be maintained on these 11 allotments (see Appendix K), allowing the populations to remain stable.

A-5

Soils and Water Quality. Authorization of grazing use at present levels would result in surface disturbance and plant defoliation (refer to Table 2-3). Both these factors increase susceptibility to erosion and related sedimentation.

The current degree of impact (cumulative soil loss estimate) for these allotments is unknown. However, it is assumed that medium or high ecological condition would minimize soil loss estimates and keep soil loss below the T value.

Vegetation. Vegetation conditions would be maintained throughout most of the GRA. On some medium and low condition sites, which have repeated livestock use year after year, ecological condition would decline.

Livestock Grazing. Livestock AUMs would be restricted to 66 percent of active preference. This action would not change the amount of forage available to wildlife.

Wildlife. This action would cause some habitat concerns for wildlife ungulates on 22 allotments and for riparian or aquatic habitat on four allotments.

Under presently authorized levels of grazing use, deer populations would remain stable to

increasing on the Blue Hill, Hatch Point, and Steamboat Mesa allotments. Elk populations are increasing on all of these allotments.

There is a potential for competition to exist between livestock and bighorn sheep on 10 allotments, primarily during the winter and early spring. These allotments are Arth's Pasture, Big Flat-Ten Mile, Kane Springs, Little Hole, Mineral Point, Potash, Rattlesnake, Spring Canyon Bottom, Ten Mile Point, and Hatch Point. (See Appendix I for season of use and overlap between species.)

Under presently authorized levels of grazing use, antelope populations would remain stable on eight allotments (Bar-X, Cisco Mesa, Cisco Springs Wash, Corral Wash, Harley Dome, Pipeline, Sulphur Canyon, and San Arroyo) and decrease on three allotments (Hatch Point, Lisbon, and Windwhistle).

The riparian and aquatic habitat would continue to decrease in ecological condition on the Cottonwood, Diamond, and Granite Creek, and Showerbath Springs allotments.

A-6

Vegetation. Maintenance of existing wildlife waters would prevent improvement of vegetation within 150 feet of those waters because of continued trampling and grazing by wildlife and, in some places, by livestock. Ecological condition on these sites would remain as it is at present or decline.

Livestock Grazing. Maintenance of wildlife waters which are also used by livestock would allow for continued livestock grazing near those waters.

Wildlife. This action would help to support antelope and other nongame wildlife on the Cisco Desert and Hatch Point areas. These wildlife water developments are located in areas where water is a limiting factor for wildlife.

A-7

Soils and Water Quality. Increased off-road vehicle (ORV) use would result in increased soil surface and cryptogam disturbance and soil compaction on the 70,000 acres of public land that already show results of increasing ORV use. The severity of the impact would be related to the intensity of use. The effects of ORV activity on the desert environment are serious, long-lasting, and highly visible; damage is generally greatest on slopes exceeding 25 percent (BLM, 1977c) and on highly erodible soils such as those derived from Mancos Shale.

Impacts to the soil from more ORV use would lead to increased runoff and sedimentation, because vehicle trails channelize runoff and increase susceptibility to rill and gully erosion. Sediment and salinity would increase in proportion to erosion. For example, increases in sediment production resulting from ORV use ranged from 50 to more than 500 percent, depending upon the site (BLM, 1977c).

Vegetation. There would be a slight overall decrease in vegetation from occasional disturbance by ORV use. Four areas in particular have a substantial ongoing impact: (1) Behind the Rocks, (2) Moab Sand Flats, (3) Dolores Triangle Sand Flats, and (4) White Wash

Sand Dunes. Most of the disturbance occurs in already denuded areas, but some adjacent plants are being disturbed or lost through ORV activity. The effect of allowing continued use at present levels throughout the GRA would be the loss of individual plants. Riparian vegetation would show the greatest decrease as a result of ORV activity, but the areawide impact would be insignificant.

Livestock Grazing. The impact to livestock would be negligible. Essentially the entire area is open now, and the impact would cause so little change that it cannot be quantified in AUMs.

Transportation. Maintaining the entire GRA as open to ORVs would increase the number of roads and trails being established each year. Since the current trend is toward an increase in ORV use (and a corresponding increase in the number of roads and trails), the result of this action would be an increase in access to some of the more isolated areas, increasing the overall transportation network.

Special Designation Areas. Leaving the entire GRA open to ORV use would result in the loss of some scenic values on 635,894 acres and 250 miles of floodplains. This could diminish potential for future special area designations.

Recreation. This action would bring about a long-term increase in recreational ORV use. This conclusion is based on the present trend, which indicates increased participation in recreational ORV use on the 70,000 acres that are now receiving active ORV use. The increasing trend for ORV use is also indicated by the Statewide increase in registration of dirt bikes and dune buggies. Over the past 10 years (1972 to 1982), registration of these vehicles in Utah has increased from 2,048 to 9,834 (a threefold increase). The GRA can be expected to show a similar increase in numbers of these vehicles purchased and put to use in the area.

A-8

Vegetation. The impacts of lands disposal on vegetation would depend upon the parcels that were disposed of and upon the management imposed after disposal. Neither of these factors is known at the present time.

Livestock Grazing. Any lands disposed of would be taken out of production for livestock forage credit, unless the forage is made available to the livestock operator in an exchange-of-use agreement. The forage would still be available if the lands are not fenced.

Wildlife. Impacts of lands disposal actions would be analyzed individually when such requests are received.

A-9

Transportation. Handling right-of-way requests individually is a time-consuming process because of the stringent environmental assessment (EA) requirements that must be met before any right-of-way is granted. An interdisciplinary team must examine the area affected by any request and stipulate actions necessary to protect critical resources involved. These requirements have sometimes resulted in a large backlog of cases and costly delays to applicants.

The possibility of situating major utility facilities within existing de facto corridors could shorten the processing time required to meet EA requirements for right-of-way applications.

A-10

Soils and Water Quality. If the present trend continues, allowing mining claims for locatable minerals over the entire GRA, except for the 1,850 acres of scattered withdrawals, would result in soil disturbance and removal of vegetative cover on an additional 30 acres per year. Susceptibility to wind and water erosion on these 30 acres would increase significantly, because the cryptogamic layer or soil structure that protects the soil from erosion would be destroyed, and because soil compaction would modify the water infiltration patterns.

Sediment would increase in proportion to the amount of surface disturbance and erosion that takes place. It is estimated that 100 tons of soil per year would be lost onsite, and a significant portion of that soil would reach a drainage way.

Vegetation. Vegetation would decrease on the 30 additional acres that would be disturbed each year.

Livestock Grazing. Both the physical disturbance to cattle and the loss of forage through mining disturbance would impact livestock. The trend at present is a continual new disturbance to some degree as exploration takes place, but no specific loss of AUMs can be anticipated.

Wildlife. Vegetation used as wildlife forage and cover would be destroyed, and wildlife populations disturbed and displaced by exploration and mining for locatable minerals.

Mineral Resources. The volume of uranium ore produced, which is measured in pounds of yellowcake, could increase significantly, perhaps returning to the 1980 levels, although market conditions have been most stressful to the minerals industry in recent months. Mines in the vicinity of Moab could produce up to 1,000,000 pounds of yellowcake per year for an indefinite period of time, depending on the market value in relation to the cost of mining.

Placer gold production on public lands (presently estimated at 400 to 450 ounces per year) could increase to between 500 and 550 ounces per year if market conditions further improve. Note that these figures are estimates only. Production figures are highly confidential among miners.

Mineral Rights. Maintenance of mineral withdrawals on 1,850 acres for campgrounds and scenic sites prevents the filing of mining claims on these areas. Approximately 20,000 mining claims are present in the GRA, about 500 for placer gold, and the balance for uranium. (There are no mining claims within the 1,850 acres of withdrawals.)

Transportation. Development of more mining claims would increase the need for access and require more roads. An estimated 10 to 15 miles of new roads are built each year to meet mining access needs. This action would therefore increase the overall transportation network. For those claims where 5 acres or more of land are to be disturbed, the claimant must submit a plan of operations. This allows BLM to review any new access roads to

determine whether they are properly located and built. The new roads built in response to mining would improve access to many remote areas.

Visual Resources. Locatable mineral exploration and development activities could, in cases where the mining development is very large or where extensive road development is required, temporarily change the VRM class of the surrounding area. However, rehabilitation required in Title 43 of the Code of Federal Regulations, Subpart 3809 (43 CFR 3809) would ensure that the affected area was returned to its original class over the long term. Impacts to visual quality, therefore, could be significant in some cases (depending on the extent of surface disturbance) but would always be short-term.

A-11

Soils and Water Quality. Although several potash leases issued around 1960 are still current, no mining activity has taken place on those leases. Buttes Resources has applied for major additional leases. If the Buttes leases are fully developed, at least 720 additional acres would be disturbed.

Merely leasing the 150,000 acres favorable to potash would not affect soils, but any resultant mining would bring about disturbance and removal of vegetative cover, projected to occur on 100 additional acres for potash prospecting and related road development. Erosion might increase by approximately 300 to 500 tons or more per year.

The resulting increase in sedimentation could be minimized by proper road construction and mitigating measures added by BLM personnel during review of the mining plan.

Vegetation. Any mining activity on the leases would cause a substantial but unquantifiable decrease in vegetation, especially if evaporation ponds are constructed.

Livestock Grazing. The impacts to livestock grazing would be the loss of an undetermined amount of forage and the physical displacement of livestock by mining activity.

Wildlife. Potash development could result in a loss of bighorn sheep habitat. Approximately 50 percent (13,567 acres) of bighorn habitat is located within existing potash lease areas or areas that have lease potential (see Figures 1-5 and 2-19). Bighorn sheep are sensitive to human occupancy (BLM, 1981c).

Mineral Resources. Although several potash leases issued around 1960 are still current, no mining activity has taken place. Since no production has taken place, no basis exists for estimating the amount of potash that could be removed.

Transportation. Leasing might lead to an increase in road construction to meet demands for access. But since development within the foreseeable future is unlikely, the potential increase in road construction is improbable.

Visual Resources. Potash exploration and development activities could, in cases where the development is very large (if solar evaporation ponds are constructed) or where extensive roads are required, temporarily change the VRM class of the surrounding area. However, mitigation required in the lease stipulations would ensure that the affected area was returned to its original class over the long term. Impacts to visual quality, therefore,

could be significant in some cases (depending on the extent of surface disturbance) but would always be short-term.

A-12

Soils and Water Quality. Oil and gas activities that take place under the present category system would result in an estimated 350 to 500 acres of new surface disturbance annually. When soil is disturbed and the vegetation removed, there is a significant increase in susceptibility to erosion, sedimentation, and related salinity.

Areas of excessive erosion (e.g., the Book Cliffs), intermittent floodplains, and highly saline soils are being disturbed. Saline soils are very susceptible to erosion when moist. Salt and sediment to the Colorado River increase when travel and surface disturbance take place on these soils.

Mitigating measures help prevent offsite sedimentation and salinity problems. The impact for a dry well should be temporary. BLM requires that the pad and roads be recontoured, topsoils replaced, and the disturbed areas reseeded. Nonproductive areas of producing wells are also required to be rehabilitated. Generally, the area left disturbed averages half an acre per pad. But the impact in a desert environment (such as the identified saline-alkali soils) is not temporary. Because of the lack of precipitation, other climatic factors, and physical and chemical soil properties, the reestablishment of vegetation is difficult.

Vegetation. An undetermined amount and type of vegetation (forage) is currently being lost to oil and gas production activities. The vegetation on the 350 to 500 acres is being lost yearly.

Livestock Grazing. Loss of forage cannot be quantified because, although 350 to 500 acres are disturbed each year, most of the area is rehabilitated. Continuation of the present oil and gas category system would allow this trend to continue. A lesser impact would be the continued physical disturbance of livestock by the presence of persons, vehicles, and equipment on roads and at well pads.

Wildlife. Oil and gas activities allowed on 1.7 million acres under Category 1 for oil and gas leasing would affect deer and elk wintering areas, yearlong bighorn sheep habitat, and yearlong antelope habitat.

About 99 percent (198,369 acres) of the deer and elk winter range and calving and fawning areas located within Herd Unit 28-B is impacted by oil and gas exploration and development activities. This results in the physical stress and displacement of wintering deer and elk and the loss of winter habitat through surface occupancy (see Figures 2-20 and 3-2).

One percent (2,400 acres) of deer and elk winter range within Herd Unit 28-B is protected under Category 2 by special stipulations that restrict exploration during the winter season.

Approximately 49,737 acres of deer and elk winter range within Herd Unit 30-A is protected under Category 2 by special stipulations. This area is south of the LaSal mountains, and it is outside the known and potential oil and gas fields.

Approximately 56 percent (15,331 acres) of the desert bighorn sheep habitat within the Mineral Bottom area has a Category 1 designation and is within potential oil and gas fields. About 44 percent (12,158 acres) is protected by Category 3 (No Surface Occupancy). The Category 3 designation ensures that bighorn habitat will not be occupied by oil and gas activities and that bighorn will not be lost from stress related to these activities.

Approximately 68 percent (9,154 acres) of the desert bighorn habitat within the Potash area has a Category 1 designation, and 32 percent (4,239 acres) has a Category 2 designation. The Category 2 designation does not protect bighorn. Under Category 1, there is a potential for bighorn sheep habitat to be lost, and bighorn could be displaced or lost through stress due to oil and gas exploration and development activities, if such activities increase.

Approximately 82 percent (7,344 acres) of the Westwater bighorn sheep area is protected by Category 3 and 4 designations. The other 18 percent (1,567 acres) is open to oil and gas activities under Category 1. There is a potential for loss of habitat and bighorn sheep through displacement and stress in the Category 1 area. This area is presently outside of the known and potential oil and gas production area.

All of the bighorn sheep habitat (11,420 acres) in the Rattlesnake area has a Category 1 designation. There is potential for bighorn habitat to be lost and bighorn sheep to be displaced or lost through stress if oil and gas activities take place.

One hundred percent (94,735 acres) of yearlong antelope habitat which includes 18,128 acres of kidding areas within the Cisco Desert and 8 percent (6,235 acres) of yearlong antelope habitat in the Hatch Point area is open to year-round exploration and development activities. The above acreages are within known and potential oil and gas production areas. There is a potential for antelope losses to occur through stress and displacement if development occurs, because Category 1 does not protect the antelope kidding areas. There are 7,040 acres of antelope kidding areas within the Hatch Point herd outside of the known and potential oil and gas production area which also have a Category 1 designation.

Mineral Resources. Of the 150 new wells permitted each year, between 15 and 25 become producers, yielding approximately 20,000 barrels of oil and 600,000 to 1,000,000 MCF (thousand cubic feet) of natural gas per year. This does not represent an increase of 15 to 25 in the total number of producing wells, however, since some of the older wells dry up each year.

Transportation. In the past several years, oil and gas development has necessitated the building of 75 to 100 miles of new roads each year, and many more miles of existing roads have been upgraded and maintained to facilitate mineral development.

Most of the roads are built in accordance with the three road class standards developed in the East Book Mountain Transportation Plan. Not only does the transportation plan indicate preferred routes and locations for future development, it also sets standards for construction to ensure that high quality roads are constructed. The present demand for oil and gas has a significant impact on the transportation network by extending access throughout the area.

Visual Resources. Continuation of present management for oil and gas leasing under the category system would help prevent changes from occurring in the VRM class for 15 of the 22 areas that possess exceptional scenic values. Seven of these areas (see Table 2-9 for areas marked "0" under Alternative A) could experience short-term changes in VRM class and, in the case of a major oil field development, could possibly experience a long-term change in the VRM class.

Recreation. Seven areas that provide exceptional scenic recreational opportunities could lose these resource values under this action. Fifteen areas of exceptional scenic recreational opportunities would be protected by the current application of the oil and gas leasing category system. These areas are marked "X" under Alternative A in Table 2-9.

A-13

Soils and Water Quality. Continuing to allow sales of common varieties of minerals (sand and gravel) on 6,000 acres free of mining claims would result in a slight increase in erosion on the acres involved, with a resulting small increase in sedimentation. The severity of the impact would depend on the number and size of sand and gravel sites that were actually developed.

Vegetation. It is unreasonable to think that sand and gravel sites would cover the entire 6,000 acres. There would be a slight decrease in vegetation over the entire acreage and a total loss of vegetation at each individual site. The actual surface disturbance cannot be estimated at this time, nor can probable forage loss be quantified.

Mineral Resources. This action would provide sand and gravel to Grand County and the Utah Department of Transportation for maintenance of existing roads. Smaller volumes would be available for private building needs and for drill pad construction.

Transportation. An increase in roads would be necessary to provide access to the sand and gravel sites. It is impossible to predict the number of miles of new roads that would be needed to access these sites. A secondary impact to transportation would be the availability of increased amounts of sand and gravel for road construction and maintenance.

A-14

Soils and Water Quality. Soil disturbance could take place on approximately 200 acres within a 250-acre humate contract. Mitigating measures would minimize the surface disturbing impacts and offsite erosion and provide for timely reclamation of disturbed areas. The cumulative soil loss from this action may be estimated at less than 1,000 tons per year.

Vegetation. Not all of the 250 acres under contract would be affected by mining. At the end of 4 years, approximately 200 acres of pinyon-juniper vegetation would be altered. This amount represents approximately 3 percent of the total pinyon-juniper stand in the immediate area (within 5 miles).

Mineral Resources. The 250-acre humate site should provide an estimated 50,000 tons of material per year. Total production provided for in the contract is 1,120,000 tons, but no time limit is set.

Cultural Resources. Six archaeological sites were identified in an archaeological clearance conducted on the proposed humate sale site; however, the contract stipulates that the sites will be inventoried prior to mining.

Visual Resources. The humate sale site is located in a Class III area and adjacent to a Class IV area. No significant change in the VRM class is anticipated.

Recreation. Humate mining would create additional traffic on the Westwater access road, causing some congestion for river recreationists. The area where the road narrows and passes under a railroad trestle could present a safety hazard to recreationists using the Westwater road, but the contract stipulates that traffic control lights will be installed on both sides of the trestle, and that these lights will be activated by drivers of the humate trucks as they approach the trestle.

A-15

Recreation. Maintenance of the existing recreational facilities would protect the dollar investment in these developments (see Table 3-9) and continue the current level of recreational opportunities. Many of these facilities are not being used to capacity at the present time, but the trend is toward an increase in recreational use.

A-16

Soils and Water Quality. Continued issuance of recreation use permits for commercial horseback trips, four-wheel drive vehicle tours, commercial bear hunting camps, survival school, and other activities would allow the trend toward increasing recreational use to continue, increasing soil surface disturbance, soil compaction, and surface runoff. These factors, along with potential decreases in vegetative cover, would lead to increased erosion. The increased erosion would be followed by increases in runoff and sedimentation. The significance of the impact would depend on the severity and intensity of use.

Vegetation. The present slight loss of vegetation would continue. Many of the recreational activities (e.g., four-wheel drive tours) have no impact on vegetation, while others have a temporary impact. In most cases there would be no permanent loss of vegetation.

Transportation. New roads and trails could be established. At the very least, this action would help to maintain existing trails and roads in a condition adequate to allow continued use, serving to maintain or increase the overall transportation network.

A-17

Recreation. Maintenance of developed hiking trails would protect the dollar investment in these facilities (see Table 3-9) and ensure the continued availability of recreational hiking opportunities.

A-18

Soils and Water Quality. The severity of impacts to soils from continued ORV use (such as motorcycle and four-wheel drive activity) is directly related to the intensity of use (Snyder, et al., 1976). Permitting these events annually would serve to continue the

downward trend in watershed condition. Onsite gully erosion would increase because runoff would be channelized in tracks and ruts. The increase in sediment and salinity would be directly proportional to the increased soil compaction, runoff, and erosion caused by such ORV disturbance.

Vegetation. The recreational events that are currently permitted would have no significant impact on vegetation, since the vegetation in the affected areas has already been disturbed. New activities might impact vegetation, depending upon the location and extent of surface use.

Livestock Grazing. No significant loss of livestock forage is anticipated at this time from any recreational event that might be permitted. Present activities are scheduled so as not to bother livestock.

A-19

Recreation. Maintaining developed motorcycle trails would protect the dollar investment in these facilities (See Table 3-9) and ensure the continued availability of recreational motorcycle use opportunities.

A-20

Recreation. Maintaining 27 miles of developed scenic roads would protect the dollar investment in these facilities and ensure continued access to scenic recreational opportunities.

A-21

Recreation. Continuation of the present river management program would provide for visitor safety and enjoyment while protecting scenic recreational resources. This would result in increased recreational enjoyment, since the long-range trend is toward an increase in demand for recreational use of the rivers.

A-22

Wildlife. Continued management of 65 miles of study corridor along the Colorado and Dolores rivers as required by the Wild and Scenic Rivers Act would prevent human occupancy and intrusions on wildlife habitat. Populations of peregrine falcons, bald and golden eagles, and bighorn sheep would remain stable or increase as a result of this action.

Recreation. This action would also prevent any change in the character of the rivers until such time as Congress acts on the recommendation, and would help protect scenic recreational qualities from degradation that could impair future recreational enjoyment. This could result in increased recreational enjoyment, since the long-range trend is toward increased recreational use.

A-23

This action would not have a significant impact on any of the indicators.

Soils and Water Quality. Surface disturbance would not be precluded under a recommendation of all eight WSAs as nonsuitable for wilderness designation, but that which would occur from mineral activities is estimated at no more than 5 acres per year, excluding areas of oil and gas exploration. This would result in an increase in soil loss and sedimentation of about 25 tons per year until the area is suitably reclaimed and revegetated.

Vegetation. Construction of new roads, well pads, and mines, or expansion of existing facilities would cause some loss of vegetation. At most, one new site per year might be affected, for a total disturbance of 5 acres due to oil and gas. Rehabilitation measures would return the vegetation to its present condition within 2 years on those areas that proved unproductive for mineral activities.

Minerals. Final recommendation of all WSAs as nonsuitable for wilderness could impact mineral production, since there is unproven potential for uranium, oil, and gas in the Behind the Rocks WSA and for oil and gas in Desolation Canyon WSA. Since the potential is unproven, possible production cannot be quantified, but is expected to be very small.

Transportation. Although some increase in the number of roads would be possible, the current areawide increase would be limited on the areas covered by this management action. Oil and gas activities would account for the majority of new access roads being developed.

Special Designation Areas. Nondesignation of existing WSAs would result in the loss of some of the wilderness values on 219,480 acres. This would reduce the potential for any possible future wilderness designation.

ECONOMIC IMPACTS OF ALTERNATIVE A, NO ACTION

Economic impacts of the management actions proposed in Alternative A area discussed below as they relate to the planning issues. The methodologies and computations that were used to estimate economic impacts are discussed in Appendix V.

ECONOMIC IMPACTS RELATED TO LIVESTOCK GRAZING

A-2, A-3, A-4, A-5

None of the quantifiable management actions under this alternative would cause any significant impacts to livestock operators. Restriction of grazing to the past 5 years' average use would prevent significant expansion of herd size.

Grazing permits that do not increase a ranch's carrying capacity (i.e., permits that do not reflect available forage) may have speculative value. Under these conditions, any decrease from active preference could impact an operator's wealth. Under Alternative A, long-term grazing privileges would be reduced by 37,471 AUMs. At a market value of \$60 per AUM for BLM grazing permits, total operator wealth could decline by as much as \$2,248,260, a 6 percent reduction in base property value.

Lending institutions base loans on a number of factors, including the rancher's ability to repay the loan. The repayment ability is usually measured by the rancher's likely future income with the loan. Because aggregate rancher income is not expected to change under this alternative, the rancher's ability to repay a loan should not be impacted.

Base properties are used as collateral for some types of loans. If lending institutions base their ranch assessments on grazing privileges that do not reflect available forage, then any reduction from active preference could have some effect on the total indebtedness allowed.

ECONOMIC IMPACTS RELATED TO WILDLIFE

A-2, A-3, A-4, A-6, A-12 See Economic Impacts Related to Recreation.

ECONOMIC IMPACTS RELATED TO ORV

A-7 See Economic Impacts Related to Recreation.

ECONOMIC IMPACTS RELATED TO MINERALS

A-10 See Economic Impacts Related to Recreation.

A-12 See Economic Impacts Related to Recreation.

ECONOMIC IMPACTS RELATED TO RECREATION

BLM's recreation management can affect the local economy by changing (1) the number of people who visit the GRA, (2) their length of stay, and (3) the mix of recreational activities in which people participate.

Greater visitation or longer lengths of stay would increase local sales, employment, and income. Certain recreation activities (hunting, boating, and motorized recreation) are associated with greater local expenditures than are other activities. Management actions that encourage participation in these more expensive activities over other activities would also result in greater local sales, income, and employment.

The relationship of visitation by activity type to local sales, income, and employment can be quantified; however, quantifying the relationship between management actions and visitation to the GRA has not been possible for most activities. The analysis of economic impacts on recreation, therefore, consists of identifying and discussing management actions that could affect those recreational resources identified in Chapter 3 as being the most important to the local economy.

A-2, A-3, A-4, A-5, A-6, A-12

These management actions would support current big game populations. Although the local population, which accounts for nearly half of the hunter pressure, is not projected to grow much, some increased hunter pressure could be expected, due to regional population growth. Constant big game populations could deter greater hunter pressure. Hunter pressure and related local expenditures are therefore expected to grow little under Alternative A.

A-7

Maintaining the entire GRA as open to ORV use would allow the trend toward increasing ORV use and related local expenditures to continue. Primitive recreation opportunities in several heavily used canyons would decrease. One commercial operation that relies on Negro Bill Canyon could be forced to discontinue if the canyon is degraded through increased ORV use.

A-10

Locatable mineral activities could take place with a minimum of restrictions in those public recreation areas which are of local economic importance. Such activities could affect recreation use and related local expenditures, and possibly affect the demand for commercial outfitter services.

A-12

Leasable mineral activities would be controlled in several important public recreational resources. Leasable mineral activities would not be allowed in the immediate foreground of the Colorado River corridor. Primitive nonmotorized use in several heavily used (including commercially used) canyons would be protected. Campgrounds and scenic overlooks would also be protected. These actions would allow the trends towards increasing recreational use of the GRA and related local expenditures to continue.

A-15, A-16, A-17, A-18, A-19, A-20, A-21, A-22

Maintaining recreation facilities would allow the trend toward increasing recreation use and related local expenditures to continue.

A-24

Under the wilderness nonsuitability recommendation, mineral production, road construction, and other activities that would be allowed in WSAs could negatively affect their existing primitive nonmotorized recreation use and related local expenditures. Westwater WSA is locally important and, if it were to be degraded, outfitters could have to reduce the prices they charge for their services. The commercial use of Negro Bill Canyon could also discontinue with further degradation.

SOCIAL IMPACTS OF ALTERNATIVE A, NO ACTION

Under this alternative there would be little change from the existing environment and certainly not enough of a change to affect the existing social environment. Changes in attitudes toward BLM would be affected only by outside factors and the way management actions are implemented.

SOCIAL IMPACTS RELATED TO WILDERNESS NONDESIGNATION

A-24 See Economic Impacts Related to Recreation.

B-1 Refer to Alternative A, Management Action A-1.

B-2

Soils and Water Quality. Continuation of present livestock management practices on 45 allotments would impact soil through surface disturbance, soil compaction and water infiltration, and changes in ground cover. Since these factors influence the erosion rate and sediment yield, erosion rates and trends would continue at present levels. Decreases in soil erosion generally follow increases in production of vegetation and improvement in ecological condition, although soil changes lag behind plant changes (USDA, 1976). Maintaining the present medium to high ecological condition would allow soil loss values to remain at or below the T value. Areas of high geologic erosion are generally in critical erosion condition. These soils occur on slopes greater than 50 percent and are in medium or high ecological condition.

Since the present medium to high ecological condition on these allotments would continue under current management, runoff and sediment would also remain the same. Coliform bacterial pollution of streams would be unchanged because of the level of livestock and wildlife use. Vegetation increases stabilize the soil and provide more aerial cover to intercept and dissipate the erosive energy of raindrops, thus decreasing sediment.

Vegetation. Ecological condition would be affected by continuation of current livestock management on 45 allotments. Much of the area that is not grazed during critical growing periods is in high or climax condition. On other sites, since present ecological condition results partly from past livestock use, present management at the level of the past 5 years' average use (see Management Action A-5) would maintain ecological condition in most instances. Some sites that receive substantial livestock use would decline in ecological condition as desirable forage plants are replaced by undesirables that are not components of the site in upper seral stages. See Appendix I for present ecological condition of each allotment, and Appendix K for listing of specific allotments that would continue under present management.

Livestock Grazing. Maintaining the present ecological condition would maintain the present forage yield and enable livestock grazing to continue at current levels.

Wildlife. Continued present management on 45 allotments (56 percent of the GRA) would affect wildlife habitat productivity on 10 allotments (see Appendix K). On the remaining 35 allotments, wildlife ungulates would not be affected.

Under current management, the deer population is stable to increasing and the elk population increasing on the Blue Hill Allotment. This allotment has been identified as an area where there is potential for competition with livestock. Since reproductive success and fawn or calf survival depends largely on the condition of the female animal when she leaves the winter/spring range, forage quality and quantity must be sufficient to support these herds through the winter and spring (Wallmo, 1981; Kerr, 1979). See Appendix I for season of use. Threshold levels for livestock and elk competition problems are unknown.

Bighorn sheep populations are increasing, and they would continue to do so until threshold levels are reached. Current populations and trends are discussed in Chapter 3.

There is a potential for desert and Rocky Mountain bighorn sheep to compete with domestic sheep and cattle for forage and space on seven allotments (Appendix K). These allotments are Arth's Pasture, Kane Springs, Big Flat-Ten Mile, Little Hole, Potash, Rattlesnake, and Spring Canyon Bottom. Refer to Appendix I for seasons of use and species overlaps.

Specific evidence, documented by several researchers, indicates that livestock compete directly with bighorn sheep for food, space, and water (BLM, 1981c). Domestic sheep could also transmit parasites and disease on three of these allotments (Big Flat-Ten Mile, Little Hole, and Rattlesnake). Threshold levels for livestock and bighorn sheep competition and parasite or disease problems are unknown.

Under current management, antelope populations would remain stable or slightly increase on the Bar-X Allotment and decrease on the Windwhistle Allotment (see Appendix K for management actions by allotment). Drought, severe winter weather, predation, and marginal or unsuitable habitat conditions have contributed to the stable to decreasing population trend.

Under current livestock management on 45 allotments, aquatic and riparian habitat would continue to decrease in ecological condition on the Cottonwood, Diamond, Granite Creek, and Showerbath Springs allotments. All four of these allotments have aquatic and riparian habitat that shows evidence of past concentration of livestock along these drainage bottoms. Granite Creek is one of three creeks in the GRA that presently support trout fisheries. Refer to Alternative A, Management Action A-2, for a display of present ecological condition of the riparian and aquatic habitat in these four allotments.

B-3

Soils and Water Quality. Livestock manipulation techniques and grazing management would reduce runoff, sediment, and salt by 15 percent after 15 years (BLM, 1977c). In heavy use areas, improving present low ecological condition to medium would reduce erosion on the saline-alkali soils found in these allotments by approximately 15 to 45 percent (see Appendix D). Improving ecological condition from low to high would result in a 30 to 65 percent reduction in soil loss and salinity.

Vegetation. It is estimated that perennial forage plants would increase by 5 to 25 percent.

A plant's health and survival depend on its abilities to synthesize and store food, form vegetative structures for renewal of top growth, maintain a healthy root system, and develop reproductive organs (Stoddart, et al., 1975). Grazing, through removal of photosynthetic leaf tissue, interferes with these processes. Systematic grazing management is designed to offset these impacts by providing rest.

Livestock Grazing. Water developments may improve livestock distribution and thus improve ecological conditions in previous heavy use areas.

Fences, water developments, and rotation of grazing use areas would have a greater impact

on cattle than on sheep, because cattle are social animals and creatures of habit. Any significant change in their habitual use patterns through concentration, change in season of use for a particular use area, or change in pasture would have a short-term impact on their well-being and productive capacity.

Concentration of livestock would reduce the opportunity for selective grazing and cause them to utilize less palatable forage plants. Their initial response to concentration in a single grazing unit would be to walk the fences, spending less time grazing; this would result in weight loss, potential reduction in calf crop percentage, lighter calves, and possibly a longer period of adjustment to the seasonal movement of livestock. However, as cattle become adjusted to the periodic pasture changes, and replacement animals remain in the herd, the potential for improved production in terms of calves and pounds of beef would be enhanced because of the increased forage production as a result of grazing systems and because new areas of the allotment could be used if waters are developed.

Wildlife. Implementation of livestock manipulation techniques (See Appendix K) on 22 allotments (44 percent of the GRA) would improve water and cover and reduce spatial competition for wildlife ungulates.

Deer populations would remain stable to increasing, while elk populations would continue to increase.

Yearlong forage and water for bighorn sheep would be increased and spatial competition reduced on the Hatch Point, Mineral Point, and Ten-Mile Point allotments. Bighorn sheep populations would continue to increase as a result of reduced spatial competition and increased forage availability (BLM, 1981c).

Antelope populations would remain stable to increasing on seven allotments (Cisco Herd Unit 13), but population trends for Hatch Point Herd Unit 12 cannot be anticipated, since this herd currently has low numbers and is in a downward trend. Population numbers and trends were discussed in Chapter 3.

Winter/spring forage would be increased through managing for a subclimax seral stage on the following allotments for the species indicated: Barley Flat-Ronzio, deer and elk; Cisco Mesa, deer and antelope; Cisco Springs Wash, deer and antelope; Corral Wash, deer and antelope; Harley Dome, antelope; Hatch Point, deer, elk, and antelope; Horse Canyon, deer; Lisbon, deer, elk, and antelope; Nash Wash, deer; Pipeline, antelope; Professor Valley, deer and elk; San Arroyo, deer, elk, and antelope; Steamboat Mesa, deer and elk; and Sulphur Canyon, antelope.

Transportation. It is not known how many reservoirs would be constructed, or where they might be located, but the necessary road construction would improve access in a number of allotments.

B-4 Refer to Alternative A, Management Action A-4.

B-5

Soils and Water Quality. Plowing and seeding would reduce plant cover and lead to localized short-term erosion (Gifford, 1972), but in the long term, soil erosion would be

reduced as ground cover increased. Grass and browse species would become established, holding the soil in place and increasing water infiltration, thus reducing soil erosion and improving water quality. Chaining would cause short-term surface disturbance and the uprooting of trees, possibly increasing soil loss by one-half ton per acre. Buckhouse and Gifford (1976) studied areas in southern Utah that received this treatment and found that sediment yield did not increase if the debris was left in place. In the long term, sediment yield would be reduced even more as ground cover increased. Drill seeding would not increase sediment yield or surface runoff, since the existing vegetation cover would not be removed, and soil disturbance would be localized and minimal. In the long term, since previously bare soil spots would be covered by vegetation, sediment yield and surface runoff would be reduced, decreasing suspended solids in stream water.

Vegetation. A short-term decrease in vegetation would occur on the 70,705 acres of chaining, plowing, and seeding, but within 2 to 3 years, the land should produce a greater variety of species than before treatment, although reinvasion of pinyon-juniper and sagebrush would occur. The useful life of chainings and seedings is generally 20 to 30 years (Tueller and Tausch, 1977).

Livestock Grazing. On the average, implementation of land treatments would decrease forage for the first 2 years, until the seeded species become established. Livestock would be restricted from using these areas, most of which are now being grazed to some extent. Disturbance of grazing habits might cause a negligible decrease in weight gain, depending on the amount of movement necessary to keep livestock off the area for 2 years.

The long-term impact would be an increase of 6,222 AUMs for livestock. Since most of the treatment areas would be grazed in the spring, the long-term increase in amount and quality of forage would increase weight gain and calf crop percentage.

Wildlife. An additional 2,617 AUMs of winter/spring forage would be provided for deer, elk, and antelope, allowing their populations to increase (See Appendix K).

Visual Resources. The chaining of pinyon-juniper areas on Dome Plateau and Hatch Point would change the VRM classes temporarily, but the regrowth of vegetation following the land treatment would return the areas to their original VRM classes.

B-6

Soils and Water Quality. Authorization of grazing use at present levels would maintain continued surface disturbance and plant defoliation. Both these factors increase susceptibility to erosion and related sedimentation.

The current degree of impact (cumulative soil loss estimate) for these allotments is unknown. However, it is assumed that medium or high ecological condition would minimize soil loss estimates and keep soil loss below the T value.

Vegetation. On the 616,267 acres that are in high and climax condition, no significant impact to vegetation would occur. On the 923,383 acres that are in low to medium condition, vegetation would probably decline even further. Other proposed management actions, such as livestock manipulation techniques, would lessen the impact.

Livestock Grazing. The future AUMs shown in this management action represent the total of changes that would result from all actions under Alternative B. Impacts are analyzed in the narrative for each of these actions.

Wildlife. The authorization of grazing use at present levels (average of past 5 years' licensed use) would cause some habitat concerns for wildlife ungulates on 10 allotments and for riparian and aquatic habitat on four allotments.

On the Blue Hill Allotment, deer populations would remain stable or increase, and elk populations would continue to increase.

There is a potential for competition between livestock and bighorn sheep on seven allotments, primarily during the winter and early spring. These allotments are Arth's Pasture, Big Flat-Ten Mile, Kane Springs, Little Hole, Potash, Rattlesnake, and Spring Canyon Bottom. Seasons of use and species overlaps are shown in Appendix I.

Under presently authorized levels of grazing use, antelope populations would remain stable or slightly increase on the Bar-X Allotment and decrease on the Windwhistle Allotment.

The riparian and aquatic habitat would continue to decrease in ecological condition on the Cottonwood, Diamond, Granite Creek, and Showerbath Springs allotments.

(B-7) Refer to Alternative A, Management Action A-6.

(B-8)

The impacts of this designation would be the same as those of maintaining the entire GRA as open for ORV use. Refer to Alternative A, Management Action A-7.

(B-9)

Vegetation. The vegetation on any parcels disposed of would be lost to BLM management.

Livestock Grazing. An estimated 644 AUMs of livestock forage would be lost through disposal of these lands. Depending on the use made of the land after that, an exchange-of-use agreement could be made to allow the livestock operator continued use of the forage.

Wildlife. Disposal of two 80-acre parcels along the Colorado River near Westwater, and of isolated tracts in the Book Cliffs (1,320 acres) and near Dead Horse Point (520 acres) would remove the associated wildlife habitat from BLM management. The Westwater tracts provide habitat for deer, waterfowl, and nongame species, and one of these tracts contains a great blue heron nesting site. Threatened or endangered species that use the Westwater sites include peregrine falcon and bald eagle. The isolated tracts in the Book Cliffs provide habitat for deer and elk, and the tracts near Dead Horse Point provide habitat for desert bighorn sheep.

(B-10)

Transportation. Acquisition of a public access easement at the Cisco boat launch area would add 0.3 mile of road to the existing transportation network and guarantee permanent public access to this essential boat takeout for recreational river use.

Recreation. Acquisition of the easement would prevent a possible closure of this private launch facility, which would increase the Westwater float trip from 1 to 2 days between the Westwater ranger station and Fish Ford. This added time factor could decrease the number of recreationists presently enjoying this part of the river.

Special Designation Areas. Acquisition of the easement would protect recreational values that are significant to potential Wild and Scenic River designation.

B-11

Wildlife. Designation of 140 miles of official utility corridors would contain future developments in the existing corridors, leaving other areas undisturbed for use by wildlife. This would allow populations of deer, elk, antelope, and bighorn sheep to remain stable.

Transportation. This action would also allow for a planned network of facilities throughout the area and reduce the amount of time required for processing right-of-way applications, since applicants would have prior knowledge of areas identified as acceptable for location of pipelines and other transportation facilities.

B-12

Wildlife. The avoidance of locating rights-of-way within 48,245 acres of critical bighorn sheep habitat (Mineral Bottom, Potash, and Westwater areas, see Figure 2-14) would ensure habitat protection. Since bighorn sheep are sensitive to human disturbances, this action would protect the existing populations.

Transportation. Transportation would be limited by any requirement to avoid critical bighorn sheep areas, particularly if such a requirement blocks the most economical route for a pipeline or other transportation facility.

Special Designation Areas. The avoidance of locating rights-of-way in a portion of Westwater WSA would help protect wilderness values on 8,911 acres of land eligible for potential wilderness designation.

B-13 Refer to Alternative A, Management Action A-10.

B-14 Refer to Alternative A, Management Action A-11.

B-15

Soils and Water Quality. Placement of the entire GRA in Category 1 for oil and gas leasing would lead to surface disturbance on an estimated 400 to 550 additional acres per year. Erosion would increase in proportion to soil disturbance, increasing sediment and salinity in the Colorado River drainage. Mitigating measures (see Appendix A) would be used to minimize offsite sedimentation and salinity. However, without stipulations to protect areas of high erosion, floodplains, and municipal watersheds or saline soils, critical watershed areas may be disturbed, leading to increased erosion and salinity problems. These cannot be quantified at this time.

Vegetation. Activities that would take place after opening the entire GRA to oil and gas leasing under Category 1 would cause a decrease in vegetation. The greatest impact would be on the approximately 136,792 acres that are currently in restrictive categories (Categories 2, 3, and 4). The decrease would occur through surface disturbance as a result of production or exploration. Those sites shown to be unproductive for oil and gas would be rehabilitated to resemble the natural vegetation.

Livestock Grazing. Increased oil and gas activity would disturb grazing habits. An undetermined loss of forage would take place on the 78,571 acres which presently are classified No Leasing or No Surface Occupancy. On the 128,622 acres where activity is presently allowed with stipulations, there should be no significant impact compared to the present situation.

A total loss of livestock forage would occur on 400 to 550 acres per year which would be disturbed through construction of roads and drill pads; however, rehabilitation would take place on much of this acreage.

Wildlife. The following analysis is based on known and potential oil and gas production areas (see Figure 1-12). The classification of 1.8 million acres as Category 1 for oil and gas leasing would affect deer and elk wintering areas, yearlong bighorn sheep habitat, and yearlong antelope habitat.

One hundred percent (200,769 acres) of the deer and elk winter range and calving and fawning areas located within Herd Unit 28-B could be impacted by oil and gas exploration and development activities. This could result in the physical stress and displacement of wintering deer and elk and the loss of winter habitat through surface occupancy.

Approximately 75 percent (24,485 acres) of the desert bighorn sheep habitat within the Potash and Mineral Bottom areas is within potential oil and gas fields. Bighorn habitat could be lost, and bighorn sheep displaced or lost through stress if these areas are occupied through exploration and development.

All of the Westwater bighorn sheep area (8,911 acres) is open to oil and gas activities under Category 1. There is a potential for loss of habitat and bighorn sheep through displacement and stress. This area is not within a presently known or potential oil and gas production area.

All of the Rattlesnake bighorn sheep area (11,420 acres) has a Category 1 designation. There is a potential for loss of habitat and displacement of bighorn or loss of bighorn sheep from stress, if oil and gas activities take place in this known potential oil and gas area.

Approximately 70 percent (121,435 acres) of antelope yearlong habitat within the Cisco Desert and Hatch Point herd units could be impacted and lost through surface occupancy. This includes 18,128 acres of kidding areas within the Cisco Desert and 7,040 acres of antelope kidding areas within the Hatch Point herd unit. The Hatch Point kidding areas are outside known and potential oil and gas areas.

Mineral Resources. Of the estimated 155 to 160 new wells, 15 to 25 would probably become producers. These new wells could reasonably be expected to produce 20,000 barrels of oil and 600,000 to 1,000,000 MCF of natural gas per year.

Transportation. The development encouraged under this action would increase the number of roads being constructed beyond the 75 to 100 miles being added each year under current management. Use of the East Book Mountain Transportation Plan would serve several objectives, including delineating preferred routes and locations and setting standards for road construction.

Visual Resources. Classification of the entire GRA as Category 1 for oil and gas leasing could result in short- and long-term changes to the VRM class in 22 areas that possess exceptional scenic values. (Refer to Table 2-9, Alternative B.)

Special Designation Areas. Sixty-five miles of the Colorado and Dolores river corridors, under study for possible designation as Wild and Scenic Rivers, would not be protected by the special provisions contained under the present oil and gas category application (Category 3). Instead, this corridor would be protected only by the standard stipulations contained in Category 1. This could result in short-term lowering of the VRM class (see Visual Resources above), depending on the extent of oil and gas activities in these areas; such a change would be inconsistent with management goals.

Recreation. Classification of the entire GRA as Category 1 for oil and gas leasing could be detrimental to the resource values in the 22 areas identified as possessing exceptional scenic recreational opportunities (refer to Table 2-9, Alternative B), especially in the Wild and Scenic River study corridors.

B-16 Refer to Alternative A, Management Action A-13.

B-17 Refer to Alternative A, Management Action A-14.

B-18

Soils and Water Quality. Assuming that development may take place on 1,500 acres, soil loss is estimated to reach 8,000 tons of soil per year. Salt loading of the Colorado River may increase substantially if much of the disturbed area is Mancos Shale. Offsite sediment damage from development would be controlled by mitigating measures. The actual impact to the Colorado River system cannot be quantified at this time.

Vegetation. Existing vegetation would be altered on 1,500 acres mined under this management action. Rehabilitation of disturbed areas would take place concurrently with new activity.

Mineral Resources. The production of humates from an expanded contract site could provide as much as 100,000 tons of material per year, but this potential production would depend upon market conditions and interest in development.

B-19 Refer to Alternative A, Management Action A-15.

B-20

Soils and Water Quality. Construction of sanitary facilities at heavily used recreation sites along the Colorado River would result in an obvious improvement in water quality at the sites, but would have little effect on the overall water quality of the Colorado River.

Recreation. Construction of rest rooms at heavily used recreation sites along the Colorado River would improve recreational opportunities in those areas by relieving unpleasant unsanitary conditions. This action would also improve health and safety conditions along the river.

B-21 Refer to Alternative A, Management Action A-16.

B-22 Refer to Alternative A, Management Action A-17.

B-23 Refer to Alternative A, Management Action A-18.

B-24 Refer to Alternative A, Management Action A-19.

B-25 Refer to Alternative A, Management Action A-20.

B-26 Refer to Alternative A, Management Action A-21.

B-27 Refer to Alternative A, Management Action A-22.

B-28

Soils and Water Quality. Implementing a limited fire suppression policy would produce a higher short-term sediment yield and surface runoff due to a lack of ground cover. But as vegetation becomes reestablished, long-term sediment yield would decrease, and water infiltration would be improved, lowering the suspended solids in stream water. A limited suppression policy would therefore result in a long-term improvement in water quality.

Air Quality. Air quality would decrease significantly during any burning of vegetation, and the visibility of fire and smoke would decrease visual quality as well. However, this decrease in air quality and visibility would be of short duration, and the air would return to its present quality when the fire was extinguished.

Vegetation. The impact of a limited fire suppression policy on vegetation would depend on the number of fires that occur and the size of each fire. Averaged over the past 3 years (1979 through 1981), 58.6 fires have burned 808.3 acres each year.

Any fires that meet the requirement for this management action (fires that do not threaten life or property) would cause a short-term loss of vegetation, particularly pinyon-juniper and sagebrush. The immediate decrease in vegetation would last for 2 to 3 years, until a variety of forage species becomes established on the site. This would also depend on the seed source onsite at the time of the fire. The overall long-term impact on vegetation would be an increase in desirable (forage species) vegetation.

Livestock Grazing. The impact on livestock cannot be quantified at this time, because there is no way of knowing how many acres would be affected. Existing forage would be lost immediately as a result of any fires, but forage quality and quantity would be increased over the next few years. Livestock production would increase until pinyon-juniper and sagebrush again begin to dominate (within 15 to 20 years).

Wildlife. Implementation of a limited fire suppression policy on designated pinyon-

juniper and sagebrush communities would increase forage for wildlife ungulates, as well as for nongame birds and mammals. Deer and elk populations would increase as a result of this action.

B-29

Soils, Water Quality, and Air Quality. The impacts of prescribed fire and seeding on soils, water quality, and air quality would be the same as those described under Management Action B-28 above.

Vegetation. Since this prescription includes seeding of sites after a prescribed fire, and since the sites (Appendix T) have been selected for their potential for success, the impact would be an increase in desirable vegetation over the long term. The initial impact would be a loss of existing vegetation, but grasses and herbaceous species would dominate within 2 to 3 years. Later, as the site progresses in ecological stages, sagebrush (in 10 to 15 years) and pinyon-juniper (in 20 to 25 years) would begin to dominate.

Livestock Grazing. Because these areas are unproductive, they are not being grazed by livestock; therefore, there would be no short-term impact to livestock. The long-term effect of prescribed fires on these 12 allotments would be an increase in livestock forage of 1,282 AUMs.

Wildlife. Forage for wildlife ungulates and nongame birds and mammals would be increased by 488 AUMs, and populations of deer and elk would increase as a result of this action (see Appendix T).

Recreation. The increase in populations of deer and elk would result in an increase in recreational hunting activities.

B-30

Soils and Water Quality. It is assumed that a recommendation of all eight WSAs as nonsuitable for wilderness designation would lead to an increase in mining activities. The potential increase in allowance of surface disturbing activities would increase erosion and sedimentation in these WSAs. The significance of this increase would be proportional to the amount of activity and subsequent subsurface disturbance.

Vegetation. Any increased surface disturbance that might result would decrease vegetation. Potential vegetation loss cannot be quantified at present.

Livestock Grazing. One particular land treatment in Westwater Canyon WSA, mentioned in Management Action B-5 above (chaining 2,600 acres) could be implemented. This chaining would result in an additional 217 AUMs of available forage.

Mineral Resources. A nonsuitability recommendation, if followed by a No Wilderness designation, would allow drilling of approximately five new oil wells per year. Production from these new wells would depend on their success or failure, which cannot be predicted at this time. Because of the remote locations and geologic nature of the areas now under wilderness study or appeal, little increase in production of other minerals is anticipated.

Mineral Rights. Following a No Wilderness designation, mining claims could be developed more quickly and at less expense under the regulations found in 43 CFR 3809 than under the presently effective regulations found in 43 CFR 3802.

Transportation. A No Wilderness designation would encourage ORV use and other land use activities, as well as mineral production. These increases would result in a corresponding increase in the number of new roads being constructed or established each year. Increased mineral development would have the most significant impact on the transportation network, as 75 to 100 miles of new roads are constructed each year in conjunction with oil and gas activities alone. The increase in the number of new roads for all of these activities cannot be predicted, but overall expansion of the transportation network would be significant.

Special Designation Areas. Nondesignation of existing WSAs would result in the loss of some of the wilderness values on 219,480 acres. This would reduce the potential for any possible future wilderness designation.

ECONOMIC IMPACTS OF ALTERNATIVE B, PRODUCTION

Economic impacts of the management actions proposed in Alternative B are discussed below as they relate to the planning issues. The methodologies and computations that were used to estimate economic impacts are discussed in Appendix V.

ECONOMIC IMPACTS RELATED TO LIVESTOCK GRAZING

B-2, B-3, B-4, B-5, B-6, B-9, B-28, B-29, B-30

These management actions would affect the amount of public rangeland forage that would be available to livestock operators, which in turn would affect rancher's income, wealth, and ability to obtain loans, with some spinoff income and employment effects through the local economy.

Under Alternative B, none of the 31 independent cattle operators would have less available forage than their existing use. In the short term, one cattle operator would have more available forage than his existing use. In the long term, 17 cattle operators would, on the average, have 19 percent more available forage than their existing use. If this added forage is grazed, these cattle operators would realize an added \$105,210 in returns above cash cost, a 1 percent increase over what they now earn.

None of the 14 independent sheep operators would have less available forage than their existing use. In the short term, three operators would have more forage than their existing use. In the long term, 12 of the 14 sheep operators would, on the average, have 37 percent more available forage than their existing use. If the added forage is grazed, sheep operators would realize an added \$57,622 in returns above cash cost, a 5 percent increase over what these operators now earn. The aggregate short-term and long-term rancher impacts are summarized in Table 4-1.

TABLE 4-1

Summary of Short-Term and Long-term Economic Impacts
to Livestock Operators under Alternative B

<u>Cattle Operators</u>	<u>Current Situation</u>	<u>Short Term</u>	<u>Long Term</u>
Gross Revenue	\$1,962,085	1,982,365	2,092,397
Total Cash Cost	1,038,598	1,045,390	1,063,700
Returns Above Cash Cost	923,487	936,975	1,028,697
Returns to Labor and Investment	482,876	496,266	582,715
 <u>Sheep Operators</u>			
Gross Revenue	2,367,988	2,425,795	2,470,702
Total Cash Cost	890,974	915,757	936,066
Returns Above Cash Cost	1,477,014	1,510,038	1,534,636
Returns to Labor and Investment	1,239,055	1,271,141	1,295,113

Any decrease from active preference would impact an operator's wealth. Under Alternative B, long-term grazing privileges would be reduced by 30,611 AUMs from active preference. At a market value of \$60 per AUM for BLM grazing permits, total operator wealth could decline by \$1,836,660, a 5 percent reduction in base property value. As discussed under Alternative A, Economic Impacts Related to Livestock Grazing, any reduction from active preference could have some effect on the total indebtedness allowed.

A number of operators live outside the impact area, and their operations contribute little to the local economy. Under Alternative B, the 22 independent cattle operators in the impact area would earn an added \$105,167 (+25 percent) in returns above cash cost. Increased rancher income and herd size would have indirect and induced local employment and income effects. Under Alternative B, long-term regional income and employment due to livestock operators in the GRA would increase by \$168,320 (+3 percent) and 8 jobs (+0.2 percent) (see Table 4-2).

TABLE 4-2
Impact Area's Income and Employment Due to Livestock Operators
in the Grand Resource Area under Alternative B

	Existing		Alternative B	
	<u>Employment</u> (Jobs)	<u>Income</u> (Dollars)	<u>Employment</u> (Jobs)	<u>Income</u> (Dollars)
Agriculture	26	\$537,325	32	\$667,271
Retail and Services	9	177,043	10	201,580
Other	<u>6</u>	<u>160,345</u>	<u>7</u>	<u>174,183</u>
	41	\$874,713	49	\$1,043,034

Source: Gee 1982; USFS 1982.

ECONOMIC IMPACTS RELATED TO WILDLIFE

B-3, B-4, B-5, B-6, B-12, B-28, B-29

Refer to Alternative A, Economic Impacts Related to Recreation, A-2, A-3, A-4, A-5, A-6, A-12.

ECONOMIC IMPACTS RELATED TO ORV MANAGEMENT

B-7

Refer to Alternative A, Economic Impacts Related to Recreation, A-7.

ECONOMIC IMPACTS RELATED TO LANDS ACTIONS

B-9

The likely methods of disposing of public lands include:

1. Sales	15,679 acres
2. Recreation and Public Purposes (R&PP) leases	6,412 acres
3. Exchanges	320 acres

Because Grand County's payments in lieu of taxes (PILT) are constrained by its population, the public land sales could only increase county revenue. R&PP leases that go to patent would also increase county revenues.

State lands do not contribute to county revenues. Exchanges with the State would not impact county PILT if the exchange takes place within the same county, and Utah Senate Bill 61 would prevent any possible loss of PILT payments to local governments because of an exchange of public lands for State lands outside the county.

The proposed disposal would increase the amount of private land near Moab and Spanish Valley by 39 percent and near Castle Valley by 30 percent. If these lands are as suitable as the existing available private land, this increase in private land would be large enough to have a depressing effect on nearby private land market prices. Green River could also be affected, but to a lesser extent because of its larger private land base relative to the nearby acreage proposed for disposal.

Sales of isolated land tracts some distance from existing communities should not impact private land prices. If suitable private land is available, R&PP leases could have a depressing effect on land prices. However, the communities (i.e., residents) would save money by not having to purchase private land, and there is some doubt as to the availability of suitable private lands for the desired uses (pistol range, water tanks, and dump sites).

B-10

See Economic Impacts Related to Recreation.

ECONOMIC IMPACTS RELATED TO UTILITY CORRIDOR DESIGNATION

B-12

The exclusions could lengthen the construction time for a major right-of-way. Added construction time would increase cost which, if significant, could deter the location of a major right-of-way. Lengthening construction time could also temporarily increase local employment and income.

The 48,245-acre avoidance area involves 2 percent of the GRA. The avoidance should have little effect on the duration of construction, or on the likelihood that a major right-of-way would be located in the GRA, and should therefore have little economic effect.

ECONOMIC IMPACTS RELATED TO MINERALS

B-13

Refer to Alternative A, Economic Impacts related to Minerals, Management Action A-10.

B-15

Placing the entire GRA in Category 1 would decrease the acreages that are presently under the more restrictive oil and gas leasing categories. Since activities under Categories 2 and 3 require more planning and coordination, more time, and more expensive equipment, placing the entire GRA into Category 1 would eventually increase oil and gas activities from what they would otherwise be.

Using the increased oil and gas drilling estimates given earlier (refer to the analysis of environmental impacts under Alternative B, Management Action B-15, Minerals) and assuming that the activities that would have taken place in Category 2 and 3 areas would not have made greater contributions to the local economy, it is estimated that eventually an additional 5 to 10 jobs (+0.1 to 0.2 percent) and \$85,000 to \$170,000 (+0.1 to 0.3 percent) income would be realized in the area. These figures do not include those who temporarily locate in the area, but do include the effect their expenditures have on the local economy and the number of permanent residents who would be employed.

Local units of government would derive an added \$7,500 to 15,000 (+0.1 to 0.2 percent of total local government revenues) of property tax revenues due to the increased oil and gas activity.

Refer to Economic Impacts related to Recreation.

B-18

Allowing sales of humates on an additional 1,500 acres would either extend the life of the mine or allow increased rates of production, or both. At the proposed production levels (280,000 tons per year) and employment levels (10 jobs), the mine life and related employment, income, and local government revenues would be extended from 4 to 28 years.

B-30

Although highly uncertain, the estimated oil and gas production increase (refer to environmental impacts of Alternative B, Management Action B-30, Minerals) would eventually result in five added jobs (+0.1 percent) and \$120,000 in increased wages, salaries, and proprietors' income in the GRA. Increased local government revenues would also be realized.

ECONOMIC IMPACTS RELATED TO RECREATION

B-8

Refer to Alternative A, Economic Impacts related to Recreation, Management Action A-7.

B-10

Securing permanent public access to Westwater Canyon's existing takeout point would prevent the possible loss of local sales discussed below.

Boating use through Westwater Canyon is restricted to avoid exceeding the canyon's environmental carrying capacity. Except during high water, closure of the existing private takeout facility would add a day to the typical Westwater trip. Since most of the existing private users float through Westwater in a day, loss of the private takeout would increase the number of overnight trips in the canyon. In order not to exceed the canyon's carrying capacity, the number of private users would have to be further restricted. Commercial operators could either use their river allocation to take fewer passengers down for a longer trip or use motors (10 percent of the commercial users are now using motors). Overall, fewer people would be able to float Westwater, resulting in a loss of local sales, income, and employment.

B-13, B-15

Locatable and leasable mineral activities could take place with a minimum of restriction in those public recreation areas which are of local economic importance. Such activities, if they significant degrade the recreation resource, could affect recreation use, related local expenditures, possibly affect the demand for commercial outfitter services.

Because tourist visitation is projected to increase, these management actions would probably result in a reduced increase in projected use, and therefore a reduced increase in tourist related sales.

B-19, B-20, B-21, B-22, B-24, B-25, B-26, B-27

Maintaining and building recreation facilities in response to an existing demand would allow the trends toward increasing recreation related local expenditures to continue.

B-30

Refer to Alternative A, Economic Impacts to Recreation, Management Action A-24.

ECONOMIC IMPACTS RELATED TO FIRE MANAGEMENT

B-28

The limited suppression policy would still require the existing fire crew size. The fire crew would spend less time on fires and more time working on other BLM projects. Although fire program costs are expected to decrease, the local importance of BLM activities would not change.

ECONOMIC IMPACTS RELATED TO WILDERNESS NONDESIGNATION

B-30

Nondesignation of wilderness areas would allow a proposed land treatment to be implemented which could not have been implemented in a wilderness area. If the added forage from this land treatment is grazed, operators would realize an estimated \$3,240 in increased sales, an added \$1,581 in returns to family labor and investment, and an increased ranch value of \$9,770.

Refer to Economic Impacts Related to Minerals and Alternative A, Economic Impacts Related to Recreation.

SOCIAL IMPACTS OF ALTERNATIVE B, PRODUCTION

None of the management actions would impact local communities so far as to noticeably affect their existing social environment. Of the four alternatives, Alternative B would place the fewest restrictions on activities taking place on public land. This alternative would be perceived by most residents as having the greatest beneficial impact on the local economy.

In general, local attitudes toward the BLM would improve because of the reduced restrictions and greater local resource use and development allowed. These attitudes would vary, however, by those individuals and groups who would gain and those who would lose under this alternative. See the Economic Impacts section for the identification of gainers and losers under this alternative.

Soils

C-1 Refer to Alternative A, Management Action A-1.

C-2

Soils and Water Quality. Implementation of the suggested salinity control treatments would reduce active soil erosion (BLM, 1977c). Areas of gully and rill erosion would be stabilized, and the upward extension of gully systems reduced (Jackson and Julander, 1982). This would result in collection of approximately 335 acre-feet of runoff from 41,000 acres of highly saline soils, trapping an anticipated 141,040 tons of sediment and reducing salinity contribution to the Colorado River system by approximately 5,140 tons per year. Appendix E shows the acreage of proposed treatment of highly saline soils by allotment, an estimate for runoff coming from these soils, and the anticipated tons of sediment trapped by these structures, using an average of 3.44 tons per acre (Jackson and Julander, 1982).

Vegetation. Because of the nature of the associated soils, impacts to vegetation would be confined to within 2 or 3 feet of the structures themselves. There would be a slight increase in vegetation in this immediate area. A recent (September 1982) field observation of existing structures in the same area showed an increase in rubber rabbitbrush and snakeweed, with hardly any difference in grass species. Near those structures where crested wheatgrass seed had been broadcast, there was a definite increase in the number of plants that survived, as a result of the water held by the structures.

Wildlife. Forage, cover, and water for wildlife ungulates and nongame wildlife species would increase, allowing populations of nongame birds and mammals to increase (Carothers, 1977). Deer populations would remain stable.

C-3

Soils and Water Quality. Diversion and evaporation of water from Stinking Spring would require construction of an evaporation pond. The evaporation pond would reduce water yield by 128 acre-feet and the salt load to the Colorado River to 3,100 tons per year (BLM, 1980a).

Vegetation. Construction of the evaporation pond would remove about 70 acres from vegetative production.

Livestock Grazing. Two AUMs of livestock forage would be lost on this low production site.

C-4

Soils and Water Quality. Specific vegetation manipulation practices and land and watershed treatments have not been described, nor have their locations been identified; therefore, definite impacts cannot be anticipated at this time. However, a short-term impact

to soils and vegetation would occur through any initial surface disturbance. A long-term increase in vegetation and resultant decrease in erosion, sedimentation, and salinity could be expected to occur from any watershed treatments.

Vegetation. Vegetation would increase over the long term wherever these practices are initiated.

Livestock Grazing. Depending on the type and method of watershed and vegetation treatment, livestock forage would increase to some degree. No quantification can be made at this time.

Wildlife. Implementing vegetation manipulation and land treatments on three critical watershed subbasins (313,800 acres) would increase forage, water, and cover for nongame birds and small mammals. Nongame bird and small mammal populations would increase, and wildlife ungulates and would remain stable (Carothers, 1977).

C-5

Soils and Water Quality. Continuation of present livestock management practices on 37 allotments would impact soil through surface disturbance, soil compaction and water infiltration, and changes in ground cover. Since these factors influence the erosion rate and sediment yield, erosion rates and trends would continue at present levels. Decreases in soil erosion generally follow increases in production of vegetation and improvement in ecological condition, although soil changes lag behind plant changes (USDA, 1976). Maintaining the present medium to high ecological condition would allow soil loss values to remain at or below the T value. Areas of high geologic erosion are generally in critical erosion condition. These soils occur on slopes greater than 50 percent and are in medium or high ecological condition.

Vegetation. Continuation of current livestock management on 37 allotments (Appendix K) would affect ecological condition (Appendix I). Much of the area that is not grazed during critical growing periods is in high or climax condition at present. These sites would continue in high or climax condition. On other sites, since present ecological condition results partly from past livestock use, present management at the level of the past 5 years' average use (see Management Action A-5) would maintain ecological condition in most instances. Some sites that receive substantial livestock use would decline in ecological condition as desirable forage plants are replaced by undesirables that are not components of the site in upper seral stages. See Appendix I for present ecological condition of each allotment, and Appendix K for listing of specific allotments that would continue under present management.

Livestock Grazing. Maintaining the present ecological condition would maintain the present forage yield and enable livestock grazing to continue at current levels.

Wildlife. Continuation of present livestock management on 37 allotments would not affect wildlife ungulates on 29 allotments; however, on the remaining eight allotments, some habitat concerns exist.

On the Blue Hill Allotment, the deer population is stable to increasing, and the elk population is increasing. This allotment has been identified as an area where there is potential for competition with livestock. Since reproductive success and fawn or calf

survival depend largely on the condition of the female animal when she leaves the winter/spring range, forage quality and quantity must be sufficient to support these herds through the winter and spring (Wallmo, 1981; Kerr, 1979). See Appendix I for seasons of use. Threshold levels for livestock and elk competition problems are unknown.

Bighorn populations are increasing, and they would continue to do so until threshold levels are reached. There is a potential for desert and Rocky Mountain bighorn sheep to compete with cattle for forage and space on five allotments: Arth's Pasture, Big Flat-Ten Mile, Kane Springs, Little Hole, and Rattlesnake. (Refer to Appendix I for seasons of use and species overlaps).

Specific evidence, documented by several researchers, indicates that livestock compete directly with bighorn sheep for food, space, and water (BLM, 1981c). Domestic sheep could also transmit parasites and disease on three of these allotments (Big Flat-Ten Mile, Little Hole, and Rattlesnake). Threshold levels for livestock and bighorn sheep competition and parasite and disease transmission are unknown.

Under current livestock management, antelope populations would remain stable or slightly increase on the Bar-X Allotment, and decrease on the Windwhistle Allotment. The presently stable to decreasing trend is attributed to drought, severe winter weather, predation, and marginal or unsuitable habitat conditions.

On the Granite Creek allotment, which is one of three allotments presently supporting trout fisheries and where aquatic and riparian habitat shows evidence of past concentration of livestock along drainage bottoms, present ecological condition is 50 percent low and 50 percent medium. Riparian and aquatic habitat would continue to decrease in ecological condition.

C-6

Soils and Water Quality. Livestock manipulation techniques would reduce runoff, sediment, and salt by 15 percent after 15 years (BLM, 1977c). Improving overuse areas to medium or high ecological condition would reduce sediment and potential salt loads by 30 to 65 percent. Reduction estimates were derived by comparing universal soil loss estimates for saline-alkali soils (Appendix C).

Vegetation. It is estimated that perennial forage plants would increase by 5 to 25 percent. A plant's health and survival depend on its abilities to synthesize and store food, form vegetative structures for renewal of top growth, maintain a healthy root system, and develop reproductive organs (Stoddart, et al., 1975). Grazing, through removal of photosynthetic leaf tissue, interferes with these processes. Systematic grazing management is designed to offset these impacts by providing rest. Water developments may improve livestock distribution and thus improve ecological conditions in previous heavy use areas.

Livestock Grazing. Fences, water developments, and rotation of grazing use areas would have a greater impact on cattle than on sheep, because cattle are social animals and creatures of habit. Any significant change in their habitual use patterns through concentration, change in season of use for a particular use area, or change in pasture would have a short-term impact on their well-being and productive capacity.

Concentration of livestock would reduce the opportunity for selective grazing and cause them to utilize less palatable forage plants. Their initial response to concentration in a single grazing unit would be to walk the fences, spending less time grazing; this would result in weight loss, potential reduction in calf crop percentage, lighter calves, and possibly a longer period of adjustment to the seasonal movement of livestock. However, as cattle become adjusted to the periodic pasture changes, and replacement animals remain in the herd, the potential for improved production in terms of calves and pounds of beef would be enhanced because of the increased forage production as a result of grazing systems and because new areas of the allotment could be used if waters are developed.

Wildlife. Implementation of livestock manipulation techniques (Appendix K) on 15 allotments (28 percent of the GRA) would improve water and cover and reduce spatial competition for wildlife ungulates.

Deer populations would remain stable to increasing, and elk populations would continue to increase.

Bighorn sheep populations are expected to continue to increase as a result of reduced spatial competition and increased forage availability (BLM, 1981c).

Antelope populations would remain stable to increasing on one allotment in Cisco Herd Unit 13; population trends for the Hatch Point herd (Herd Unit 12) cannot be anticipated, since this herd currently has low numbers and is in a downward trend. The presently stable to decreasing trend is attributed to drought, severe winter weather, predation, and marginal or unsuitable habitat conditions.

Winter/spring forage would increase through managing for a subclimax seral stage on the following allotments for the species indicated: Barley Flat-Ronzio, deer and elk; Cisco Springs Wash, deer and antelope; Floy Creek, deer; Hatch Point, deer, elk, antelope, and bighorn; Horse Canyon, deer; Lisbon, deer, elk, and antelope; Nash Wash, deer; Professor Valley, deer and elk; Spring Canyon Bottom, bighorn sheep; Steamboat Mesa, deer and elk; and Ten Mile Point, bighorn sheep.

Implementation of these techniques would increase yearlong forage, provide additional water, and reduce spatial competition for bighorn sheep on Spring Canyon Bottom, Hatch Point, and Ten Mile Point allotments (BLM, 1981c).

C-7 Refer to Alternative A, Management Action A-4.

C-8

Soils and Water Quality. Plowing and seeding would reduce plant cover and lead to localized short-term erosion, but in the long term, soil erosion would be reduced as ground cover increased. Grass and browse species would become established, holding the soil in place and increasing water infiltration, thus reducing soil erosion and improving water quality. Chaining would cause short-term surface disturbance and the uprooting of trees, possibly increasing soil loss by one-half ton per acre. Buckhouse and Gifford (1976) studied areas in southern Utah that received this treatment and found that sediment yield did not increase if the debris was left in place. In the long term, sediment yield would be reduced even more as ground cover increased. Drill seeding would not decrease sediment yield or surface runoff, since the existing vegetation cover would not be removed, and

soil disturbance would be localized and minimal. In the long term, since previously bare soil spots would be covered by vegetation, sediment yield and surface runoff would be reduced, decreasing suspended solids in stream water.

Vegetation. A short-term decrease in vegetation would occur on the 68,105 acres of chaining, plowing, and seeding, but within 2 to 3 years, the land should produce a greater quantity of forage and a greater variety of species than before treatment, although reinvasion of pinyon-juniper and sagebrush would occur. The useful life of chainings and seedings is generally 20 to 30 years (Tueller and Tausch, 1977).

Livestock Grazing. On the average, implementation of land treatments would decrease forage for the first 2 years, until the seeded species become established. Livestock would be restricted from using these areas, most of which are now being grazed to some extent. Disturbance of grazing habits might cause a negligible decrease in weight gain, depending on the amount of movement necessary to keep livestock off the area for 2 years.

The long-term impact would be an increase of 4,734 AUMs for livestock. Since most of the treatment areas would be grazed in the spring, the long-term increase in amount and quality of forage would increase weight gain and calf crop percentage.

Wildlife. Implementation of land treatments on 13 allotments would provide an additional 3,780 AUMs of winter/spring forage for deer, elk, and antelope (See Appendix K). This action would allow deer, elk, and antelope populations to remain stable or increase.

C-9

Soils and Water Quality. Authorization of grazing use at present levels would result in continued surface disturbance and plant defoliation. Both these factors increase susceptibility to erosion and related sedimentation.

The current degree of impact (cumulative soil loss estimate) for these allotments is unknown. However, it is assumed that medium or high ecological condition would minimize soil loss estimates and keep soil loss below the T value.

Vegetation. On the 616,267 acres that are in high and climax condition, no significant impact to vegetation would occur. On the 923,383 acres that are in low to medium condition, vegetation would probably decline even further. Other proposed management actions, such as livestock manipulation techniques, would lessen the impact.

Livestock Grazing. The future AUMs shown in this management action represent the total of changes that would result from all actions under Alternative C. Impacts are analyzed in the narrative for each of these actions.

Wildlife. Continued authorization of grazing use at present levels would cause some habitat concerns for wildlife ungulates on eight allotments and for riparian and aquatic habitat on one allotment.

Deer populations would remain stable to increasing, and elk populations would continue to increase on the Blue Hill Allotment.

There is potential for competition between livestock and bighorn sheep, primarily during

the winter and early spring, on five allotments: Arth's Pasture, Big Flat-Ten Mile, Kane Springs, Little Hole, and Rattlesnake. (Seasons of use and species overlaps are shown in Appendix I.)

Antelope populations would remain stable or slightly increase on the Bar-X Allotment and decrease on the Windwhistle Allotment. The presently stable to decreasing trend is attributed to drought, severe winter weather, predation, and marginal or unsuitable habitat conditions.

Riparian and aquatic habitat would continue to decrease in ecological condition on the Granite Creek Allotment.

C-10

Soils and Water Quality. Changing the season of use to winter grazing on allotments where a significant portion of the soils are derived from Mancos Shale would reduce erosion, salinity and sedimentation.

Moderate winter grazing while the soils are frozen produces 10 percent more sediment loss than does nongrazing (BLM, 1980a). Studies on watersheds similar to those found in the GRA indicated that winter sheep grazing produced 29 percent less sediment than did winter-spring sheep and cattle grazing at Badger Wash, Colorado (Lusby, 1978). In spring when frost heaving has taken place and the infiltration rate has been naturally improved, trampling of the soil surface by livestock causes significant damage to the infiltration rate and increases the soil's susceptibility to erosion and sedimentation (Lusby, 1965; Branson and Owen, 1970).

Changing the season of use on the Cisco Mesa, Corral Wash, Diamond, Floy, Harley Dome, Mineral Point, Monument Wash, Pipeline, Potash, San Arroyo, South Sand Flats, Sulphur Canyon, and Whipsaw Flat allotments would result in an anticipated reduction of 2,239 acre-feet in runoff; 159,695 tons in sediment; and 4,790 tons of salt delivered to the Colorado River in 3 years. These estimates were derived using an averaged 30 percent reduction of the existing runoff, sediment, and salt yields by allotment (Appendix D).

Vegetation. The proposed season of use changes would probably improve the condition of desirable forage areawide more than would any other action. The start of the growing season is the most critical time for the plants. Grazing at this time, particularly on arid ranges, is detrimental to the plant (Stoddart, et al., 1975), and repeated spring grazing is damaging (Holmgren and Hutchings, 1972).

Most of the season of use changes would result in protection for the plants during the critical period beginning in mid to late March, (phenology studies conducted from 1978 through 1981 show this to be the date throughout the majority of the GRA). A change in season of use on summer grazing allotments would allow the forage plants to begin building their carbohydrate reserves before grazing begins in June.

Livestock Grazing. Changing the season of use to restrict spring grazing on 13 allotments (Appendix K) would significantly decrease the livestock program. Spring forage provides more nutrition than forage grazed during any other season of the year (Cook, 1971), and nutritious forage is critical to gestation and lactation, which take place during spring.

The individual animals would not have access to this spring forage. (Economic impacts of this action are discussed later in this chapter.)

Wildlife. A change in season of use would restrict livestock use of winter/spring forage, allowing bighorn sheep and antelope populations to remain stable or increase as a result of improved habitat (BLM, 1981c; BLM, 1970). Bighorn sheep compete for forage and space on the Harley Dome, Mineral Point, and Potash allotments. Antelope compete with livestock for spring forbs on the Cisco Mesa, Corral Wash, Harley Dome, Pipeline, San Arroyo, and Sulphur Canyon allotments. The restriction of livestock grazing through a change in season of use would help to improve riparian and aquatic habitat toward a climax ecological condition in the Diamond Allotment.

C-11

Vegetation. A change in the class of livestock from sheep to cattle would decrease the vigor and production of grasses because of increased grazing pressure. There would be comparable increase in the vigor of browse species.

Livestock Grazing. With the change in class of livestock on the Buckhorn Allotment, 1,497 AUMs presently used by sheep would be converted to cattle. The number of AUMs that would be available for cattle is unknown at this time, since the conversion rate would have to be determined from inventory data for this particular allotment. For Appendix K, 1,497 AUMs will be shown.

Wildlife. Changing the class of livestock from sheep to cattle on the Buckhorn Allotment (4 percent of the GRA) would help reduce competition for winter/spring forage for approximately 2,189 deer and 100 elk. These herd units are presently at 90 percent of estimated prior stable numbers of deer, and 50 percent of estimated prior stable numbers of elk (Tables 3-2 and 3-3). The populations would remain stable or increase as a result of this action (Wallmo, 1981).

C-12

Soils and Water Quality. Managing of perennial streams by fencing or rotation of grazing use would control grazing of the vegetation that is useful to stream protection. This existing streamside vegetation is valuable to the aquatic environment because it reduces water temperatures, provides natural cover, increases terrestrial food, reduces sediment and runoff, and stops minor slash and debris movement. Soil disturbance along the stream channels in these degraded areas would be minimized, and the overall water quality of Cottonwood, Diamond, and Rattlesnake drainageways would improve slightly.

Vegetation. Rest from grazing would improve the condition of riparian vegetation. But spring rest alone has little effect in riparian areas, because any increase achieved can be nullified when grazing is resumed and cattle congregate along the stream bottoms (Martin, 1973). With only periodic rest, any increase in desirable forage species may be offset by a decrease in undesirables, with no resulting gain in ground cover.

Livestock Grazing. Livestock would be denied the use of these areas during certain periods. As forage conditions improve over the long term, livestock would benefit.

Wildlife. Management of 3 miles of perennial stream by fencing and rotation of grazing

use areas on the Diamond, Cottonwood, and Showerbath Springs allotments would allow vegetative cover to increase, thereby improving riparian and aquatic habitat for nongame birds and mammals and fish. Deer populations would remain stable.

C-13

Soils and Water Quality. Highly saline lands are often characterized by unstable soils and sparse vegetation. The fine-textured soils are easily compacted by trampling, resulting in low infiltration, high runoff, increased salinity, and low levels of effective soil moisture (BLM, 1977c). Removal of livestock from such lands would be an effective means of controlling salinity (BLM, 1980a).

Studies on a similar watershed in Colorado indicate runoff in the hilly Mancos Shale areas occurs almost wholly in response to high intensity summer rains. Gullies draining heavily grazed watersheds have nearly twice as much erosion as those from ungrazed watersheds. Heavily grazed watersheds produce 30 percent more runoff and 45 percent more sediment load than do ungrazed watersheds. Maximum reduction in sediment load occurs after 3 years of exclusion from grazing (Lusby, 1970).

Restriction of livestock grazing on 27,000 acres of highly saline soils would result in an annual reduction in sediment of 27,945 tons within 3 years. Assuming that 3 percent of that sediment is salt from Mancos-derived soils (BLM, 1977c), there would be a reduction of 838 tons per year in the salt delivered to the Colorado River system. There would also be a reduction in runoff of 66 acre-feet, lowering the amount of salt load to the Colorado another 180 tons. The total salt reduction would be approximately 1,018 tons.

Vegetation. Livestock grazing gives a competitive advantage to some plants by decreasing the vigor of grazed species. The vigor of these grazed plants would increase in areas of grazing restrictions. The vigor of previously ungrazed plants would decrease. The net effect would be an improvement in ecological condition.

Although the vigor of individual forage species would increase, the increase in density would not be as high for those species that reproduce primarily by seed, since they would not receive the beneficial effect of livestock trampling.

The rate of recovery in low condition areas would be slow because of the lack of rainfall and the poor productivity of soils.

Livestock Grazing. Restricting livestock from grazing 27,000 acres of highly saline soils would decrease available forage by 558 AUMs.

Wildlife. This action would increase forage, water, and cover for nongame wildlife species and allow deer, elk, and antelope populations to remain stable. Aquatic habitat would improve slightly as a result of reduced salinity and sedimentation, but fish populations would not increase as a result of this action.

C-14

Refer to Alternative A, Management Action A-6.

C-15

Wildlife. The reservation of all forage and space for current wildlife populations on the Pear Park (105 deer, 30 elk), Spring Creek (42 deer), and Castle Valley (550 deer) areas would protect winter/spring habitat for deer and elk.

C-16

Soils and Water Quality. Limiting ORV use on 596,234 acres would decrease erosion and sedimentation. Soils derived from Mancos Shale are particularly fragile and susceptible to damage by ORVs, especially when wet. The soils undergo changes in hydration with temperature change, and this contraction and expansion acts as a powerful weathering agent (BLM, 1977c). Because of the fineness of the shale, the rate of water infiltration is so slow that most rainfall runoff carries away the fine soil particles and salts. ORV use aggravates this already poor situation by destroying existing vegetation, disturbing soils, and leaving tracks that provide additional channels for runoff to follow.

Designation of these areas as limited to existing roads and trails would help reduce the annual introduction of an estimated 12,000 to 18,000 tons of sediment and 363 to 548 tons of salt into the Colorado River drainage.

Vegetation. This action would act as a protection device for vegetation.

Livestock Grazing. Forage would remain available to livestock.

Transportation. This designation would decrease the number of new roads and trails currently being established each year. The overall impact would be to decrease future road and trail building and thereby limit access to some of the more isolated areas within the GRA.

Special Designation Areas. This action would protect the scenic values of 596,234 acres which would be placed under restricted ORV use designation. The scenic values of such other potential special designation areas as Wild and Scenic Rivers and parts of a WSA would also be protected.

Visual Resources and Recreation. Protection of the vegetation would help to maintain visual quality and associated scenic recreational opportunities.

C-17

Soils and Water Quality. Closing these areas (24,454 acres) to ORV use would reduce soil erosion and the resultant annual introduction of an estimated 100 tons of sediment into the Colorado River drainage.

Vegetation. There would be an estimated overall 5 percent increase in vegetation, and a sensitive plant, Cycladenia humilis var. jonesii, would be protected from ORV traffic.

Wildlife. This closure would increase wildlife habitat by providing an area unoccupied by humans or vehicles, and free of noise. Harassment by ORVs of wildlife ungulates, especially wintering deer, would not occur. Vegetation utilized as food would increase. The degradation of riparian and aquatic areas such as Negro Bill Canyon would no longer occur. Populations of wildlife ungulates, fish, and nongame species would remain stable or increase as a result of this action.

Transportation. ORV use would be decreased and access into certain areas limited. Roads and trails would be closed, and these access routes would eventually degenerate into impassible routes. The closure would also prevent establishment of new roads and trails. The transportation network within the closed areas would be downgraded.

Special Designation Areas. This action would protect the scenic and recreational values on 24,454 acres of ORV designation areas. These values would also receive additional protection within several WSAs.

Visual Resources. The protection of vegetation would help to maintain visual quality and associated scenic recreational opportunities.

Recreation. The protection of vegetation would help to maintain visual quality and associated scenic recreational opportunities. Opportunities for recreational ORV use would be decreased.

C-18

Soils and Water Quality. Closing duplicate roads and limiting ORV use to designated roads and trails in the Mill Creek area would allow vegetation, as well as the cryptogamic soil surface layer, to become reestablished, reducing soil erosion by approximately 200 tons per year. The subsequent reduction in sedimentation would prolong the useful life of Ken's Lake.

Vegetation. The limitation of ORV use to designated roads and trails would provide a 5 percent increase in vegetation where random ORV activity now occurs (off existing roads and trails).

Livestock Grazing. This action would result in a negligible increase in AUMs, since the vegetation is a low production site.

Transportation. Limitation of ORV use would decrease the transportation system. Seven miles of existing roads would be closed, and new roads and trails would not be established.

Special Designation Areas. This action would protect the scenic and recreational values on 15,206 acres.

Recreation. Designation would decrease opportunities for recreational ORV use.

C-19

Vegetation. The vegetation on these 11,629 acres would be lost to BLM management through disposal of these lands.

Livestock Grazing. Approximately 153 AUMs of forage would be lost to BLM management. Depending on the use of the land after disposal, an exchange-of-use agreement could be made to allow the livestock operator continued use of the forage.

C-20

Refer to Alternative B, Management Action B-10.

C-21 Refer to Alternative B, Management Action B-11.

C-22

Wildlife. Excluding rights-of-way from 130,164 acres (see Figure 2-15) would ensure protection of 48,245 acres of critical bighorn sheep habitat in the Mineral Bottom, Potash, and Westwater areas. Since bighorn sheep are sensitive to human disturbance, this action would protect the existing populations.

Transportation. Transportation would be limited by the requirement to avoid locating rights-of-way within these 130,164 acres, particularly if the requirement blocks the most economical route for a pipeline or other transportation facility.

Special Designation Areas. Excluding rights-of-ways from 130,164 acres would provide additional protection for wilderness values on 89,455 acres of WSAs recommended as suitable for wilderness.

C-23

Soils and Water Quality. Withdrawal of 32,000 acres (about 2 percent of the GRA) from mineral activity would cause only a minor decrease in the acreage disturbed for access roads, placer mining sites, etc. Therefore, the decrease in erosion, sedimentation, and salinity would also be small.

Vegetation. Vegetation would be maintained on the 32,000 acres (presently open to mining claims) that would be closed to mining under this management action. This would represent a minor decrease in the amount of vegetation that is presently being disturbed by locatable mineral activities.

Mineral Rights. The entire GRA would remain open to mining claims except for 1,850 acres of existing withdrawals for protection of campgrounds and scenic sites and 32,000 acres of new withdrawals along the Colorado River for protection of scenic values. Within withdrawal areas, valid existing rights would stand. There are no claims in the 1,850 acre areas, but claims do exist in the 32,000 acre area. Abandonment of a claim, however, would mean that it would be permanently lost to the claimant. No rate of abandonment can be anticipated. This withdrawal would primarily affect some 200 placer gold claims along the river. There are approximately 20,000 claims in the GRA; 500 are for placer gold and the balance for uranium.

C-24 Refer to Alternative A, Management Action A-11.

C-25

Soils and Water Quality. Under the oil and gas category system outlined here, the acreage disturbed would be somewhat less than under current management. But more significant is the allowance for special stipulations (see Appendix R) for development in floodplains (19,040 acres) and areas of high geologic erosion (slopes greater than 50 percent; 414,424 acres). While it is certain that these stipulations would decrease erosion, sedimentation, and salinity, the actual reductions would depend on the development in these areas. Cumulative impacts cannot be quantified at this time.

Vegetation. Approximately 526,000 acres would receive more protection under this management action than under current management; oil and gas activity would continue, and vegetation would be lost, but all this would occur on only about 300 to 450 acres per year.

Livestock Grazing. Forage would be lost on 300 to 450 acres per year. Rehabilitation of disturbed areas would allow for grazing at the current level of use.

Wildlife. The classification of 1.1 million acres as Category 1 for oil and gas leasing could affect deer and elk wintering areas, yearlong bighorn sheep habitat, and yearlong antelope habitat.

The following analysis is based on known and potential oil and gas production areas (see Figures 1-12 and 2-21).

All (200,769 acres) of the deer and elk winter range and fawning and calving areas located within Herd Unit 28-B would be protected by Category 2 special stipulations. This would eliminate physical stress and displacement of deer and elk while they are on the winter range.

Approximately 34 percent (16,873 acres) of the desert bighorn sheep habitat within the Potash, Mineral Bottom, and Westwater areas would be protected under the No Surface Occupancy designation of Category 3 and the No Lease designation of Category 4. Bighorn habitat would not be lost, and bighorn sheep would not be displaced or loss through stress under this leasing category application.

On the remaining 66 percent (32,920 acres) of bighorn sheep habitat that would be designated as Category 1, bighorn sheep losses through stress and displacement could occur.

All of the bighorn sheep habitat (11,420 acres) in the Rattlesnake area would be designated as Category 2. There is a potential for bighorn sheep habitat to be lost and for bighorn sheep to be displaced or lost through stress, since the special stipulations that are applied under this Category 2 designation do not protect bighorn sheep habitat requirements.

Golden eagle nest sites in the Cisco Desert would be protected on the 2,880 acres that would be designated as Category 2 and on the 960 acres that would be designated as Category 3.

Approximately 19 percent (18,391 acres) of the antelope kidding areas in the Cisco Desert would be protected by Category 2 special stipulations. A potential exists for antelope losses to occur through stress and displacement on 81 percent (76,344 acres) of the Cisco Desert antelope habitat designated as Category 1.

On the 7,040 acres of antelope kidding areas in the Hatch Point area, losses through stress and displacement would not occur, since these areas would be under Category 2 protection.

Mineral Resources. Under the oil and gas category system proposed here, between two and five fewer new wells would be drilled than the 150 mentioned under Alternative A. The annual production under Alternative C (from new wells only) is estimated at 19,500 barrels of oil and 560,000 to 960,000 MCF of natural gas.

Transportation. This action would increase by 80,615 acres the amount of land in Categories 3 and 4, which inhibit development. This could result in a decrease in oil and gas activities and a corresponding decrease in road building from the current 75 to 100 miles of road being established each year for oil and gas development.

Visual Resources. The oil and gas leasing category application proposed under Alternative C would provide sufficient protection for existing VRM classes within 22 areas identified as possessing exceptional scenic qualities (See Table 2-9, Alternative C).

Special Designation Areas. The application of oil and gas leasing categories proposed under Alternative C would provide protection under Categories 2, 3, and 4 for the 22 areas identified as possessing exceptional scenic qualities (see Table 2-9, Alternative C). Included would be scenic resources located in WSAs and Wild and Scenic River study corridors. The areas protected would include 89,455 acres in WSAs recommended for preliminary wilderness suitability, and 65 miles of the Colorado and Dolores river study corridors. Protecting the scenic resources and associated natural qualities would help to preserve eligibility for designation.

- C-26 Refer to Alternative A, Management Action A-13.
- C-27 Refer to Alternative A, Management Action A-14.
- C-28 Refer to Alternative A, Management Action A-15.
- C-29 Refer to Alternative B, Management Action B-20.
- C-30 Refer to Alternative A, Management Action A-16.
- C-31 Refer to Alternative A, Management Action A-17.
- C-32 Refer to Alternative A, Management Action A-18.
- C-33 Refer to Alternative A, Management Action A-19.
- C-34 Refer to Alternative A, Management Action A-20.
- C-35 Refer to Alternative A, Management Action A-21.
- C-36 Refer to Alternative A, Management Action A-22.
- C-37

Recreation

The designation of 1,375 acres of Negro Bill Canyon as an ONA would serve to identify it and attract attention to it. As a result, visitation and recreational use would increase, since the public would be aware of the area.

- C-38 Refer to Alternative B, Management Action B-28.

Soils, Water Quality, and Air Quality. The impacts of prescribed fire and seeding on soil, water quality, and air quality would be the same as those described under Management Action B-28.

Vegetation. Since this prescription includes seeding of sites after a prescribed fire, and since the sites (Appendix T) have been selected for their potential for success, the impact would be an increase in desirable vegetation over the long term. The initial impact would be a loss of existing vegetation, but grasses and herbaceous species would dominate within 2 to 3 years. Later, as the site progresses in ecological stages, sagebrush (in 10 to 15 years) and pinyon-juniper (in 20 to 25 years) would begin to dominate.

Livestock Grazing. Because these areas are unproductive, they are not being grazed by livestock; therefore, there would be no short-term impact to livestock. The long-term effect of prescribed fires on these 11 allotments would be an increase in livestock forage of 1,039 AUMs.

Wildlife. Forage for wildlife ungulates and nongame birds and mammals would be increased by 731 AUMs, and populations of deer and elk would increase as a result of this action (see Appendix T)

Recreation. The increase in populations of deer and elk would result in an increase in recreational hunting activities.

Soils and Water Quality. The recommendation of suitability for wilderness designation could minimize surface disturbing activities in WSAs, such as ORV use and road development, which would decrease onsite erosion and sediment damage. The significance of this decrease would be proportional to the amount of activity or disturbance that would occur if this designation were not placed on the area.

Wildlife. Wilderness management of Behind the Rocks WSA and parts of Westwater and Desolation Canyon WSAs would eliminate ORV use, which disturbs bald and golden eagles, peregrine falcons, other raptors, and bighorn sheep. Populations of these species (where present) would remain stable.

Mineral Resources. Because of rough topography there is a lack of data from exploratory drilling. Therefore, a judgment as to impact on uranium development cannot be given, for the Behind the Rocks WSA. The Desolation Canyon WSA has been identified as an area of substantial potential for the presence of oil and gas resources. It must be emphasized that there has been no production from the area as of this date. It can be stated that designation of the Desolation Canyon WSA as wilderness could limit oil and gas exploration and development. No numerical estimate of lost production is feasible.

Special Designation Areas. This recommendation could lead to the designation of 89,455 acres as wilderness.

ECONOMIC IMPACTS OF ALTERNATIVE C, LIMITED PROTECTION

Economic impacts of the management actions proposed in Alternative C are discussed below as they relate to the planning issues. The methodologies and computations that were used to estimate economic impacts are discussed in Appendix V.

ECONOMIC IMPACTS RELATED TO CRITICAL WATERSHED MANAGEMENT

C-2, C-3, C-10, C-13, C-16, C-17, C-18

Reducing the amount of sediment that originates in the GRA would increase the electrical production, flood control, recreation, and water storage values of Lake Powell and reduce the maintenance costs of small livestock reservoirs downstream from the points of erosion. Reducing the salt pickup by water originating in and passing through the GRA's critical watershed areas would reduce the costs associated with the use of saline water in the Lower Colorado River Basin. There would be a loss of value whenever a management action reduces the amount of water that enters the Colorado River.

Value estimates for those management actions where significant changes in water yield, sedimentation, and salt loading could be quantified are presented in Table 4-3. Because these values would be realized by numerous water users, the management actions would have a negligible impact on any particular water user. The benefits of preserving soil productivity could not be quantified.

TABLE 4-3

Salinity and Sediment Economic Benefits
of Various Watershed Management Actions (in 1981 Dollars)

Management Action	Years to Benefits	Life of Project	Annual Value			Annual Value Loss from Decreased Water Yield
			From Decreased Sedimentation of Lake Powell	From Decreased Salinity ^a	From Decreased Salinity ^b	
C-2	1	12	\$54	\$260,000	\$200,000	\$34,000
C-3	1	^c --	0	157,000	120,000	13,000
C-10	3	^c --	62	212,000	162,000	N/A
C-13	3	^c --	11	52,000	39,000	7,000
C-16	10	^c --	5 to 7	18,390 to 27,762	14,000 to 21,000	N/A

^aIncludes indirect and induced impacts as calculated by the Bureau of Reclamation.

^bDoes not include indirect and induced impacts as calculated by the Bureau of Reclamation.

^cThe life of the project would be infinite.

Source: BLM

The oil and gas category system under Alternative C would afford greater protection to local water users from water contamination. Water-based recreation along Mill Creek and Thompson, and agricultural water diversions along Floy, Diamond, Cottonwood, Nash, and Westwater washes would have greater protection from surface water contamination. Culinary water depends upon spring and well water, which at most requires chlorination. These water sources would be afforded greater protection under Alternative C. Contamination of these water sources would either force communities to use more chlorine to treat the water or, if certain water quality thresholds are exceeded, to find new water sources.

ECONOMIC IMPACTS RELATED TO LIVESTOCK GRAZING

C-5, C-6, C-7, C-8, C-9, C-10, C-11, C-13, C-19, C-38, C-39

These quantifiable management actions would affect either the amount of forage or the time of its availability to livestock operators. This in turn could affect ranchers' income, wealth, and ability to obtain loans, with some spinoff income and employment effects through the local economy.

Under Alternative C, none of the 31 independent cattle operators would in the long run have less available forage than their existing use. In the short term, two operators would, on the average, have 30 percent more available forage, and two operators would, on the average, have 2 percent less available forage. In the long term, vegetation manipulation and land treatments would provide 19 percent more forage for 16 operators. If this forage is grazed, cattle operators would realize an added \$96,250 in returns above cash cost, a 12 percent increase over what these operators now earn.

Under Alternative C, one sheep operator would have a short-term increase of 23 percent in available forage, and 3 operators would have a 13 percent short-term decrease in available forage. In the long term, two operators would have 16 percent less available forage, resulting in a \$25,250 decrease in revenue above cash cost, 12 percent less than what these operators now earn. In the long term, eight of the 14 sheep operators would, on the average, have 26 percent more available forage than their existing use. If the added forage is grazed, sheep operators would realize an added \$31,933 in returns above cash cost, a 3 percent increase over what these operators now earn.

Changes in season of use would also affect rancher's income. The spring (March through May) exclusions of livestock would be of particular concern to livestock operators, since they have few options with which to respond to these exclusions.

The spring exclusions would also force sheep operators who had been lambing on public land to lamb on their base property. Most operators can either purchase feed to replace the lost forage, shift forage that is normally used in other months to this period, or reduce herd size so that forage produced from the base property will last longer.

Replacing lost forage with purchased hay should represent a worst-case analysis. Feeding hay during the spring may adversely affect weight gains and reduce gross revenues. If the hay is fed on alfalfa-producing property during the spring, alfalfa yields may be affected, and bloating problems may arise. However, all of the spring exclusions in Alternative C

extend the available use of the GRA forage during some other season. In some cases, it may be possible to shift forage normally used during these other seasons (mostly winter) to the excluded period in spring. In addition, base properties could increase alfalfa production, which is significantly less expensive than purchasing the hay. Also, reducing the herd size is usually a more economical response to spring exclusions than are hay purchases (Godfrey, 1981).

Under Alternative C, six of the 31 cattle operators would be excluded from using GRA forage during the spring, thereby losing the spring use of approximately 117 AUMs. The cost of replacing this forage with alfalfa purchased at \$75 per ton would be \$2,945. Including these change of season impacts, these cattle operators could realize a loss of up to 2 percent in returns above cash costs.

Sheep operators are affected by spring exclusions to a much greater extent. Six of the 14 sheep operators would receive significant spring exclusions, thereby losing the use of approximately 2,639 AUMs during the spring. The cost of replacing this forage with alfalfa purchased at \$75 per ton would be \$65,975. Including these change of season impacts, these sheep operators could realize a loss of up to 9 percent in returns above cash costs.

Under Alternative C, total cattle herd size could increase by 13 percent, and total sheep herd size could increase by 1 percent, which implies an aggregate increase in ranch value. However, two sheep operators would have less available forage, resulting in an estimated 7 percent reduction in their ranch carrying capacity, which implies a reduced ranch value.

Any decrease from active preference could impact an operator's wealth. Under Alternative C, total long-term grazing privileges would be reduced by 32,411 AUMs from active preference. At a market value of \$60 per AUM for BLM grazing permits, total operator wealth could decline by as much as \$1,944,660, a 6 percent base property value reduction.

Because aggregate rancher income is expected to increase under this alternative, most ranchers' ability to repay a loan should also increase. Several sheep operators would realize a long-term decrease in net revenue, and their ability to repay loans should thereby decrease.

The aggregate short-term and long-term rancher impacts from changes in available forage and season of use are summarized in Table 4-4. The figures in Table 4-4 represent a worst-case analysis. The overestimation of negative income impacts should be most noticeable for the sheep group, as cattle operators were not significantly affected by changes in season of use.

Under Alternative C, the 22 independent cattle operators residing in the GRA would earn an added \$97,223 (+23 percent) in returns above cash costs. Increased rancher income and herd size would also have indirect and induced local employment and income effects. Under this alternative, long-term regional income and employment due to livestock operators in the GRA would increase by \$156,785 (+0.3 percent) and seven jobs (+0.2 percent) (refer to Table 4-5).

TABLE 4-4

Summary of Short-Term and Long-Term Economic Impacts
to Livestock Operators under Alternative C

	Current Situation	Short Term	Long Term
<u>Cattle Operators</u>			
Gross Revenue	\$1,962,085	\$1,990,472	\$2,077,798
Total Cash Cost	1,038,598	1,044,309	1,061,006
Returns Above Cash Cost	923,487	946,163	1,016,792
Returns to Labor and Investment	482,876	504,378	571,338
<u>Sheep Operators</u>			
Gross Revenue	\$2,367,988	\$2,330,227	\$2,389,712
Total Cash Cost	890,974	916,092	940,697
Returns Above Cash Cost	1,477,014	1,449,015	1,449,015
Returns to Labor and Investment	1,239,055	1,084,835	1,178,884

TABLE 4-5

Impact Area's Income and Employment Due to Livestock Operators
in the Grand Resource Area under Alternative C

	Existing		Alternative C	
	<u>Employment</u> (Jobs)	<u>Income</u> (Dollars)	<u>Employment</u> (Jobs)	<u>Income</u> (Dollars)
Agriculture	26	\$537,325	31	\$ 657,923
Retail and Services	9	177,043	10	200,180
Other	<u>6</u>	<u>160,345</u>	<u>7</u>	<u>173,394</u>
	41	\$874,713	48	\$1,031,497

Source: Gee, 1982; USFS, 1982.

ECONOMIC IMPACTS RELATED TO WILDLIFE

C-5, C-6, C-7, C-8, C-10, C-11, C-12, C-14, C-15, C-22, C-38, C-39

See Economic Impacts Related to Recreation

ECONOMIC IMPACTS RELATED TO OFF-ROAD VEHICLE DESIGNATION

C-16, C-17, C-18

ORV limitations and closures would have little impact on activities that normally require BLM authorization, since authorized activities are exempt from ORV limitations and closures. Activities that do not normally require BLM authorization (prospecting, surveying, rancher ORV use) would, however, require such authorization for ORV travel in limited and closed areas. Authorization would require greater time and planning by the BLM and those involved in the impacted activities. Significant delays could affect the economics of some activities, with resulting impacts to local sales, income, and employment. Under Alternative C, 35 percent of the GRA would be under ORV closure or limitation. Depending upon the delay, the size of the ORV limitations and closures could significantly affect those activities requiring ORV travel that do not normally require BLM authorization.

See Economic Impacts Related to Recreation and Critical Watersheds.

ECONOMIC IMPACTS RELATED TO LANDS ACTIONS

C-19

The likely methods of disposing of public lands under Alternative C include:

- | | |
|----------------|-------------|
| 1. Sales | 9,498 acres |
| 2. R&PP Leases | 1,820 acres |
| 3. Exchanges | 320 acres |

Refer to Alternative B, Economic Impacts Related to Lands Actions, Management Action B-9 for an analysis of the economic impacts of lands disposal on local government revenues and private land prices.

C-20

Refer to Alternative B, Economic Impacts Related to Recreation, Management Action B-10.

ECONOMIC IMPACTS RELATED TO UTILITY CORRIDOR DESIGNATION

C-22

The 130,164 acres of avoidance and exclusion areas involve 6 percent of the GRA. The avoidance and exclusion requirements could lengthen the construction and employment duration of some major rights-of-way, which would result in a short-term increase in local employment and income. Added construction time would increase cost which, if significant, could deter the location of a major right-of-way through the GRA.

ECONOMIC IMPACTS RELATED TO MINERALS

C-23, C-25

Mineral withdrawals should not affect uranium production. Withdrawals along the Colorado

River would prevent new gold production. This alternative would also increase the acreage under the more restrictive oil and gas leasing categories.

Greater planning and coordination are required for oil and gas activities in Category 2 areas, particularly because of seasonal restrictions for wildlife and critical watersheds. Activities in Category 3 areas require directional drilling, which has technological limitations, requires more time to achieve a given depth, and uses specialized equipment and techniques which are more expensive.

The greater cost associated with leasable mineral activities in Category 3 and some Category 2 areas would deter some of these activities from taking place. However, since activities under these categories are more expensive, those that do take place would make greater contributions to local sales, income, and employment. The total exclusions under Category 4 could only decrease the local contribution made by oil and gas activities. Using the decreased oil and gas drilling estimates given earlier (refer to the analysis of environmental impacts under Alternative C, Management Action C-25) it is estimated that eventually there would be two to five fewer jobs (-0.1 percent) and \$35,000 to \$85,000 less wages, salaries, and proprietors' income in the GRA. Future gold production and related employment and income would also be affected. However, gold production accounts for few local jobs, and even a significant impact to this sector would have little impact on the local economy.

Royalties from the decreased oil and gas production would give the State \$70,000 less revenue.

See also Economic Impacts Related to Recreation (C-23, C-25) and Critical Watersheds.

C-40

There is some uncertainty as to the potential for mineral development in the WSAs. Significant mineral production within 20 years is not expected from either Westwater Canyon or Behind the Rocks WSA, even without designation. Designation of the Desolation Canyon WSA as wilderness could have some impact on future mineral related employment opportunity. Although the future mineral related employment foregone with designation is expected to be small and locally insignificant, local economic impact estimates are speculative, as the presence of mineral resources and the future economic and technologic conditions are uncertain.

ECONOMIC IMPACTS RELATED TO RECREATION

C-5, C-6, C-7, C-8, C-10, C-11, C-12, C-14, C-15, C-22, C-38, C-39

These management actions would contribute to projected big game population increases, which would result in higher hunter success rates. The distance hunters must travel and hunter success rates have been found to be the primary determinants of hunter pressure on deer herds in Utah (Wennergren, et al., 1973). Higher success rates would encourage more hunters to hunt in the GRA. Assuming that population/harvest and harvest/hunter ratios would remain constant, projected hunter pressure and expenditures would increase local income by \$190,000 and employment by seven jobs (USFS, 1982).

To draw the greater hunter pressure, hunter success rates would have to be higher than the existing success rates. Since it was assumed that success rates would remain constant, the real increase in local income and jobs would be somewhat lower.

Increased nonconsumptive use of wildlife is not expected to draw more visitors and related expenditures to the area.

C-16, C-17, C-18

The ORV restrictions and closures would reduce recreational ORV travel. However, the majority of ORV users who visit the area travel along existing roads and trails. Also, much of the restricted acreage is in areas of low recreational ORV use. These restrictions and closures would therefore have little if any recreation related local economic impact. The quality scenic, camping, and primitive nonmotorized recreation opportunities would be preserved or improved in several locally important recreation resources. The ORV restriction in Negro Bill Canyon should help preserve the existing commercial horseback use of the canyon and allow the trend toward increasing commercial use to continue.

C-23, C-25

The Colorado River corridor and the Westwater Canyon and the Behind the Rocks WSAs would be closed to locatable and leasable mineral activities under Alternative C. The Colorado River corridor, including the Westwater WSA, is of local economic importance. The Behind the Rocks visual resources are viewed by a locally significant number of tourists and have a high potential for commercial and greater private use. Leasable mining activities would also be controlled in several other recreation areas. Preventing degradation of these recreation resources would allow the trend toward increasing recreation use to continue, benefiting commercial outfitters and other tourist related businesses. The significance of these management actions to the tourist industry cannot be quantified.

C-28, C-29, C-30, C-31, C-32, C-33, C-34, C-35, C-36

Refer to Alternative B, Economic Impacts Related to Recreation, Management Actions B-19 through B-27.

C-37

Designating Negro Bill Canyon as an ONA would increase public awareness of this area and could result in some minor increased recreation use and related local expenditures. Designation could also increase the demand for commercial outfitters' services through the area.

C-40

Designation of Behind the Rocks WSA and parts of Westwater and Desolation Canyon WSAs as wilderness would preserve the quality of primitive nonmotorized recreation opportunities available in these areas. Westwater WSA receives significant private and commercial use and is a locally important recreation resource. The visual resources of Behind the Rocks WSA, which would be preserved under Alternative C, are viewed by a locally significant number of tourists. Increased public awareness that could result from designation could

also bring about an increase in private and commercial use of the area. A probable visitation rate of between 0.1 and 0.5 visitor days per acre in the Behind the Rocks WSA would contribute an estimated \$4,000 to \$8,000 annually to local income. By increasing public awareness, designating the Desolation Canyon WSA as wilderness could result in some minor increase in the demand for commercial outfitters who float Desolation Canyon, which forms the 6 to 7 mile western boundary of the WSA. Designation would also improve the chances that commercial horseback trips would become established in the WSA. Due to user constraints through Desolation Canyon, access, and site characteristics, private use and related local expenditures are not expected to increase significantly.

ECONOMIC IMPACTS RELATED TO FIRE MANAGEMENT

C-38

Refer to Alternative B, Economic Impacts Related to Fire Management, Management Action B-28.

C-39

The prescribed fires would benefit 11 livestock operators. If the added forage is grazed, these livestock operators would realize an estimated additional \$8,000 in returns above costs (+1.1 percent), which would generate an added \$3,636 in local indirect and induced wages, salaries, and proprietors' income.

ECONOMIC IMPACTS RELATED TO WILDERNESS

See Economic Impacts Related to Minerals and Recreation.

SOCIAL IMPACTS OF ALTERNATIVE C, LIMITED PROTECTION

None of the management actions would affect the existing social environment of communities in the area. This alternative would place greater restrictions on livestock use, ORV use, and mineral activities. Except for several livestock operators and future gold miners, there would be few impacts to the social well-being of individuals or groups. In fact, several groups (hunters, primitive nonmotorized recreation users, commercial outfitters, and the retail service industries that cater to tourism) could benefit significantly under this alternative. However, this alternative would probably be perceived by most residents as having a significant negative impact upon the local community.

In general, local attitudes toward BLM would probably worsen because of the increased restrictions and less local resource use and development that would be allowed. These attitudes would vary, however, by those individuals and groups who would gain and those who would lose under this alternative. Refer to the Economic Impacts section for identification of losers and gainers under this alternative.

D-1 Refer to Alternative A, management Action A-1.

D-2

Soils and Water Quality. Soil erosion would be reduced in areas of active erosion. Areas of gully and rill erosion can be stabilized, and gully plugs may be used to reduce the upward extension of the gully system. The salinity control treatments that would be implemented on 93,000 acres of highly saline soils would trap 759 acre-feet of runoff and 319,920 tons of sediment, reducing the salinity contribution to the Colorado River system by approximately 11,666 tons (see Appendix D).

Vegetation. Because of the nature of the associated soils, impacts to vegetation would be confined to within 2 or 3 feet of the structures themselves. There would be a slight increase in vegetation in this immediate area. A recent (September 1982) field observation of existing structures in the same area showed an increase in rubber rabbitbrush and snakeweed, with hardly any difference in grass species. Near those structures where crested wheatgrass seed had been broadcast, there was a definite increase in the number of plants that survived, as a result of the water held by the structures.

D-3 Refer to Alternative C, Management Action C-3.

D-4

Soils and Water Quality. Specific vegetation manipulation practices and land and watershed treatments have not been described, nor have their locations been identified; therefore, definite impacts cannot be anticipated at this time. However, a short-term impact to soils and vegetation would occur through any initial surface disturbance. A long-term increase in vegetation and resultant decrease in erosion, sedimentation, and salinity could be expected to occur from any watershed treatments.

Vegetation. A long-term increase in vegetation would occur, but cannot be quantified at this time because specific vegetation manipulation practices and land and watershed treatments have not been described, nor have their locations been identified.

Livestock Grazing. Depending on the type and method of watershed and vegetation treatment, livestock forage would increase to some degree. No quantification can be made at this time.

Wildlife. Implementing vegetation manipulation and land treatments on three critical watershed subbasins (630,200 acres) would increase forage, water, and cover for nongame birds and small mammals. Nongame bird and small mammal populations would increase, and wildlife ungulate populations would increase as a result of this action.

D-5

Soil and Water Quality. Continuation of present livestock management practices on 34 allotments would impact soil through surface disturbance, soil compaction and water

infiltration, and changes in ground cover. Since these factors influence the erosion rate and sediment yield, erosion rates and trends would continue at present levels. Decreases in soil erosion generally follow increases in production of vegetation and improvement in ecological condition, although soil changes lag behind plant changes (USDA, 1976). Maintaining the present medium to high ecological condition would allow soil loss values to remain at or below the T value. Areas of high geologic erosion are generally in critical erosion condition. These soils occur on slopes greater than 50 percent and are in medium or high ecological condition.

Vegetation. Continuation of current livestock management on 34 allotments (Appendix K) would affect ecological condition (Appendix I). Much of the area that is not grazed during critical growing periods is in high or climax condition at present. These sites would continue in high or climax condition. On other sites, since present ecological condition results partly from past livestock use, present management at the level of the past 5 years' average use (see Management Action A-5) would maintain ecological condition in most instances. Some sites that receive substantial livestock use would decline in ecological condition as desirable forage plants are replaced by undesirables that are not components of the site in upper seral stages. See Appendix I for present ecological condition of each allotment, and Appendix K for listing of specific allotments that would continue under present management.

Livestock Grazing. Maintaining the present ecological condition would maintain the present forage yield and enable livestock grazing to continue at current levels.

Wildlife. Continuation of present livestock management on 34 allotments would not affect wildlife ungulates on 28 of these allotments; however, on the remaining six allotments, there would be some habitat concerns.

On the Blue Hill Allotment, the deer population is stable to increasing, and the elk population is increasing. However, this allotment has been identified as an area of potential for competition with livestock. Since reproductive success and fawn or calf survival depend largely on the condition of the female animal when she leaves the winter/-spring range, forage quality and quantity must be sufficient to support these herds through the winter and spring (Wallmo, 1981; Kerr, 1979). Threshold levels for livestock and elk competition problems are unknown.

Bighorn populations are increasing, and they would continue to increase until threshold levels are reached.

There is a potential for desert and Rocky Mountain bighorn sheep to compete with domestic sheep and cattle for forage and space on the Arth's Pasture, Big Flat-Ten Mile, Little Hole, and Rattlesnake allotments. Specific evidence, documented by several researchers, indicates that livestock compete directly with bighorn sheep for food, space, and water (BLM, 1981c)

Domestic sheep could also transmit parasites and disease to bighorn sheep on the Big Flat-Ten Mile, Little Hole, and Rattlesnake allotments. Threshold levels for livestock and bighorn sheep competition and parasite and disease transmission are unknown.

Under current management, antelope populations would decrease on the Windwhistle allot-

ment. Drought, severe winter weather, predation, and marginal or unsuitable habitat conditions have contributed to the presently decreasing population trend.

D-6

Soils and Water Quality. Livestock manipulation techniques would reduce runoff, sediment, and salt by 15 percent after 15 years (BLM, 1977c). Improving low to medium ecological condition in overuse areas would reduce sediment and potential salt loads by 15 to 45 percent. Improving overuse areas to high ecological condition would reduce sediment and potential salt loads by 30 to 65 percent. Reduction estimates were derived by comparing universal soil loss estimates for saline-alkali soils (Appendix C).

Vegetation. It is estimated that perennial forage plans would increase by 5 to 25 percent. Water developments may improve livestock distribution and thus improve ecological condition in previous heavy use areas. A plant's health and survival depend on its abilities to synthesize and store food, form vegetative structures for renewal of top growth, maintain a healthy root system, and develop reproductive organs (Stoddart, et al., 1975). Grazing, through removal of photosynthetic leaf tissue, interferes with these processes. Systematic grazing management is designed to offset these impacts by providing rest.

Livestock Grazing. Fences, water developments, and rotation of grazing use areas would have a greater impact on cattle than on sheep, because cattle are social animals and creatures of habit. Any significant change in their habitual use patterns through concentration, change in season of use for a particular use area, or change in pasture would have a short-term impact on their well-being and productive capacity.

Concentration of livestock would reduce the opportunity for selective grazing and cause them to utilize less palatable forage plants. Their initial response to concentration in a single grazing unit would be to walk the fences, spending less time grazing; this would result in weight loss, potential reduction in calf crop percentage, lighter calves, and possibly a longer period of adjustment to the seasonal movement of livestock. However, as cattle become adjusted to the periodic pasture changes, and replacement animals remain in the herd, the potential for improved production in terms of calves and pounds of beef would be enhanced because of the increased forage production as a result of grazing systems and because new areas of the allotment could be used if waters are developed.

Wildlife. This action would improve water and cover and reduce spatial competition for wildlife ungulates. Deer populations would remain stable to increasing, elk populations would continue to increase. Antelope population trends for the Hatch Point herd (Herd Unit 12) cannot be anticipated, since this herd currently has low numbers and is in a downward trend. The decreasing trend is attributed to drought, severe winter weather, predation and marginal or unsuitable habitat conditions.

Implementation of livestock management techniques would increase yearlong forage, provide additional water, and reduce spatial competition of bighorn sheep on the Hatch Point and Ten Mile Point allotments. Bighorn sheep populations are expected to continue to increase as a result of reduced spatial competition and increased forage availability (BLM, 1981c).

Winter/spring forage would be increased through managing for a subclimax seral stage on

the following allotments for the species indicated: Floy Creek, deer; Hatch Point, deer, elk, antelope, and bighorn sheep; Horse Canyon, deer; Lisbon, deer, elk, and antelope; Nash Wash, deer; Professor Valley, deer and elk; Steamboat Mesa, deer and elk; and Ten Mile Point, bighorn sheep.

Implementation of livestock manipulation techniques (see Appendix K) on 11 allotments (22 percent of the GRA) would improve water and cover and reduce spatial competition of wildlife ungulates.

D-7 Refer to Alternative A, Management Action A-4.

D-8

Soils and Water Quality. Plowing and seeding would reduce plant cover and lead to localized short-term erosion, but in the long term, soil erosion would be reduced as ground cover increased. Grass and browse species would become established, holding the soil in place and increasing water infiltration, thus reducing soil erosion and improving water quality. Chaining would cause short-term surface disturbance and the uprooting of trees, possibly increasing soil loss by one-half ton per acre. Buckhouse and Gifford (1976) studied areas in southern Utah that received this treatment and found that sediment yield did not increase if the debris was left in place. In the long term, sediment yield would be reduced even more as ground cover increased. Drill seeding would not increase sediment yield or surface runoff, since the existing vegetation cover would not be removed, and soil disturbance would be localized and minimal. In the long term, since previously bare soil spots would be covered by vegetation, sediment yield and surface runoff would be reduced, decreasing suspended solids in stream water.

Vegetation. A short-term decrease in vegetation would occur on the 68,105 acres of chaining, plowing, and seeding, but within 2 to 3 years, the land should produce a greater quantity of forage and a greater variety of species than before treatment, although reinvasion of pinyon-juniper and sagebrush would occur. The useful life of chainings and seedings is generally 20 to 30 years (Tueller and Tausch, 1973).

Livestock Grazing. On the average, implementation of land treatments would decrease forage for the first 2 years, until the seeded species become established. Livestock would be restricted from using these areas, most of which are now being grazed to some extent. Disturbance of grazing habits might cause a negligible decrease in weight gain, depending on the amount of movement necessary to keep livestock off the area for 2 years.

The long-term impact would be an increase on 3,503 AUMs for livestock. Since most of the treatment areas would be grazed in the spring, the long-term increase in amount and quality of forage would increase weight gain and calf crop percentage.

Wildlife. Implementation of land treatments on 13 allotments (see Appendix K) would provide an additional 5,011 AUMs of winter/spring forage for deer, elk, and antelope, allowing their populations to remain stable or increase.

D-9

Soils and Water Quality. Authorization of grazing use at present levels would result in

continued surface disturbance and plant defoliation. Both these factors increase susceptibility to erosion and related sedimentation.

The current degree of impact (cumulative soil loss estimate) for these allotments is unknown. However, it is assumed that medium or high ecological condition would minimize soil loss estimates and keep soil loss below the T value.

Vegetation. On the 616,267 acres that are in high and climax condition, no significant impact to vegetation would occur. On the 923,383 acres that are in low to medium condition, vegetation would probably decline even further. Other proposed management actions, such as livestock manipulation techniques, would lessen the impact.

Livestock Grazing. The future AUMs shown in this management action represent the total of changes that would result from all actions under Alternative D. Impacts are analyzed in the narrative for each of these actions.

Wildlife. Continued authorization of grazing use at present levels would cause some habitat concerns for wildlife ungulates on six allotments.

On the Blue Hill Allotment, deer populations would remain stable to increasing and elk populations would increase.

There is potential for competition between livestock and bighorn sheep on four allotments (Arth's Pasture, Big Flat-Ten Mile, Little Hole, and Rattlesnake), primarily during the winter and early spring (see Appendix I for seasons of use and species overlaps).

Antelope populations would decrease on the Windwhistle Allotment. The decreasing trend is attributed to drought, severe winter weather, predation, and marginal or unsuitable habitat condition.

D-10

Soils and Water Quality. Changing the season of use on Barley Flat-Ronzio, Bar-X, Bogart, Cisco Mesa, Cisco Springs Wash, Corral Wash, Diamond, Floy Canyon, Harley Dome, Highlands, Mineral Point, Monument Wash, Pipeline, San Arroyo, South Sand Flats, Sulphur Canyon and Whipsaw Flat allotments would result in anticipated reduction of 3,192 acre-feet in runoff; 209,683 tons in sediment; and 6,484 tons in salt delivered to the Colorado River in 3 years. These estimates were derived using an averaged 30 percent reduction of the existing runoff, sediment, and salt yields, by allotment (Appendix C).

Vegetation. The proposed season of use changes would improve the condition of desirable forage areawide. The start of the growing season is the most critical time for the plant. Grazing at this time, particularly on arid ranges, is detrimental to the plant (Stoddart, et al., 1975), and repeated spring grazing is damaging (Holmgren and Hutchings, 1972).

Studies conducted (Cook, 1971) in western Utah on ranges similar to those in the planning area have shown that there is an interrelationship between season of use and intensity of harvesting vegetation by grazing. These studies found, without exception, that excessive spring grazing reduced twig length in browse and number of seed stalks in grasses and caused a larger portion of the plants in each species to die. Clipping in the spring caused about 89 percent more death loss of plants and about 54 percent greater crown

reduction in living plants than did harvesting in other seasons. There were no significant differences among the average death losses from fall, early winter, and late winter harvesting.

Most of the season of use changes would result in protection for the plants during the critical period beginning mid to late March. (Phenology studies conducted from 1978 through 1981 show this to be the date throughout the majority of the GRA.)

A change in season of use on summer grazing allotments would allow the forage plants to begin building their carbohydrate reserves before grazing begins in June.

Livestock Grazing. Changing the season of use to restrict spring grazing on 17 allotments would significantly decrease the livestock program. Spring forage provides more nutrition than forage grazed during any other season of the year (Cook, 1971), and nutritious forage is critical to gestation and lactation, which take place during the spring. The individual animals would not have access to this spring forage. (Impacts of this action are discussed further under Economic Impacts, Alternative D, Protection).

Wildlife. This action would restrict livestock use of winter/spring forage, allowing antelope and bighorn sheep populations to remain stable or increase as a result of improved habitat (BLM, 1981c; BLM, 1970). Bighorn sheep compete for forage and space on the Harley Dome and Mineral Point allotments. Antelope compete with livestock for spring forbs on the Bar-X, Cisco Mesa, Cisco Springs Wash, Corral Wash, Harley Dome, Pipeline, San Arroyo, and Sulphur Canyon allotments.

The restriction of livestock grazing through a change in the season of use would help to improve aquatic and riparian habitat toward a climax ecological condition in the Diamond allotment.

D-11

Vegetation. A change in the class of livestock from sheep to cattle would decrease the vigor and production of grasses because of increased grazing pressure. There would be a comparable increase in the vigor of browse species.

Livestock Grazing. With a change in class of livestock on the Buckhorn and Hatch Point allotments, 4,374 AUMs presently used by sheep would be converted to cattle. The number of AUMs that would be available for cattle is unknown at this time, since the conversion rate would have to be determined from inventory data for the particular allotments. For Appendix K, 4,374 AUMs will be shown.

Wildlife. Changing class of livestock from sheep to cattle on the Buckhorn and Hatch Point allotments (9 percent of the GRA) would help to prevent competition with wildlife for winter and spring forage if the sheep AUMs were to be activated. Domestic sheep compete with deer and elk on the Buckhorn Allotment (BLM, 1970) and with antelope on Hatch Point Allotment. Deer, elk, and antelope populations would increase as a result of this action.

D-12

Soil and Water Quality. Managing perennial streams by fencing or rotation of grazing use

would control grazing of vegetation that is useful to stream protection. This existing streamside vegetation is valuable to the aquatic environment because it reduces water temperatures, provides natural cover, increases terrestrial food, reduces sediment and runoff, and reduces debris movement.

Vegetation. Rest from grazing would improve the condition of riparian vegetation. But spring rest alone has little effect in riparian areas, because any increase achieved can be nullified when grazing is resumed and cattle congregate along the stream bottoms (Martin, 1973). With only periodic rest, any increase in desirable forage species may be offset by a decrease in undesirables, with no resulting gain in ground cover.

Livestock Grazing. Livestock would be denied use of these areas during certain periods of time. As forage conditions improve over the long term, livestock would benefit.

Wildlife. Management of 2 miles of perennial stream on the Diamond and Cottonwood allotments by fencing and rotation of grazing use areas would restore and improve riparian and aquatic habitat that has been degraded by concentrations of livestock along these drainage bottoms. These concentrations have also resulted in the degradation and loss of habitat for fish and nongame birds and mammals. This action would allow vegetation to become established and stream banks to stabilize. As a result of the improved habitat, populations of fish and nongame birds and mammals would increase; deer populations would remain stable.

D-13

Soils and Water Quality. Restriction of livestock grazing from 50,000 acres of highly saline soils would reduce sediment by 51,767 tons per year within 3 years. Assuming that 3 percent of this sediment is salt (BLM, 1977c), there would be an annual reduction of 1,553 tons in the salt load to the Colorado River. There would also be a reduction of 122 acre-feet in runoff, reducing salt load to the Colorado River by another 333 tons per year. The total salt reduction would be approximately 1,886 tons.

Vegetation. Livestock grazing gives a competitive advantage to some plants by decreasing the vigor of grazed species. The vigor of these grazed plants would increase in areas of grazing restrictions. The vigor of previously ungrazed plants would decrease. The net effect would be an improvement in ecological condition.

Although the vigor of individual forage species would increase, the increase in density would not be as high for those species that reproduce primarily by seed, since they would not receive the beneficial effect of livestock trampling.

The rate of recovery in low condition areas would be slow because of the lack of rainfall and the poor productivity of soils.

Livestock Grazing. Restriction of livestock from grazing 50,000 acres of highly saline soils would decrease available forage by 1,099 AUMs.

Wildlife. Restriction of livestock grazing (Appendix K) from portions of 19 allotments (50,000 acres) would increase forage, water, and cover for nongame wildlife species. Antelope populations would remain stable.

D-14

Soils and Water Quality. Restricting livestock from three riparian areas would decrease soil disturbance and increase riparian vegetation along the streams, which would in time decrease channel bank erosion, improving the overall quality of the drainageways.

Vegetation. This management action involves fencing off a total of 3 miles of riparian vegetation. The fencing would act as an enclosure for livestock. The resulting increase in vegetation would be more dramatic than when only periodic rest from livestock grazing is allowed. In areas where this livestock restriction applies, ecological condition would improve rapidly (Dahlem, 1979).

Livestock Grazing. Fencing of these riparian areas to exclude livestock would result in the loss of 3 AUMs. Livestock would have to graze around these areas and water at either end of the enclosures (the greatest distance would be 0.5 mile).

Wildlife. Restriction of livestock grazing from three riparian areas on the Showerbath, Floy Canyon, and South Sand Flats allotments would allow restoration and improvement of the riparian and aquatic habitat, where livestock grazing has resulted in loss of fish and wildlife habitat. The exclusion of livestock would allow vegetation to become established and stream banks to stabilize. As a result of improved riparian habitat and stabilized stream banks, populations of fish and nongame birds and mammals would increase; deer populations would remain stable.

D-15

Soils and Water Quality. Eliminating livestock grazing on 33,489 acres would help increase water infiltration, reduce surface runoff, and decrease sediment production. Salinity reductions would not be significant because the soils are predominantly derived from sandstone parent material.

Vegetation. Elimination of livestock grazing on 33,489 acres would cause the ecological condition to improve (approach climax) throughout all four allotments (Kane Springs, Potash, Spring Canyon Bottom, and Granite Creek).

Livestock Grazing. Elimination of livestock grazing on these four allotments would result in the loss of 638 AUMs of forage for livestock.

Wildlife. Elimination of livestock grazing on these four allotments (2 percent of the GRA) would remove bighorn sheep competition for forage and space on the Kane Springs, Potash, and Spring Canyon Bottom allotments and protect riparian and aquatic habitat on the Granite Creek Allotment. Forage for bighorn would increase by 599 AUMs. Since bighorn sheep are socially intolerant of cattle, their use is limited to areas that are isolated from livestock. Forage for deer and elk would increase by 39 AUMs on the Granite Creek Allotment. Concentration of cattle in the drainage bottom has resulted in degradation and loss of fish and wildlife habitat. Both bighorn and fish populations (including trout) would increase as a result of this action (BLM, 1981c).

D-16

Soils and Water. Restriction of livestock grazing would result in decreased soil distur-

bance and compaction on soils that are presently being grazed. Runoff would also decrease, and water infiltration would improve. Soil loss estimates would be reduced by as much as 45 percent as a result of this action.

Vegetation. Vegetation on this 700 acres would improve in ecological condition.

Livestock Grazing. Restriction of livestock grazing on a portion of Little Hole Allotment would reduce available forage for livestock by 32 AUMs; there would be no impact to livestock grazing habits.

Wildlife. The restriction of domestic sheep grazing from 700 acres would eliminate forage and spatial competition of bighorn sheep and reduce the potential of disease transmission to bighorn sheep from domestic sheep. Forage for bighorn would increase by 32 AUMs. The bighorn sheep population would increase as a result of this action.

Recreation. The improvement of the bighorn sheep populations as a result of disease reduction through limiting livestock grazing would increase opportunities for recreational wildlife observation in Westwater Canyon on the Colorado River.

D-17 Refer to Alternative A, Management Action A-6.

D-18 Refer to Alternative C, Management Action C-15.

D-19 Refer to Alternative C, Management Action C-16.

D-20

Soils and Water Quality. These major washes and floodplains have been identified as primary sources of sedimentation and salinity. The impact of this action would be to reduce the introduction of sediment and salinity into the Colorado River drainage by reducing the amount of surface disturbance in these critical watershed areas.

Vegetation. Limitation of ORVs to existing roads and trails would protect vegetation. However, little of the associated vegetation is presently being disturbed.

Livestock Grazing. Although there would be no significant gain or loss in AUMs through protection of vegetation from ORVs, there would be a slight decrease in physical disturbance in the subject areas, which are generally congregation areas for livestock.

Wildlife. Limiting ORVs to existing roads and trails in the floodplains of 150 miles of streams and from 10 major washes would protect riparian and aquatic habitats. Nongame wildlife species would increase, and aquatic species would remain stable as a result of reduced salinity and sedimentation.

Transportation. Limiting ORVs to existing roads and trails in 150 miles of streams and 250 miles of major washes would reduce ORV use in the future and bring about a corresponding decrease in the number of newly developed roads and trails. Access to some areas would be limited to the roads and trails that now exist; however, the effect on the overall transportation network would be insignificant.

D-21 Refer to Alternative C, Management Action C-17.

D-22 Refer to Alternative C, Management Action C-18.

D-23

Vegetation. The vegetation on these 6,642 acres would be lost to BLM management through disposal of these lands.

Livestock Grazing. Approximately 91 AUMs of livestock forage would be lost to BLM management. Depending on the resultant use of the land, and exchange-of-use agreements could be made to allow the livestock operator continued use of the forage.

D-24 Refer to Alternative B, Management Action B-10.

D-25

Recreation. Acquisition of scenic easements on 9,990 acres of private land along 80 miles of the Colorado and Dolores river corridors would protect scenic recreational qualities and contribute to long-range increases in recreational use in this area.

D-26 Refer to Alternative B, Management Action B-11.

D-27

Wildlife. Excluding rights-of-way from 845,540 acres would ensure protection of 48,245 acres of critical bighorn sheep habitat in the Mineral Bottom, Potash, and Westwater areas (Figure 2-16). Since bighorn sheep are sensitive to human disturbance, this action would protect the existing populations.

Implementation of the avoidance areas would protect approximately 485,251 acres of deer and elk winter range within Deer Herd Units 28-B, 30-A, and 30-B, and Elk Herd Units 20 and 21. This would protect deer and elk from disturbance during the winter season.

Transportation. The avoidance of siting major rights-of-way within 845,540 acres in critical areas would inhibit the development of transportation facilities in a major portion of the GRA.

Special Designation Areas. The avoidance of siting rights-of-way within 282,350 acres of exclusion areas and 563,190 acres of avoidance areas would protect the wilderness values on 219,480 acres in 8 WSAs and on 65 miles of the Colorado and Dolores river corridors identified as suitable for Wild and Scenic River designation.

D-28

Soil and Water Quality. Withdrawal of 47,000 acres (about 3 percent of the GRA) from mineral activity would cause only a minor decrease in the acreage disturbed for access roads and placer mining sites. Therefore, the decrease in erosion, sedimentation, and salinity would also be small.

Vegetation. Vegetation throughout the affected area would be protected from the disturbance that might otherwise occur as a result of mining activity.

Mineral Resources. Withdrawal of 47,000 acres along the Colorado and Dolores river corridors from filing of new lode mining claims would have a negligible impact on uranium, since ore grade materials are not present in the areas. The withdrawal would have no immediate impact on placer gold production. All favorable areas are already under claims, and these 500 claims will probably still be in effect at the time of withdrawal. There is no way to estimate the effect on production, since maintenance of mining claim rights depends entirely upon the individual claimants.

Mineral Rights. The entire GRA would remain open to mining claims with the exception of 1,850 acres of existing withdrawals for protection of campgrounds and scenic sites, and 47,000 acres of new withdrawals along the Colorado and Dolores rivers for protection of scenic values. Within withdrawal areas valid existing rights would stand. There are no claims in the 1,850 acre areas, but claims do exist in the 47,000 acre area. Abandonment of a claim would mean that it would be permanently lost to the claimant; no rate of abandonment can be anticipated. This withdrawal would primarily affect some 500 placer gold claims along the rivers. There are approximately 20,000 claims in the GRA, 500 for placer gold and the remainder for uranium.

D-29

Refer to Alternative A, Management Action A-11.

D-30

Soils and Water Quality. Implementation of the oil and gas category system proposed under Alternative D would provide special stipulations (see Appendix R) to protect floodplains (19,040 acres) and areas of high geologic erosion (slopes greater than 50 percent; 25,909 acres) from development. Stipulations would also protect 320,470 acres of Mancos-derived soils, which are highly erodible and susceptible to damage by vehicular traffic when wet. The soils undergo changes in hydration with temperature change, and this contraction and expansion acts as a powerful weathering agent (BLM, 1977c). Because of the fineness of the shale, the rate of water infiltration is so slow that most rainfall runoff carries away the fine soil particles and salts. Seasonal restriction of vehicle use (see Appendix R) would reduce the introduction of sediment and salt into watercourses in the Mancos desert. While it is certain that these stipulations would decrease erosion, sedimentation, and salinity, the actual reductions would depend on the development in these areas. Cumulative impacts cannot be quantified at this time.

Vegetation. Vegetation losses would result from any new oil and gas activity; however, rehabilitation would be required on all unproductive drilling sites. Some 220,362 additional acres would be under No Surface Occupancy or No Leasing. Vegetation would be protected in these areas.

Livestock Grazing. Oil and gas activity would continue under this leasing category application; between 250 and 400 acres per year would be disturbed, forage would be lost, and new construction would alter livestock grazing habits. Rehabilitation would allow for grazing at current levels.

Wildlife. Classification of 744,262 acres as Category 1 for oil and gas leasing could affect deer and elk wintering areas, yearlong bighorn sheep habitat, and yearlong antelope habitat. The following analysis is based on known and potential oil and gas production areas (Figure 1-12 and 2-22).

All of the deer and elk winter range and calving and fawning areas (200,769 acres) located within herd Unit 28-B would be protected by Category 2 stipulations. This would eliminate physical stress and displacement of wintering deer and elk by oil and gas activities.

Bighorn sheep losses through stress and displacement could occur on approximately 66 percent (32,920 acres) of bighorn habitat that would be designated as Category 1. Approximately 34 percent (16,873 acres) of the desert bighorn sheep habitat within the Potash, Mineral Bottom, and Westwater areas would be protected under the No Surface Occupancy designation of Category 3 and the No Lease designation of Category 4. Bighorn habitat would not be lost, and bighorn sheep would not be displaced or loss through stress under this leasing category application.

All of the bighorn sheep habitat in the Rattlesnake area (11,420 acres) would be under Category 3 (No Surface Occupancy) or Category 4 (No Lease) designation. Bighorn sheep habitat in this area would not be lost, and bighorn sheep would not be displaced or lost from stress, even if oil and gas activities take place.

Of the antelope kidding areas in the Cisco Desert, 19 percent (18,128 acres) would be protected by Category 2 special stipulations. A potential exists for antelope losses to occur through stress and displacement on the 81 percent (76,607 acres) of Cisco Desert antelope habitat that would be designated as Category 1.

The 7,040 acres of antelope kidding areas in the Hatch Point area would be protected under Category 2, and losses through stress and displacement would not occur.

Golden eagle nest sites in the Cisco Desert would be protected under Categories 2 (2,880 acres) and 3 (960 acres).

Mineral Resources. Approximately 125 new wells would be permitted each year. The annual production of these new wells is estimated at 17,500 barrels of oil and 480,000 to 880,000 MCF of natural gas.

Transportation. The oil and gas leasing category application proposed under Alternative D would increase by 220,362 the acres in restrictive Categories 3 and 4. The resulting decrease in mineral development would bring about a corresponding decrease in the 75 to 100 miles of new roads that are currently being developed each year in connection with mineral activities.

Visual Resources. Application of the oil and gas category system proposed under Alternative D would protect existing VRM classes from change in 22 areas identified as possessing exceptional scenic qualities (refer to Table 2-9, Alternative D).

Special Designation Areas. Protective stipulations beyond those found in Category 1 would be applied to scenic resources and associated natural qualities. Some of these resources are found within WSAs and Wild and Scenic River study areas, including 65 miles of river study corridors and 219,480 acres that would be recommended as suitable for wilderness designation.

Recreation. Application of the oil and gas category system proposed under Alternative D would protect the resource values in 22 areas identified (see Table 2-9, Alternative D) as possessing exceptional scenic qualities that are associated with recreational values.

- D-31 Refer to Alternative A, Management Action A-13.
- D-32 Refer to Alternative A, Management Action A-14.
- D-33 Refer to Alternative A, Management Action A-15.
- D-34 Refer to Alternative B, Management Action B-20.
- D-35 Refer to Alternative A, Management Action A-16.
- D-36 Refer to Alternative A, Management Action A-17.
- D-37 Refer to Alternative A, Management Action A-18.
- D-38 Refer to Alternative A, Management Action A-19.
- D-39 Refer to Alternative A, Management Action A-20.
- D-40 Refer to Alternative A, Management Action A-21.
- D-41 Refer to Alternative A, Management Action A-22.
- D-42 Refer to Alternative B, Management Action B-28.
- D-43

Soils and Water Quality. Designation of these areas as wilderness would restrict surface disturbing activities such as ORV use. The actual decrease in soil loss and sediment damage that would result cannot be quantified, because it would be proportional to the amount of disturbance that would occur if this designation were not placed on these areas.

Wildlife. Wilderness designation would ensure that habitat for bighorn sheep, bald eagles, and other raptors would remain undisturbed. Populations of these species could increase.

Mineral Resources. Withdrawal of 219,480 acres from new mining claims would have little impact on mineral production. Potential production of yellowcake would be reduced by a small but undetermined amount, but placer gold would not be affected.

Special Designation Areas. The designation of all WSAs in the GRA would provide permanent protection of all the wilderness values on 219,480 acres.

Recreation. The designation of eight WSAs as wilderness would prevent change from occurring to primitive qualities as a result of long-term limitations on mineral and road developments. Trends indicate an increase in primitive recreation visits over a period of time as a result of this action.

ECONOMIC IMPACTS OF ALTERNATIVE D, PROTECTION

Economic impacts of the management actions proposed in Alternative A are discussed below

as they relate to the planning issues. The methodologies and computations that were used to estimate economic impacts are discussed in Appendix V.

ECONOMIC IMPACTS RELATED TO CRITICAL WATERSHED MANAGEMENT

D-2, D-3, D-10, D-13, D-19, D-21, D-22

Reducing the amount of sediment that originates in the GRA would benefit the electrical, production flood control, recreation, and water storage values of Lake Powell and reduce the maintenance costs of small livestock reservoirs downstream from the points of erosion. Reducing the salt pickup by water originating in and passing through the GRA's critical watershed areas would reduce the costs associated with the use of saline water in the Lower Colorado River Basin. There would be a loss of value whenever a management action reduces the amount of water that enters the Colorado River.

Value estimates for those management actions where significant changes in water yield, sedimentation, and salt loading could be quantified are presented in Table 4-6. The benefits of preserving soil productivity could not be quantified.

D-30

Refer to Alternative C, Economic Impacts Related to Critical Watersheds (C-25)

ECONOMIC IMPACTS RELATED TO LIVESTOCK GRAZING

D-5, D-6, D-7, D-8, D-9, D-10, D-11, D-13, D-14, D-15, D-16

These quantifiable management actions would affect either the amount of forage or the seasons when public rangeland forage would be available to livestock operators. This in turn could affect ranchers' income, wealth, and ability to obtain loans, with some spinoff income and employment effects through the local economy.

Two cattle operators would have a short-term increase of 29 percent in available forage, and nine operators would have a 5 percent short-term decrease in available forage, resulting in a decrease of \$8,667 in returns above cash costs, 8 percent less than what these operators now earn. These figures nearly obscure the fact that three of these operators would be totally excluded from using forage in the GRA, and that their returns above cash costs would decrease an estimated 73 percent.

In the long term, 5 operators would have 29 percent less available forage, resulting in a \$6,306 decrease in returns above cash costs, 9 percent less than what they earn now.

In the long term, 17 of the cattle operators would, on the average, have 25 percent more available forage than their existing use. If the added forage is grazed, cattle operators would realize an added \$89,466 in returns above cash cost, an 11 percent increase over what these operators now earn.

One sheep operator would have a short-term 22 percent increase in available forage, and five sheep operators would have a 31 percent short-term decrease in available forage. In the long term, five operators would have 44 percent less available forage, resulting in a \$192,088 decrease in returns above cash costs, 36 percent less than what these operators

now earn. In the long term, six of the 14 sheep operators would, on the average, have 24 percent more available forage than their existing use. If the added forage is grazed, sheep operators would realize an added \$21,903 in returns above cash cost, a 3 percent increase over what these operators now earn.

TABLE 4-6

Salinity and Sediment Economic Benefits
of Various Watershed Management Actions (in 1981 Dollars)

Management Action	Years to Benefits	Life of Project	Annual Value			Annual Value Loss from Decreased Water Yield
			From Decreased Sedimentation of Lake Powell	From Decreased Salinity ^a	From Decreased Salinity ^b	
D-2	1	12	\$54	\$608,000	\$464,000	\$75,000
D-3	1	^c --	0	157,000	120,000	13,000
D-10	3	^c --	62	328,000	251,000	N/A
D-13	3	^c --	11	96,000	73,000	41,000
D-19	10	^c --	5 to 7	18,000 to 28,000	14,000 to 21,000	N/A

^a Includes indirect and induced impacts as calculated by the Bureau of Reclamation.

^b Does not include indirect and induced impacts as calculated by the Bureau of Reclamation.

^c The life of the project would be infinite.

Six of the 31 cattle operators would be excluded from using public rangeland forage in the GRA during the spring, thereby losing the spring use of approximately 328 AUMs. The cost of replacing this forage with alfalfa purchased at \$75 per ton would be \$8,125. Including these change of season impacts, these cattle operators could realize an average loss of up to 5 percent in returns above cash costs.

Sheep operators are affected by spring exclusions to a much greater extent. Seven of the 14 sheep operators would receive significant spring exclusions, thereby losing the use of approximately 3,246 AUMs. The cost of replacing this forage with alfalfa purchased at \$75 per ton would be \$81,150. Including these change of season impacts, these sheep operators could realize an average loss of up to 11 percent in returns above cash costs.

The aggregate short-term and long-term rancher impacts from changes in both available forage and season of use are summarized in Table 4-7. The figures in Table 4-7 represent a worst-case analysis. The overestimate of negative income impacts should be most noticeable for the sheep group, as cattle operators would not be significantly affected by changes in season of use.

Under Alternative D, total available cattle forage would increase 16 percent, and available sheep forage would increase 13 percent, which implies an aggregate increase in ranch value. However, five cattle operators would have less available forage, which would result in an estimated 5 percent reduction in ranch carrying capacity.

Available sheep forage would decrease under Alternative D, which would result in an

estimated 4 percent reduction in ranch carrying capacity. Six sheep operators would have more available forage, which would increase herd size and ranch values.

Any decrease from active preference could impact an operator's wealth. Under Alternative D, total long-term grazing privileges would be reduced by 35,833 AUMs from active preference. At a market value of \$60 per AUM for BLM grazing permits, total operator wealth could decline by as much as 7 percent.

Because aggregate rancher income is expected to increase under Alternative D, the ranchers' ability to repay loans should also increase. Several sheep and cattle operators would realize a long-term decrease in net revenues, and their ability to repay loans should thereby decrease.

TABLE 4-7
Summary of Short-Term and Long-Term Economic Impacts
to Livestock Operators under Alternative D

	Current <u>Situation</u>	Short <u>Term</u>	Long <u>Term</u>
<u>Cattle Operators</u>			
Gross Revenue	\$1,962,085	\$1,962,615	\$2,056,007
Total Cash Cost	1,038,598	1,043,912	1,057,485
Returns Above Cash Cost	923,487	918,703	998,522
Returns to Labor and Investment	482,876	478,081	553,951
<u>Sheep Operators</u>			
Gross Revenue	\$2,367,988	\$2,073,727	\$2,146,737
Total Cash Cost	890,974	856,902	921,058
Returns Above Cash Cost	1,477,014	1,216,825	1,225,679
Returns to Labor and Investment	1,239,055	982,790	989,631

Independent cattle operators residing in the GRA would earn an added \$85,368 in returns above cash costs. Increased rancher income and herd size would have indirect and induced local employment and income effects. Under this alternative, long-term regional income and employment due to livestock operators in the GRA would increase by \$139,713 (+0.3 percent) and six jobs (+0.2 percent) (refer to Table 4-8).

TABLE 4-8
Impact Area's Income and Employment Due to Livestock Operators
in the Grand Resource Area under Alternative D

	Existing		Alternative D	
	<u>Employment</u> (Jobs)	<u>Income</u> (Dollars)	<u>Employment</u> (Jobs)	<u>Income</u> (Dollars)
Agriculture	26	\$537,325	30	\$ 644,016
Retail and Services	9	177,043	10	198,158
Other	<u>6</u>	<u>160,345</u>	<u>7</u>	<u>172,253</u>
	41	\$874,713	47	\$1,014,427

Source: GEE, 1982; USFS, 1982.

ECONOMIC IMPACTS RELATED TO WILDLIFE

Refer to Alternative C, Economic Impacts Related to Recreation (C-5, C-6, C-7, C-8, C-10, C-11, C-12, C-14, C-15, C-38)

ECONOMIC IMPACTS RELATED TO OFF-ROAD VEHICLE USE

Refer to Alternative C, Economic Impacts Related to Recreation (C-16, C-17, C-18)

ECONOMIC IMPACTS RELATED TO LANDS ACTIONS

D-23

The likely method of disposing of public lands under Alternative D would be the sale of 6,642 acres of isolated tracts.

The proposed disposal would increase the amount of private land near Castle Valley by 30 percent. If this land is as suitable as the existing available private land, this increase in private land would be large enough to have a depressing effect on nearby private land market prices. Moab and Green River could also be affected, but to a lesser extent because of their larger private land bases relative to the nearby acreages proposed for sale.

D-24

Refer to Alternative B, Economic Impacts Related to Recreation, Management Action B-10.

D-25

Scenic easements along the Colorado and Dolores rivers would prevent certain types of developments from taking place on private lands. These developments, if they took place, would increase property values, and increase county property tax revenues.

ECONOMIC IMPACTS RELATED TO UTILITY CORRIDOR DESIGNATION

D-27

The 845,540-acre avoidance and exclusion areas involve 36 percent of the GRA. The avoidance and exclusion requirements could affect the construction and employment duration of major rights-of-way, which would result in a short-term increase in local income and employment. The added construction cost could also deter the locating of some major rights-of-way through the GRA, with a corresponding short-term local impact.

ECONOMIC IMPACTS RELATED TO MINERALS

D-28, D-30

The areas withdrawn from locatable mineral entry would prevent new gold and uranium operations from starting in these areas, and could reduce future gold and uranium production. The acreage under the more restrictive oil and gas leasing categories would also be increased under Alternative D. Using the production estimates from the analysis of

environmental impacts in Alternative D, Management Action D-28, Minerals, and Management Action D-30, Minerals, it is estimated that eventually there would be 65 fewer jobs (-1.5 percent) and \$1,340,000 less income in the area.

It is estimated that the decrease in royalties from oil and gas production would give the State \$150,000 less revenue. From this, the Grand County highway department would receive \$5,000 to \$6,000 less revenue, some of which would also be lost by local units of government. There would also be an estimated \$45,000 to \$65,000 loss of property tax revenues collected by local units of government (0.7 to 0.9 percent less local government revenues).

See also Economic Impacts Related to Critical Watersheds and Recreation.

D-43

There is some uncertainty as to the potential for mineral development in the WSAs. The increased oil and gas drilling and production discussed in Alternative B would not be realized if all the WSAs were designated as wilderness areas. Other significant mineral production within 20 years is not expected from the WSAs.

D-28, D-30

The Dolores River corridor would be protected from locatable and leasable mineral activities. The Dolores River supports commercial and private recreational use. The boating season is short, and much of the private expenditures associated with boating along the Dolores occur outside the GRA. Although the recreational opportunities afforded by the Dolores River would be sensitive to mineral activities, because of the low use and low related local expenditures, there would be little added sales, income, and employment because of this added protection. Commercial use of Negro Bill Canyon would be preserved.

D-33, D-34, D-35, D-37, D-38, D-39, D-40, D-41

Refer to Alternative B, Economic Impacts Related to Recreation, Management Actions B-19 through B-27.

D-43

The recreation related economic impacts of designating the Behind the Rocks, Westwater, and Rattlesnake WSAs as wilderness were discussed in Alternative C, Economic Impacts Related to Recreation, Management Action C-40. Designating Negro Bill WSA as wilderness would preserve and probably increase the commercial use of Negro Bill Canyon. Designation would increase public awareness of the WSAs, and some increased private use and related local expenditures could be expected. Except for Negro Bill Canyon, the existing primitive, nonmotorized use of the additional WSAs is low and, due to access and site characteristics, is expected to remain low. Furthermore, access patterns to these WSAs result in low local expenditures per visit.

ECONOMIC IMPACTS RELATED TO FIRE MANAGEMENT

D-42

Refer to Alternative B, Impacts Related to Fire Management, Management Action B-28.

ECONOMIC IMPACTS RELATED TO WILDERNESS

D-43

See Economic Impacts Related to Minerals and Recreation

SOCIAL IMPACTS OF ALTERNATIVE D, PROTECTION

This alternative would place the greatest restrictions on livestock grazing, ORV use, and mineral activities. A number of livestock operators would be significantly impacted, and their social well-being affected. Some operators may be forced to seek a second job, and operators who are forced to sell their operations would have to change their way of life entirely. For those who do not have the training and skills to enter the job market, the impact on their social well-being would be significant. The mineral restrictions would not affect ongoing operations; however, the restrictions on mineral activities could have a significant impact on future developments. Hunters, primitive nonmotorized recreation users, commercial outfitters, and retail service industries catering to tourism would be the primary beneficiaries under Alternative D.

There would be some loss to the mining sector and some gain to the recreation sector, with an accompanying change in type of employment, wage scales, and associated lifestyle values. These shifts would be relatively small, and there would be little noticeable effect on the existing social environment.

In general, local attitudes toward BLM would worsen because of the increased restrictions, less local resource use and development that would be allowed, and the perceived significant negative impacts on the local economy under this alternative. These attitudes would vary, however, by those individuals and groups who would gain and those who would lose under this alternative. Refer to the Economic Impacts section for identification of losers and gainers under Alternative D.

UNAVOIDABLE ADVERSE IMPACTS

This section identifies adverse impacts on land uses and components of the human environment resulting from the prescribed management actions in the alternatives. These are actually residual impacts that would remain after mitigation. They are also primary impacts for analyses (or changes, as identified in the Environmental Consequences portion of this document).

SOILS AND WATER QUALITY

Since the Environmental Consequences section describes the impacts upon a resource after

mitigation, the detailed adverse impacts may be found there. Under all the alternatives, any form of surface disturbance would result in changes in vegetative cover, water infiltration patterns, increases in runoff, and subsequent increases in erosion rates. These increases in erosion often are substantial enough to affect sediment and salinity of the Upper Colorado River Basin. However, under Alternatives C and D, they would be minimized by land treatments and control of surface disturbing activities in critical watersheds.

VEGETATION

Under Alternative A, vegetation on an undetermined number of acres would be lost to BLM management through lands disposal. Loss of vegetation would occur on 1,600 acres of sand and gravel sites.

Under Alternative B, vegetation on 22,411 acres would be lost to BLM management through land disposal. Vegetation on an additional 200,000 acres would be subject to removal under the oil and gas category system. Loss of vegetation would be possible on 7,500 acres of sand and gravel sites.

Seventy acres of vegetation would be removed through construction of an evaporation pond under Alternative C. Vegetation on 11,629 acres would be lost to BLM management through lands disposal. Loss of vegetation would occur on 1,600 acres of sand and gravel sites.

Under Alternative D, seventy acres of vegetation would be removed through construction of an evaporation pond. Vegetation on 6,642 acres would be lost to BLM management through lands disposal. Loss of vegetation would occur on 1,600 acres of sand and gravel sites.

LIVESTOCK GRAZING

An undetermined loss of AUMs would occur through lands disposal under Alternative A.

Under Alternative B, 644 AUMs would be lost through lands disposal. An undetermined number of AUMs would be lost through new oil and gas activity on the 200,000 acres which are not now open to surface occupancy.

Construction of an evaporation pond under Alternative C would result in the loss of 2 AUMs. Livestock use would be reduced by 558 AUMs through livestock restriction on highly saline soils. A total of 153 AUMs would be lost through lands disposal.

Under Alternative D, construction of an evaporation pond would result in the loss of 2 AUMs. Livestock use would be reduced by 1,099 AUMs through livestock restriction on highly saline soils. Ninety-one AUMs would be lost through lands disposal. Fencing of riparian areas would reduce available AUMs by 3, and 638 AUMs would be lost through elimination of livestock grazing on four allotments. Restriction of livestock from 700 acres would reduce available forage by 32 AUMs.

WILDLIFE

There would be a loss of wildlife habitat productivity under continuation of present livestock management. Under Alternative A, wildlife ungulates would be affected on 21 allotments, and riparian and aquatic habitat would be affected four allotments. Under

Alternative B, riparian and aquatic habitat would be adversely affected on four allotments, as would wildlife ungulates on 22 allotments. Under Alternative C, wildlife habitat would be adversely affected on nine allotments (including one allotment that has riparian and aquatic habitat). Under Alternative D, loss of wildlife habitat would occur on six allotments, but no aquatic or riparian habitat would be involved. Deer, elk, bighorn sheep, and antelope would continue to compete with livestock for forage and space on the affected allotments, and riparian and aquatic habitat would continue to decrease in ecological condition.

Under continuation of the present AMPs, there would be a loss of wildlife habitat and riparian area productivity on three allotments.

Oil and gas activities could have unavoidable impacts on wildlife (except for those areas having Category 3 and 4 designations). Bighorn sheep could be lost through stress and displacement because up to 75% of their yearlong habitat could be occupied by oil and gas activities.

Disposal of tracts along the Colorado River near Westwater, in the Book Cliffs, and near Dead Horse Point could result in a loss of habitat for deer, elk, bighorn sheep, bald eagle, and peregrine falcon, since BLM would no longer be responsible for protection of wildlife values.

Development of existing potash leases or additional areas with lease potential could occupy approximately 50 percent (13,567 acres) of the bighorn sheep habitat.

MINERAL RESOURCES

Under Alternatives A and B the following mineral resources could be removed from the geologic formations and environments where they naturally occur: natural gas, 10 million MCF per year; oil, 50,000 barrels per year; placer gold, 600 ounces per year; and potash, indeterminate volume. Under Alternative C, the same volumes of materials could be expected to be removed as under A and B with the exception of oil and gas. For these resources, the figures could be as much as 49,500 barrels of oil and 9,560,00 to 9,960,000 MCF of natural gas. Under Alternative D, the same volumes of materials could be expected to be removed as under A and B except for oil and gas. The figures could be as much as 47,500 barrels of oil and 9,480,000 to 9,880,000 MCF of natural gas.

MINERAL RIGHTS

Under Alternatives A, B, C, and D, 1,850 acres would continue to be withdrawn from the filing of mining claims. Under Alternative C, an additional block of 32,000 acres would be withdrawn for a scenic river corridor along the Colorado River and a block totalling 89,455 acres would be withdrawn for wilderness designation. New mining claims would not be allowed in the scenic river corridor withdrawal. In the areas recommended as suitable for wilderness, new mining claims would not be allowed after December 31, 1983. Existing claims would be honored until abandoned in all cases. Under Alternative D, a scenic river corridor withdrawal along the Dolores and Colorado rivers would cause an additional block of 47,000 acres to be closed to new mining claims. Under Alternative D, 219,480 acres could also be withdrawn if designated as wilderness. In all these withdrawals, existing mining claims would be honored, but new ones could not be filed.

VISUAL RESOURCES

There would be short-term unavoidable impact to visual quality on 34,760 acres as a result of pinyon-juniper chaining in Alternative B. In Alternatives C and D, 32,160 acres would show unavoidable impacts to visual quality as a result of pinyon-juniper chaining.

SPECIAL DESIGNATION AREAS

The nondesignation of existing WSAs in Alternatives A and B would result in a loss of some of the wilderness values on 219,480 acres. The designation of only 89,455 acres as wilderness under Alternative C would result in a loss of some of the wilderness values on 124,925 acres. This figure does not include the Black Ridge Canyon West 5,100-acre WSA, on which recommendations would be made at a later date. The loss of wilderness values would reduce the potential for any possible future wilderness designation.

RECREATION

The nondesignation of WSAs in Alternatives A and B would result in the loss of some of the primitive recreation opportunities on 219,480 acres. The nondesignation of 124,925 acres of WSAs in Alternative C would result in the loss of some of the primitive recreation opportunities on those lands. This figure does not include the 5,100 acre Black Ridge Canyon West WSA on which recommendations would be made at a later date. Under Alternatives C and D, the designation on 635,894 acres of limited and closed ORV use areas, and under Alternative D, the limiting of ORV use in 150 miles of stream channel would reduce ORV recreational use in those areas.

ECONOMIC CONDITIONS

Season of use exclusions and reductions in available forage would affect livestock operators under Alternatives C and D. Base property values could be reduced under all four alternatives. Private land values could be affected under the Alternatives B and C. Future mineral related employment and income could be reduced under Alternatives C and D. Commercial outfitters and other recreation related businesses could be negatively affected under Alternative B.

THE RELATIONSHIP BETWEEN SHORT-TERM USES OF MAN'S ENVIRONMENT AND THE MAINTENANCE AND ENHANCEMENT OF LONG-TERM PRODUCTIVITY

This section identifies the trade-offs between short-term use and long-term productivity of the resources involved in the four alternatives. For this analysis, short-term refers to the period of implementation of the plan within about 5 years, and long-term refers to the period of up to 20 years or beyond in which the adverse or beneficial impacts would still occur.

SOILS

In the short-term soil loss from vegetative manipulation and mineral development would increase under all alternatives. Increased soil loss would also be expected under Alter-

natives A and B from increased ORV use by maintaining or designating the whole GRA as open for ORV use. Soil loss would continue under livestock actions under the A and B alternatives. Some actions (e.g., livestock manipulation techniques, changing season of use and restriction or elimination of livestock grazing) would ensure long-term productivity under Alternatives C and D.

Long-term productivity of the soils would decline where erosion rates continue to exceed the T value. Vegetation manipulation would help increase the long-term productivity of the soils once vegetation has been reestablished.

In the short term, soil loss from vegetative manipulation and mineral development would increase under all the alternatives. The least loss would result under Alternative D. In the long term, increased soil loss would be expected in intensive ORV use areas. Also in the long term, increased vegetative production and ground cover would reduce soil loss and provide long-term net improvements to the soils resource.

WATER QUALITY

Overall water quality, more specifically sediment and salinity to the Colorado River, would improve under Alternatives C and D. Water yield would decline under these alternatives because of the impounding of saline surface runoff and saline point sources, and through improved water infiltration. Water quality conditions would decline slightly in the short term under all the alternatives because of vegetative manipulation and surface disturbing activities. However, in the long term, once vegetation has become reestablished and ground cover increased, the watershed condition should improve. Water quality may decline in some areas under Alternatives A and B because of emphasis on livestock grazing and production based resource uses such as oil and gas leasing and mineral development.

VEGETATION

Under Alternatives A, B, C, and D, short-term uses of the vegetation resource would not be lost over the long term, except through those actions that completely remove vegetation without later rehabilitation (e.g., certain mining areas that remain in productivity), or that take vegetation out of BLM management.

Other management actions, although possibly resulting in short-term loss of vegetation would not result in a long term loss of productivity. Mineral activity would cause a short-term loss of vegetation, but it could be recovered through rehabilitation measures on most areas.

Under alternatives B and C, land treatments and prescribed fires would result in a short-term loss of vegetation. Long-term productivity would improve as a result of the treatment, and the areas could be maintained in high productivity through followup treatments. These areas would eventually return to their present ecological condition if the treatments are not maintained. Disposal of land would take vegetation out of BLM management. Livestock manipulation techniques, changes in seasons of use, etc. would ensure long-term productivity.

Other management actions, although possibly resulting in short-term loss of productivity, would not result in a long-term loss of productivity. Some actions (e.g., livestock manipulation techniques, changes in seasons of use) would ensure long-term productivity.

LIVESTOCK GRAZING

Total livestock forage would increase over the long term by 6,860 AUMs under Alternative B; by 5,060 AUMs under Alternative C; and by 1,638 AUMs under Alternative D. Specific actions that restrict or eliminate livestock grazing would decrease livestock production over both the short and long terms.

WILDLIFE

Land treatments and prescribed burning would result in a short-term loss of wildlife forage, but over the long term, forage production for wildlife would be increased. Short-term mineral activities such as oil and gas exploration and mining of locatable minerals would result in a loss of forage (caused by surface disturbance) and the displacement of wildlife (caused by human occupancy). Long-term productivity would probably not be affected, because after mineral activities have been completed, the disturbed areas would be rehabilitated, and wildlife could again occupy the area.

Land disposal within the Westwater area, in the Book Cliffs, and near Dead Horse Point would result in the loss of long-term productivity, because the disposed land would no longer be under BLM management. Habitat for deer, elk, bighorn sheep, bald eagle and peregrine falcon could be lost. Long-term productivity of wildlife habitat would increase through livestock manipulation techniques, which would increase forage and reduce spatial competition for wildlife.

Under Alternatives C and D, long-term productivity of wildlife habitat would be increased through changes in season of use, changes in class of livestock, the total elimination of livestock grazing from four allotments, and through reservation of all forage and space on Pear Park, Spring Creek, and Castle Valley for winter/spring use by deer and elk.

Long-term productivity for bighorn sheep in the Potash area would be lost if existing potash leases are developed to full potential. Long-term productivity of sensitive species such as bighorn sheep, bald and golden eagles, and peregrine falcons could be enhanced through wilderness area designation.

MINERAL RESOURCES

The short-term removal of mineral resources would result in the long-term loss of opportunity to remove these resources, since they would no longer be available for future use. Mineral withdrawals would protect the resources included in the withdrawal areas, preserving them for future use.

MINERAL RIGHTS

Mineral withdrawals would have no short-term impact on existing mining claims, but new claims could not be filed in withdrawal areas. In the long term, however, mining claims could not be refiled when abandonment occurred from failure to file annual assessment notices. There is no way to predict the frequency of such occurrence.

CULTURAL RESOURCES

In the short term for all alternatives, cultural resources could benefit because the

increased project work would create the need for cultural inventories and clearances on the lands to be affected by the projects. In the long term, high value sites would benefit from identification and protection. All other long-term effects to cultural resources would be insignificant.

VISUAL RESOURCES

Such short-term uses as chaining and land treatments and those associated with energy, mining and related development would create short-term changes in VRM classes; however, these uses would not significantly change VRM classes over the long term. This is because the areas would essentially be returned to the original VRM classes by natural revegetation and by rehabilitation work required under the regulations. This applies to the activities and associated uses described in all four alternatives.

SPECIAL DESIGNATION AREAS

In Alternatives A, B, and C, long-term loss of wilderness values could result from lack of protection on WSAs not recommended as suitable for wilderness designation. This would reduce the potential of these areas over the long-term for future wilderness designation.

RECREATION

In all alternatives and in both short-term and long-term use trends, the demand for most recreational activities is expected to increase. In Alternatives A and B, the nondesignation of wilderness on 219,480 acres could result in a decrease in long-term primitive recreation and an increase in motorized recreation. In Alternative C the nondesignation of 124,925 acres as wilderness could also result in a decrease in long-term primitive recreation and an increase in motorized recreation. The designation of 89,455 acres in Alternative C as wilderness would tend to provide for increased trends in primitive and a decrease in motorized recreation on 89,455 acres. In Alternative D the designation of all WSAs as wilderness would tend to provide for increased trends in primitive recreation and a decrease in motorized recreation on 219,480 acres.

ECONOMIC CONDITIONS

Short-term livestock production and ranchers' income would be less than long-term livestock production and ranchers' income under all four alternatives. Alternative C involves short-term decreases and long-term increases in livestock production and ranchers' income.

IRREVERSIBLE AND IRRETRIEVABLE COMMITMENT OF RESOURCES

This section identifies the extent to which the four alternatives would irreversibly limit potential uses of the land and resources. Irreversible and irretrievable commitments of resources occur when a wide range of future options are foreclosed.

SOILS

Due to the slow rate of soil development, subsequent soil productivity would be irretrievably committed in areas where erosion rates exceed the T value.

<u>T Value</u> <u>(in tons per acre per year)</u>		<u>Inches of Soil Loss Per Year</u>
1	=	.0063
2	=	.0125
3	=	.0188
4	=	.0250
5	=	.0313

Areas of surface disturbance and accelerated erosion areas are areas where human activity has caused soil loss values to exceed the natural rate of soil development.

VEGETATION

In Alternatives A, B, C, and D, monies, fuels, and materials used to conduct and maintain land treatments are considered to be irretrievable.

Vegetation is a renewable resource, and any loss or use through most of the management actions is considered to be irretrievable, but not an irreversible commitment. Although it would take time in some cases, reclamation would keep initial vegetative loss from being irreversible. Vegetation on any lands that are disposed of would be irretrievably lost to BLM management.

LIVESTOCK GRAZING

An undetermined number of AUMs would be lost through lands disposal under Alternative A. Under Alternative B, approximately 644 AUMs would be lost through lands disposal. Construction of an evaporation pond under Alternatives C and D would result in the loss of 2 AUMs. Approximately 153 AUMs (Alternative C) or 91 AUMs (Alternative D) would be lost through lands disposal.

WILDLIFE

Oil and gas discoveries within wildlife habitat areas that become developed oil and gas fields would result in an irretrievable loss of habitat for deer, elk, bighorn sheep, and antelope. Bighorn sheep habitat would be irretrievably lost if existing potash leases are developed to full potential.

MINERAL RESOURCES

The leasing and removal of oil, gas, and potash would result in the irreversible and irretrievable loss of those resources. No estimates of potash removal volumes are feasible. Estimates of oil removal rates are: 50,000 barrels per year for Alternatives A and B; 49,500 barrels per year for Alternative C; and 47,500 barrels per year for Alternative D. Production from uranium mining claims could be as high as 1,000,000 pounds of yellowcake per year under all four alternatives. Gold production could be as high as 600 ounces per year under all four alternatives.

SPECIAL DESIGNATION AREAS

In Alternatives A, B, and C, the nondesignation of existing WSAs for wilderness would result in an irreversible and irretrievable loss of wilderness values in those areas where permanent changes are created by road building and energy development.

ECONOMIC CONDITIONS

Labor and much of the capital resources required to implement each alternative plan would be irretrievably committed.

CHAPTER 5

Consultation and Coordination

The Grand Resource Area (GRA) Draft Resource Management Plan/Environmental Impact Statement (RMP/EIS) was prepared by GRA and Moab District office specialists with expertise in watershed, range management, wildlife, lands, geology, recreation, wilderness, and economics. The list of preparers appears at the end of this chapter.

Writing of the RMP/EIS began in April 1982; however, a complex process over a 3-year period preceded the writing phase. This process included resource inventory, coordination with the public and other agencies, and establishment of goals and objectives. Consultation and coordination with agencies, organizations, and individuals occurred in a variety of ways throughout the preparation process.

Federal, State, and local organizations were contacted for consultation and assistance. Public land users and other interested groups and individuals were notified through planning systems updates in the form of public meetings.

During preparation of the planning documents and Draft RMP/EIS, Federal, State, county, and local agencies were contacted to gain information and help close data gaps. These agencies are listed below:

FEDERAL GOVERNMENT

ADVISORY COUNCIL ON HISTORIC PRESERVATION

U.S. DEPARTMENT OF AGRICULTURE

Forest Service (USFS)
Soil Conservation Service (SCS)

U.S. DEPARTMENT OF ENERGY

ENVIRONMENTAL PROTECTION AGENCY

U.S. DEPARTMENT OF THE INTERIOR

Bureau of Indian Affairs
Bureau of Reclamation
Fish and Wildlife Service (FWS)
Geological Survey (USGS)
Minerals Management Service (MMS)
National Park Service

STATE OF UTAH

A-95 Clearing House

Department of Agriculture

Department of Natural Resources

Division of History (State Historic Preservation Officer)
Division of Lands and Forestry
Division of Oil, Gas, and Mining
Division of Water Rights
Division of Wildlife Resources (UDWR)

Utah State University Extension Service

State Planning Coordinator

State Land Board

Southeastern Utah Association of Governments

Environmental Coordination Committee

COUNTIES, CITIES, AND TOWNS

City of Moab
Grand County Commission
Grand County Economic Development Commission
Grand County Planning Commission
Grand County Travel Council
San Juan County Commission
San Juan County Planning Commission
San Juan County Travel Council
Southeastern Utah Association of Governments

PUBLIC INVOLVEMENT AND CONSULTATION DURING DEVELOPMENT OF THE DRAFT RMP/EIS

Public meetings were initiated in 1979 to gather additional information related to the issues and to examine possible new issues.

All livestock operators were contacted prior to and during the preparation of this document. Prior to implementation of this plan, close coordination and cooperation with the affected livestock operators and other affected interests will be necessary.

Informal consultation took place with FWS regarding threatened and endangered species in the GRA. The UDWR was also involved in periodic consultation for needed expertise.

Many local individuals were interviewed, and their ideas, suggestions, and concerns were considered in the plan as well.

Informing and involving the public included notices in the Federal Register and news releases which were sent to broadcasting stations and newspapers. These releases ranged in subject matter from general announcements at the beginning of the planning process to dates and places of specific meetings and requests for public comments. These public participation efforts are listed chronologically below.

August 14, 1979 A news release to area media announced the start of the planning effort.

August 23 through August 31, 1979 Letters were sent to key user groups announcing the start of planning and requesting comments on problems and potential planning issues. These groups were the GRA grazing permittees, commercial river outfitters, the Moab Chamber of Commerce, Utah State Land Board, Southeastern Utah Association of Governments, energy companies having rights-of-way in the GRA, Utah Power and Light, and Continental Telephone Company.

September 7, 1979 A Federal Register notice announced initiation of the Preplanning Analysis.

February 4, 1980 A Federal Register notice announced revision of the multiple land use plan for the GRA.

February 28, 1980 A news release announced a public workshop to be held March 17 for the purpose of identifying problems and potential planning issues.

March 17, 1980 The public workshop was attended by 12 persons. Many concerns raised at the meeting were not appropriate as planning issues because they could be handled administratively. Potential issues discussed were delineated on a map, and the comments were later considered and analyzed by the RMP team. The following concerns were discussed: legal mandates for multiple use and sustained yield; forage resources; land treatments; off-road vehicle use; utility corridors; land withdrawals, disposal, trespass actions, and rights-of-way; minerals; nuclear waste and tailings; forestry and woodlands; watershed and water; recreation; fire management; and wilderness.

May 7, 1980 A planning workshop for 15 local officials was attended by three persons. No new concerns appropriate for the planning process were raised.

August 14, 1980 The Grand Resource Area Manager briefly summarized the planning effort at a meeting of the Moab District Multiple Use Advisory Council. The Council's Land and Water Use Evaluation committee undertook a study of the issues and planning criteria that had been developed for the RMP.

October 3, 1980 After a formal presentation on the GRA planning effort, the Multiple Use Advisory Council accepted the recommendation of the Land and Water Use Evaluation committee that the Council support the GRA planning effort as developed to date.

October 29, 1980 A brochure explaining the planning issues and criteria was sent to 300 individuals and groups who had indicated interest in land use planning information. This brochure contained a public comment form, and 18 of these were returned. These comments were analyzed by the RMP team.

January 8, 1981 The Advisory Council's Land and Water Use Evaluation committee discussed the RMP planning criteria and subsequently reported to the Advisory Council on January 16. No changes in the criteria were suggested.

- May 27, 1982 A Federal Register notice announced the availability of the revised planning issues and criteria and invited public comments on those revisions and participation in the scoping of the Management Situation Analysis (MSA). It also announced two public meetings for this purpose to be held on June 30.
- June 4, 1982 A news release to local media announced a public workshop to be held June 30 to discuss the future management of the GRA. It summarized the issues and invited comments.
- June 4 through Letters were sent to approximately 350 persons and groups who had expressed interest in land use planning information, announcing the availability of a brochure describing the revised planning issues and criteria. Copies of the brochure and letters announcing the June 30 public meeting were sent to all who requested copies and to key user groups and city, county, and State government agencies with land management responsibility.
- June 30, 1982 A public meeting was held for the purpose of obtaining comments on the revised issues and criteria and on scoping the MSA. This meeting was attended by 14 persons.

Efforts to maintain contact with and supply information to the various elements of the public were continued into the writing of the RMP/EIS. Such contacts were primarily oriented toward those individuals, groups, and agencies that would be directly concerned with the proposal, including stockmen, recreationists, wildlife concerns, mineral interests, the academic community, and the four Utah Congressional delegates. Representatives from many of the previously mentioned individuals, groups, and agencies were contacted for specific information used in the description and analysis in this RMP/EIS. Comments on the development of the RMP/EIS have been received from the following agencies and interest groups:

American Mining Congress	National Parks Conservation Association
AMOCO Production Company	Northwest Pipeline Corporation
Atlantic Richfield Company	Phillips Uranium Corporation
Atlas Minerals	Rio Algom Corporation
Bowers Oil and Gas Exploration, Inc.	Standard Oil Company of Indiana
Buttes Resources	Space River Rats
Conoco, Inc.	Tenneco Oil
Dead Horse Point State Park	Texas Gulf Sulphur, Inc.
Energy Fuels	Texas Oil and Gas Company
Four Corners Wilderness Workshop	TXO Production Corporation
GRA Livestock Operators	Union Carbide Corporation
Gulf Oil	Utah Power and Light Company
Husky Oil Company	Utah Wool Growers
Moab District Grazing Advisory Board	Wexpro Company
Moab Ready-Mix	

Additional opportunities for public participation will occur during the 90-day review and comment period following publication of the Draft RMP/EIS. Copies of the document will be

sent to all who have commented (previously listed in this chapter), as well as to the following and to those who request copies.

Audubon Society
Environmental Defense Fund
Green River Wilderness Association
National Association of Counties
National Wildlife Federation
Natural Resources Defense Council
Sierra Club (San Francisco)
Sierra Club (Washington, D.C.)

Slickrock Country Council
Southern California Edison Co.
The Wilderness Society
Utah Chapter, Sierra Club
Utah Farm Bureau
Utah Wilderness Association, Inc.
Western River Guides Association
Westwater Commercial River Operators

CONSISTENCY REVIEW

Consistency reviews were provided for and completed with the Utah Division of Wildlife Resources, State Resource Development Coordinating Committee, Ute Tribal Council Chairman (Fort Duchesne), the Grand County Commission, and the San Juan County Commission.

<u>Name and Title</u>	<u>Planning Responsibility</u>	<u>Education</u>	<u>Experience</u>
Cleary, Kevin G. Realty Specialist	Lands Actions; Utility Corridors; Transportation	B.S., Forestry University of Maine	BLM 4 years; Pri- vate industry 2 years
Cresto, Joseph G. Wildlife Management Biologist	Wildlife Habitat Require- ments; Wildlife	B.S., Range/Wildlife New Mexico State University	BLM 17 years; Forest Service 1½ years
Dawson, Gregory R. Range Conservationist	Livestock Requirements; Vegetation; Livestock Grazing	B.S., Range Management Idaho State University	BLM 9 years
deGruyter, Beverly L. Wildlife Management Biologist	Wildlife Management Statistics	B.S., Wildlife Science New Mexico State Uni- versity	BLM 3 years
Greene, William B. Planning Coordinator	Team Leader	B.S., Forestry Michigan State University	BLM 5 years; Bureau of Outdoor Recreation 10 years; Forest Service 10 years
Miller, C. Wallace Geologist	Minerals; Mineral Resources; Mineral Rights	B.S., Geology, State University of Maryland; M.A., Environmental Management Geology, Tulane University	BLM 3 years, Geological Survey 2½ years
Milton, Robert T. Regional Economist	Socioeconomics	M.S., Economics, Colorado State University	BLM 2 years; Colorado State University 2 years (Research Associate)
Minor, David C. Outdoor Recreation Planner	Off-Road Vehicle Use and Management; Recreation; Wilderness; Visual Resources; Special Designation Areas	B.S., Park Management California State Uni- versity at Sacramento	ELM 6 years; National Park Service 15 years
Ramstetter, Patricia J. Clerk/Stenographer	Typing	Monticello High School, Monticello, Utah	BLM 1 year; Private industry 3 years
Stewart, John H. Cartographic Technician	Maps and Graphics	Westminster College Salt Lake City, Utah	BLM 16 years; U.S. Marine Corps 3 years
Svejnoha, Wayne M. Soil Conservationist	Critical Watersheds; Soils; Water Quality; Air Quality	B.S. Geography; M.S., Soils/Hydrology, Northern Illinois Uni- versity	BLM 4 years; Northern Illinois University 2 years (Regional Environ- mental Planner)

Continued

LIST OF PREPARERS

<u>Name and Title</u>	<u>Planning Responsibility</u>	<u>Education</u>	<u>Experience</u>
Thompson, William J. Range Conservationist	Vegetation and Allotment statistics	B.S., Range Science Utah State University	BLM 3 years; private industry 1 year; Forest Service 6 months
Thurston, Ruth A. Writer/Editor	Editing; Tracking; Visuals Coordination	Capital Business College Jefferson City, Missouri	BLM 5 years; Private industry 15 years
Wilbur, Donald R. Range Conservationist	Technical Coordinator; Fire Management	B.S., Range Management California State University at Humboldt.	BLM 11 years; State of California 6 years

LIST OF PREPARERS (Concluded)

APPENDIX A

Mitigating Measures

CRITICAL WATERSHEDS

Mitigating measures are used in the GRA to help prevent offsite sedimentation and salinity from oil and gas impacts. Specific recommended measures require timely rehabilitation and revegetation of a site, as well as preliminary input into the location and design of the drill pad and roads to ensure watershed protection.

All areas disturbed for access to critical areas will be properly reclaimed as specified by the Area Manager.

Native material (i.e., logs, stones, etc.) will be used as much as possible to minimize cost and visual intrusions..

Reseeding will also be required for all disturbed areas. The seed mixture will be determined by the Area Manager.

LIVESTOCK REQUIREMENTS

MITIGATING MEASURES FOR LAND TREATMENTS (CHAINING OR PLOWING FOLLOWED BY SEEDING)

The patterns of the vegetation modification will be designed to blend into the landscape to maintain the natural appearance of the area. Irregular patterns will be implemented to increase the ecotone.

Areas within 200 feet of well-traveled roads will not be chained.

Steep drainages (over 30 percent slope) will not be chained.

The need for and proper dimensions of buffer zones will be jointly agreed to by BLM and the Utah Division of Wildlife Resources (UDWR) prior to on-the-ground development of projects. Buffer zones will be provided, where necessary, to prevent disturbance to riparian ecosystem.

Vegetation will be left in place. Permits will be given for salvage of trees for firewood and posts.

Seed from a mixture of plant species adapted to the specific site will be used for seeding. This will be a variety of browse, forbs, and grass species that are desirable for both livestock and wildlife.

Treatment areas will not be grazed by livestock until vegetation becomes established. Two growing seasons of rest will be required in most cases.

MITIGATING MEASURES FOR DRILL SEEDING

Seed from a mixture of plant species adapted to the specific site will be used for seeding. This will be a variety of browse, forbs, and grass species that are desirable for both livestock and wildlife.

Treatment areas will not be grazed by livestock until vegetation becomes established. Two growing seasons of rest will be required in most cases.

MITIGATING MEASURES FOR MAINTENANCE OF PRIOR TREATMENT BY SPRAYING (2,4-D)

Prescribed spraying plans will be developed in accordance with BLM Manual 9220. Herbicide 2,4-D mixed with water at the rate of 1 pound of acid equivalent per acre will be applied by airplane. Contamination of water will be avoided, and proximity to agricultural lands will be identified.

Projects will not exceed State and Environmental Protection Agency (EPA) pollution standards. Application of chemicals will conform to EPA regulations and BLM requirements.

The patterns of the vegetation modification will be designed to blend into the landscape to maintain the natural appearance of the area.

Chemical spray will be applied only when winds are less than 5 miles per hour, to control drift.

The need for and proper dimensions of buffer zones will be jointly agreed upon (by BLM and UDWR) prior to on-the-ground development of projects.

Sprayed vegetation will be left in place.

WILDLIFE

Water developments will be designed to include small animal escape ramps. Water troughs will not be higher than 24 inches above the ground. Overflow discharge will be a minimum of 50 feet from the trough and fenced to exclude livestock from the discharge area.

OFF-ROAD VEHICLE USE AND MANAGEMENT

Suitable access routes will be signed in each designated area.

LANDS ACTIONS

Site-specific mitigating measures will be designated for each right-of-way based upon the field examination, environmental analysis, and land report.

When any public lands are transferred out of Federal ownership, access to surrounding public lands will be retained. Site specific mitigating measures will be designated for each areas based upon field exam, environmental analysis, and land report.

MINERALS

Stipulations have been developed for oil and gas activities under the oil and gas leasing category system (Appendix R contains all of the stipulations). This system uses four categories designed to provide a framework for specifying surface protection measures. The categories are:

Category 1. Areas open to leasing with standard stipulations added to the leases.

Category 2. Areas open to leasing, but with special stipulations added to the leases. These special stipulations are designed to protect environmental qualities of particular locations.

Category 3. Areas open to leasing but closed to surface occupancy for protection of sensitive environmental qualities. Directional drilling is permitted from sites in adjacent Category 1 and 2 areas.

Category 4. Areas closed to leasing for protection of extremely sensitive environmental qualities.

Protective stipulations are applied to oil and gas activities taking place in areas under wilderness review (see Appendix S.)

Stipulations have been written to apply the regulations contained in Title 43 of the Code of Federal Regulations, Subpart 3802 (43 CFR 3802) to individual mining claim development projects in areas that are under wilderness review.

Special stipulations have been written to apply the regulations contained in 43 CFR 3809 to individual mining claim development projects that disturb 5 or more acres on BLM administered lands.

Special stipulations are applied for individual mineral lease development projects where mineral materials other than oil and gas are being removed.

Special conditions are written individually for free use permits granted for removal of common mineral materials such as sand, gravel, and building stone.

Special stipulations are written for individual projects involving the removal of common varieties of minerals such as sand, gravel, and building stone under a sale contract.

RECREATION

Rest rooms will be designed to blend in with the natural surroundings.

Soil disturbance from construction of rest rooms will be confined to the immediate vicinity of the construction site.

Disturbed areas will be reseeded to native vegetation.

FIRE MANAGEMENT

Prescribed fires will be implemented according to a written fire suppression plan.

Weather factors will be monitored for proper conditions prior to implementation of a prescribed fire.

Prescribed fires will not exceed pollution standards of the State of Utah and/or the EPA.

Prescribed fires will be scheduled to occur when the most desirable plants are dormant.

Any prescribed fires will leave at least 1 percent of the existing targeted species, in the form of islands of vegetation, for use by wildlife and for aesthetics.

Prescribed fires in antelope habitat areas will be implemented in patches or spots, leaving at least 20 percent of the existing vegetative cover (primarily sagebrush) for use by antelope, while providing an opportunity for forbs to proliferate on the burned areas.

Prescribed fires will be implemented only when the ground moisture is optimum for burning without permanently damaging desirable plants.

PLANNING TIME FRAMES, ISSUES, AND MANAGEMENT ACTIONS	1983	1984	1985	1986	1987	1988	1989	1990	1991	1992	1993
Final Resource Management Plan/ Environmental Impact Statement	█										
Public Comment Period	█										
Decision Document		█									
<u>Critical Watersheds</u>											
A-1, B-1, C-1, D-1		█									
C-2, D-2		█									
C-3, D-3		█									
C-4, D-4		█									
<u>Livestock Requirements</u>											
B-3, C-6, D-6		█									
B-5, C-8, D-8		█									
C-10, D-10		█									
C-11, D-11		█									
C-12, D-12		█									
C-13, D-13		█									
D-14		█									
D-15		█									
D-16		█									
<u>Off-Road Vehicle Use and Management</u>											
C-16, D-19		█									
D-20		█									
C-17, D-21		█									
C-18, D-22		█									

(Continued)

APPENDIX B

General Implementation Schedule

PLANNING TIME FRAMES, ISSUES, AND MANAGEMENT ACTIONS	1983	1984	1985	1986	1987	1988	1989	1990	1991	1992	1993
<u>Lands Actions</u> B-9, C-19, D-23 B-10, C-20, D-24 D-25 ^a		█	█	█	█	█	█				
<u>Utility Corridors</u> B-11, C-21, D-26 B-12, C-22, D-27		█	█								
<u>Minerals</u> B-15, C-25, D-30 B-18 ^a		█									
<u>Recreation</u> B-20, C-29, D-34 C-37		█	█	█	█	█					
<u>Fire Management</u> B-28, C-38, D-42 B-29, C-39		█	█	█	█	█	█	█	█	█	█
<u>Wilderness</u> A-24, B-30, C-40, D-43 ^a		█	█	█	█	█	█	█	█	█	█

NOTE: The proposed management actions that represent a continuation of current management are not listed here unless a definite time frame has been established. Cyclic, ongoing programs (e.g., maintaining existing land treatments and wildlife waters and case-by-case handling of right-of-way and lands disposal requests) are not shown. All implementation schedules would depend on availability of work months and project funds.

^aTime frame would depend upon external factors.

APPENDIX B (Concluded)

General Implementation Schedule

APPENDIX C

Soil Loss Estimates for Saline-Alkali Soils

(Tons Per Acre Per Year)

<u>Taxonomic Unit List</u>	<u>Ecological Condition</u>		
	<u>Low</u>	<u>Medium</u>	<u>High</u>
Blueflat L., 2-15% slopes	^a 1.06	0.60	^a 0.50
Blueflat L., saline, 2-15% slopes	^a 1.30	0.90	^a 0.75
Chipeta SiCL., 1-10% slopes	^a 1.13	0.60	^a 0.40
Chipeta SiCL., thick, 1-10% slopes	^a 1.60	1.30	^a 1.00
Chipeta SiCL., 10-25% slopes	^a 2.60	^a 1.70	^a 1.30
Chipeta SiCL., 25-50% slopes	^a 11.60	^a 8.20	^a 5.80
Glenton family, 0-3% slopes	^b 0.45	^b 0.37	^b 0.27
Hanksville family, 40-60% slopes	^a 12.30	^a 8.90	^a 5.80
Hanksville family, 15-40% slopes	^a 8.10	^a 5.80	^a 3.80
Killpack SiL, 1-10% slopes	^b 1.16	^b 0.96	^b 0.77
Killpack SiCL, 10-25% slopes	^b 3.30	^b 2.80	^b 2.20
Leebench vfSL, 0-3% slopes	^b 0.60	^b 0.41	^b 0.34
Muff family, 1-15% slopes	^b 1.87	^b 1.44	^b 1.27
Ravola family, 0-3% slopes	^b 0.39	^b 0.32	^b 0.28
Redbank family, 0-3% slopes	0.23	^a 0.18	^a 0.16
Sagers SiL, 1-3% slopes	^a 1.27	^a 0.70	0.60
Toddler family, 0-3% slopes	^b 0.31	^b 0.25	^b 0.19

NOTE: L=loam; SiCL=silty clay loam; SiL=silty loam; vfSL=very fine sandy loam.

^a Estimated value using the projected canopy cover difference for ecological conditions.

^b Estimated value using projected cover factor for ecological site, K value from series description, and average estimated slope and length.

Allotment Name	Vegetative Type	Annual precip. (inches)	Percent Runoff Factor	Concentration of salt in Runoff (Mg/l)	Sediment yield (tons/acre)	Percent salt in sediment	TOTAL			SALT YIELD (TONS)		
							Runoff (ac/ft)	Sediment (Tons)	Runoff Sed.	Total	Total	Total
Barley Flat-Ronzio	Salt desert shrub (Mancos)	7	1.4	2,000	2.3	3.0	75	21,107	204	633	837	
	Salt desert shrub	7	1.4	1,000	0.75 ^a	1.0	109	10,037	148	100	248	
	Big sagebrush	12	3.5	600	1.0	0.5	67	1,912	55	10	65	
	Pinyon-juniper	12	2.8	600	1.0	0.5	375	13,383	306	67	373	
	Douglas fir	17	17.0 ^b	100	1.2	0.1	92	458	12	--	12	
	TOTAL						718	46,897	725	810	1,535	
Bar X	Salt desert shrub (Mancos)	7	1.4	2,000	2.3	3.0	26	7,222	70	217	287	
	Salt desert shrub	7	1.4	1,000	0.75	1.0	23	2,093	31	21	52	
	Big sagebrush	12	3.5	600	1.0	0.5	153	4,361	125	22	147	
	Pinyon-juniper	12	2.8	600	1.0	0.5	184	6,554	150	33	183	
		TOTAL						386	20,230	376	293	669
Eogart	Big sagebrush	12	3.5	600	1.0	0.5	5	133	4	1	5	
	Pinyon-juniper	12	2.8	600	1.0	0.5	223	7,979	182	40	222	
	Douglas fir	17	17.0	100	1.2	0.1	1,249	6,224	170	6	176	
		TOTAL						1,477	14,336	356	47	403
		Cisco Mesa	7	1.4	2,000	2.3	3.0	118	33,299	321	999	1,320
Cisco Mesa	Salt desert shrub (Mancos)	7	1.4	1,000	0.75	1.0	185	17,012	252	170	422	
	Big sagebrush	12	3.5	600	1.0	0.5	84	2,413	69	12	81	
	Pinyon-juniper	12	2.8	600	1.0	0.5	243	8,687	198	43	241	
		TOTAL						630	61,411	840	1,224	2,064

Continued

APPENDIX D

Existing Runoff, Sediment, and Salt Yields on Allotments with Grazing Conflicts

Allotment Name	Vegetative Type	Annual precip. (inches)	Percent Runoff Factor	Concentration of salt in Runoff (Mg/l)	Sediment yield (tons/acre)	Percent salt in sediment	TOTAL			SALT YIELD (TONS)		
							Runoff (ac/ft)	Sediment (Tons)	Runoff Sed.	Total	Total	Total
Cisco Springs Wash	Salt desert shrub (Mancos)	7	1.4	2,000	2.3	3.0	194	54,699	528	1,641	2,169	
	Salt desert shrub	7	1.4	1,000	0.75	1.0	128	11,785	174	118	292	
	Big sagebrush	12	3.5	600	1.0	0.5	15	425	12	2.	14	
	Pinyon-juniper	12	2.8	600	1.0	0.5	71	2,548	58	---	58	
	TOTAL						408	69,457	772	1,761	2,533	
Corral Wash	Salt desert shrub (Mancos)	7	1.4	2,000	2.3	3.0	44	12,418	120	373	493	
	Salt desert shrub	7	1.4	1,000	0.75	1.0	75	6,852	102	69	171	
	Big sagebrush	12	3.5	600	1.0	0.5	218	6,229	178	31	209	
	Pinyon-juniper	12	2.8	600	1.0	0.5	581	20,765	474	104	578	
	TOTAL						918	46,264	874	577	1,451	
Diamond	Big sagebrush	12	3.5	600	1.0	0.5	13	379	11	2	13	
	Pinyon-juniper	12	2.8	600	1.0	0.5	313	11,189	255	56	311	
	Douglas fir	17	17.0	100	1.2	0.1	1553	77,376	211	77	288	
	TOTAL						1879	88,944	477	135	612	
Floy Canyon	Salt desert shrub	7	1.4	1,000	0.75	1.0	6	524	8	5	13	
	Big sagebrush	12	3.5	600	1.0	0.5	34	977	28	5	33	
	Pinyon-juniper	12	2.8	600	1.0	0.5	270	9,627	220	48	268	
	Douglas fir	17	17.0	100	1.2	0.1	605	3,013	82	3	85	
	TOTAL						915	14,141	338	61	399	

APPENDIX D (Continued)

Existing Runoff, Sediment, and Salt Yields on Allotments with Grazing Conflicts

Harley Dome	Salt desert shrub (Mancos)	7	1.4	2,000	2.3	3.0	99	27,807	269	834	1,103
	Salt desert shrub	7	1.4	1,000	0.75	1.0	69	6,347	94	63	157
	Big sagebrush	12	3.5	600	1.0	0.5	34	967	28	5	33
	Pinyon-juniper	12	2.8	600	1.0	0.5	74	2,660	60	13	73
	TOTAL						276	37,781	451	915	1,366
Highlands	Salt desert shrub (Mancos)	7	1.4	2,000	2.3	3.0	36	10,040	98	301	399
	Salt desert shrub	7	1.4	1,000	0.75	1.0	94	8,630	128	86	214
	Pinyon-juniper	12	2.8	600	1.0	0.5	111	3,968	91	20	111
	TOTAL						241	22,638	317	407	724
Mineral Point	Salt desert shrub (Mancos)	7	1.4	2,000	2.3	3.0	53	14,803	144	444	588
	Salt desert shrub	7	1.4	1,000	0.75	1.0	22	2,033	30	20	50
	Pinyon-juniper	12	2.8	600	1.0	0.5	85	3,049	69	15	84
	TOTAL						160	19,885	243	479	722
Monument Wash	Salt desert shrub (Mancos)	7	1.4	2,000	2.3	3.0	151	42,548	411	1,276	1,687
	Salt desert shrub	7	1.4	1,000	0.75	1.0	124	11,377	169	114	283
	Pinyon-juniper	12	2.8	600	1.0	0.5	9	330	7	2	9
	TOTAL						284	54,255	587	1,392	1,979
Pipeline	Salt desert shrub (Mancos)	7	1.4	2,000	2.3	3.0	62	17,544	169	526	695
	Salt desert shrub	7	1.4	1,000	0.75	1.0	24	2,193	33	22	55
	Pinyon-juniper	12	2.8	600	1.0	0.5	57	2,034	47	10	57
	TOTAL						143	21,771	249	558	807

Continued

APPENDIX D (Continued)
Existing Runoff, Sediment, and Salt Yields on Allotments
with Grazing Conflicts

TOTAL

Allotment Name	Vegetative Type	Annual precip. (inches)	Percent Runoff Factor	Concentration of salt in Runoff TDS (Mg/l)	Sediment yield (tons/acre)	Percent salt in sediment	TOTAL			SALT YIELD (TONS)	
							Runoff (ac/ft)	Sediment (Tons)	Runoff	Salt Yield	Total
Potash	Salt desert shrub (Mancos)	7	1.4	2,000	2.3	3.0	11	3,197	30	96	126
	Salt desert shrub	7	1.4	1,000	0.75	1.0	41	3,736	56	37	93
	TOTAL						52	6,933	86	133	219
San Arroyo	Salt desert shrub (Mancos)	7	1.4	2,000	2.3	3.0	128	35,990	348	1,080	1,428
	Salt desert shrub	7	1.4	1,000	0.75	1.0	97	8,920	132	89	221
	Big sagebrush	12	3.5	600	1.0	0.5	526	15,022	429	75	504
	Pinyon-juniper	12	2.8	600	1.0	0.5	543	19,404	443	97	540
	Douglas fir	17	17.0	100	1.2	0.1	151	751	21	1	22
	Total						1445	80,087	1,373	1,342	2,715
South Sand Flat	Salt desert shrub	7	1.4	1,000	0.75	1.0	51	4,649	69	46	115
	Pinyon-juniper	12	2.8	600	1.0	0.5	78	2,799	64	14	78
	TOTAL						129	7,448	133	60	193
Sulphur Canyon	Salt desert shrub (Mancos)	7	1.4	2,000	2.3	3.0	54	15,157	147	455	602
	Salt desert shrub	7	1.4	1,000	0.75	1.0	91	8,364	124	84	208
	Big sagebrush	12	3.5	600	1.0	0.5	89	2,535	73	13	86
	Pinyon-juniper	12	2.8	600	1.0	0.5	142	5,069	116	25	141
	TOTAL						376	31,125	460	577	1,037

APPENDIX D (Continued)

Existing Runoff, Sediment, and Salt Yields on Allotments with Grazing Conflicts

Whipsaw Flat	Salt desert shrub (Mancos)	7	1.4	2,000	2.3	3.0	205	57,702	558	1,731	2,289
	Salt desert shrub	7	1.4	1,000	0.75	1.0	50	4,570	68	46	114
	TOTAL						255	62,272	626	1,777	2,403

^a Sediment yield factor for shadscale, galleta grass vegetative type (BLM, 1980).

^b Runoff factor from Stone Cabin Allotment, mountain brush and aspen vegetative type (similar ecological site).

Source: BLM, 1977c.

APPENDIX D (Concluded)
Existing Runoff, Sediment, and Salt Yields on Allotments
with Grazing Conflicts

APPENDIX E

Breakdown of Proposed Salinity Control Treatments,
Acreages and Anticipated Impacts
(Management Action C-2)

<u>Allotment</u>	<u>Acreage</u>	<u>Runoff^a (acre feet) from Treatment Area</u>	<u>Anticipated Sediment (tons) Trapped</u>	<u>Salt (tons)</u>		
				<u>Sediment^b</u>	<u>Runoff</u>	
					<u>Total</u>	
Athens	1,000	8.2	3,440	103.2	22.2	125
Barley Flat-Ronzio	10,000	81.7	34,400	1,032.0	222.1	1,254
Cisco Mesa	7,000	57.2	24,080	722.4	155.5	879
Cisco Springs Wash	10,000	81.7	34,400	1,032.0	222.1	1,254
Crescent Canyon	2,000	16.3	6,880	206.4	44.4	250
Highlands	2,000	16.3	6,880	206.4	44.4	250
Monument Wash	4,000	32.7	13,760	412.8	88.8	502
Thompson	500	4.1	1,720	51.6	11.0	62
Whipsaw Flats	4,000	32.7	13,760	412.6	88.8	502
Dewey Corral	<u>500</u>	<u>4.1</u>	<u>1,720</u>	<u>51.6</u>	<u>11.0</u>	<u>62</u>
TOTAL	41,000	335.0	141,040	4,231.0	910.3	5,140

^aUsing runoff factor 1.4 percent of precipitation, concentration of salt in water of 2,000 milligrams per liter, and 7 inches annual precipitation.

^bThree percent salt per ton sediment.

APPENDIX F

Breakdown by Allotment of Proposed Salinity Control Treatments, Acreages, and Anticipated Impacts (Management Action D-2)

Allotment	Acreage	Runoff ^a (acre-ft) from Treatment Area	Anticipated Sediment (tons) Trapped	Salt (tons)	
				Sediment ^b	Runoff
Agate	2,000	16.3	6,880	206.4	44.4
Athena	2,000	16.3	6,880	206.4	44.4
Barley Flat-Ronzio	10,000	81.7	34,400	1,032.0	222.1
Big Flat-Ten Mile	3,000	24.5	10,320	310.0	66.6
Cisco Mesa	10,000	81.7	34,400	1,032.0	222.1
Cisco Springs Wash	11,000	89.8	37,840	1,135.0	244.3
Corral Wash	3,000	24.5	10,320	310.0	66.6
Crescent Canyon	5,000	40.8	17,200	516.0	111.0
Crescent Junction	2,000	16.3	6,880	206.4	44.4
Dewey Corral	4,000	32.7	13,760	412.8	88.9
Floy Creek	3,000	24.5	10,320	310.0	66.6
Harley Dome	3,000	24.5	10,320	310.0	66.6
Highlands	3,000	24.5	10,320	310.0	66.6
Lost Spring	2,000	16.3	6,880	206.4	44.4
Monument Wash	12,000	98.0	41,280	1,238.0	266.6
Nash	2,000	16.3	6,880	206.4	44.4
Pipeline	2,000	16.3	6,880	206.4	44.4
Sulfur Canyon	3,000	24.5	10,320	310.0	66.6
Thompson Canyon	2,000	16.3	6,880	206.4	44.4
Whipsaw Flat	9,000	73.5	30,960	929.0	200.0
Totals	93,000	759.3	319,920	9,599.6	2,065.4
					11,626.0

^a Using runoff factor 1.4 percent of precipitation, concentration of salt in water of 2,000 milligrams per liter, and 7 inches annual precipitation.

^b Three percent salt per ton sediment.

Table 1. Summary of the 2010-2011 season.

1. All data are preliminary.

2. The number of cases is based on the number of cases reported to the state health department.

State	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020
Alabama	1,100	1,200	1,300	1,400	1,500	1,600	1,700	1,800	1,900	2,000	2,100
Alaska	100	110	120	130	140	150	160	170	180	190	200
Arizona	1,200	1,300	1,400	1,500	1,600	1,700	1,800	1,900	2,000	2,100	2,200
Arkansas	1,300	1,400	1,500	1,600	1,700	1,800	1,900	2,000	2,100	2,200	2,300
California	1,400	1,500	1,600	1,700	1,800	1,900	2,000	2,100	2,200	2,300	2,400
Colorado	1,500	1,600	1,700	1,800	1,900	2,000	2,100	2,200	2,300	2,400	2,500
Connecticut	1,600	1,700	1,800	1,900	2,000	2,100	2,200	2,300	2,400	2,500	2,600
Delaware	1,700	1,800	1,900	2,000	2,100	2,200	2,300	2,400	2,500	2,600	2,700
District of Columbia	1,800	1,900	2,000	2,100	2,200	2,300	2,400	2,500	2,600	2,700	2,800
Florida	1,900	2,000	2,100	2,200	2,300	2,400	2,500	2,600	2,700	2,800	2,900
Georgia	2,000	2,100	2,200	2,300	2,400	2,500	2,600	2,700	2,800	2,900	3,000
Hawaii	2,100	2,200	2,300	2,400	2,500	2,600	2,700	2,800	2,900	3,000	3,100
Idaho	2,200	2,300	2,400	2,500	2,600	2,700	2,800	2,900	3,000	3,100	3,200
Illinois	2,300	2,400	2,500	2,600	2,700	2,800	2,900	3,000	3,100	3,200	3,300
Indiana	2,400	2,500	2,600	2,700	2,800	2,900	3,000	3,100	3,200	3,300	3,400
Iowa	2,500	2,600	2,700	2,800	2,900	3,000	3,100	3,200	3,300	3,400	3,500
Kansas	2,600	2,700	2,800	2,900	3,000	3,100	3,200	3,300	3,400	3,500	3,600
Kentucky	2,700	2,800	2,900	3,000	3,100	3,200	3,300	3,400	3,500	3,600	3,700
Louisiana	2,800	2,900	3,000	3,100	3,200	3,300	3,400	3,500	3,600	3,700	3,800
Maine	2,900	3,000	3,100	3,200	3,300	3,400	3,500	3,600	3,700	3,800	3,900
Maryland	3,000	3,100	3,200	3,300	3,400	3,500	3,600	3,700	3,800	3,900	4,000
Massachusetts	3,100	3,200	3,300	3,400	3,500	3,600	3,700	3,800	3,900	4,000	4,100
Michigan	3,200	3,300	3,400	3,500	3,600	3,700	3,800	3,900	4,000	4,100	4,200
Minnesota	3,300	3,400	3,500	3,600	3,700	3,800	3,900	4,000	4,100	4,200	4,300
Mississippi	3,400	3,500	3,600	3,700	3,800	3,900	4,000	4,100	4,200	4,300	4,400
Missouri	3,500	3,600	3,700	3,800	3,900	4,000	4,100	4,200	4,300	4,400	4,500
Montana	3,600	3,700	3,800	3,900	4,000	4,100	4,200	4,300	4,400	4,500	4,600
Nebraska	3,700	3,800	3,900	4,000	4,100	4,200	4,300	4,400	4,500	4,600	4,700
Nevada	3,800	3,900	4,000	4,100	4,200	4,300	4,400	4,500	4,600	4,700	4,800
New Hampshire	3,900	4,000	4,100	4,200	4,300	4,400	4,500	4,600	4,700	4,800	4,900
New Jersey	4,000	4,100	4,200	4,300	4,400	4,500	4,600	4,700	4,800	4,900	5,000
New Mexico	4,100	4,200	4,300	4,400	4,500	4,600	4,700	4,800	4,900	5,000	5,100
New York	4,200	4,300	4,400	4,500	4,600	4,700	4,800	4,900	5,000	5,100	5,200
North Carolina	4,300	4,400	4,500	4,600	4,700	4,800	4,900	5,000	5,100	5,200	5,300
North Dakota	4,400	4,500	4,600	4,700	4,800	4,900	5,000	5,100	5,200	5,300	5,400
Ohio	4,500	4,600	4,700	4,800	4,900	5,000	5,100	5,200	5,300	5,400	5,500
Oklahoma	4,600	4,700	4,800	4,900	5,000	5,100	5,200	5,300	5,400	5,500	5,600
Oregon	4,700	4,800	4,900	5,000	5,100	5,200	5,300	5,400	5,500	5,600	5,700
Pennsylvania	4,800	4,900	5,000	5,100	5,200	5,300	5,400	5,500	5,600	5,700	5,800
Rhode Island	4,900	5,000	5,100	5,200	5,300	5,400	5,500	5,600	5,700	5,800	5,900
South Carolina	5,000	5,100	5,200	5,300	5,400	5,500	5,600	5,700	5,800	5,900	6,000
South Dakota	5,100	5,200	5,300	5,400	5,500	5,600	5,700	5,800	5,900	6,000	6,100
Tennessee	5,200	5,300	5,400	5,500	5,600	5,700	5,800	5,900	6,000	6,100	6,200
Texas	5,300	5,400	5,500	5,600	5,700	5,800	5,900	6,000	6,100	6,200	6,300
Utah	5,400	5,500	5,600	5,700	5,800	5,900	6,000	6,100	6,200	6,300	6,400
Vermont	5,500	5,600	5,700	5,800	5,900	6,000	6,100	6,200	6,300	6,400	6,500
Virginia	5,600	5,700	5,800	5,900	6,000	6,100	6,200	6,300	6,400	6,500	6,600
Washington	5,700	5,800	5,900	6,000	6,100	6,200	6,300	6,400	6,500	6,600	6,700
West Virginia	5,800	5,900	6,000	6,100	6,200	6,300	6,400	6,500	6,600	6,700	6,800
Wisconsin	5,900	6,000	6,100	6,200	6,300	6,400	6,500	6,600	6,700	6,800	6,900
Wyoming	6,000	6,100	6,200	6,300	6,400	6,500	6,600	6,700	6,800	6,900	7,000

Source: U.S. Department of Health and Human Services, Centers for Disease Control and Prevention, National Health and Medical Research Council, and the World Health Organization.

1. All data are preliminary.

2. The number of cases is based on the number of cases reported to the state health department.

3. The number of cases is based on the number of cases reported to the state health department.

4. The number of cases is based on the number of cases reported to the state health department.

5. The number of cases is based on the number of cases reported to the state health department.

6. The number of cases is based on the number of cases reported to the state health department.

7. The number of cases is based on the number of cases reported to the state health department.

8. The number of cases is based on the number of cases reported to the state health department.

9. The number of cases is based on the number of cases reported to the state health department.

GRAND SOIL SURVEY

Soil Map Unit	Percent of Mapping Unit	Soil Series	Depth to Bedrock (inches)	pH	Salinity-Alkalinity	AWC ^a (inches)	Surface Runoff	Hydrologic Group	Erosion Factor K-T-WEG	Ecological Site
1	40	Mesa	60+	7.4 to 9.0	very slightly saline to slightly saline	Moderate	Medium	B	Moderate 5 4L	Desert Loam
	25	Mack	60+	7.4 to 9.0	very slightly saline to slightly saline	Moderate to High	Medium	C	Moderate 5 5	Desert Loam
	20	Chipeta	5 to 20	7.4 to 9.0	moderately saline	Very Low	Medium to rapid	D	High 1 4L	Desert Shallow clay
	15	Minor <u>Inclusions</u>								
2	50	Chipeta	5 to 20	7.4 to 9.0	moderately saline	Very Low	Medium to rapid	D	High 1 4L	Desert Shallow clay
	20	Killpack	20 to 40	7.4 to 8.4	slightly saline	Low	Medium to rapid	C	High 2 4L	Desert Clay
	15	Blueflat	20 to 40	7.9 to 9.0	very slightly saline	Low	Medium	C	High 2 4L	Desert Shallow Clay
	15	Minor <u>Inclusions</u>								
3	30	Toddler family	60+	7.9+	slightly saline to highly saline	Moderate	Medium	B	Moderate 5 4L	Alkali Fan
	30	Ravola family	60+	7.9+	very slightly to highly saline	High	Slow	B/C	High 5 4L	Alkali Flat

Continued

APPENDIX G
General Soils Information

Soil Map Unit	Percent of Mapping Unit	Soil Series	Depth to Bedrock (inches)	pH	Salinity-Alkalinity	AWC ^a (inches)	Surface Runoff	Hydrologic Group	Erosion Factor K-T-WEG ^b	Ecological Site
20		Glenton family	60+	7.9+	very slightly saline to slightly saline	Moderate	Medium	A	Moderate to high 5 4L	Alkali Fan
20		Minor Inclusions								
4	25	Badland	--	--	-----	-----	-----	--	-----	-----
25		Rock outcrop	--	--	-----	-----	-----	--	-----	-----
20		Moenkokie	5 to 20	7.4 to 9.0	very slightly saline	very low	Slow to Moderate	D	Moderate 1 8	Desert Shallow Sandy Loam
30		Minor Inclusions								
5	35	Moenkokie	5 to 20	7.4 to 9.0	very slightly saline	very low	slow to moderate	D	moderate 1 8	Desert Shallow Sandy Loam
30		Monue	40 to 60	7.9 to 9.0	very slightly saline	low to moderate	slow	B	moderate 3 2	Desert Sandy Loam
15		Rock Outcrop	--	--	-----	-----	-----	--	-----	-----
20		Minor Inclusions								
6	35	Thedalund family, steep	20 to 60	7.9 to 9.0	very slightly saline	very low to low	very rapid	D	moderate 3 4L	Semidesert shallow Shallow Loam (ELSA,ATCO)

APPENDIX G (Continued)
General Soils Information

30	Walknolls family	5 to 20	7.4 to 8.4	very slightly saline	very low	very rapid	D	Moderate 1 3	Desert Shallow loam (very steep)
15	Pennell	8 to 20	7.9 to 8.4	very slightly saline	very low to low	Medium	D	Moderate 1 3	Desert Shallow sandy loam (CORA)
20	Minor <u>Inclusions</u>								
35	Rizo, dry	4 to 20	7.4 to 9.0	very slightly saline	very low	Medium	D	Moderate 1 3	Semidesert Shallow Sandy Loam (JP)
30	Begay	60+	7.9 to 8.4	very slightly saline	Moderate	Medium	B	High 5 2	Semidesert Sandy Loam
20	Rock outcrop	--	-----	-----	-----	-----	--	-----	-----
15	Minor <u>Inclusions</u>								
30	Shalako, dry	5 to 20	7.4 to 9.0	very slightly saline	Low	Slow	D	Moderate 1 3	Semidesert Shallow Loam (JP)
25	The dalund family, steep	20 to 60	7.4 to 9.0+	very slightly saline	Very Low to Low	Very rapid	D	Moderate 3 4L	Semidesert Shallow Loam (ELSA)
15	Hanksville family	20 to 60	6.6 to 9.0	very slightly saline	Low to Moderate	Medium	D	Moderate 2-8	Desert Shallow Clay
30	Minor <u>Inclusions</u>								
45	Clovis	60+	7.4 to 8.4	very slightly saline	High	Medium	B	Moderate 3 3	Semidesert Loam (Artr2)
20	Ildefonso	60+	7.9 to 9.0	very slightly saline	Low to moderate	Slow	B	Low 5 8	Semidesert Stony Loam (JP)

Continued

APPENDIX G (Continued)
General Soils Information

Soil Map Unit	Percent of Mapping Unit	Soil Series	Depth to Bedrock (inches)	pH	Salinity-Alkalinity	AWC ^a (inches)	Surface Runoff	Hydrologic Group	Erosion Factor K-T-WEG	Ecological Site
20		Sandoval	10 to 20	7.9 to 9.0	very slightly saline	very low	Slow	C	Moderate 2 3	Semidesert Shallow Loam (ELSA)
15		Minor <u>Inclusions</u>								
40		The dalund family, moist	20 to 60	7.4 to 9.0+	very slightly saline	Low	very rapid	C	Moderate 3 4L	Semidesert Loam (JP) very steep
20		The dalund family, steep	20 to 60	7.4 to 9.0+	very slightly saline	Very low to Low	very rapid	C	Moderate 3 4L	Semidesert Loam (ELSA) very steep
15		Dast Family	20 to 60	7.4 to 9.0+	very slightly saline	Very low to low	Rapid	D	Moderate 4 3	Upland Loam (PJ, very steep)
25		Minor <u>Inclusions</u>								
30		Dast Family	20 to 60	7.9 to 9.0+	very slightly saline	Very low to Low	Rapid	D	Moderate 4 3	Upland Loam (PJ, very steep)
25		Reva Family	3 to 20	7.4 to 8.4	very slightly saline	very Low	Rapid	D	Low 1 8	Upland Shallow Loam (PJ, Douglas fir)
20		Travesilla	4 to 20	7.4 to 8.4	very slightly saline	Very Low	Medium	D	Moderate 1 8	Upland Shallow Loam (PJ, Cemo2)
25		Minor <u>Inclusions</u>								

APPENDIX G (Continued)
General Soils Information

12	35	Sula Family	20 to 60	6.6 to 9.0	-----	Very Low to Low	Medium	C	Moderate 2 4	Mountain Loam (Douglas fir)	
	30	Razorba Family, warm	20 to 60	6.1 to 8.4	-----	Low to Moderate	Moderately rapid	B	Moderate 1 4	Mountain Loam (oak)	
	20	Reva family	3 to 20	7.4 to 8.4	very slightly saline	Very Low	Rapid	D	Low 1 8	Upland Shallow Loam (PJ, Douglas fir)	
	15	Minor Inclusions									
CANYONLANDS SOIL SURVEY											
C2	50	Moenkopie	3 to 20	7.9 to 8.4	very slightly saline	Very low	Medium	D	Moderate 1 2	Desert Shallow Sandy Loam (CORA)	
	20	Rock Outcrop	--	-----	-----	----	-----	--	-----	-----	
	10	Hoskinnini	10 to 20	7.9 to 9.0	very slightly saline	Very Low	Medium	D	Moderate 1 3	Desert Shallow Sandy Loam (CORA)	
	20	Minor Inclusions									
C3	30	Sheppard	60+	7.9 to 9.0	very slightly saline	Low	Medium	A	Low 5 1	Desert Sand D35	
	20	Thoroughfare	60+	7.9 to 8.4	----	Moderate	Slow	B	Moderate 5 5	Alkali Flat	
	15	Monue	60+	7.9 to 9.0	very slightly saline	Low to Moderate	Medium	B	Moderate 5 3	Desert Sandy Loam	
	10	Needle	10 to 20	7.4 to 8.4	very slightly saline	Very low	Medium	D	High 1 1	Desert Shallow Sand (CORA, D-35)	
	25	Minor Inclusions									

APPENDIX G (Continued)
General Soils Information

Soil Map Unit	Percent of Mapping Unit	Soil Series	Depth to Bedrock (inches)	pH	Salinity-Alkalinity	AWC ^a (inches)	Surface Runoff	Hydrologic Group	Erosion Factor K-T-WEG ^b	Ecological Site
C4	30	Ustic Torriorthents	20+	7.9 to 9.0	very slightly saline	Very low to Moderate	Medium to very rapid	B	Moderate 1 2	Semidesert Stony Loam
	25	Lithic Torriorthents	10 to 20	7.9 to 9.0	very slightly saline	very low	Rapid	D	Moderate 1 3	Desert Shallow sandy Loam (CORA)
	25	Rock outcrop	-----	-----	-----	-----	-----	-----	-----	-----
C5	20	Minor <u>Inclusions</u>								
	55	Rock outcrop	-----	-----	-----	-----	-----	-----	-----	-----
	17	Rizozo, dry	4 to 20	7.9 to 9.0	very slightly saline	Very low	Medium	D	Moderate 1 3	Semidesert Shallow Sandy Loam (PJ, CORA, D-35)
C6	13	Mido	60+	7.9 to 9.0	very slightly saline	Low	Medium	A	Moderate 5 1	Semidesert Sand D-35
	15	Minor <u>Inclusions</u>								
	45	Begay	60+	7.9 to 9.0	very slightly saline	Low to Moderate	Slow	B	High 5 3	Semidesert Sandy Loam (D-35)
C6	20	Windwhistle	20 to 40	7.4 to 9.0	very slightly saline	Very low	Slow	B	High 3 2	Semidesert Sandy Loam
	20	Red-bank	60+	8.4 to 9.0	very slightly saline	High	Slow	B	Moderate 5 3	Upland Loam
	15	Minor <u>Inclusions</u>								

APPENDIX G (Continued)
General Soils Information

C7	45	Rizozo, dry	4.0 to 20	7.9 to 9.0	very slightly saline	Very low	Medium	D	Moderate 1 3	Semidesert Shallow Sandy Loam (PJ, (CORA)
	25	Rock outcrop	-----	-----	-----	-----	-----	-----	-----	-----
	30	Minor <u>Inclusions</u>								
C8	30	Palma	40 to 60	7.4 to 9.0	very slightly saline	Low to Moderate	Slow	B	High 4 3	Upland Loam
	25	Cahona	60+	6.6 to 8.4	very slightly saline	Moderate to High	Medium	B	Moderate 5 3	Upland Loam
	20	Hagerman	20 to 40	6.6 to 8.4	-----	Low to Moderate	Medium	C	High 2 3	Upland Loam
	25	Minor <u>Inclusions</u>								
C9	40	Rizozo	4 to 20	7.9 to 9.0	very slightly saline	Very low	Medium	D	Moderate 1 3	Upland Shallow Loam (PJ)
	35	Rock Outcrop	-----	-----	-----	-----	-----	-----	-----	-----
	25	Minor <u>Inclusions</u>								
C10	50	Ustic Torriorthents	20+	7.4 to 8.4	very slightly saline	Very Low to Moderate	Medium to very rapid	B	Low 1 2	Semidesert Stony Loam (PJ)
	15	Ustollic Calciorthids	20+	7.4 to 8.4	very slightly saline	Very Low to Moderate	Medium	C	Moderate 3 3	Semidesert Stony Loam (PJ)
	15	Ustollic Haplargids	20+	7.4 to 8.4	very slightly saline	Low to High	Medium	B	Moderate 3 8	Upland Stony Loam
	20	Minor <u>Inclusions</u>								

APPENDIX G (Continued)
General Soils Information

Soil Map Unit	Percent of Mapping Unit	Soil Series	Depth to Bedrock (inches)	PH	Salinity-Alkalinity	AWC (inches)	Surface Runoff	Hydrologic Group	Erosion Factor K-T-NEG	Ecological Site
C11	25	Herm	60+	6.1 to 7.8	-----	High	Medium	C	Moderate 5 6	Mountain Loam (Oak)
	25	Falcon	10 to 20	6.1 to 7.3	-----	Very Low	Medium to rapid	D	Low 1 3	Mountain Shallow Loam (ponderosa)
	20	Maas	60+	6.6 to 8.4	very slightly saline	Moderate to High	Slow	B	Moderate 5 3	Mountain Loam (ARTR E-48)
	10	Showalter	60+	6.6 to 8.4	very slightly saline	High	Slow	D	Moderate 1 6	Mountain Stony Loam
	20	Minor Inclusions								
C12	35	Falcon	10 to 20	6.1 to 7.3	-----	very low	Medium to rapid	D	Low 1 3	Mountain Shallow Loam (ponderosa)
	20	Ponil	60+	6.1 to 7.3	-----	Moderate	rapid	D	Low 3 8	Mountain Loam (oak E-48)
	20	Toone	60+	6.1 to 7.3	very slightly saline	Low to Moderate	Slow	C	Low 3 6	Mountain Loam (oak) E-48
	5	Rock Outcrop	-----	-----	-----	-----	-----	-----	-----	-----
	20	Minor Inclusions								

^a AWC = available water capacity.

^b Refer to the Glossary for definitions of K value, T value, and wind erodibility groups (WEG).

APPENDIX G (Concluded)
General Soils Information

APPENDIX H

Allotment Management Category Criteria

MAINTAIN CATEGORY CRITERIA

- Present range condition is satisfactory.
- Allotments have moderate or high resource production potential, and are producing near their potential (or trend is moving in that direction).
- No serious resource-use conflicts exist.
- Opportunities may exist for positive economic return from public investments.
- Present management appears satisfactory.
- Other criteria appropriate to the environmental impact statement (EIS) area.

IMPROVE CATEGORY CRITERIA

- Present range condition is unsatisfactory.
- Allotments have moderate to high resource production potential and are producing at low to moderate levels.
- Serious resource-use conflicts exist.
- Opportunities exist for positive economic return from public investments.
- Present management appears unsatisfactory.
- Other criteria appropriate to EIS area.

CUSTODIAL CATEGORY CRITERIA

- Present range condition is not a factor.
- Allotments have low resource production potential, and are producing near their potential.
- Limited resource-use conflicts may exist.
- Opportunities for positive economic return on public investment do not exist or are constrained by technological or economic factors.
- Present management appears satisfactory or is the only logical practice under existing resource conditions.
- Other criteria appropriate to EIS area.

[The text in this section is extremely faint and illegible, appearing to be a multi-paragraph document.]

Allotment	Category	Allotment Acreage ^a		Ecological Condition ^c by Percentage of Allotment					Numbers and Class of Livestock and Wildlife Species ^e	Season of Use												Active Preference (AUMs) 1	1977-1982 Average Use (AUMs) 8	Nonuse (Years)
		Noncritical	Critical ^b	RO/BD ^d	Low	Med	High	Climax		Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec			
5821 Aljabe Mesa	I	2,705	None	6	--	42	52	--	59 Cattle 22 Deer 20 Elk	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	176	152	1
5853 Algate	I	16,120	None	4	15	73	8	--	944 Sheep 9 Deer	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	623	351	3
5861 Arth's Pasture	M	27,480	None	49	--	50	1	h--	131 Cattle 9 Deer 15 Bighorn	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	657	453	--
5809 Athena	I	42,772	None	2	1	36	51	10	170 Cattle 15 Deer	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	1,135	452	--
5804 Barley Flat- Ronzio	I	42,718	None	--	3	78	18	1	2,394 Sheep 44 Deer 14 Deer 5 Elk	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	2,394	873	--
5808 Bar-X	I	None	19,363	4	21	40	35	--	2,241 Sheep 12 Deer 4 Deer 2 Elk 40 Antelope	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	2,241	407	--

(Continued)

APPENDIX I

Present Management Category, Ecological Condition, and
Livestock and Wildlife Use by Allotment

5810 Cisco Nesa	I	60,620	None	4	5	47	35	9	3,180 Sheep 39 Deer 225 Deer 10 Antelope	3,180	2,267	--
5805 Cisco Springs Wash	I	58,467	None	5	2	41	48	4	1,416 Sheep 145 Cattle 17 Deer 31 Deer 10 Antelope	1,416 1,157	826 943	-- --
5865 Coal Canyon	M	4,250	None	12	--	13	72	3	57 Cattle 3 Deer	401	159	--
5862 Corral Wash	I	23,732	20,357	--	8	23	55	14	3,000 Sheep 2 Deer 122 Deer 12 Deer 1 Elk 14 Antelope	3,300	1,406	--
5816 Cotton- wood	I	33,155	1,981	4	--	6	75	15	200 Cattle 99 Deer 17 Deer 50 Elk	900	--	5
5856 Crescent Canyon	I	26,911	None	8	2	47	40	3	998 Sheep 30 Deer 4 Deer 5 Elk	998	811	--
5826 Crescent Junction	I	11,311	None	2	10	88	--	h--	743 Sheep 5 Deer	208	173	--

Present Management Category, Ecological Condition, and
Livestock and Wildlife Use by Allotment

Allotment	Category	Allotment Acreage ^a		Ecological Condition ^c by Percentage of Allotment					Numbers and Class of Livestock and Wildlife Specie ^e	Season of Use												Active Preference Use (AUMs) ^f	1977-1982 Average Use (AUMs) ^g	Nonuse (Years)
		Noncritical	Critical ^b	RO/BD ^d	Low	Med	High	Clmax		Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec			
5847 Kane Springs	I	16,978	None	70	--	10	20	--	60 Cattle 3 Deer 7 Deer 30 Bighorn	300	287	--												
5388 Lisbon	I	117,028	3,790	17	4	35	36	8	1,241 Cattle 734 Deer 11 Deer 50 Elk 5 Antelope	8,687	7,758	--												
5883 Little Hole	I	15,245	None	5	10	85	--	--	1,980 Sheep 6 Deer 10 Bighorn	990	642	1												
5837 Lone Cone	M	7,600	None	8	--	55	37	--	53 Cattle 14 Deer 2 Deer	210	130	2												
5387 Lower Lisbon	I	18,120	None	5	20	30	40	5	132 Cattle 31 Deer	790	787	--												
5879 Main Canyon	I	13,340	None	--	1	25	72	2	150 Cattle 36 Deer 14 Deer 10 Elk	450	210	3												

APPENDIX I (Continued)

Allotment	Management Category	Area (Acres)	Ecological Condition	1	2	11	52	34	Livestock and Wildlife Use	500	264	Other
5871 Middle Canyon	I	52,300	None	1	2	11	52	34	100 Cattle 188 Deer 17 Deer 50 Elk		264	--
5844 Mill Creek	C	4,560	None	19	--	20	60	1	33 Cattle 33 Deer 5 Elk	138	48	4
5852 Mineral Point	I	7,472	None	28	2	68	2	h--	53 Cattle 5 Deer 30 Bighorn	320	162	--
5811 Monument Wash	I	43,147	None	12	11	74	3	h--	1,750 Sheep 1,964 Sheep 13 Deer	1,915 2,160	-- 1,397	5 --
5814 Nash Wash	I	42,471	7,421	--	5	52	42	1	374 Cattle 371 Deer 45 Deer	2,994	1,978	--
5819 North River	C	6,669	None	17	--	71	12	h--	36 Cattle 5 Deer	200	166	--
5860 North Sand Flat	C	20,534	None	40	1	16	40	3	145 Cattle 55 Deer 3 Deer 2 Elk	798	240	--

Present Management Category, Ecological Condition, and Livestock and Wildlife Use by Allotment

5823 Ruby Ranch	C	30,155	None	38	13	49	--	h--	222 Cattle 10 Deer	665	561	--
5845 San Arroyo	I	16,368	52,105	--	--	11	81	8	3,700 Sheep 16 Deer 42 Deer 22 Deer 4 Elk 50 Antelope	4,255	2,180	--
5849 Scarf Mesa	M	None	10,209	4	20	23	14	39	12 Cattle 75 Deer 15 Elk	48	48	3
5836 Shower- bath Springs	I	47,090	None	1	1	10	63	25	127 Cattle 131 Deer 35 Deer 20 Elk 50 Elk	601	480	1
5813 South Sand Flat	I	11,720	None	10	2	41	42	5	108 Cattle 77 Deer 5 Deer 2 Elk	592	131	--
5846 Spring Canyon Bottom	I	5,662	None	43	--	55	2	h--	100 Cattle 42 Deer 30 Bighorn	200	--	5
5843 Streamboat Mesa	I	None	10,147	11	1	14	36	38	200 Cattle 223 Deer 30 Elk	932	453	1

Present Management Category, Ecological Condition, and
Livestock and Wildlife Use by Allotment

5875 Willow Flats	I	7,918	None	36	2	59	3	h--	61 Cattle 8 Deer	153	153	153	--
5384 Wind-whistle	I	None	6,156	23	1	20	43	13	158 Cattle 159 Deer 10 Deer 20 Antelope	632	608	608	--
5854 Winter Camp	I	6,300	None	--	5	10	85	--	665 Sheep 5 Deer	266	248	248	4
Bald Mesa	N/A	395	None	--	--	100	--	--	18 Cattle 30 Deer 5 Deer 8 Elk	N/A	N/A	N/A	N/A
Brumley Creek	N/A	240	None	--	--	100	--	--	12 Cattle 25 Deer 5 Deer 5 Elk	N/A	N/A	N/A	N/A
Castle Valley	N/A	659	None	--	10	85	5	--	24 Cattle 200 Deer 10 Deer	N/A	N/A	N/A	N/A
Mason Draw	N/A	195	None	--	--	100	--	--	6 Cattle 20 Deer 5 Deer 5 Elk	N/A	N/A	N/A	N/A

Present Management Category, Ecological Condition, and Livestock and Wildlife Use by Allotment

Allotment	Category	Allotment Acreage ^a		Ecological Condition ^c by Percentage of Allotment					Numbers and Class of Livestock and Wildlife Specie ^e	Season of Use												1977-1982 Average Use (AUMs) ^g	Active Preference (AUMs) ^f	Nonuse (Years)
		Noncritical	Critical ^b	RO/BD ^d	Low	Med	Hgh	Climax		Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec			
Polar Mesa ^j	N/A	1,479	None	--	15	80	5		349 Cattle 100 Deer 30 Deer 10 Elk	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	N/A	N/A	N/A

^aAllotment acreages include scattered State and private lands.

^bCritical acreage denotes riparian areas or areas essential to the survival and perpetuation of wildlife.

^cEcological condition is the present state of a vegetative community in relation to climax; it does not denote wildlife habitat condition.

^dRO/BD = Rock Outcrop/Badlands.

^eLivestock numbers were calculated by dividing preference AUMs by the season of use (number of months). Wildlife numbers were adjusted from prior stable population estimates in cooperation with the Utah Division of Wildlife Resources.

^fAUM = Animal Unit Month (the amount of forage necessary to feed one cow or five sheep for 1 month).

^gAverage use figure does not include years of nonuse.

^hEcological condition was based on three classes.

ⁱSince the Scarf Mesa Allotment is also a pasture in the Buckhorn Allotment, the acreage given here is not to be included in the total.

^jThese allotments are managed by the Forest Service, but are included here because BLM is accountable for these lands in the grazing portion of the environmental impact statement.

APPENDIX I (Concluded)

Present Management Category, Ecological Condition, and Livestock and Wildlife Use by Allotment

APPENDEX J

Vegetative Types

<u>Zone</u>	<u>Ecological Site Name</u>	<u>Habitat Type</u>	<u>Acres</u>	<u>Percent of Surveyed Area^a</u>
Saltbush	Semi-wet stream bottom	willow, oak, reedgrass	1,174	0.06
Saltbush	Semi-wet stream bottom	willow, big sagebrush, bluegrass	3,164	0.16
Saltbush	Salty stream bottom	tamarisk, willow, saltgrass	5,147	0.26
Saltbush	Talus slope-steep	shadscale, blackbrush, wildrye	20,393	1.02
Saltbush	Desert Sand	buckwheat, indian rice-grass, galleta	3,399	0.17
Saltbush	Desert Alkali Flat	greasewood, galleta, pickleweed	10,201	0.51
Saltbush	Desert Alkali Flat	greasewood, shadscale, alkali sacaton	48,930	2.44
Saltbush	Desert Shallow Sandy Loam	shadscale, galleta, Indian ricegrass	4,945	0.25
Saltbush	Desert Clay	nuttall saltbush, galleta, Indian ricegrass	129,746	6.48
Saltbush	Desert Shallow Sandy Loam	blackbrush, shadscale, galleta	46,971	2.34
Saltbush	Desert Shallow Sandy Loam	blackbrush, galleta, Indian ricegrass	17,011	0.85
Saltbush	Desert Stony Loam	blackbrush, shadscale, galleta	3,083	0.15
Saltbush	Desert Loam	shadscale, galleta, Indian ricegrass	117,784	5.88
Saltbush	Desert Sandy Loam	shadscale, Indian ricegrass, galleta	6,460	0.32
Saltbush	Desert Sandy Loam	fourwing saltbush, galleta, Indian ricegrass	40,516	2.02
Saltbush	Desert Sand	fourwing saltbush, Indian ricegrass, galleta	7,924	0.40

<u>Zone</u>	<u>Ecological Site Name</u>	<u>Habitat Type</u>	<u>Acres</u>	<u>Percent of Surveyed Area^a</u>
Saltbush	Desert Shallow Loam-steep	shadscale, nuttall saltbush, galleta	17,415	0.87
Saltbush	Desert Alkali Fan	nuttall saltbush, shadscale galleta	30,784	1.54
Saltbush	Desert Shallow Clay	mat saltbush, nuttall saltbush, galleta	132,098	6.59
Saltbush	Desert Loamy Clay	shadscale, bud sage, nuttall saltbush	1,677	0.08
Saltbush	Semi-Desert Stony Loam	blackbrush, pinyon-juniper, shadscale	18,778	0.94
Saltbush	Semi-Desert Sand	fourwing saltbush, Indian ricegrass, galleta	6,027	0.30
Saltbush	Semi-Desert Sand	fourwing saltbush, sand sage, Indian ricegrass	11,490	0.57
Saltbush	Semi-Desert Loam	fourwing saltbush, Indian ricegrass, galleta	774	0.04
Saltbush	Semi-Desert Loam	spiny hopsage, galleta, Indian ricegrass	8,059	0.40
Saltbush	Semi-Desert Sandy Loam	fourwing saltbush, galleta, Indian ricegrass	22,886	1.14
Saltbush	Semi-Desert Sandy Loam	fourwing saltbush, blackbrush, Indian ricegrass	68,824	3.44
Saltbush	Semi-Desert Sandy Loam	blackbrush, mormon tea, Indian ricegrass	2,466	0.12
Saltbush	Semi-Desert Shallow Sandy Loam	blackbrush, pinyon-juniper, galleta	79,223	3.95
Saltbush	Semi-Desert Loam-steep	wildrye, shadscale, nuttall saltbush	33,922	1.69
Saltbush	Semi-Desert Shallow Loam	wildrye, shadscale, nuttall saltbush	47,607	2.38
Pinyon-juniper	Semi-Desert Stony Loam	pinyon-juniper, Indian ricegrass, galleta	35,292	1.76

<u>Zone</u>	<u>Ecological Site Name</u>	<u>Habitat Type</u>	<u>Acres</u>	<u>Percent of Surveyed Area^a</u>
Pinyon-juniper	Semi-Desert Stony Loam	pinyon-juniper, wildrye, mountain mahogany	3,638	0.18
Pinyon-juniper	Semi-Desert Stony Loam	wildrye, pinyon-juniper, galleta	13,767	0.69
Pinyon-juniper	Semi-Desert Shallow Sandy Loam	pinyon-juniper, blackbrush, galleta	95,658	4.77
Pinyon-juniper	Semi-Desert Loam-steep	pinyon-juniper, wildrye, cliffrose	53,822	2.69
Pinyon-juniper	Semi-Desert Shallow Loam	pinyon-juniper, blacksage, wildrye	23,131	1.15
Pinyon-juniper	Upland Shallow Loam-seeded	crested wheatgrass	7,167	0.36
Pinyon-juniper	Upland Stony Loam	crested wheatgrass	7,670	0.38
Pinyon-juniper	Upland Shallow Loam	pinyon-juniper, mountain mahogany, bluegrass	89,351	4.46
Pinyon-juniper	Upland Shallow Loam	pinyon-juniper, mountain mahogany, cliffrose	48,198	2.41
Pinyon-juniper	Upland Sand	mormon tea, blue grama, Indian ricegrass	2,269	0.11
Pinyon-juniper	Upland Shallow Sandy Loam	black sage, pinyon-juniper, bluegrass	11,180	0.56
Pinyon-juniper	Upland Stony Loam	pinyon-juniper, big sagebrush, mountain mahogany	26,585	1.33
Pinyon-juniper	Upland Loam-steep	pinyon-juniper, mountain mahogany, wildrye	53,330	2.66
Pinyon-juniper	Upland Shallow Loam	pinyon-juniper, Douglas fir, wildrye	90,254	4.50
Pinyon-juniper	Upland Loam	pinyon-juniper, mountain mahogany, gambel oak	11,460	0.57
Sagebrush	Loamy Bottom	big sagebrush, fourwing saltbush, blue grama	8,365	0.42
Sagebrush	Loamy Bottom	big sagebrush, wildrye, mountain brome	8,805	0.44

<u>Zone</u>	<u>Ecological Site Name</u>	<u>Habitat Type</u>	<u>Acres</u>	<u>Percent of Surveyed Area^a</u>
Sagebrush	Semi-Desert Loam-steep	big sagebrush, Indian rice-grass, fourwing saltbush	3,645	0.18
Sagebrush	Semi-Desert Loam	big sagebrush, Indian rice-grass, galleta	39,052	1.95
Sagebrush	Upland Loam-seeded	crested wheatgrass	25,511	1.27
Sagebrush	Upland Loam	big sagebrush, galleta, blue grama	47,341	2.36
Sagebrush	Upland Loam	big sagebrush, Indian rice-grass, western wheatgrass	3,862	0.19
Douglas Fir	Mountain Loam	big sagebrush, snowberry, mountain mahogany	3,529	0.18
Douglas Fir	Mountain Shallow Loam	manzanita, bitterbrush, bluegrass	774	0.04
Douglas Fir	High Mountain Loam	Douglas Fir, white fir, wheatgrass	4,654	0.23
Douglas Fir	Mountain Loam	gambel oak, big sagebrush, bluegrass	9,327	0.47
Dopuglas Fir	Mountain Loam	gambel oak, serviceberry, wildrye	21,757	1.09
Douglas Fir	Mountain Loam	Douglas Fir, snowberry, gambel oak	47,215	2.36
	Rock/Badlands		<u>258,059</u>	<u>12.88</u>
			2,003,546	100.00

^aIncludes scattered State and private lands.

Allot. Number	Allotment Name	Alternative A No Action		Alternative B Production		Alternative C Limited Protection		Alternative D Protection	
		Initial AUMs	Management Actions	Future AUMs	Management Actions	Future AUMs	Management Actions	Future AUMs	Management Actions
5821	Adobe Mesa ^d	C= 152	Present Management	152	Present Management	392	Present Management	332	Present Management
		D= 19		19		79		109	
		E= 53		53		113		143	
5853	Agate ^e	S= 351	Present management	351	Livestock Manipulation techniques	348	Livestock Manipulation techniques	348	Livestock Manipulation techniques
		D= 19		19		19		19	
									Restrict grazing on saline soils (1,000 acres)
5861	Arth's Pasture ^a	C= 524	Present Management	524	Present Management	524	Present Management	524	Present Management
		D= 19		19		19		19	
		B= 32		32		32		32	
5809	Athena ^e	C= 452	Present Management	452	Present Management	450	Present Management	436	Present Management
		D= 31		31		31		31	
									Restrict grazing on saline soils (1,000 acres)
5804	Barley Flat-Ronzio	S= 873	Present Management	873	Livestock Manipulation techniques	873	Livestock Manipulation techniques	837	Change season of use (11-1 to 3-31)
		D= 67		67		67		67	
		E= 13		13		13		13	
5808	Bar X	S= 407	Present Management	407	Present Management	675	Present Management	607	Land Treatment (3,200 acres,
		D= 18		18		18		18	plowing)
		E= 5		5		5		5	
		A= 50		50		182		250	Change season of use 10-15 to 3-15

Continued

APPENDIX K

Breakdown by Allotment of Proposed Livestock Management Actions; Initial and Future Livestock and Wildlife Forage Animal Unit Months

Allot. Number	Allotment Name	Alternative A		Alternative B		Alternative C		Alternative D	
		Initial AUMs	Management Actions	Future AUMs	Management Actions	Future AUMs	Management Actions	Future AUMs	Management Actions
5864	Between the Creeks	C= 88 D= 21	Present Management	88 21	Present Management	88 21	Present Management	88 21	Present Management
5827	Big Flat-Ten Mile ^a	S=2,930 C=5,500	Continue AMP	2,930 5,500	Present Management	2,695 5,265	Present Management	2,918 5,487	Present Management
		D= 166 B= 43		166 43		166 43		166 43	Restrict grazing on saline soils (1,000 acres)
5872	Big Triangle	C= 127 D= 194	Present Management	127 194	Present Management	127 194	Present Management	127 194	Present Management
5817	Blue Hill ^e	C=1,842 D= 314 E= 132	Present Management	1,842 314 132	Present Management	1,919 341 159	Present Management	1,891 355 173	Present Management
			Maintain land treatments (2,883 acres chaining)		Land treatment (320 acres chaining; 980 acres drill seeding)		Land treatments (320 acres chaining; 980 acres drill seeding)		Land Treatment (320 acres chaining; 980 acres drill seeding)
5815	Bogart ^e	C= 208 D= 397 E= 310	Present Management	208 397 310	Present Management	188 397 310	Present Management	208 397 310	Maintain land treatments (2,883 acres chaining)
5863	Buckhorn ^{b,c,d}	S=1,497 C=2,743 D=1,904 E= 263	Continue AMP. Maintain Land treatments (2,740 acres chaining)	1,497 2,743 1,904 263	Present Management	1,818 3,064 2,062 421	Present Management	0 4,557 2,144 503	Present Management
					Land treatment (4,740 acres chaining; 1,715 acres drill seeding)		Land treatment (2,140 acres chaining; 1,715 acres drill seeding)		Land treatment (2,140 acres chaining; 1,715 acres drill seeding)
					Maintain land treatments (2,883 acres chaining)		Maintain land treatments (2,883 acres chaining)		Maintain land treatments 2,883 acres chaining)
									Change season of use 6-15 to 10-15
									Present Management
									0 4,402 2,173 532
									Maintain land treatment

APPENDIX K (Continued)

Breakdown by Allotment of Proposed Livestock Management Actions; Initial and Future Livestock and Wildlife Forage Animal Unit Months

5810	Cisco Mesa ^e	S=2,267 D= 500 A= 13	Present Management 2,267 500 13	Livestock Manipulation techniques 2,257 500 13	Change season of use 11-1 to 3-31 Restrict grazing on saline soils (3,000 acres)	2,177 500 13	Change season of use 11-1 to 3-31 Restrict grazing on saline soils (3,500 acres)	ments (2,470 acres chaining) Change class of livestock, sheep to cattle.
5805	Cisco Springs Wash ^e	S= 826 C= 943 D= 79 A= 13	Present Management 826 943 79 13	Livestock manipulation techniques 677 1,085 79 13	Livestock manipulation techniques Restrict grazing on saline soils (5,000 acres)	609 1,013 79 13	Change season of use 10-15 to 3-31 Restrict grazing on saline soils (5,000 acres)	754 870 79 13
5865	Coal Canyon	C= 159 D= 6	Present Management 159 6	Present Management 159 6	Present Management	159 6	Present Management	159 6
5862	Corral Wash	S=1,406 D= 132 E= 3 A= 18	Present Management 1,406 132 3 18	Livestock Manipulation techniques Land treatment, (4,480 acres plowing) 1,966 132 3 18	Land Treatment (4,480 acres plowing) Change season of use 11-1 to 3-31	1,966 132 3 18	Land treatment, (4,480 acres plowing) Change season of use 10-15 to 3-15 Restrict grazing on saline soils (4,000 acres)	1,900 132 3 18
5816	Cottonwood ^{b, d}	C= 450 D= 154 E= 132	Present Management 450 154 132	Present Management 508 168 146	Manage perennial stream	494 176 154	Manage perennial stream	450 154 132

Continued

APPENDIX K (Continued)

Breakdown by Allotment of Proposed Livestock Management Actions; Initial and Future Livestock and Wildlife Forage Animal Unit Months

Allot. Number	Allotment Name	Alternative A		Alternative B		Alternative C		Alternative D		
		Initial AUMs	No Action Management Actions	Future AUMs	Production Management Actions	Future AUMs	Limited Protection Management Actions	Future AUMs	Management Actions	Protection
5856	Crescent Canyon	S= 811	Present Management	811	Present management	811	Present Management	777	Present Management	777
		D= 34		34		34		34		34
		E= 13		13		13	Restrict grazing on saline soils (1,000 acres)	13	Restrict grazing on saline soils (1,000 acres)	13
5826	Crescent Junction	S= 173	Present Management	173	Livestock manipulation techniques	173	Livestock manipulation techniques	173	Livestock manipulation techniques	20
		D= 10		10		10		10		10
5842	Diamond ^d	C= 390	Present Management	390	Present Management	416	Land treatment (90 acres drill seeding)	409	Land treatment (90 acres drill seeding)	394
		D= 102		102		109		113		107
		E= 79		79	Land treatment (90 acres drill seeding)	85	Change season of use 6-1 to 11-10.	87	Change season of use 6-1 to 11-10.	81
5386	East Coyote	C= 884	Continue AMP.	884	Present Management	884	Present Management	884	Present Management	884
		D= 29		29		29		29		29
			Maintain land treatments (3,023 acres chaining; 3,279 acres plowing)		Maintain land treatments (3,023 acres chaining; 3,279 acres plowing)		Maintain land treatments (3,023 acres chaining; 3,279 acres plowing)		Maintain land treatments (3,023 acres chaining; 3,279 acres plowing)	
5838	Elgin ^e	C= 48	Present management	48	Present Management	24	Present Management	24	Present Management	24
		D= 17		17		17		17		17
5874	Floy Canyon ^d	C= 255	Continue AMP	255	Present Management	304	Change season of use 6-1 to 11-5	292	Change season of use 6-1 to 11-15.	254
		D= 78		78		90		94		78
		E= 116		116		128		135		116

APPENDIX K (Continued)

Breakdown by Allotment of Proposed Livestock Management Actions; Initial and Future Livestock and Wildlife Forage Animal Unit Months

5801	Floy Creek ^c	S=1,208 D= 40	Present Management 1,208 40	Present Management 1,208 40	Livestock manipu- lation techniques 1,208 40	Livestock Manipu- lation techniques 1,181 40	Restrict grazing from 1/2 mile of stream.
5851	Granite Creek	C= 39 D= 71 E= 13	Present Management 39 71 13	Present Management 39 71 13	Present Management 39 71 13	Eliminate grazing 104 19	Restrict grazing on saline soils (1,000 acres).
5803	Green River Flats ^e	S= 9 C= 32 D= 20	Present Management 9 32 20	Present Management 7 24 20	Present Management 7 24 20	Present management 7 24 20	
5825	Harley Dome ^e	S= 861 D= 53 A= 56 B= 4	Present management 861 53 56 4	Livestock manipu- lation techniques 851 53 56 4	Change season of use 12-1 to 3-31 861 53 56 4	Change season of use 11-15 to 3-15 816 53 56 4	Restrict grazing on saline soils (2,000 acres)
5389	Hatch Point ^d ^e	S=2,877 C=7,490 D= 350 E= 92 A= 73 B= 21	Present Management 2,877 7,490 350 92 73 21 1,025 acres spraying)	Livestock manipu- lation techniques 3,281 7,894 350 92 477 21 1,920 acres drill seeding)	Livestock manipu- lation techniques 3,179 7,792 350 92 683 21 1,920 acres drill seeding)	Livestock manipu- lation techniques 10,685 350 92 706 21 1,920 acres drill seeding)	Maintain land treat- ments (2,903 acres chaining; 2,961 acres plowing; 1,205 acres spraying) Change class; sheep to cattle.

Continued

APPENDIX K (Continued)

Breakdown by Allotment of Proposed Livestock Management Actions;
Initial and Future Livestock and Wildlife Forage Animal Unit Months

5883 Little Hole^d

S= 642	Present Management	642	Present Management	945	Present Management	945	Present Management	610
D= 12		12		12		12		12
B= 21		21		21		21	Restrict grazing	53
							from 700 acres.	

5837 Lone Cone

C= 120	Present Management	120	Present Management	120	Present Management	120	Present Management	120
D= 16		16		16		16		16

5387 Lower Lisbon

C= 787	Continue AMP	787	Present Management	967	Present Management	922	Present Management	876
D= 27		27		116		162		207
	Maintain land treatments (1,111 acres chaining; 2,788 acres plowing)		Land treatment (350 acres chaining; 200 acres plowing; 1,600 acres drill seeding)		Land treatment (350 acres chaining; 200 acres plowing; 1,600 acres drill seeding)		Land treatment (350 acres chaining; 200 acres plowing; 1,600 acres drill seeding)	
			Maintain land treatments (1,111 acres chaining; 2,788 acres plowing)		Maintain land treatments (1,111 acres chaining; 2,788 acres plowing)		Maintain land treatments (1,111 acres chaining; 2,788 acres plowing)	

5879 Main Canyon^d

C= 210	Present Management	210	Present Management	293	Present Management	273	Present Management	210
D= 72		72		93		103		72
E= 26		26		47		57		26

5871 Middle Canyon^d

C= 264	Present Management	264	Present Management	348	Present Management	327	Present Management	264
D= 262		262		283		293		262
E= 132		132		153		163		132

5844 Mill Creek

C= 48	Present Management	48	Present Management	48	Present Management	48	Present Management	48
D= 28		28		28		28		28
E= 13		13		13		13		13

5852 Mineral Point

C= 162	Present Management	162	Livestock manipulation techniques	162	Change season of use 10-1 to 3-31	162	Change season of use 10-1 to 3-31	162
D= 10		10		10		10		10
B= 64		64		64		64		64

APPENDIX K (Continued)

Breakdown by Allotment of Proposed Livestock Management Actions; Initial and Future Livestock and Wildlife Forage Animal Unit Months

Continued

Allot. Number	Allotment Name	Alternative A		Alternative B		Alternative C		Alternative D		
		Initial AUMs	Management Actions	No Action	Production Management Actions	Limited Protection Management Actions	Future AUMs	Management Actions	Future AUMs	Protection Management Actions
5811	Monument Wash ^b	S= 958	Present Management	958	Livestock Manipulation techniques (640 acres chain-ing)	984	Land treatments (640 acres chain-ing)	954	Land treatments (640 acres chain-ing)	947
		S=1,397		1,397		1,423		1,392		1,385
		D= 27		27	Land Treatments (640 acres chain-ing)	54		67		81
5814	Nash Wash	C=1,978	Present Management	1,978	Livestock manipulation techniques	1,978	Livestock manipulation techniques	1,978	Livestock manipulation techniques	1,924
		D= 413		413		413		413		413
5819	North River	C= 166	Present Management	166	Present Management	166	Present Management	166	Present Management	166
		D= 10		10		10		10		10
5860	North Sand Flats	C= 240	Present Management	240	Present Management	240	Present Management	240	Present Management	240
		D= 53		53		53		53		53
		E= 5		5		5		5		5
5822	Pipeline	S= 797	Present Management	797	Livestock manipulation techniques	797	Change season of use 12-1 to 3-31	797	Change season of use 11-15 to 3-15	701
		D= 29		29		29		29		29
		A= 19		19		19		19		19
5869	Potash ^e	C= 212	Present Management	212	Present Management	205	Change season of use 12-1 to 4-30	212	Eliminate grazing	0
		D= 21		21		21		21		21
		B= 161		161		161		161		373

APPENDIX K (Continued)

Breakdown by Allotment of Proposed Livestock Management Actions; Initial and Future Livestock and Wildlife Forage Animal Unit Months

5820	Professor Valley ^e	C= 424 D= 126 E= 39	Present Management Maintain land treat- ments (1,247 acres chaining)	424 126 39	Livestock Manipu- lation techniques Maintain land treat- ments (1,247 acres chaining)	424 126 39	Livestock Manipu- lation techniques Maintain land treat- ments (1,247 acres chaining)	422 126 39
5802	Rattlesnake ^e (Grand County)	S= 344 C= 90 D= 72 E= 239 B= 32	Present Management	344 90 72 239 32	Present Management	344 90 72 239 32	Present Management	344 90 72 239 32
5385	Rattlesnake (San Juan Co.)	C= 210 D= 9	Present Management Maintain land treat- ments (1,753 acres plowing)	210 9	Present Management Maintain land treat- ments (1,753 acres plowing)	210 9	Present Management Maintain land treat- ments (1,753 acres plowing)	210 9
5876	River	C= 11 D= 2	Present Management	11 2	Present Management	11 2	Present Management	11 2
5823	Ruby Ranch	C= 561 D= 21	Present Management	561 21	Present Management	561 21	Present Management	561 21
5845	San Arroyo	S=2,180 D= 101 E= 11 A= 63	Present Management	2,180 101 11 63	Livestock Manipu- lation techniques Land treatment (11,520 acres plowing)	3,145 101 11 538	Land treatments (11,520 acres plowing) Change season of use 10-15 to 3-31.	2,900 101 11 783 1,028
5849	Scarf Mesa	C= 48 D= 65 E= 39	Present Management	48 65 39	Present Management	48 65 39	Present Management	48 65 39
5836	Showerbath Springs ^d	C= 480 D= 230 E= 206	Present Management	480 230 206	Present Management Manage perennial stream	501 236 212	Present Management Restrict grazing from 1/4 mile of stream.	479 230 206

Continued

APPENDIX K (Continued)

Breakdown by Allotment of Proposed Livestock Management Actions;
Initial and Future Livestock and Wildlife Forage Animal Unit Months

Allot. Number	Allotment Name	Alternative A No Action		Alternative B Production		Alternative C Limited Protection		Alternative D Protection	
		Initial AUMs	Management Actions	Future AUMs	Management Actions	Future AUMs	Management Actions	Future AUMs	Management Actions
5813	South Sand Flats ^{a,c,e}	C= 383	Present Management	383	Present Management	378	Change season of use 11-1 to 4-15	378	Change season of use 11-1 to 4-15
		D= 76		76		76		76	
		E= 11		11		11		11	Restrict grazing from 1/2 mile of stream
5846	Spring Canyon ^b Bottom	C= 100	Present Management	100	Present Management	100	Livestock Manipulation techniques	100	Eliminate grazing
		D= 36		36		36		36	
		E= 64		64		64		64	
5843	Steamboat Mesa	C= 453	Present Management	453	Livestock Manipulation techniques	453	Livestock Manipulation techniques	453	Livestock Manipulation techniques
		D= 192		192		192		192	
		E= 79	Maintain land treatments (1,647 acres chaining)	79	Maintain land treatments (1,647 acres chaining)	79	Maintain land treatments (1,647 acres chaining)	79	Maintain land treatments (1,647 acres chaining)
5857	Sulphur Canyon	S= 897	Present Management	897	Livestock manipulation techniques	897	Change season of use 11-1 to 3-31	897	Change season of use 11-1 to 3-31
		D= 47		47		47		47	
		A= 25		25		25		25	Restrict grazing on saline soils (1,000 acres)
5882	Taylor	C= 3,744	Continue AMP	3,744	Present Management	4,257	Present Management	4,082	Present Management
		D= 296		296		546		676	
		E= 5	Maintain land treatments (2,914 acres chaining; 466 acres plowing)	5	Land treatment (6,120 acres chaining)	7	Land treatment (6,120 acres chaining)	7	Land treatment (6,120 acres chaining)

APPENDIX K (Continued)

Breakdown by Allotment of Proposed Livestock Management Actions; Initial and Future Livestock and Wildlife Forage Animal Unit Months

5824	Ten Mile Point	C=1,663 D= 35 B= 47	Present Management 1,663 35 47	Livestock Manipu- lation techniques 1,663 35 47	Maintain land treat- ments (2,914 acres chaining; 466 acres plowing)	Restrict grazing on saline soils (2,500 acres)	Restrict grazing on saline soils (5,100 acres)	1,663 35 47	Livestock Manipu- lation techniques 1,663 35 47	Maintain land treat- ments (2,913 acres chaining; 466 acres plowing)	1,663 35 47	257 23	Present Management 257 23	257 23
5873	Thompson Canyon	C= 379 D= 41 E= 39	Present Management 379 41 39	Present Management 379 41 39				364 41 39	Present Management 364 41 39		364 41 39	257 23	Present Management 257 23	257 23
5878	Tusher Wash	C= 257 D= 23	Present Management 257 23	Present Management 257 23				257 23	Present Management 257 23		257 23	257 23	Present Management 257 23	257 23
5830	Whipsaw Flat	S=2,932 D= 27	Present Management 2,932 27	Livestock manipu- lation techniques 2,932 27				2,789 27	Change season of use 10-1 to 3-31 2,789 27		2,789 27	2,789 27	Change season of use 10-1 to 2-28 2,789 27	2,789 27
5875	Willow Flats ^e	C= 153 D= 17	Present Management 153 17	Livestock Manipu- lation techniques 153 17				143 17	Livestock Manipu- lation techniques 143 17		143 17	143 17	Livestock Manipu- lation techniques 143 17	143 17
5384	Windwhistle	C= 608 D= 158 A= 25	Present Management 608 158 25	Present Management 608 158 25	Maintain land treat- ments (1,825 acres plowing)			608 158 25	Present Management 608 158 25	Maintain land treat- ments (1,825 acres plowing)	608 158 25	608 158 25	Present Management 608 158 25	608 158 25

Continued

APPENDIX K (Continued)

Breakdown by Allotment of Proposed Livestock Management Actions;
Initial and Future Livestock and Wildlife Forage Animal Unit Months

Allot. Number	Allotment Name	Alternative A No Action		Alternative B Production		Alternative C Limited Protection		Alternative D Protection	
		Initial AUMs	Management Actions	Future AUMs	Management Actions	Future AUMs	Management Actions	Future AUMs	Management Actions
5854	Winter Camp	S= 248 D= 10	Present Management	248	Present Management Land treatment (640 acres plowing)	301 37	Present Management Land treatment (640 acres plowing)	288 50	Present Management Land treatment (640 acres plowing)

NOTE: S=sheep, C=cattle, B=bighorn sheep, E=elk, A=antelope, D=deer.

^a Average licensed use shown is the average use that the current permittee has taken.

^b Since licensed use has been complete nonuse, allowable use would initially be 50 percent of active preference.

^c New operators' initial AUMs would be the same as active preference.

^e All or part of decrease is due to land disposal (Management Action B-9, C-19, or D-23) and/or construction of evaporation pond (Management Action C-3 or D-3).

APPENDIX K (Concluded)

Breakdown by Allotment of Proposed Livestock Management Actions;
Initial and Future Livestock and Wildlife Forage Animal Unit Months

Utah Guidance for Range Studies

BASIC CONSIDERATIONS

PRIORITIES

Allotments will receive studies in the following priority:

- (1) problem allotments or those in the Improve Category;
- (2) allotments under allotment management plans (AMPs) or grazing systems;
- (3) allotments where management is planned;
- (4) all remaining allotments.

Studies will be conducted as follows:

- (1) A complete set of studies (excluding climate) will be established on allotments.
- (2) Climate studies will be established in representative areas or areas where there are data voids to supplement existing weather station data.
- (3) Studies will be conducted to provide data necessary to verify or adjust stocking rates for livestock and/or wildlife ungulate populations, adjust seasons of use for livestock, and evaluate progress in achieving management objectives for vegetation resources.

STUDIES

Basic studies will include actual use, utilization, trend, condition, and climate. Phenology and green weight/dry weight conversion studies will be done as necessary to adjust inventory data, or to support studies such as climate/phenology correlation. These studies will be considered the standard. Additional studies (water quality, browse utilization, soil erosion, etc.) may be necessary on crucial, key areas. The key area-species concept will be used in all range studies.

STUDY METHODS

Study methods listed below are those recommended for Utah. Specific circumstances may warrant use of other study methods outlined in Bureau Manual 4412.2 or other modified study procedures. Alternative study procedures must be approved by the State Director prior to implementation.

ACTUAL USE STUDIES

Actual grazing use surveys from operators will be taken annually at the end of the grazing season or billing year. Livestock (and wildlife) counts can be taken at any time deemed appropriate by the range manager.

The following information will be required from the livestock operator:

(1) allotment name, pastures grazed; (2) livestock numbers grazed; and (3) season of use (dates); and (4) movement dates to and from specific use areas.

Animal counts will be documented on Bureau Form 4113-1 for livestock and on Form 6602-1 for big game.

UTILIZATION STUDIES

Data will be collected at the end of each grazing period as soon as possible after each class of animal leaves an allotment or pasture. Where both livestock and wildlife ungulates use the area simultaneously, it may be necessary to compare use on adjacent nonuse pastures or on differential exclosures.

Methodology will normally be the key forage plant method. Techniques for estimating utilization are found in Bureau Manual 4412.22(b)7.

Photographs of key species can be taken showing the different levels of use in both grasses and shrubs to supplement transect information. Mapping should show utilization patterns according to the standard 20 percent class intervals. Mapping will be done in the field on topographic maps, orthophotoquads, or other suitable maps or photos, and kept in the allotment file.

TREND STUDIES

Trend data will quantify vegetation changes in terms of plant density (number of plants per unit area) by species and plant community composition by age and form class.

Data will be collected the year prior to proposed 3- and 5-year decisions following an environmental impact statement (EIS) or resource management plan (RMP) and in accordance with the frequency key for range trend thereafter.

Trend study areas will be correctly located on a topographic map or orthophotoquads and made a part of the study area's permanent file.

Three permanently located plots will be used. Under no circumstances will plants be clipped within these study plots. Plot size will normally be a 9-square-foot frame nested within an 8.3-foot-radius plot (1/200 acre). Plant density and characterization data will be recorded on Bureau Form 4412.27(V-2).

CLIMATE STUDIES

Climate data is needed to make a reasonable analysis of climate influences on plant growth as related to normal or average years and to differentiate between management-caused vegetation changes and natural occurrences.

Sites will be selected on the basis of the climatic classification scheme used by the Soil Conservation Service (i.e., desert, semi-desert, upland, mountain, and high mountain).

Data needs include daily precipitation and daily maximum and minimum air and soil temperatures. Additional data needed to improve accuracy of calculations, especially in early phases, include (1) the date of last permanent snow cover; (2) soil moisture at beginning of growth for selected key species at representative locations, then at mid and late growing season; and (3) wind speed and duration.

Data can be gathered from a number of sources (e.g., livestock operators; BLM rain gauges; remote automatic sensing devices; other local and Federal agencies; and permanent weather stations) to provide adequate coverage with limited resources.

EVALUATION

Evaluation of studies data will be in accordance with Bureau Manual 4413.

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APPENDIX M

Off-Road Vehicle Designations Defined in Executive Order 11644

OPEN AREAS AND TRAILS

ORVs may be used subject to the operating regulations and vehicle standards set forth in Title 43 of the Code of Federal Regulations (CFR) Subparts 8341 and 8343. All public land not designated as limited or closed will be designated as open.

SENSITIVE OPEN AREAS

These areas are open to ORV use but contain certain resource values that are sensitive to adverse impacts from ORV activity, especially if the existing level or extent of ORV use increases. These areas should receive special attention in the BLM monitoring program to ensure that the open designation is amended if it is determined that ORV use is causing considerable adverse impacts. BLM should take special care to discourage ORV use of these areas, especially commercial or group recreational vehicle activities.

LIMITED AREAS AND TRAILS

Use of ORVs is subject to restrictions deemed appropriate by the authorized officer. Restrictions may limit the number or types of vehicles allowed, dates and times of use, and similar matters. Limited areas and trails may be designated for special or intensive use, such as organized recreational events, and may be subject to rules set forth in 43 CFR 8341.2.

LIMITED TO EXISTING ROADS AND TRAILS

Cross-country vehicle travel is prohibited; all vehicle use is restricted to existing roads and trails.

LIMITED TO DESIGNATED ROADS AND TRAILS

Cross-country vehicle travel is prohibited on lands in this category. All vehicles are limited to designated roads and trails. Roads and trails where vehicle travel is permitted will be signed open.

CLOSED AREAS AND TRAILS

ORV use is permanently or temporarily prohibited. County and State roads are not subject to this designation.

The open, limited, and closed designations apply only to public land within the designated boundary. These designations are not intended to affect use of private, county-maintained, or State roads.

THE UNITED STATES OF AMERICA

IN SENATE

REPORT OF THE COMMISSIONER OF THE GENERAL LAND OFFICE
ON THE PROGRESS OF THE PUBLIC LANDS DURING THE YEAR
ENDING JUNE 30, 1902

WASHINGTON

1903

GOVERNMENT PRINTING OFFICE

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APPENDIX N

Criteria for Categorization of Public Lands for Retention, Disposal, or Further Study According to the Bureau's Asset Management Program

Asset management criteria will apply to lands currently managed by the Bureau of Land Management (BLM) and those lands which become subject to BLM administration as a result of withdrawal revocations. All BLM lands under asset management will be assigned to one of three categories, as follows:

- lands and mineral resources to be retained in Federal ownership and not considered for sale or transfer;
- lands and mineral resources to be made available for sale or transfer; and
- lands and mineral resources that will require further study in order to determine whether they should be retained or transferred.

Land and mineral resources to be retained contain environmental and/or economic assets of National significance, including wilderness areas, wilderness study areas, national conservation areas, wild and scenic rivers, national or historic trails, natural or research natural areas, designated areas for cultural or natural history, designated areas of critical environmental concern, and wild horse ranges.

Currently designated mineral resources with National economic significance that will be retained include known recoverable coal resource areas, known geologic structures (oil and gas), the outer continental shelf, known geothermal resource areas, areas identified as having nationally significant oil shale deposits, designated tar sands areas, and known potash, sodium, and phosphate areas.

Further classes of lands, minerals, or other resources with economic or environmental assets of possible National significance may be included in the retention category as further studies of other lands are completed.

Public lands that are likely to be made available for sale or transfer out of Federal ownership include:

- lands proximate to cities, towns, or development areas not under application for recreation or other public purposes;
- scattered nonurban tracts so located as to make effective and efficient management impractical;
- lands designated for agricultural, commercial, or industrial development as the highest value or otherwise most appropriate use; and
- other types of lands and minerals identified for sale in an existing land use plan.

Other lands may be included in this category as further studies of other lands are completed.

Lands and mineral resources that require further study to determine whether they should be retained or transferred out of Federal ownership will be identified for further study.

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APPENDIX 0

Lands that are Proximate to Communities but will Require Further Study
to Determine their Suitability for Retention or Disposal

<u>Area</u>	<u>Township and Range</u>	<u>Section</u>	<u>Subdivision</u>	<u>Acres</u>
Green River	T. 21 S., R. 17 E., SLB&M	4	Lots 11, 12, 13, 14	160
		5	E $\frac{1}{2}$ SE $\frac{1}{2}$	80
		7	Lot 4	34
			SE $\frac{1}{2}$ SW $\frac{1}{2}$	40
			SE $\frac{1}{2}$	160
		8	NW $\frac{1}{2}$ SW $\frac{1}{2}$	40
			SE $\frac{1}{2}$ NW $\frac{1}{2}$	40
			SE $\frac{1}{2}$	160
			18	N $\frac{1}{2}$
Castle Valley	T. 25 S., R. 23E., SLB&M	23	SW $\frac{1}{2}$	160
			W $\frac{1}{2}$ SE $\frac{1}{2}$	80
		25	W $\frac{1}{2}$	320
			SE $\frac{1}{2}$	160
		26	(A11)	640
		27	N $\frac{1}{2}$	320
			SE $\frac{1}{2}$	160
		35	N $\frac{1}{2}$	320
			W $\frac{1}{2}$ SE $\frac{1}{2}$	80
			NE $\frac{1}{2}$ SE $\frac{1}{2}$	<u>40</u>
			Subtotal	2,280
Moab	T. 27 S., R. 23E., SLB&M	20	W $\frac{1}{2}$ NE $\frac{1}{2}$	80
			NE $\frac{1}{2}$ NE $\frac{1}{2}$	40
			W $\frac{1}{2}$	320
		29	W $\frac{1}{2}$ SE $\frac{1}{2}$	80
			SE $\frac{1}{2}$ SE $\frac{1}{2}$	40
			(A11)	<u>640</u>
				Subtotal
LaSal Junction	T. 29 S., R. 23 E., SLB&M	3	NE $\frac{1}{2}$	160
			W $\frac{1}{2}$	320
		4	E $\frac{1}{2}$	320
			9	(A11)
			Subtotal	1,440
LaSal	T. 29 S., R. 24 E., SLB&M	1	(A11)	<u>640</u>
			Subtotal	640
TOTAL ACRES				<u>6,594</u>

APPENDIX P

Isolated Tracts

<u>Township and Range</u>	<u>Section and Subdivision</u>	<u>Acres</u>
1. T. 17 S., R. 20 E.	Sec. 33: E $\frac{1}{2}$ SE $\frac{1}{2}$	37.50
2. T. 18 S., R. 17 E.	Sec. 25: Lot 1	1.0
	Sec. 36: Lot 1	0.24
3. T. 18 S., R. 19 E.	Sec. 9: S $\frac{1}{2}$ S $\frac{1}{2}$	7
	Sec. 15: S $\frac{1}{2}$	112
	Sec. 22: W $\frac{1}{2}$ W $\frac{1}{2}$ NE $\frac{1}{2}$	40
4. T. 18 S., R. 20 E.	Sec. 4: E $\frac{1}{2}$	160
	Sec. 9: Most	400
	Sec. 17: NE $\frac{1}{2}$	145
	Sec. 21: W $\frac{1}{2}$	175
	Sec. 28: NW $\frac{1}{2}$ NW $\frac{1}{2}$	39
	Sec. 29: E $\frac{1}{2}$	145
5. T. 19 S., R. 21 E.	Sec. 5: Lots 3,4	58.65
6. T. 20 S., R. 16 E.	Sec. 21: SE $\frac{1}{2}$ SW $\frac{1}{2}$	40
	Sec. 23: SW $\frac{1}{2}$ NE $\frac{1}{2}$	40
	Sec. 28: Lot 2, NW $\frac{1}{2}$ S $\frac{1}{2}$	439.84
	Sec. 33: Lots 1, 2, 3, NE $\frac{1}{2}$ E $\frac{1}{2}$ NW $\frac{1}{2}$ NE $\frac{1}{2}$ SW $\frac{1}{2}$, N $\frac{1}{2}$ SE $\frac{1}{2}$	488.7
	Sec. 34: E $\frac{1}{2}$ NW $\frac{1}{2}$	80
7. T. 20 S., R. 24 E.	Sec. 18: SW $\frac{1}{2}$ NE $\frac{1}{2}$, W $\frac{1}{2}$ SE $\frac{1}{2}$, SE $\frac{1}{2}$ SE $\frac{1}{2}$	160
8. T. 20 S., R. 25 E.	Sec. 11: NW $\frac{1}{2}$ NE $\frac{1}{2}$, N $\frac{1}{2}$ NW $\frac{1}{2}$	120
9. T. 21 S., R. 16 E.	Sec. 1: Lots 1,4,5,7,8,9,10 12,13,14,15,16	423
	Sec. 13: SW $\frac{1}{2}$ SE $\frac{1}{2}$	40
	Sec. 14: NE $\frac{1}{2}$ SE $\frac{1}{2}$	40
	Sec. 22: NE $\frac{1}{2}$ SE $\frac{1}{2}$	40
10. T. 21 S., R. 17 E.	Sec. 6: Lots 2,3,4,5,6,7,10,11 12,13,14,17,18; E $\frac{1}{2}$ SW $\frac{1}{2}$	607.51
11. T. 21 S., R. 23 E.	Sec. 33: NW $\frac{1}{2}$ NW $\frac{1}{2}$, S $\frac{1}{2}$ NW $\frac{1}{2}$, N $\frac{1}{2}$ SW $\frac{1}{2}$ N $\frac{1}{2}$ SE $\frac{1}{2}$, NW $\frac{1}{2}$ NE $\frac{1}{2}$	320
	Sec. 34: NW $\frac{1}{2}$ NW $\frac{1}{2}$	40
12. T. 24 S., R. 20 E.	Sec. 25: S $\frac{1}{2}$ SE $\frac{1}{2}$	80

13. T. 24 S., R. 21 E.	Sec. 7: Lots 1,2,3,4, E $\frac{1}{2}$ W $\frac{1}{2}$ E $\frac{1}{2}$	636.92
	Sec. 18: Lots, 1,2,3,4, E $\frac{1}{2}$ W $\frac{1}{2}$ E $\frac{1}{2}$	637.28
	Sec. 19: Lots 1,2,3,4, E. $\frac{1}{2}$ W $\frac{1}{2}$, E $\frac{1}{2}$	637.56
	Sec. 30: Lots 1,2 NE $\frac{1}{2}$, E $\frac{1}{2}$ NW $\frac{1}{2}$	318.93
14. T. 24 S., R. 22 E.	Sec. 35: Lot 1, NW $\frac{1}{2}$ NE $\frac{1}{2}$	76.56
	Sec. 36: Lots 1,2	71.49
15. T. 24 S., R. 22 E.	Sec. 1: SE $\frac{1}{2}$ NE $\frac{1}{2}$	40
	Sec. 12: NE $\frac{1}{2}$ NW $\frac{1}{2}$ NE $\frac{1}{2}$	10
16. T. 25 S., R. 22 E.	Sec. 7: Lot 4	38.55
	Sec. 18: Lots 6, 10, 16	118.11
	Sec. 20: Lot 2,4,6	160.52
	Sec. 28: Lot 4, SE $\frac{1}{2}$ NW $\frac{1}{2}$, NW $\frac{1}{2}$ SE $\frac{1}{2}$, SE $\frac{1}{2}$ SE $\frac{1}{2}$	154.85
17. T. 26 S., R. 20 E.	Sec. 21: SE $\frac{1}{2}$	160
	Sec. 27: S $\frac{1}{2}$ NW $\frac{1}{2}$, W $\frac{1}{2}$ SW $\frac{1}{2}$	160
	Sec. 28: NW $\frac{1}{2}$ NE $\frac{1}{2}$, E $\frac{1}{2}$ E $\frac{1}{2}$	200
18. T. 26 S., R. 25 E.	Sec. 28: W $\frac{1}{2}$ W $\frac{1}{2}$	160
19. T. 26 S., R. 26 E.	Sec. 31: Lots 1,2,3,4	142.32
20. T. 29 S., R. 22 E.	Sec. 25: SE $\frac{1}{2}$ SW $\frac{1}{2}$	40
21. T. 27 S., R. 23 E.	Sec. 6: Lot No. 1	40

City-County Requests

<u>Legal Description</u>	<u>Requested By</u>	<u>Purpose</u>	<u>Known Conflict</u>
1. T. 27 S., R. 23 E., SLB&M Sec. 5: S $\frac{1}{2}$ Sec. 6: E $\frac{1}{2}$ SW $\frac{1}{4}$, SE $\frac{1}{4}$	Grand County Water Conservancy District	Recreation and Public Purpose (R&PP) lease, Mill Creek dam area (500 acres)	
2. T. 26 S., R. 22 E., SLB&M Sec. 5: W $\frac{1}{2}$ SW $\frac{1}{4}$ NW $\frac{1}{4}$ Sec. 6: NW $\frac{1}{2}$ SE $\frac{1}{2}$ SE $\frac{1}{2}$, W $\frac{1}{2}$ NE $\frac{1}{2}$ SE $\frac{1}{2}$ SE $\frac{1}{2}$, SW $\frac{1}{2}$ NE $\frac{1}{2}$ SE $\frac{1}{2}$, W $\frac{1}{2}$ SE $\frac{1}{2}$ NE $\frac{1}{2}$ SE $\frac{1}{2}$	City of Moab	Dump and disposal extension (170 acres)	1. Some requested lands in Sec. 6 are in private or State ownership.
3. T. 26 S., R. 21 E., SLB&M Sec. 12: SE $\frac{1}{2}$ NW $\frac{1}{4}$	City of Moab	R&PP lease, city water tank (40 acres)	1. Four rights-of way exist in this area.
4. T. 26 S., R. 21 E., SLB&M Sec. 12: NW $\frac{1}{4}$ NW $\frac{1}{4}$, NW $\frac{1}{2}$ SE $\frac{1}{2}$, NE $\frac{1}{2}$ SW $\frac{1}{2}$ SE $\frac{1}{2}$, SE $\frac{1}{2}$ SE $\frac{1}{2}$ Sec. 13: NE $\frac{1}{2}$ NE $\frac{1}{2}$	City of Moab	Community expansion land below canyon rim (3,230 acres)	1. Special Land Use Permit U-024683 exist in Section 34.
Sec. 26 S., R. 22 E., SLB&M Sec. 18: W $\frac{1}{2}$ NW $\frac{1}{4}$, SW $\frac{1}{4}$, SW $\frac{1}{2}$ SE $\frac{1}{2}$ Sec. 19: NE $\frac{1}{2}$ NE $\frac{1}{2}$ Sec. 20: N $\frac{1}{2}$, W $\frac{1}{2}$ SE $\frac{1}{2}$, SE $\frac{1}{2}$ SE $\frac{1}{2}$ Sec. 27: S $\frac{1}{2}$ SW $\frac{1}{4}$ Sec. 28: S $\frac{1}{2}$ N $\frac{1}{2}$, S $\frac{1}{2}$ Sec. 29: NE $\frac{1}{2}$ NE $\frac{1}{2}$, NE $\frac{1}{2}$ NW $\frac{1}{2}$ NE $\frac{1}{2}$, SE $\frac{1}{2}$ NE $\frac{1}{2}$ Sec. 33: NE $\frac{1}{2}$ Sec. 34: W $\frac{1}{2}$ NE $\frac{1}{2}$, NW $\frac{1}{4}$, NE $\frac{1}{2}$ SW $\frac{1}{2}$, SE $\frac{1}{2}$ SW $\frac{1}{2}$, NW $\frac{1}{2}$ SE $\frac{1}{2}$, S $\frac{1}{2}$ SE $\frac{1}{2}$ Sec. 35: SW $\frac{1}{2}$ SW $\frac{1}{4}$			2. Sec. 20 is within Reclamation Withdrawals U-018045. 3. Mining claims
T. 27 S., R. 22 E., SLB&M Sec. 3: N $\frac{1}{2}$ NE $\frac{1}{2}$, SE $\frac{1}{2}$ NE $\frac{1}{2}$, E $\frac{1}{2}$ SW $\frac{1}{4}$ Sec. 2: NW $\frac{1}{2}$ NW $\frac{1}{4}$, NE $\frac{1}{2}$ SW $\frac{1}{2}$, SE $\frac{1}{2}$ SW $\frac{1}{2}$, W $\frac{1}{2}$ SE $\frac{1}{2}$ Sec. 11: N $\frac{1}{2}$ NE $\frac{1}{2}$, SE $\frac{1}{2}$ NE $\frac{1}{2}$ Sec. 12: SW $\frac{1}{2}$ NW $\frac{1}{4}$, W $\frac{1}{2}$ SW $\frac{1}{2}$, SE $\frac{1}{2}$ SW $\frac{1}{2}$ Sec. 13: W $\frac{1}{2}$ NE $\frac{1}{2}$, SE $\frac{1}{2}$ NE $\frac{1}{2}$, NE $\frac{1}{2}$ NW $\frac{1}{4}$, SE $\frac{1}{2}$			

APPENDIX Q

Lands Requested for Disposal

<u>Legal Description</u>	<u>Requested By</u>	<u>Purpose</u>	<u>Known Conflict</u>
5.		Included in No. 4	
6. T. 25 S., R. 21 E., SLB&M Sec. 26: SW $\frac{1}{2}$ SW $\frac{1}{2}$ NE $\frac{1}{2}$ SE $\frac{1}{2}$	City of Moab	Police pistol range (2 $\frac{1}{2}$ acres)	1. Within a Powersite Withdrawal. 2. Within close proximity to Arches National Park and Colorado River.
7. T. 25 S., R. 23 E., SLB&M Sec. 5: S $\frac{1}{2}$ S $\frac{1}{2}$ S $\frac{1}{2}$ SW $\frac{1}{2}$ Sec. 6: SE $\frac{1}{2}$ NW $\frac{1}{2}$, NW $\frac{1}{2}$ SW $\frac{1}{2}$, SE $\frac{1}{2}$ SE $\frac{1}{2}$ Sec. 8: NE $\frac{1}{2}$ NE $\frac{1}{2}$	Grand County	Land along Loop Road (Castle Valley) (180 acres)	1. Two rights-of-way exists. 2. Portions of requested lands are not in BLM ownership.
8. T. 26 S., R. 25 E., SLB&M Sec. 28: W $\frac{1}{2}$ W $\frac{1}{2}$	Grand County	Isolated tracts to State Forest or private rangeland use as requested by Grand County (320 acres)	1. Sec. 28 adjacent to Manti-LaSal National Forest and State of Utah land; Sec. 31 adjacent to State of Utah Land.
T. 26 S., R. 26 E., SLB&M -Sec. 31: W $\frac{1}{2}$ W $\frac{1}{2}$	Grand County	Low level nuclear waste site east of Cisco, south of I-70, (160 acres).	
9. Request being revised	Grand County	Isolated tract near Cisco (40 acres)	1. Surrounded by State and private lands.
10. T. 21 S., R. 23 E., SLB&M Sec. 23: NE $\frac{1}{2}$ SE $\frac{1}{2}$	Grand County	Nuclear waste (No acreage figures available)	
11. T. 21 S., R. 21 E., & 22 E., SLB&M More accurate legal description needed.	Grand County	Community expansion near Green River (160 acres)	1. Request lands adjacent to Dept. of Defense Withdrawal (PLO 3279).
12. T. 21 S., R. 16 E., SLB&M Sec. 13: NE $\frac{1}{2}$ NE $\frac{1}{2}$, SW $\frac{1}{2}$ SE $\frac{1}{2}$ Sec. 14: NW $\frac{1}{2}$ NW $\frac{1}{2}$ NE $\frac{1}{2}$ SE $\frac{1}{2}$	City of Green River		2. NW $\frac{1}{2}$ NW $\frac{1}{2}$ Sec. 14 is in Lieu Selection Land by State of Utah.
13. Request being revised	City of Green River		
14. Request being revised	City of Green River		

APPENDIX Q (Continued)
Lands Requested for Disposal

15.	T. 24 S., R. 19 E., SLB&M Sec. 1: All T. 24 S., R. 20 E., SLB&M Sec. 6: W $\frac{1}{2}$ E $\frac{1}{2}$, W $\frac{1}{2}$, SE $\frac{1}{4}$ SE $\frac{1}{4}$	City of Green River	Moab airport crossing (960 acres)	<ol style="list-style-type: none"> Numerous mining claims. S$\frac{1}{2}$SW$\frac{1}{4}$ of Sec. 1 is within a State of Exchange application (U-39780). Two rights-of-way in Sec. 1 (U-015341 and U-10657). Sec. 6 is within Determination Area (P.L. 167).
16.	T. 28 S., R. 24 E., SLB&M Sec. 33: N $\frac{1}{2}$ NW $\frac{1}{4}$, NE $\frac{1}{4}$ SW $\frac{1}{4}$ NW $\frac{1}{4}$	San Juan County	Gravel for county (90 acres)	<ol style="list-style-type: none"> Numerous mining claims staked.
17.	T. 25 S., R. 20 E., SLB&M Sec. 4: E $\frac{1}{2}$, E $\frac{1}{2}$ Lot 14, W $\frac{1}{2}$ Lot 15 NW $\frac{1}{4}$ SW $\frac{1}{4}$, SE $\frac{1}{4}$ SW $\frac{1}{4}$ SW $\frac{1}{4}$ Sec. 9: NW $\frac{1}{4}$ NW $\frac{1}{4}$ NE $\frac{1}{4}$, N $\frac{1}{2}$ NE $\frac{1}{4}$ NW $\frac{1}{4}$ NE $\frac{1}{4}$ N $\frac{1}{2}$ NE $\frac{1}{4}$ NW $\frac{1}{4}$ NE $\frac{1}{4}$ T. 24 S., R. 20 E., SLB&M Sec. 6: S $\frac{1}{2}$ SW $\frac{1}{4}$, SW $\frac{1}{4}$ SE $\frac{1}{4}$ T. 24 S., R. 19 E., SLB&M Sec. 1: S $\frac{1}{2}$ S $\frac{1}{2}$ Sec. 3: S $\frac{1}{2}$ SW $\frac{1}{4}$ Sec. 4: E $\frac{1}{2}$, NENW $\frac{1}{4}$ Sec. 10: NE $\frac{1}{4}$, N $\frac{1}{2}$ NW $\frac{1}{4}$, NE $\frac{1}{4}$ SE $\frac{1}{4}$ Sec. 11: All Sec. 12: All T. 23 S., R. 19 E., SLB&M Sec. 19: SW $\frac{1}{4}$ SW $\frac{1}{4}$ Sec. 30: SW $\frac{1}{4}$ NW $\frac{1}{4}$, NW $\frac{1}{4}$ SW $\frac{1}{4}$ Sec. 33: W $\frac{1}{2}$ NW $\frac{1}{4}$, SE $\frac{1}{4}$ NW $\frac{1}{4}$, SW $\frac{1}{4}$ T. 23 S., R. 18 E., SLB&M Sec. 24: N $\frac{1}{2}$ NE $\frac{1}{4}$, W $\frac{1}{2}$, S $\frac{1}{4}$ SE $\frac{1}{4}$ Sec. 25: N $\frac{1}{2}$	San Juan County Grand County	Gravel for county (90 acres) Community development (3,900 acres)	<ol style="list-style-type: none"> Some Requested Lands with State Exchange application area Lands potentially valuable for oil, gas, sodium, potash and coal. Many mining claims are staked for uranium and vanadium. Determination area (P.L. 167). S$\frac{1}{2}$NE$\frac{1}{4}$ Sec. 25 is within Public Water Reserve #107.

APPENDIX Q (Continued)
Lands Requested for Disposal

State Requests

<u>Legal Description</u>	<u>Requested By</u>	<u>Purpose</u>	<u>Known Conflict</u>
1. T. 26 S., R. 20 E., Sec. 33: NE $\frac{1}{2}$ SW $\frac{1}{2}$, NW $\frac{1}{2}$ SE $\frac{1}{2}$, S $\frac{1}{2}$ S $\frac{1}{2}$ T. 26 S., R. 20 E. Sec. 20, W $\frac{1}{2}$ NE $\frac{1}{2}$, NW $\frac{1}{2}$, SW $\frac{1}{2}$, W $\frac{1}{2}$ SE $\frac{1}{2}$; Sec. 29: NW $\frac{1}{2}$ NE $\frac{1}{2}$, N $\frac{1}{2}$ NW $\frac{1}{2}$ Sec. 30: N $\frac{1}{2}$ N $\frac{1}{2}$ T. 26 S., R. 19 E. Sec. 25, excluding land below 5,800 feet. Sec. 26, excluding land below 5,800 feet. Sec. 36, W $\frac{1}{2}$ E $\frac{1}{2}$ T. 26 S., R. 20 E. Sec. 31, SW $\frac{1}{2}$, S $\frac{1}{2}$ NW $\frac{1}{2}$, SW $\frac{1}{2}$ NE $\frac{1}{2}$, W $\frac{1}{2}$ SE $\frac{1}{2}$, SE $\frac{1}{2}$ SE $\frac{1}{2}$. T. 27 S., R. 20 E. Sec. 6: All; Sec. 7, N $\frac{1}{2}$ Sec. 8: NW $\frac{1}{2}$ T. 27 S., R. 20 E. Sec. 4, NW $\frac{1}{2}$, NE $\frac{1}{2}$ SW $\frac{1}{2}$	Division of Parks and Recreation	Recreational purposes near Dead Horse Point (4,400 acres)	

APPENDIX Q (Continued)
 Lands Requested for Disposal

Private Requests

Known Conflicts

Request

Applicant

Legal Description

1. T. 25 S., R. 23 E., SLB&M Sec. 6: SW $\frac{1}{2}$ SW $\frac{1}{4}$ SE $\frac{1}{4}$ NW $\frac{1}{4}$	Mr. Ken Drogin P.O. Box 905 Moab, Utah 84532	Lease with option to purchase (approximately 5 acres).	
2. T. 25 S., R. 22 E., SLB&M Sec. 1: SE $\frac{1}{4}$ NE $\frac{1}{4}$	Mr. Hermann Kusek P.O. Box 1368 Moab, Utah 84532	Lease with option to purchase (40 acres).	
3. T. 26 S., R. 22 E., SLB&M Sec. 5 and 6	Mr. Ivan Winder 59 $\frac{1}{2}$ South Main Moab, Utah 84532	Lease or purchase (no specific parcels requested).	
4. T. 26 S., R. 22 E., SLB&M Sec. 17: Lot 62	Mr. Dave Cozzens Moab, Utah 84532	Purchase (2.47 acres) at public sale.	
5. T. 23 S., R. 23 E., SLB&M Sec. 7: SW $\frac{1}{4}$ NE $\frac{1}{4}$, E $\frac{1}{2}$ SE $\frac{1}{4}$ NW $\frac{1}{4}$	Mr. Keith A. Miller P.O. Box 1416 Moab, Utah 84532	Desert land entry, lease with option to purchase (80 acres).	
6. T. 23 S., R. 18 E., SLB&M Sec. 25: S $\frac{1}{2}$ NE $\frac{1}{4}$	Mr. Ray Tibbetts 5 North Main Moab, Utah 84532	Purchase (80 acres) at public sale.	1. Land withdrawn for Public Water Reserve. 2. Land within Determination Area (P.L. 167).
7. T. 25 S., R. 22 E., SLB&M Sec. 12: NE $\frac{1}{2}$ SE $\frac{1}{4}$	Mr. & Mrs. Kirk Cooley P.O. Box 182 Moab, Utah 84532	Agricultural lease with option to purchase (17.5 acres).	

APPENDIX Q (Concluded)
Lands Requested for Disposal

APPENDIX R

Oil and Gas Category Stipulations

Category 1

The following standard stipulations apply to oil and gas activities in designated Category 1 areas. These appear on all oil and gas leases issued and also apply as standard stipulations to leases in Category 2 and 3 areas.

1. Notwithstanding any provision of this lease to the contrary, any drilling, construction, or other operation on the leased lands that will disturb the surface thereof or otherwise affect the environment, hereinafter called "surface disturbing operation," conducted by lessee shall be subject, as set forth in this stipulation, to prior approval of such operation by the Area Oil and Gas Supervisor in consultation with appropriate surface management agency and to such reasonable conditions, not inconsistent with the purposes for which this lease is issued, as the Supervisor may require to protect the surface of the leased lands and the environment.
2. Prior to entry upon the land or the disturbance of the surface thereof for drilling or other purposes, lessee shall submit for approval two (2) copies of a map and explanation of the nature of the anticipated activity and surface disturbance to the District Engineer or Area Oil and Gas Supervisor, as appropriate, and will also furnish the appropriate surface management agency, named above, with a copy of such map and explanation.

An environmental analysis will be made by the U.S. Department of the Interior, Geological Survey (USGS) in consultation with the appropriate surface management agency for the purpose of assuring proper protection of the surface, the natural resources, the environment, existing improvements, and for assuring timely reclamation of disturbed lands.

3. Upon completion of said environmental analysis, the District Engineer or Area Oil and Gas Supervisor, as appropriate, shall notify lessee of the conditions, if any, to which the proposed surface disturbing operations will be subject.

Said conditions may relate to any of the following:

- (a) Location of drilling or other exploratory or developmental operations or the manner in which they are to be conducted;
- (b) Types of vehicles that may be used and areas in which they may be used; and
- (c) Manner or location in which improvements such as roads, buildings, pipelines, or other improvements are to be constructed.

The following are special stipulations for the protection of cultural resources. They also apply to Category 2 leases.

The Federal surface management agency is responsible for assuring that the leased lands are examined to determine if cultural resources are present and to specify mitigation measures. Prior to undertaking any surface disturbing activities on the lands covered by

this lease, the lessee or operator, unless notified to the contrary by the authorized officer of the surface management agency or BLM, as appropriate, shall:

1. Contact the appropriate BLM office on lands managed by BLM, or the appropriate surface management agency on lands where the surface is administered by such agency, to determine if a site-specific cultural resource inventory is required. If a survey is required, then
2. Engage the services of a qualified cultural resource specialist acceptable to the Federal surface management agency to conduct an intensive inventory for evidence of cultural resource values;
3. Submit a report acceptable to the authorized officer of the surface management agency.
4. Implement mitigation measures required by the surface management agency to preserve or avoid destruction of cultural resource values. Mitigation may include relocation of proposed facilities, testing and salvage, or other protective measures. Where impacts cannot be mitigated to the satisfaction of the surface management agency, surface occupancy on that area must be prohibited.

The lessee or operator shall immediately bring to the attention of the Minerals Management Service (MMS) or the authorized officer of the Federal surface management agency or BLM any cultural resources or any other object of scientific interest discovered as a result of surface operations under this lease, and not disturb such discoveries until directed to proceed by the MMS.

Category 2

The following is a list of stipulations that may be applied in whole or in part to individual leases for the protection of specific resources in specific locations.

1. In order to minimize watershed damage, exploration, drilling, and other development activity will be allowed only during the period from April 30 to November 1. This limitation does not apply to maintenance and operation of producing wells. Exceptions to this limitation in any year may be specifically authorized in writing by the District Engineer of the USGS, with the concurrence of the authorized officer of the Federal surface management agency.
2. The lessee is informed that the floodplain portions of the lease area require special attention to prevent damage to surface resources and contamination to the Colorado River system. Any surface use within such areas will be strictly controlled or restricted where not essential for operations. Appropriate modifications to imposed restrictions will be made for maintenance and operations of producing oil and gas wells.
3. Construction of access roads and drill pads on slopes in excess of 30 percent will require special design standards to minimize watershed damage. Drilling operations and any associated construction activities on slopes in excess of 50 percent may require directional drilling to prevent damage to the watershed. Exceptions to these limitations may be specifically authorized in writing by the District Engineer of the

USGS, with concurrence of the authorized officer of the Federal surface management agency.

4. In order to protect elk winter range, exploration, drilling, and other development activity will be allowed only from May 16 to October 31. This limitation does not apply to maintenance and operation of producing wells. Exceptions to this limitation in any year may be specifically authorized in writing by the District Engineer of the USGS, with the concurrence of the authorized officer of the Federal surface management agency.
5. In order to protect deer winter range, exploration, drilling, and other development activity will be allowed only from May 16 to October 31. This limitation does not apply to maintenance and operation of producing wells. Exceptions to this limitation in any year may be specifically authorized in writing by the authorized officer of the Federal surface management agency.
6. In order to protect antelope fawning, exploration, drilling, and other development activity will be allowed only from June 16 to May 14. This limitation does not apply to maintenance and operation of producing wells. Exceptions to this limitation in any year may be specifically authorized in writing by the authorized officer of the Federal surface management agency.
7. No occupancy or other surface disturbance will be allowed within 330 feet of the channel centerline of (Bitter Creek, Westwater Creek, Cottonwood Wash, Cisco Wash, Nash Wash, Sagers Wash, Thompson Wash, Grand Wash, Floy Wash, Salt Wash, Spring Canyon, Hell Roaring Canyon, Mineral Canyon, Bull Canyon, Dry Fork, Sevenmile Canyon, Springs Canyon, Pole Canyon, West Coyote Creek, East Coyote Creek, Castle Creek, Professor Creek, Onion Creek, Granite Creek, Ryan Creek, or Coates Creek). This distance may be modified when specifically approved in writing by the District Engineer of the USGS with the concurrence of the authorized officer of the Federal surface management agency.
8. No occupancy or other surface disturbance will be allowed within one-quarter mile of the channel centerline of the Colorado River. This distance may be modified when specifically approved in writing by the authorized officer of the Federal surface management agency.
9. The lessee is informed that the lease is within a sensitive, high use recreation area, and will require special attention to prevent undue damage to the scenic and recreational values. Measures such as natural or artificial screening, painting of all production facilities to blend with the landscape, special rehabilitation requirements, or other similar practices will be required as necessary by the Federal surface management agency.

Category 3

The following stipulation applies to all leases in Category 3 areas:

No occupancy or other activity on the surface of (legal subdivision) is allowed under this lease.

Category 4

No leases are issued in Category 4 areas.

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APPENDIX S

Explanation of Oil and Gas Lease Stipulations for Activities in Wilderness Study Areas

Existing oil and gas categories and attendant stipulations (see Appendix R) were developed in 1975, prior to designation of wilderness study areas (WSAs) in 1980 and 1981. Wilderness values were generally not used as the basis for these categories.

Similarly, WSAs and wilderness inventory units not designated as WSAs which are currently under appeal, were not considered in developing new category proposals (see Table 2-2, Management Actions B-15, C-25, and D-30). In compliance with the Kerr decision (Rocky Mountain Oil and Gas Association v. Cecil D. Andrus and Leo Krulitz, Wyoming, 1980), wilderness values were not evaluated in determining category recommendations. Category recommendations developed for these areas would protect resource values other than wilderness, if these areas are not designated wilderness.

So long as these areas are under wilderness review authorized by the Federal Land Policy and Management Act of 1976 (FLPMA), wilderness values present are protected by BLM's Interim Management Policy and Guidelines for Lands Under Wilderness Review, December 1979 (IMP), subject to certain valid rights existing at the time FLPMA was passed.

Under IMP, a wilderness stipulation is attached to each oil and gas lease issued in IMP areas after FLPMA. This stipulation (printed below) sets forth certain criteria that must be followed to ensure nonimpairment of wilderness values present. It does not apply to leases issued prior to FLPMA. If any WSA were to be designated as wilderness by Congress, it would be managed under BLM's Wilderness Management Policy of September 1981, and new leasing would not be allowed. Leases in effect at the time of wilderness designation would be valid and could be developed, subject to lease stipulations, but would not be renewed.

The following is reprinted from IMP, Appendix A.

Wilderness Protection Stipulation

By accepting this lease the lessee acknowledges that the lands contained in this lease are being inventoried or evaluated for their wilderness potential by the Bureau of Land Management (BLM) under section 603 of the Federal Land Policy and Management Act of 1976, 90 Stat. 2743 (43 USC Sec. 1782), and that exploration or production activities which are not in conformity with section 603 may never be permitted. Expenditures in leases on which exploration drilling or production are not allowed will create no additional rights in the lease, and such leases will expire in accordance with law.

Activities will be permitted under the lease so long as BLM determines they will not impair wilderness suitability. This will be the case either until the BLM Wilderness inventory process has resulted in a final wilderness inventory decision that an area lacks wilderness characteristics, or in the case of a wilderness study area until Congress has decided not to designate the lands included within this lease as wilderness. Activities will be considered nonimpairing if the BLM determines that they meet each of the following three criteria:

- (a) It is temporary. This means that the use or activity may continue until the time when it must be terminated in order to meet the reclamation requirement of paragraphs (b) and (c) below. A temporary use that creates no new surface disturbance may continue unless Congress designates the area as wilderness, so long as it can easily and immediately be terminated at that time, if necessary to management of the area as wilderness.

- (b) Any temporary impacts caused by the activity must, at a minimum, be capable of being reclaimed to a condition of being substantially unnoticeable in the wilderness study area (or inventory unit) as a whole by the time the Secretary of the Interior is scheduled to send his recommendations on that area to the President, and the operator will be required to reclaim the impacts to that standard by that date. If the wilderness study is postponed, the reclamation will be scheduled for completion within 4 years after approval of the activity. (Obviously, if and when the Interim Management Policy ceases to apply to an inventory unit dropped from wilderness review following a final wilderness inventory decision of the BLM State Director, the reclamation deadline previously specified will cease to apply). The Secretary's schedule for transmitting his recommendations to the President will not be changed as a result of any unexpected inability to complete the reclamation by the specified date, and such inability will not constrain the Secretary's recommendation with respect to the area's suitability or unsuitability for preservation as wilderness.

The reclamation will, to the extent practicable, be done while the activity is in progress. Reclamation will include the complete recontouring of all cuts and fills to blend with the natural topography, the replacement of topsoil, and the restoration of plant cover at least to the point where natural succession is occurring. Plant cover will be restored by means of reseeding or replanting, using species previously occurring in the area. If necessary, irrigation will be required. The reclamation schedule will be based on conditions, so as to ensure that the reclamation will be complete, and the impacts will be substantially unnoticeable in the area as a whole, by the time the Secretary is scheduled to send his recommendations to the President. ("Substantially unnoticeable" is defined in Appendix F of the IMP.)

- (c) When the activity is terminated, and after any needed reclamation is complete, the area's wilderness values must not have been degraded so far, compared with the area's values for other purposes, as to significantly constrain the Secretary's recommendation with respect to the area's suitability or unsuitability for preservation as wilderness. The wilderness values to be considered are those mentioned in section 2(c) of the Wilderness Act, including naturalness, outstanding opportunities for solitude or for primitive and unconfined recreation, and ecological, geological or other features of scientific, educational, scenic, or historical value.

If all or any part of the area included within the leasehold estate is formally designated by Congress as wilderness, exploration and development operations taking place or to take place on that part of the lease will remain subject to the requirements of the stipulation, except as modified by the Act of Congress designating the land as wilderness. If Congress does not specify in such act how existing leases like this one will be managed, then the provision of the Wilderness Act of 1964 will apply, as implemented by rules and regulations promulgated by the Department of the Interior.

APPENDIX T

Areas with Potential for Improvement through Prescribed Fire

<u>Allotment Name</u>	<u>Potential Acres</u>	<u>Future Forage Increase (AUMs)^a</u>
Buckhorn	1,200	150
Cottonwood	692	87
Diamond	212	27
Showerbath Springs	320	40
Little Hole	2,420	303
Adobe Mesa	2,880	360
Hatch Point	2,240	280
Lisbon	1,600	200
Middle Canyon	1,000	125
Main Canyon	1,000	125
Floy Canyon	<u>585</u>	<u>73</u>
TOTALS	14,149	1,770

^a AUM=Animal Unit Month (enough forage to feed one cow or five sheep for 1 month).

APPENDIX U

Summary of Preliminary Wilderness Suitability Recommendations

UT-060-068A Desolation Canyon Grand County 51,250 acres

Recommendation: Partial Wilderness designation

The wilderness study area (WSA), totaling 250,750 acres in two resource areas, offers outstanding recreational values in whitewater river rafting along the Green River. Side canyons offer exceptional hiking opportunities. Numerous excellent river campsites are also available. Area eliminated consists of peripheral area with energy conflicts.

UT-060-100B Flume Canyon Grand County 47,550 acres

Recommendation: No Wilderness

The WSA is in an area known for oil and gas production and has fairly high mineral values. Wilderness designation could create an adverse effect to the local economy. Numerous pre-FLPMA (Federal Land Policy and Management Act) leases and inheld State section would hinder manageability as a wilderness.

UT-060-100C Spruce Canyon Grand County 20,350 acres

Recommendation: No Wilderness

The WSA is in an area known for oil and gas production and has fairly high mineral values. Wilderness designation could create an adverse effect to the local economy. Numerous pre-FLPMA leases would hinder manageability as a wilderness.

UT-060-100C Coal Canyon Grand County 43,815 acres

Recommendation: No Wilderness

The WSA is in an area known for oil and gas production and has fairly high mineral values. Wilderness designation could create an adverse effect to the local economy. Numerous pre-FLPMA leases would hinder manageability as a wilderness.

UT-060-138 Negro Bill Canyon Grand County 7,620 acres

Recommendation: No Wilderness-Outstanding Natural Area

The WSA has numerous intrusions and a narrow configuration which detracts from manageability as a wilderness. Area does have exceptional scenic recreational opportunities.

UT-060-118 Westwater Canyon Grand County 31,160 acres

Recommendation: Partial Wilderness designation:

The heart of the WSA, containing the Westwater Canyon of the Colorado River, offers superb recreational values in the whitewater river rafting opportunities present. Side canyons offer exceptional hiking. Areas eliminated are small peripheral areas believed to have manageability conflicts.

UT-060-140A Behind the Rocks Grand & San Juan Counties 12,635 acres

Recommendations: All Wilderness

Although the WSA has fairly high mineral potential, the primitive recreation values created by the unique red sandstone fins and supplemental wilderness values are believed to supersede mineral potential. No minerals have been produced from the WSA.

Acreage Summary, Wilderness Studies

Breakdown by WSA, showing WSA acreage, alternatives considered for each WSA, acreages for each alternative, and preferred alternative (BLM recommendation). The preferred alternative is marked with an asterisk (*) and underlined.

WSA Number	WSA Name Alternatives	WSA Acres	Wilderness Acres	Drop Acre	Other Designa- tion Acres
UT-060-068A	DESOLATION CANYON	51,250			
	All Wilderness		51,250	0	0
	No Wilderness		0	51,250	0
	* <u>Partial Wilderness #1</u>		<u>50,820</u>	<u>430</u>	<u>0</u>
	Partial Wilderness #2		7,180	44,070	0
UT-060-100B	FLUME CANYON	47,550			
	All Wilderness		47,550	0	0
	* <u>No Wilderness</u>		<u>0</u>	<u>47,550</u>	<u>0</u>
UT-060-100C	SPRUCE CANYON	20,350			
	All Wilderness		20,350	0	0
	* <u>No Wilderness</u>		<u>0</u>	<u>20,350</u>	<u>0</u>
UT-060-100C	COAL CANYON	43,815			
	All Wilderness		43,815	0	0
	* <u>No Wilderness</u>		<u>0</u>	<u>43,815</u>	<u>0</u>

<u>WSA Number</u>	<u>WSA Name Alternative</u>	<u>WSA Acres</u>	<u>Wild. Acre</u>	<u>Drop Acre</u>	<u>Other Designation Acres</u>
UT-060-118	WESTWATER CANYON	31,160			
	All Wilderness		31,160	0	0
	No Wilderness		0	31,160	0
	No Wilderness-Wild & Scenic		0	27,000	4,160
	<u>*Partial Wilderness</u>		<u>26,000</u>	<u>5,160</u>	<u>0</u>
UT-060-138	NEGRO BILL CANYON	7,620			
	All Wilderness		7,620	0	0
	No Wilderness		0	7,620	0
	*No Wilderness, Outstanding				
	<u>Natural Area</u>		<u>0</u>	<u>7,620</u>	<u>1,375</u>
UT-060-140A	BEHIND THE ROCKS	12,635			
	<u>*All Wilderness</u>		<u>12,635</u>	<u>0</u>	<u>0</u>
	No Wilderness		0	12,635	0
Total Acreage Studied		<u>214,380</u>			
Total Acreage <u>*Preferred Alternative</u>			<u>89,455</u>	<u>124,925</u>	<u>1,375</u>

Areas Still Under Study

<u>WSA Number</u>	<u>WSA Name</u>	<u>Acres</u>	<u>Office</u>
UT-060-116/117	Black Ridge Canyon West (portion)	5,100	Grand Junction District

APPENDIX V

Methodology for Determining Economic Impacts

ECONOMIC IMPACTS RELATED TO CRITICAL WATERSHED MANAGEMENT

Estimated changes in water yield and salt loading from the Grand Resource Area (GRA) were used in the following formulas to estimate changes in the total dissolved solids (TDS) levels at Imperial Dam:

$$\text{Change in concentration at Imperial} = \frac{\text{Flow below Parker} \times \text{Salt above Parker} + \text{Flow above Parker} \times \text{Salt below Parker}}{\text{Flow at Imperial}}$$

Where

X = Change in salt load due to project in 1,000 tons

Y = Change in flow due to project in 1,000 acre-feet

735.29 = Conversion from tons per acre-foot to milligrams per liter (mg/l)

		$\frac{9710 + X}{8129 + Y}$	-	7919.5	$\frac{735.29}{5632}$
Year 1990:	conc = 6630				
		$\frac{9665 + X}{7509 + Y}$	-	8529.8	$\frac{735.29}{5613}$
Year 2000:	conc = 6627				
		$\frac{0694 + X}{7399 + Y}$	-	8694.3	$\frac{735.29}{5662}$
Year 2010:	conc = 6636				

The changes in TDS levels at Imperial Dam were then applied to the mg/l cost presented below:

Summary of Annual Cost per mg/l at Imperial Dam
for Varing Levels of Salinity

Kleinman & Brown Cost Estimates Minus
Indirect and Induced Impacts (1981 Dollars)

	<u>Low</u>	<u>Medium</u>	<u>High</u>	<u>Bureau of Reclamation Recommended Cost Estimates</u>
800	\$208,882	\$351,897	\$454,187	\$472,000
900	212,588	355,603	457,893	
1000	218,814	361,829	464,119	
1100	229,279	372,294	474,584	
1200	246,880	389,895	492,185	
1300	276,421	419,436	521,726	
1400	326,091	469,106	571,396	

The Bureau of Reclamation salinity cost estimates are based on a projected future TDS level in the absence of any action to control salinity, and include indirect and induced economic impacts. These cost estimates portray regional impacts, however, only under particular circumstances, such as chronic unemployment and imperfect mobility of capital, are indirect and induced impacts included in a benefit/cost analysis. For this reason, value estimates were presented both including and not including indirect and induced impacts.

The Colorado River Compact of 1922 specifies that the upper Colorado river basin states allow an average of 7.5 million acre-feet of water to pass Lee's Ferry, Arizona (U.S. Congress, 1921). Because of this compact, changes in water yield due to implementing a salinity project would not affect the amount of water passing Lee's Ferry, and therefore, would not affect TDS levels at Imperial dam. However, whenever water yield is reduced the amount of water available for downstream use is also reduced. There have been a number of studies estimating the implicit value of agricultural water in the region (Anderson & Kleinman, Moore and Hedges, USDI 1969, Barney, 1982). The value loss estimates from decreased water yield were based on a \$50 per acre foot value figure and assumed a 50% average return flow.

ECONOMIC IMPACTS RELATED TO LIVESTOCK GRAZING

As a result of a 1979 interagency agreement between the Economic Statistics and Cooperative Service (ESCS), U.S. Department of Agriculture, Forest Service (USFS), and the Bureau of Land Management (BLM), ESCS collected rancher economic data for the USFS and BLM.

Producers using BLM forage in the GRA were stratified according to herd size, season of Federal rangeland use, and dependency on Federal lands for grazing. Average costs and returns for producers in these strata were first based upon U.S. Department of Agriculture cost of production survey data for a broad geographic area including the GRA. To reflect local conditions, the survey data were adjusted through local producers' panels, extension specialists, lending institutions, and universities. The final ranch budgets for the GRA are shown in Table V-1.

Based upon these ranch budgets, a linear programming model was developed for each rancher strata. Models were set up to maximize net income based on a series of production parameters and constraints. The amount of grazing on public lands enters the model at a constrained level equal to that used by each of the typical ranches. The BLM forage constraints were then varied to see how the typical profit-maximizing ranches would adjust to these changes. Average costs, returns, herd size, and hired labor requirements were then computed by rancher strata for 10 through 30 percent increases in available public land forage, and 10 through 100 percent decreases in available public land forage. The results of this modeling are shown in Table V-2.

Operators in the GRA were then grouped into the same strata used in the linear programming models. Each ranch has a unique set of characteristics affecting its operation which cannot be fully represented by a ranch model. However, the ranch models can be used to estimate the aggregate impacts of changing the allocation of public land forage to those ranches in each stratum.

Impacts were estimated assuming that those ranches not using their full active preference would continue at their 5-year average licensed use. Therefore, only when the proposed level of use was below an operator's 5-year average was a decrease in income recorded. This assumption tends to overestimate the rancher benefits of each alternative.

The changes in forage availability were evaluated by assuming that the changes would be uniform throughout the existing period of use. Changes in season of use constrain the periods that operators can use public forage. These changes were not evaluated by ESCS or through linear program modeling. The proposed changes in season of use most consistently exclude grazing during some periods in the spring (March through May). Spring is also the period when ranchers have the fewest alternative sources of forage.

TABLE V-1

Sales, Costs, and Returns for Livestock Operators

<u>Sales (Average Prices 1978-1980)</u>	Cattle Herds			
	1 to 99 Cattle	100 or More Cattle	of all Sizes (Yearlong Grazing)	Sheep Herds of All Sizes
Steer Calves	\$ 6,017	\$ 97,951	\$ 40,117	-----
Heifer Calves	3,494	48,114	18,816	-----
Yearlong Heifers	350	2,449	1,050	-----
Cull Cows	1,094	27,715	13,857	-----
Slaughter Lambs	-----	-----	-----	\$ 88,805
Feeder Lambs	-----	-----	-----	58,650
Ewes	-----	-----	-----	15,085
Wool	-----	-----	-----	27,819
Wool Incentive Payment	-----	-----	-----	10,850
Unshorn Lamb Payment	-----	-----	-----	<u>3,077</u>
TOTAL SALES	\$10,955	\$176,229	\$ 73,840	\$204,286

Cash Costs (1980 Dollars)

BLM Grazing Fees	\$ 437	\$ 11,498	\$ 6,200	\$ 6,661
Forest Service Grazing Fees	246	6,300	0	5,360
State Lease	0	2,007	450	582
Hay (Produced)	1,068	5,614	6,641	0
Protein Supplement	253	1,901	803	0
Grain (Purchase)	-----	-----	-----	7,563
Salt and Minerals	51	891	349	778
Spray and Dipping	-----	-----	-----	58
Veterinary Medicine	154	1,111	436	1,000
Hired Trucking	157	1,328	520	6,778
Marketing	152	1,506	590	278
Shearing and Tagging	-----	-----	-----	5,278
Lamb Promotion	-----	-----	-----	83
Organizations	-----	-----	-----	278
Legal and Accounting	-----	-----	-----	1,056
Wool Storage	-----	-----	-----	222
Predator Control	-----	-----	-----	1,861
Ram Death Loss	-----	-----	-----	1,639
Fuel and Lubricants	1,495	9,064	3,792	4,948
Repairs	1,124	9,278	6,025	4,787
Taxes	1,098	16,253	6,805	8,742
Insurances	288	4,536	1,840	1,891
Interest on Operating Capital	472	3,849	1,867	2,333
General Farm Overhead	468	5,537	2,169	5,056
Hired Labor	<u>43</u>	<u>7,129</u>	<u>2,603</u>	<u>9,640</u>
Total Cash Costs	\$ 7,506	\$ 87,802	\$ 41,090	\$ 76,872

Other Costs (1980 Dollars)

Family Labor	\$ 2,018	\$ 15,860	\$ 5,556	\$ 9,640
Depreciation	2,406	35,643	20,093	20,541
Interest on Investment Other than Land	5,048	77,953	32,761	41,482
Interest on Land	<u>15,408</u>	<u>238,799</u>	<u>98,481</u>	<u>125,784</u>
Total Other Costs	\$24,880	\$368,255	\$156,893	\$197,447
TOTAL ALL COSTS	\$32,386	\$456,057	\$197,983	\$274,319

Returns

Return Above Cash Costs	\$ 3,449	\$ 88,427	\$ 32,750	\$127,414
Return Above Cash Costs and Family Labor	1,431	72,567	27,194	117,774
Return to Total Investment	-975	36,924	7,101	97,233
Return to Land	-6,023	-41,029	-25,660	55,751

NOTE: Information in this table and in Table V-2 was based on the following assumptions:

Annual Calf Crop/Docking Rate (percentage)	95	90	92	110
Annual Replacement Rate (percentage)	15	16	18	21
Annual Calf Loss/Lamb Loss (percentage)	5	9	7	8
Annual Cow Loss/Ewe Loss (percentage)	3	4	3	7
Cows per Bull/Ewes per Ram	20	20	20	40

The average licensed use that would be excluded during the spring under each alternative was estimated for all operators. This figure was adjusted for each alternative according to the herd size change predicted by the linear programming model. To calculate the worst-case impact of these changes, it was assumed that this forage loss would be replaced with alfalfa hay purchased at \$75 per ton. It was further assumed that an animal unit month (AUM) of public forage supplied to a typical herd combination during the spring would have to be replaced with 730 pounds of alfalfa hay.

Changes in hired labor requirements were computed using the predicted expenditure for hired labor and the average income for farm laborers in Grand County.

Direct operator income changes were calculated using linear programming estimated returns above cash cost. Indirect and induced income changes were calculated using an input-output model for Grand County. Returns above cash cost were not used to measure induced effects, since induced impacts are determined by reportable income, which is less than returns above cash costs. Reportable income was measured from changes in livestock sales and the income-to-sales ratio in the input-output model.

	No Change	+10%	+20%	+30%	-10%	-20%	-30%	-40%	-50%	-100%
<u>Herds of 1 to 99 Cows</u>										
Gross Income	\$10,956	\$11,275	\$11,577	\$11,885	\$10,654	\$10,135	\$10,034	\$9,715	\$9,413	\$7,213
Total Cash Costs	7,504	7,650	7,789	7,932	7,165	7,219	7,080	6,934	6,795	6,316
Value of Family Labor	2,018	2,076	2,132	2,189	1,962	1,903	1,849	1,789	1,733	1,339
Depreciation	2,406	2,418	2,430	2,442	2,394	2,382	2,371	2,358	2,347	2,265
Interest on Investment Other than Land	5,048	5,145	5,238	5,332	4,956	4,859	4,766	4,569	4,577	3,924
Return Above Cash Costs	3,452	3,625	3,788	3,953	3,289	3,116	2,954	2,781	2,618	937
Return Above Cash Costs and Family Labor	1,434	1,549	1,656	1,764	1,327	1,213	1,106	992	885	-402
Return to Total Investment	-972	-369	-774	-678	-1,067	-1,169	-1,265	-1,366	-1,462	-2,667
Return to Land	-6,020	-6,014	-6,017	-6,010	-6,023	-6,028	-6,031	-6,025	-6,039	-6,592
Herd Size (Head)	41,000	42,19	43,32	44,48	39,87	38,64	37,55	36,36	35,23	27,21
Family Labor (Hours)	617	635	652	669	600	582	555	547	530	430
Hired Labor (Hours)	11	13	14	14	13	12	12	12	11	9

Herds of 100 or More Cattle

Gross Income	\$176,262	\$181,153	\$181,153	\$181,153	\$174,718	\$173,174	\$162,739	\$148,003	\$132,628	\$62,453
Total Cash Costs	87,858	86,729	88,178	89,630	87,330	86,873	83,545	79,446	75,232	60,220
Value of Family Labor	15,863	16,303	16,303	16,103	15,724	15,595	14,646	13,320	11,936	5,620
Depreciation	35,644	35,854	35,854	35,844	35,576	35,512	35,064	34,432	35,772	30,762
Interest on Investment Other than Land	77,963	79,600	79,600	79,600	77,457	76,550	73,437	68,506	63,360	39,874
Return Above Cash Costs	88,404	94,424	92,975	91,523	87,388	86,301	79,194	68,557	57,396	2,233
Return Above Cash Costs and Family Labor	72,541	78,121	76,672	75,420	71,664	70,716	64,548	55,237	45,460	-3,387
Return to Total Investment	36,897	42,267	40,818	39,366	36,086	35,204	29,404	20,809	11,668	-3,149
Return to Land	-41,066	-37,333	-38,782	-40,234	-41,371	-41,724	-43,953	-47,791	-51,672	-74,023
Herd Size (Head)	727.12	737.02	747.02	757.02	710.80	704.55	682.10	662.15	642.00	556.09
Family Labor (Hours)	4,851	4,955	4,965	4,985	4,899	4,765	4,479	4,073	3,650	1,719
Hired Labor (Hours)	2,160	2,241	2,241	2,241	2,161	2,142	2,013	1,835	1,641	713

Cattle Herds of All
Sizes (Yearlong Grazing)

Gross Income	\$ 73,838	\$ 78,910	\$ 83,962	\$ 89,034	\$ 68,045	\$ 62,270	\$ 56,473	\$ 50,676	\$ 44,902	\$ 15,940
Total Cash Costs	41,098	43,779	44,453	46,133	38,866	36,641	34,406	32,172	29,946	18,783
Value of Family Labor	5,555	5,937	6,317	6,699	5,119	4,685	4,249	3,813	3,378	1,199
Depreciation	20,093	20,255	20,698	19,632	19,632	19,402	19,171	18,941	17,788	
Interest on Investments Other than Land	32,761	34,368	35,959	37,576	30,925	29,055	27,258	25,471	23,591	14,413
Return Above Cash Costs	32,740	36,131	39,509	42,901	29,179	25,629	22,067	18,504	14,956	-2,843
Return Above Cash Costs and Family Labor	27,185	30,194	33,192	36,202	24,060	20,944	17,818	14,691	11,578	-4,042
Return to Total Investment	7,092	9,899	12,696	15,504	4,198	1,312	-1,584	-4,480	-7,363	-21,330
Return to Land	-25,669	-24,469	-23,773	-22,072	-26,727	-27,783	-28,842	-29,991	-30,954	-32,243
Herd Size (Head)	281.00	300.30	319.52	338.87	258.95	246.97	234.91	192.85	170.80	130.00
Family Labor (Hours)	1,699	1,816	1,932	2,049	1,566	1,433	1,299	1,166	1,033	667
Hired Labor (Hours)	769	851	905	960	734	671	509	566	484	172

Sheep Herds of All Sizes

Gross Income	\$ 204,288	\$ 207,399	\$ 220,513	\$ 213,141	\$ 194,147	\$ 181,458	\$ 168,814	\$ 156,170	\$ 143,526	\$ 80,237
Total Cash Costs	76,883	78,205	79,530	80,752	74,128	70,849	67,582	64,315	61,048	44,690
Value of Family Labor	9,639	9,786	9,933	10,057	9,161	8,562	7,965	7,369	6,772	3,285
Depreciation	20,543	20,564	20,627	20,663	20,400	20,225	20,050	19,875	19,700	18,823
Interest on Investment Other than Land	41,480	41,898	42,316	42,669	40,119	38,415	36,718	35,021	33,324	25,425
Return Above Cash Costs	127,405	129,194	130,983	132,389	120,019	110,609	101,232	91,855	82,478	35,547
Return Above Cash Costs and Family Labor	117,766	119,408	121,050	122,332	110,858	102,047	93,267	84,486	75,706	32,262
Return to Total Investment	97,225	98,824	100,423	101,869	90,458	81,822	73,217	64,611	56,006	12,009
Return to Land	55,245	56,826	58,397	59,920	50,313	43,429	36,499	29,520	22,682	-13,220
Herd Size (Head)	2,727.81	2,820.21	2,862.75	2,896.12	2,639.92	2,467.38	2,343.45	2,183.51	2,021.60	1,626.75
Family Labor (Hours)	2,948	2,983	3,036	3,076	2,801	2,618	2,435	2,253	2,072	1,257
Hired Labor (Hours)	2,368	2,393	2,433	2,466	2,201	2,018	1,836	1,653	1,471	717

TABLE V-2

Comparison of Economic Impacts to Livestock Operators
from Increases and Reductions in Available BLM Forage

Indirect and induced effects were therefore based on changes in sales that would result from each alternative. The sale values used in the input-output model are shown in Table V-3.

TABLE V-3

Estimated Sales (in 1980 Dollars)

Industry Section	Sheep Sales (\$/AUM)	Cattle Sales (\$/AUM)	Big Game (\$/Visitor Day)	Dispersed Motorized Recreation (\$/Visitor Day)	Dispersed Non-Motorized (\$/Visitor Day)	Westwater Boating (TOTAL SALES)
Agriculture	\$30.00	\$20.00	-----	----	.70	-----
Auto repair-service	-----	-----	\$11.04	\$1.74	1.00	\$ 31,200
Eating-Drinking	-----	-----	4.94	2.72	.70	13,000
Other Retail	-----	-----	5.00	1.72	1.20	3,800
Lodging	-----	-----	1.57	2.92		20,800
Recreation services	-----	-----	-----	----	----	239,200
Other services	-----	-----	-----	----	----	-----
TOTAL	\$30.00	\$20.00	\$22.55	\$9.10	3.60	\$308,000

WILDLIFE AND RECREATION

Hunter participation rates were calculated using a constant wildlife population per hunter day ratio for deer, antelope, and elk. Hunter days were converted to visitor days and input into a regional input-output model using the sales per visitor day estimates shown in Table V-3.

The recreation related economic importance and impacts were similarly calculated for other forms of recreation. Local outfitters' sales estimates were included in the local importance estimate of Westwater Canyon. Two procedures were used to estimate the local importance of tourism. Estimated tourist sales in Grand and San Juan counties are available from several studies (ISORT 1976a, ISORT 1976b, ISORT 1977, ISORT 1981). Statistical relationships between Grand County retail and service sales and tourist visitation were also used to estimate tourist sales. An input-output model was then used to estimate the induced and indirect importance of tourism.

MINERALS

The relationship between oil, gas, and uranium activities and direct employment and the relationship between employment and income were used to estimate the direct income and employment change from a change in application of the oil and gas leasing categories. An input-output model for Grand County was then used to estimate the induced and indirect impacts.

Visual Resource Management Classification Process

ESTABLISHING VISUAL RESOURCE MANAGEMENT CLASSES

Four steps are involved in the visual resource management (VRM) classification process. These are (1) outlining and numerical evaluation of scenic quality; (2) outlining of visual sensitivity levels; (3) delineating distance zones; and (4) assigning VRM classes.

SCENIC QUALITY

The first step is accomplished by outlining scenery of similar nature on a topographic map. Once the area has been outlined, numerical values are given to its key factors (landform, color, water, vegetation, uniqueness, and intrusions). When these values are established, the total determines whether the area is an A, B, or C scenery unit.

Class A scenery combines the most outstanding characteristics of each rating factor. Class B scenery combines some outstanding features and some that are fairly common to the physiographic region. Class C scenery combines features that are fairly common to the physiographic region.

VISUAL SENSITIVITY LEVELS

Sensitivity levels indicate the relative degree of user interest in visual resources and concern for changes in the existing landscape character. This section is designed to bring input from area and district management to the weighing of the two sensitivity criteria: (1) use volume (both vehicular and pedestrian), and (2) expressed user attitudes toward change. These criteria are evaluated from a matrix, and a final sensitivity rating of high, medium, or low is given. After this evaluation, the sensitivity rating will figure in the final VRM classification.

DISTANCE ZONES

The distance zones are outlined on topographic maps in three areas: (1) foreground/midground, (2) background, and (3) seldom seen. The foreground/midground zone is a distance of from zero to 3 to 5 miles away, where activities can be viewed in detail. The background is the remaining area up to 15 miles distant, and seldom seen is that are beyond 15 miles or not seen at all from any corridor of travel.

VRM CLASSES

After classification as to scenic quality, visual sensitivity, and distance zones, areas are assigned to one of five management classes. These management classes are designed to maintain or enhance visual quality and describe the different degrees of modification of the basic elements of the landscape allowed.

ANALYSING VISUAL IMPACTS

For activities proposed on public lands, impacts are evaluated with the visual resource contrast rating system. This system is a method of evaluating the visual contrast of a proposed activity to the existing landscape character.

The amount of contrast is measured by separating the landscape into its major features (land and water surface, vegetation, and structures) and then predicting the magnitude of change in contrast of each of the basic elements (form, line, color, and texture) to each of the features. Assessing the amount of contrast for a proposed activity in this manner will indicate the severity of impact and serve as a guide in determining what is required to reduce the contrast to the point where it will meet the visual management class's requirements for the area. Objectives for the VRM classes are listed below:

Class I. One element should not exceed a weak degree of contrast (1), and the total for any feature may not exceed 10.

Class II. The degree of contrast for any one element should not exceed a moderate value (2), and the total contrast rating for any feature may not exceed 10.

Class III. The degree of contrast of any one element should not exceed a moderate value (2), and the total contrast rating for any feature may not exceed 16.

Class IV. The total contrast rating for any feature should not exceed 20.

Class V. This is an interim classification for rehabilitation or enhancement.

VRM classes identified for the GRA are shown in Figure 3-4. Table 3-7 shows the approximate acreages within the various VRM classes.

GLOSSARY

Accelerated erosion. Erosion much more rapid than normal, primarily resulting from the influence of the activities of man and animals, or natural events such as fire that expose the surface.

Acre-foot. The volume of material or water that will cover an area of 1 acre to a depth of 1 foot (43,560 cubic feet or 325,851 gallons).

Active nonuse (Grazing). The active grazing privileges not used or paid for by an operation during a year. Active nonuse and active use equal active grazing privileges or qualifications (see Grazing preference).

Active use (Grazing). The number of animal unit months (AUMs) that a livestock operation actually uses and pays for during a year. See Active nonuse.

Adjudication. Legal processing of applications, entries, claims, etc., to assure full compliance with the public land laws and regulations.

Alkali soil. Soil having so high a degree of alkalinity (pH 8.5 or higher), or so high a percentage of exchangeable sodium (15 percent or more of the total exchangeable bases), or both, that plant growth is restricted.

Allotment. An area of land where one or more permittees graze their livestock. Generally consists of public land but may include parcels of private or State lands. The number of livestock and season of use are stipulated for each allotment. An allotment may consist of several pastures or be only one pasture.

Allotment management plan (AMP). A concisely written program of livestock grazing management, including supportive measures, if required, designed to attain specific management goals in a grazing allotment.

Animal unit month (AUM). The amount of forage necessary for the sustenance of one cow or five sheep for 1 month.

Available water capacity (AWC). The capacity of soils to hold water available for use by most plants. It is commonly defined as the difference between the amount of soil water at field moisture capacity and the amount at wilting point. It is commonly expressed as inches of water per inch of soil. The capacity, in inches, in a 60-inch profile or to a limiting layer is expressed as:

Very low - 0 to 3

Low - 3 to 6

Moderate - 6 to 9

High - 9 to 12

Very high - more than 12

Badland. Steep or very steep, commonly nonstony, barren land dissected by many intermittent drainage channels. Badland is most common in semiarid and arid regions where streams are entrenched in soft geologic material. Local relief generally ranges from 25 to 500 feet. Runoff potential is very high, and geologic erosion is active.

Base property. Those lands in a ranching enterprise which are owned or under long-term control of the operator and have the capability to sustain the number of livestock for a specified time period (base property requirement).

Changing season of use. Adjusting the time of livestock grazing on a range area based on type of vegetation or stage of vegetation growth.

Climax vegetation. The final vegetation community that emerges after a series of successive vegetational stages. The climax community perpetuates itself indefinitely unless disturbed by outside forces.

Community. An aggregate of organisms that form a distinct ecological unit. Such a unit may be defined in terms of plants, animals, or both.

Compaction. The process by which soil is packed tightly, losing its porosity.

Contour furrows. A series of long, shallow, narrow trenches that follow a topographic contour. The purpose of these furrows is to detain and trap overland runoff and sediment.

Corridor. A linear strip of land forming a passageway between two points in which transportation and/or utility systems exist or may be located.

Cover. The material covering the soil and providing protection from, or resistance to, the impact of raindrops and the energy of overland flow, and expressed in percent of the area covered. Composed of vegetation, litter, small rock, and large rocks. These may be lying on or within 20 feet of the ground surface.

Cretaceous. A geologic period, noted for widespread oceans, that began about 135 million years ago and ended about 65 million years ago. Dinosaurs and many other species became extinct at the close of this period.

Critical wildlife habitat. That portion of the living area of a wildlife species that is essential to the survival and perpetuation of the species, either as individuals or as a population.

Cultural resources. Those fragile and nonrenewable remains of human activities, occupations, and endeavors as reflected in sites, buildings, structures, or objects, including works of art, architecture, and engineering. Cultural resources are commonly discussed as prehistoric and historic values, but each period represents a part of the full continuum of cultural values from the earliest to the most recent.

De facto corridor. An area in which one or more linear facilities already exist. Such a land use pattern probably developed in response to considerations such as topography and ease of access which prompted closely parallel rights-of-way. This pattern did not develop with the intent of establishing the best corridor based on environmental considerations.

Designated corridor. A linear area of land with legally defined and recognized boundaries and capacities having environmental or engineering advantages over other areas for the location of present or future rights-of-way. These areas are identified by legal public notice.

Desirable plants. Those plants that are palatable and productive forage species, often dominant under climax or near climax conditions. They are normally long-lived plants which can include grasses, forbs, and browse.

Detention dam. A sediment reservoir containing an outlet pipe to allow water detained in the reservoir to discharge downstream at a controlled rate.

Direct effect. Changes in sales, employment, or income of a firm that result directly from the firm's change in output.

Discount rate. An interest rate that represents the cost or time value of money in determining the present value of future costs and benefits.

Distance zone. The area that can be seen from a travel route as foreground-middleground (up to 3 to 5 miles), background (from foreground-middleground up to 15 miles) and areas which are seldom seen.

Easement. The right held by one person to make use of the land of another for a limited purpose.

Ecological condition. The present state of vegetation of a range site in relation to the climax (natural potential) plant community for that site. It is an expression of the relative degree to which the kinds, proportions, and amounts of plants in a plant community resemble that of the climax plant community. An ecological site condition is basically an ecological rating of the plant community. Air-dry weight is the unit of measure used in comparing the composition and production of the present plant community with that of the climax community.

Economic efficiency. A measure of how well inputs are used to achieve outputs when all inputs and outputs (including environmental) are identified and valued. It is usually measured by either an incremental present net value, benefit cost ratio, or rate of return.

Economic impact. The change, positive or negative, in economic conditions (including distribution and stability of employment and income in affected local and regional economies) that directly or indirectly results from an activity, project, or program.

Ecotone. The zone of intergradation where two plant communities come into contact.

Electrical conductivity. The reciprocal of the electrical resistivity. The resistivity is the resistance in ohms of a conductor, metallic or electrolytic, which is 1 centimeter (cm) long and has a cross-sectional area of 1 cm². Hence, electrical conductivity is expressed in reciprocal ohms per centimeter, or mhos per centimeter. The terms "electrical conductivity" and "specific electrical conductance" have the same meaning.

Employment. The sum of persons in the labor force who are currently employed (including full-time and part-time workers).

Endangered animal species. Any animal species in danger of extinction throughout all or a significant portion of its range. This definition excludes species of insects that the Secretary of the Interior determines to be pests and whose protection under the Endangered Species Act of 1973 would present an overwhelming and overriding risk to man. See Threatened animal species.

Endangered plant species. Species of plants in danger of extinction throughout all or a significant portion of their ranges. Existence may be endangered because of the destruction, drastic change, or severe curtailment of habitat, or because of overexploitation, disease, predation, or even unknown reasons. Plant taxa from very limited areas (e.g., the type localities only), or from restricted fragile habitats usually are considered endangered. See Threatened and Sensitive plant species.

Erosion. The group of natural processes including weathering, dissolution, abrasion, corrosion, and transportation, by which earthy or rocky material is removed from any part of the earth's surface.

Exchange-of-use. An agreement made with a permittee having ownership or control of nonfederal land interspersed and grazed in conjunction with surrounding Federal range. This agreement specifies the carrying capacity and gives the Bureau control of the nonfederal land for grazing purposes.

Eyrie. The nest of a bird of prey.

Facility (utility). All structures and components used by a transportation or utility system to transport or transmit electrical energy, communication signals, commodities, or services.

Fire management. The integration of fire protection, prescribed fire, and fire ecology knowledge into multiple use planning, decision making, and land management activities. Fire management is not a program of letting fires burn. Fire management places fire in perspective with overall land management objectives to fulfill the needs of society.

Flood peak. The highest value of the stage or discharge attained by a flood; thus, peak stage or peak discharge.

Floodplain. The flat ground along a stream covered by water at the flood stage.

Forage. Vegetation of all forms available for animal consumption.

Forb. A broadleaved herb other than grass; a weed.

Frost heaving. The movement of soil caused by the freezing and thawing of soil moisture.

Grazing preference. The total number of AUMs of livestock grazing on public lands apportioned and attached to base property owned or controlled by a permittee. This may include active preference or suspended preference, or a combination of the two.

Ground water. Water filling all the unblocked pores of underlying material below the water table.

Gully. A channel cut by concentrated runoff through which water commonly flows only during or immediately after heavy rains or during the melting of snow. A gully is deep enough to interfere with, and not to be obliterated by, normal tillage operations.

Headcutting. The active upslope erosion of a gully or channel.

Impact. A change in the ecosystem resulting from or accelerated by human action.

Income. Employee compensation, profits, rents, and other payments to households.

Indirect effect. Changes in sales, employment, or income that result when supporting industries sell goods or services to directly affected industries or businesses.

Induced effect. Changes in sales, employment, or income that result when employees or owners of directly or indirectly affected industries spend their income within the economy.

Infrastructure. The basic transportation systems, utilities, services, enterprises, and other investments necessary for the operation and growth of a community.

Input/output analysis. A technique for analyzing the interdependence of producing and consuming sectors in an economy.

Instream drop structures. Artificial structures installed to minimize the erosive progression of a gully or stream.

Intensity of use. Amount of vegetation consumed by grazing herbivores over a given time period.

Intrusion (visual). A land, vegetation, or structural feature that is generally considered out of context with the characteristic landscape.

Inventory. A listing of the resources (and location), natural and manmade, which characterize a land area. It is a static picture of the basic resource situation describing the quantity and quality of such attributes of land geology, vegetation, soil, and water resources. A resource inventory provides a data base that can then be periodically updated, and trends illustrated, by suitable monitoring techniques.

Isolated tract. A parcel of vacant public lands, not exceeding 1,520 acres, which is surrounded by appropriated public lands.

Jurassic. A geologic period that began about 180 million years ago and ended about 135 million years ago.

K value. A numerical expression of the potential erodibility of soil on a graduated scale of 0.10 to 0.64, divided into 12 classes. The lower index is the less erodible soil, and the high index is the highest erodible and most susceptible to sheet and rill erosion. Erodibility is low at 0.2 or less, moderate at 0.2 to 0.4, and high at 0.4 or higher.

Lands disposal. A transaction that leads to the transfer of title to public lands from the Federal Government.

Land treatment. Alteration of the soil and/or vegetation of an area by mechanical or chemical means or by burning.

Lifestyle. The characteristic way people live, indicated by consumption patterns and work, leisure, and other activities.

Limited suppression. A policy that considers areas where fire control is extremely difficult or where the values threatened do not warrant the expense associated with full suppression procedures.

Linear programming. Algorithm for maximizing an objective function based on a series of linear production parameters and constraints.

Management framework plan (MFP). A land use plan for public lands that provides a set of goals and constraints for a specific planning area to guide the development of detailed plans for the management of each resource.

M, I, C categorization. The grouping of allotments into three different categories (M=maintain, I=improve, and C=custodial) for management purposes.

Mitigating measures. Methods used (often included as lease stipulations) to reduce the significance of or eliminate an anticipated environmental impact.

Monitor. To scrutinize or check systematically with a view to collecting certain specified categories of data.

Multiple use planning. Planning for harmonious and coordinated management of the various surface and subsurface resources, without impairment of the land, that will best meet the present and future needs of the people.

Off-road vehicle (ORV). Any motorized vehicle capable of or designed for travel on or immediately over land, water, or other natural terrain, excluding (1) any nonamphibious registered motorboat; (2) any military, fire, emergency, or law enforcement vehicle while being used for emergency purposes; (3) any vehicle whose use is expressly authorized by the authorizing officer, or otherwise officially approved; (4) vehicles in official use; and (5) any combat or combat support vehicle when used in times of National defense emergencies. (Quoted from Executive Order 11644 as amended by Executive Order 11989.)

Pasture. As used in this document, a subdivision of a grazing allotment.

Payment in lieu of taxes (PILT). Payments to local or State governments based on ownership of Federal land and not directly dependent on production of outputs or receipt sharing. Specifically, they include payments made under the Payments in Lieu of Taxes Act of 1976 by the U.S. Department of the Interior.

Pennsylvanian. The geologic period that lasted from 315 to 275 million years before present; sometimes called Upper Carboniferous and known for oceans and swamp forests on continents that formed coal measures worldwide.

Perennial plant. A plant that has a life cycle of 3 or more years. Because of their longevity, it is desirable to base management on these species.

Perennial stream. A stream that flows throughout the year.

Permeability (soil). The quality that enables soil to transmit air and water. Estimates are based on porosity, texture, structure, and aggregate stability. To describe the rate of saturated flow, permeability downward in undisturbed soils, the following

terms are used, expressed in inches per hour:

Very slow: Less than 0.06
Slow: 0.06 to 0.2
Moderately slow: 0.2 to 0.6
Moderate: 0.6 to 2.0
Moderately rapid: 2.0 to 6.0
Rapid: 6.0 to 20
Very rapid: More than 20

Permian. A geologic period that began about 275 million years ago and ended about 225 million years ago. Many species became extinct at the close of the period.

Permittee (grazing). A person who has livestock grazing privileges on an allotment or allotments within the Resource Area.

Pitting. The process of constructing small basins that store runoff and sediment.

Plant vigor. The relative well-being and health of a plant as reflected by its ability to manufacture sufficient food for growth and maintenance.

Precambrian. The extremely long period of earth's geologic history which lasted from the first cooling of the molten crust to the appearance of the first masses of organic life with hard shells--a total of nearly 4 billion years ending 600 million years ago.

Preference. See Grazing preference.

Precipitation. As used in hydrology, precipitation is the discharge of water, in liquid or solid state, out of the atmosphere, generally upon a land or water surface.

Prescribed fire. The skillful application of fire to natural fuels under conditions of weather, fuel moisture, soil moisture, etc., that will allow confinement of the fire to a predetermined area and at the same time produce the intensity of heat and rate of spread required to accomplish certain planned benefits to one or more objectives of wildlife management, grazing, hazard reduction, etc. Its objective is to employ fire scientifically to realize maximum benefits at minimum damage and acceptable cost.

Present value. Discounted values (benefits) of all outputs to which monetary values or established market prices are assigned.

Proprietor. Owner of unincorporated enterprises.

Public land. Formal name for lands administered by the Bureau of Land Management (BLM).

Range trend. This is the change in vegetation and soil characteristics as a direct result of environmental factors, primarily climate and grazing. Studies in range trend are used in combination with other studies to evaluate AMPs and grazing systems. Trend data is collected on key areas and relies on key species to represent the pasture or allotment.

Raptor. Living on prey; a group of carnivorous birds consisting of hawks, eagles, falcons, vultures, and owls.

Rehabilitation. Restoration of partially or totally lost biological productive capability.

Rest. Refers to seasonal resting from grazing of a range to allow plants to replenish their food reserves, seeds to ripen, seedlings to become established, and litter to accumulate between plants.

Retail trade sector. Establishments engaged in selling merchandise for personal or household consumption.

Retention dam. A reservoir that totally contains runoff and sediment from a drainage area.

Return above cash cost. Annual sales minus those costs that must be paid that same year.

Return on labor and investment. Annual sales minus the cost that must be paid that same year, and the depreciation incurred on capital equipment.

Right-of-way. The legal right for use, occupancy, or access across land or water areas for a specified purpose or purposes. Such use on Federal land is authorized by permit, lease, easement, or license. Also, the lands covered by such an easement or permit.

Rill. A small, intermittent watercourse with steep sides, usually only a few inches deep and, hence, no obstacle to tillage operation.

Rill erosion. An erosion process in which numerous small channels only several inches deep are formed.

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 along or around springs.

Riparian vegetation. Water-loving plants (phreatophytes or hydrophytes) such as sedges, tamarisk, cottonwood, water birch, and willow.

Ripping. The process of mechanically breaking up compacted soils.

Runoff. That part of precipitation that does not immediately enter the soil or evaporate, ultimately reaching a stream channel. It occurs when the rate of snowmelt or rainfall exceeds the rate of infiltration into the soil.

Saline soil. Soil containing soluble salts in an amount that impairs growth of plants. A saline soil does not contain excess exchangeable sodium.

Salinity. Total solids in water after all carbonates have been converted to oxides, all bromide and iodide have been replaced by chloride, and all organic matter has been oxidized.

Season of use. The time of livestock grazing on a range area based on type and stage of vegetative growth.

Sediment. Soil or mineral material transported by water and deposited in streams or other bodies of water.

Sensitive plant. A plant that is not officially listed as threatened or endangered, but is being considered for such designation.

Sensitivity level (visual). An index of the level of response to visual resources in an area based on such weighted criteria as social attitudes, types of resource uses, management attitudes, etc. Levels are classified as high, medium, or low.

Services sector. Establishments primarily engaged in providing a variety of services for individuals and businesses.

Slope. The inclination of the land surface from the horizontal. Percentage of slope is the vertical distance divided by horizontal distance, then multiplied by 100. Thus, a slope of 20 percent is a drop of 20 feet in 100 feet of horizontal distance.

Soil. A natural, three-dimensional body at the earth's surface. It is capable of supporting plants and has properties resulting from the integrated effect of climate and living matter acting on earthy parent material, as conditioned by relief over periods of time.

Soil-vegetation inventory method (SVIM). A means of assessing the vegetation type and condition in a specified area. Procedures for this range survey are detailed in the Bureau Manual.

Stipulation. A condition or requirement attached to a lease, usually dealing with protection of the environment or recovery of the coal.

Tertiary. Geologic period that lasted from 65 million years before present to one million years before present; known for widespread mammal life. It ended with the onset of extensive glaciation (ice ages).

Threatened animal species. Any animal species likely to become endangered within the foreseeable future throughout all or a significant part of its range. See Endangered animal species.

Threatened plant species. Species of plants that are likely to become endangered within the foreseeable future throughout all or a significant portion of their ranges, including species categorized as rare, very rare, or depleted. See Endangered and Sensitive plant species.

Topography. The relief and contour of the land, especially when taken collectively, as over a region or large area.

Total dissolved solids (TDS). Salt-an aggregate of carbonates, bicarbonates, chlorides, sulfates, phosphates, and nitrates of calcium, magnesium, manganese, sodium, potassium, and other cations that form salts. High TDS solutions can change the

chemical nature of water. High TDS concentrations exert varying degrees of osmotic pressures and often become lethal to life in an aquatic environment.

Travel cost technique. A procedure that uses the travel cost associated with various points of origin, and participation rates from those points, to estimate the economic demand (value) for a site or commodity.

Triassic. A geologic period that began about 225 million years ago and ended about 180 million years ago.

T value. An estimate of the maximum average annual rate of soil erosion by wind or water that can occur without affecting productivity over a sustained period. The rate is expressed in tons per acre per year.

Unemployed. Not employed, but actively seeking employment.

Ungulates. Hoofed mammals such as horses, cattle, and deer.

Utilities. All privately, publicly, or cooperatively owned lines, facilities, and systems for producing, transmitting, or distributing communication signals, electrical energy, or petroleum and fossil fuel products.

Visitor day. Twelve visitor hours which may be aggregated continuously, intermittently, or simultaneously by one or more persons.

Visual resource management (VRM). The system by which BLM classifies and manages the visual resource of public lands, based on their scenic qualities, sensitivities, and the distances from which they are viewed, the lands are classified into management units.

Visual resource management (VRM) classes. Classification containing specific objectives for maintaining and enhancing visual resources, including the kinds of structures and modifications acceptable to meet established visual goals.

Visual contrast. The difference in the appearance of a viewed resource with respect to the individual's perception and interpretation of that resource as compared to his perception and interpretation of another site.

Watershed. The region draining into a river, river system, or body of water.

Water table. The upper level of an underground water body.

Wealth. Aggregate market value of an owner's assets.

Wilderness area. An area set aside for preservation of natural conditions for scientific or recreational purposes, uncultivated and uninhabited, and usually roadless.

Wilderness characteristics. Key characteristics of a wilderness listed in Section 2(c) of the Wilderness Act of 1964 and used by BLM in its wilderness inventory. These characteristics include size, naturalness, opportunities for solitude, opportunities for primitive and unconfined recreation, supplemental values, and the possibility of an area returning to a natural condition.

Wilderness study area (WSA). An area determined, through BLM's wilderness inventory, to meet the definition of wilderness established by Congress.

Wildlife. All species of mammals, birds, fish, amphibians, and reptiles found in a wild state.

Wildlife habitat. All elements of a wild animal's environment necessary for completion of its life cycle. These elements include food, cover, water, and living space.

Wind erodibility groups (WEG). An indication of the susceptibility of soil to wind erosion and the amount of soil lost. Groups are made up of soils that have similar properties affecting their resistance to wind erosion.

Withdrawal. An action that restricts the disposal of public lands and holds them for specific public purposes; also, public lands that have been dedicated to public purposes.

LIST OF ABBREVIATIONS

ac/ft	acre-foot	M	Maintain management category (for grazing allotments)
AMP	allotment management plan	MCF	thousand cubic feet
AUM	animal unit month	mg/l	milligram per liter
AWC	available water capacity	MMS	Minerals Management Service
BLM	Bureau of Land Management	MSA	management situation analysis
C	Custodial management category (for grazing allotments)	NEPA	National Environmental Policy Act
CFR	Code of Federal Regulations	NRDC	National Resource Defense Council
D&RGW	Denver and Rio Grande Western	ORV	off-road vehicle
EA	environmental assessment	PILT	payments in lieu of taxes
e.g.	<u>exempli grata</u> (for example)	R&PP	recreation and public purpose
EIS	environmental impact statement	RMA	recreation management area
EPA	Environmental Protection Agency	RMP	resource management plan
ESCS	Economic Statistics and Cooperative Service	SCS	Soil Conservation Service
FLPMA	Federal Land Policy and Management Act of 1976	SLB&M	Salt Lake Base and Meridian
FWS	Fish and Wildlife Service	SRMA	special recreation management area
GRA	Grand Resource Area	SSA	site-specific analysis
I	Improve management category (for grazing allotments)	TDS	total dissolved solids
IBLA	Interior Board of Land Appeals	T Value	soil loss tolerance value
i.e.	<u>id est</u> (that is)	UDES	Utah Department of Employment Security
IMP	Interim Management Policy	USFS	U.S. Department of Agriculture, Forest Service
ISORT	Institute for the Study of Outdoor Recreation and Tourism	USGS	U.S. Department of the Interior, Geological Survey
K Value	a numerical expression of potential soil erodibility	VRM	visual resource management

WEG wind erodibility group

WSA wilderness study area

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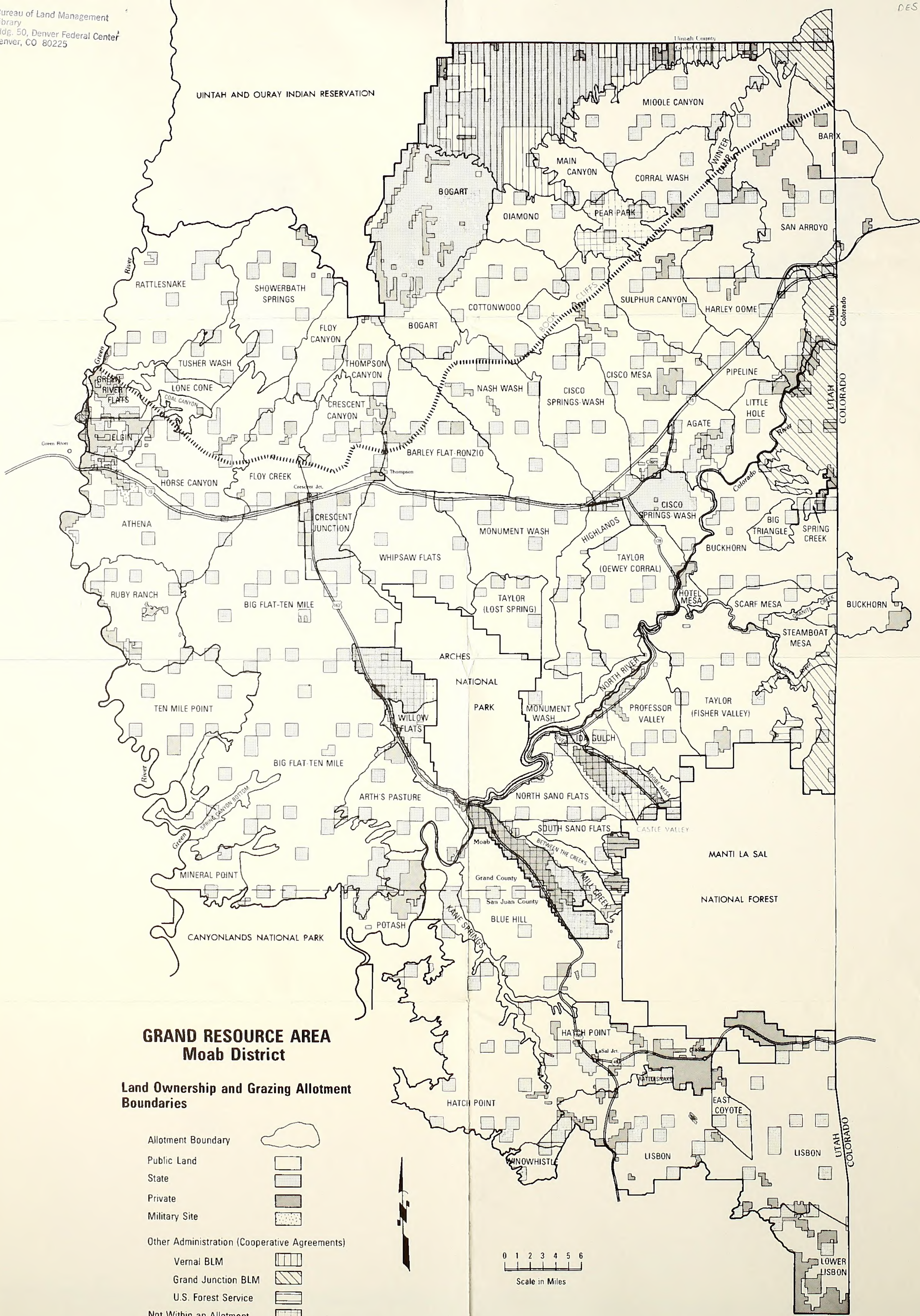
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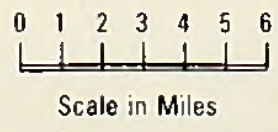


UINTAH AND OURAY INDIAN RESERVATION

**GRAND RESOURCE AREA
 Moab District**

**Land Ownership and Grazing Allotment
 Boundaries**

- Allotment Boundary 
- Public Land
 - State 
 - Private 
 - Military Site 
- Other Administration (Cooperative Agreements)
 - Vernal BLM 
 - Grand Junction BLM 
 - U.S. Forest Service 
 - Not Within an Allotment 



SUMMARY

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