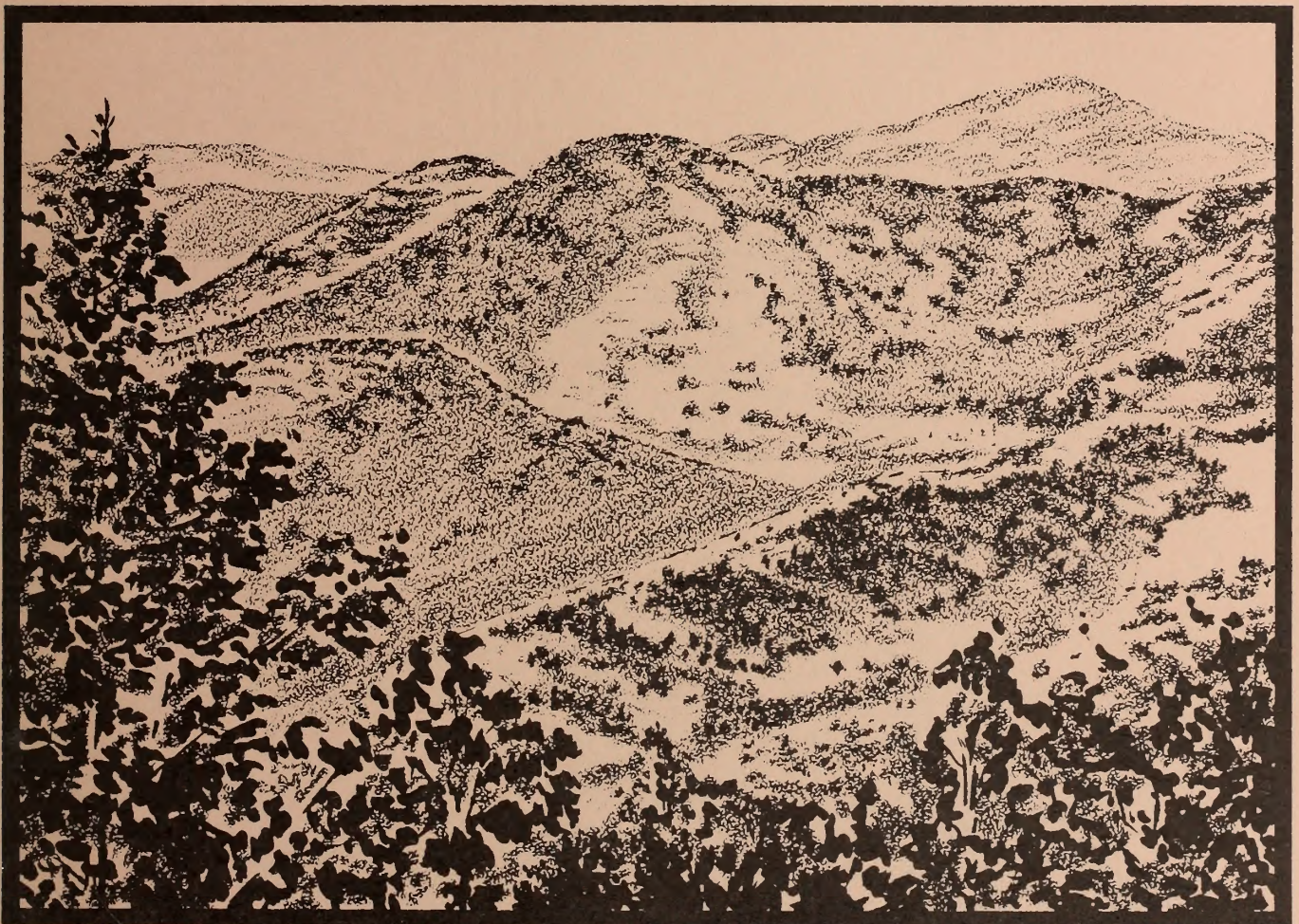


WILDERNESS TECHNICAL SUPPLEMENT TO THE LITTLE SNAKE RESOURCE MANAGEMENT PLAN AND ENVIRONMENTAL IMPACT STATEMENT



U.S. Department of the Interior
Bureau of Land Management
Craig, Colorado District
Little Snake Resource Area

Draft
February 1986



United States Department of the Interior

BUREAU OF LAND MANAGEMENT
 CRAIG DISTRICT OFFICE
 455 EMERSON STREET
 CRAIG, COLORADO 81625

Dear Reader:

Enclosed for your review and comment is the Draft Wilderness Technical Supplement to the Draft Little Snake Resource Management Plan (RMP) and Environmental Impact Statement (EIS). Written and oral comments received from the public on this draft will be fully evaluated and considered by the Bureau of Land Management (BLM) when preparing the Preliminary Final Wilderness EIS and the Wilderness Study Report.

This supplement addresses six alternatives for the management of eight wilderness study areas (WSAs) within the Little Snake Resource Area. Also considered in this document are the environmental, social, and economic impacts of implementing each of these alternatives.

Public hearings to receive oral comment on the content of this supplement are scheduled as follows:

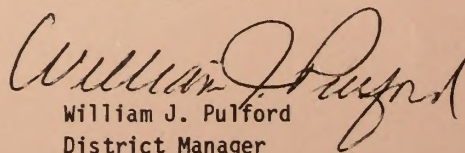
<u>Date/Time</u>	<u>City</u>	<u>Location</u>
March 10, 1986 7:00 P.M.	Denver, CO	Foothills Ramada Inn 11595 West 6th Ave. (6th Ave at Simms St)
March 12, 1986 7:00 P.M.	Craig, CO	Moffat County Courthouse 221 West Victory Way 2nd Floor Auditorium
March 13, 1986 7:00 P.M.	Vernal, UT	Bureau of Land Management Vernal District Office 170 South 500 East

At this time, this document is intended to be used in conjunction with the Draft Little Snake RMP and EIS. When the Preliminary Final Wilderness EIS and the Wilderness Study Report are approved by the BLM Colorado State Director, they will split from the Preliminary Final Little Snake RMP and EIS and be sent to the BLM Washington Office for review. The final wilderness recommendations will be made by the BLM through the Secretary of the Interior to the President and on to the Congress for legislation that would formally designate WSAs as wilderness or release them for uses other than wilderness (please see Chapter 1 for the difference between Section 202 and 603 WSAs as well as a description of the Inventory, Study, and Reporting phases of the Wilderness Review Process).

We would appreciate receiving your written comments, as well as verbal testimony, regarding this Draft Wilderness Technical Supplement. The comment period on this document will remain open through May 9, 1986. Please send your comments to the above address.

Enclosure

Sincerely yours,


 William J. Pulford
 District Manager



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WILDERNESS TECHNICAL SUPPLEMENT

to the

**LITTLE SNAKE
RESOURCE MANAGEMENT PLAN**

and

ENVIRONMENTAL IMPACT STATEMENT

Moffat County, Colorado

and

Daggett and Uintah Counties, Utah

**U.S. DEPARTMENT OF THE INTERIOR
BUREAU OF LAND MANAGEMENT
CRAIG DISTRICT OFFICE
LITTLE SNAKE RESOURCE AREA**

Abstract: This Draft Wilderness Technical Supplement describes alternatives for managing eight wilderness study areas in the Little Snake Resource Area within Moffat County, Colorado and Daggett and Uintah counties, Utah. A discussion of the environmental, economic, and social consequences of implementing the following alternatives is presented for the various wilderness study areas. The alternatives presented in this document include: (1) All Wilderness, (2) Conflict Resolution, (3) Combined WSAs, (4) No Wilderness, (5) No Action, and (6) Preferred. The wilderness study areas include: West Cold Spring (17,682 acres), Diamond Breaks (35,380 acres), Cross Mountain (14,081 acres), Ant Hills (4,354 acres), Chew Winter Camp (1,320 acres), Peterson Draw (5,160 acres), Tepee Draw (5,490 acres) and Vale of Tears (7,420 acres).

For Further Information Contact: Greg Goodenow, Program Manager, BLM, Craig District Office, 455 Emerson, Craig, Colorado 81625, or call (303) 824-8261.

Comments have been requested from those agencies, organizations, and individuals listed in Chapter 5. Comments must be received no later than May 9, 1986.

Bill Murray
D-505A, Building 50
Denver Federal Center
P. O. Box 20447
Denver, CO 80282-0447

SUMMARY

This draft document analyzes the suitability of each of eight wilderness study areas (WSAs) for inclusion in the National Wilderness Preservation System (NWPS). It also describes impacts of designating all, some, or none of each of these eight WSAs as wilderness. This has been done through analyzing 6 alternatives. A summary of the analysis is presented in Table S-1.

Based on the results of this analysis and additional analysis in the Little Snake Resource Management Plan the following findings are presented for public review and comment before preparation of a final document:

- Diamond Breaks WSA is recommended as suitable for inclusion in the NWPS.
- West Cold Spring and Cross Mountain WSAs are not recommended as suitable for inclusion in the NWPS.
- Ant Hills, Chew Winter Camp, Peterson Draw, Tepee Draw, and Vale of Tears WSAs are not suitable for inclusion in the NWPS and will be dropped from further consideration.

The Bureau of Land Management (BLM) recognizes that each of the eight WSAs under consideration possesses the minimum mandatory wilderness characteristics. However, the BLM also recognizes that the characteristics are present in the eight WSAs to varying degrees. Other resource values which are also present in varying degrees, must be considered in a suitability recommendation. The qualification and quantification of these values is a subjective process and must be reviewed in its entirety. Therefore, the reader is encouraged to carefully read the entire document.

WILDERNESS CRITERIA AND QUALITY STANDARDS FOR ANALYSIS AND DOCUMENTATION	WEST COLD SPRING	DIAMOND BREAKS	CROSS MOUNTAIN
WILDERNESS CRITERIA			
Evaluation of Wilderness Values			
Size-	Exceeds the criterion	Exceeds the criterion	Exceeds the criterion
Naturalness-	Minor imprints of man exist on the periphery of the WSA. Sights and sounds from ranching in Browns Park and infrequent use of State Highway 318 are noticeable within portions of the study area.	Numerous minor imprints exist but are widely distributed, represent less than 1 percent of the area, and do not detract significantly from the area's naturalness.	All intrusions are minor.
Outstanding Opportunities for Solitude or Primitive and Unconfined Recreation-	Draws and canyons provide opportunities for isolation. The rugged terrain provides excellent opportunities for primitive recreation.	On the northern edge there may be some sights and sounds from Browns Park. The rest of the area is extremely isolated. There are excellent opportunities for primitive recreational activities.	Outstanding opportunities exist primarily in and north of the canyon. Opportunities exist south of the canyon, but may be confined. Unique recreation opportunities include kayaking and bighorn sheep hunting.
Special Features: Presence or Absence of the Quality of Optional Wilderness Characteristics-	Beaver Creek is unique in northwest Colorado (Little Snake Resource Area) because it is the only perennial stream with public access, that supports a cutthroat trout population. It is also crucial habitat for bighorn sheep and the WSA is within a Colorado Division of Wildlife's Quality Elk Management Area. There is good potential for occurrence of cultural resources. Large percentage of red rock outcropping contrasts with dark green pinyon-juniper vegetation.	Stark contrast exists between red rock outcrops and dark green pinyon-juniper. the WSAs Browns Park Area. There is potential for cultural resource sites. There is potential occurrence of peregrine falcon and bald eagle; however, no population has been documented within the WSA.	The canyon has sheer vertical walls and is of geologic interest. Bighorn sheep and threatened and endangered fish are present; peregrine and prairie falcons may also be present.

SUMMARY
ANALYSIS AND RECOMMENDATIONS CONT.

WILDERNESS CRITERIA AND QUALITY STANDARDS FOR ANALYSIS AND DOCUMENTATION	WEST COLD SPRING	DIAMOND BREAKS	CROSS MOUNTAIN
Multiple Resource Benefits-	Bighorn sheep habitat would be protected legislatively rather than administratively.	Any existing raptor species would be protected.	Designation would offer legislative rather than administrative protection.
Diversity in the National Wilderness Preservation System:			
Expansion of Diversity of Natural Systems and Features-	Transition zone between physiographic provinces. This is not well represented in the NWPS.	Actually a transition zone between 3 natural vegetative types providing the greatest diversity of topography and vegetation in the general vicinity. This is not well represented in the NWPS.	Designation would contribute. This ecosystem is not well represented in designated areas, but is represented in other WSAs and areas administratively endorsed for wilderness designation.
Assessments of Opportunities for Solitude or Primitive Recreation within 5 Hours Driving Time of Major Cities-	WSA is within 5 hours of 4 Standard Metropolitan Statistical Areas (SMSAs) as are several other WSAs and wilderness areas.	Within 5 hours of 4 SMSAs, as are several other WSAs and wilderness areas.	Within 5 hours of 4 SMSAs, as are several other WSAs and wilderness areas.
Balancing the Geographic Distribution of Wilderness Areas-	Designation would add to geographic distribution if Diamond Breaks WSA is not designated; if Diamond Breaks is designated, distribution would not be greatly enhanced.	Adjacent to and complements NPS administratively endorsed area.	Would add to geographic distribution, but contribution would not be as great if Diamond Breaks is designated.
Manageability; Capability to Preserve Wilderness Characteristics-	Good	The west side is bounded primarily by private land resulting in no control of adjacent development. Preferred Alternative makes minor boundary adjustments to improve manageability.	Along southern boundary, 200 acres potential conflict if limestone mining claims are developed. Most of west side and sagebrush flats on the northeast of the WSA may have to be fenced and patrolled to prevent unauthorized use.

SUMMARY
ANALYSIS AND RECOMMENDATIONS CONT.

WILDERNESS CRITERIA AND QUALITY STANDARDS FOR ANALYSIS AND DOCUMENTATION	WEST COLD SPRING	DIAMOND BREAKS	CROSS MOUNTAIN
Identified or Potential Energy and Mineral Resource Value-	While no resources are known to exist within the WSA, potential is high for oil and gas occurrence.	No known significant resources, but moderate potential for oil and gas; moderate-high potential for base/precious metals.	High potential for oil & gas occurrence, but no known resources; high potential for occurrence of limestone.
Extent to Which Other Resource Values (other than wilderness) Would be Forgone or Adversely Affected if Area Designated Wilderness-	If mineral resources occur they may be forgone, if the area is designated. No other significant values forgone or adversely affected.	If mineral resources occur they may be forgone, if the area is designated. No other resources forgone.	If mineral resources occur they may be forgone, if their area is designated. Development of hydro-power is not necessarily precluded, but may be through legislative action.
Effect of Nondesignation on Wilderness Values-	Bighorn sheep habitat would not be legislatively protected, but would be administratively protected under the Preferred Alternative.	Low potential for loss of wilderness, due to low potential for development.	Values in the canyon are anticipated to be protected administratively through an ACEC and legislatively through withdrawal. Other portions (slopes) may lose wilderness values because of possible oil and gas development, but the top of the mountain would be protected as a special recreation management area, under the Preferred Alternative.
Public Comment-	Mixed for and against.	Mixed for and against.	Mixed - adamantly for; adamantly against. Not significant.
Local Social and Economic Effects-	Not significant.	No important effects.	No known inconsistencies.
Consistency With Other Federal, State, and Local Resource-Related Plans-	No known inconsistencies.	No known inconsistencies.	No known inconsistencies.
PRELIMINARY RECOMMENDATION	Not suitable for inclusion in the National Wilderness Preservation System (NWPS).	Suitable for inclusion in the NWPS.	Not suitable for inclusion in the National Wilderness Preservation System (NWPS).

SUMMARY
ANALYSIS AND RECOMMENDATIONS CONT.

WILDERNESS CRITERIA AND QUALITY STANDARDS FOR ANALYSIS AND DOCUMENTATION	WEST COLD SPRING	DIAMOND BREAKS	CROSS MOUNTAIN
<p>RATIONALE</p>	<p>While the area qualifies as a wilderness, the values that BLM feels are most important (Beaver Creek and bighorn sheep can be protected through multiple use management, while allowing oil and gas development. Representation of the vegetation and topographic features in the NWPS can be partially achieved through designation of the Diamond Breaks.</p>	<p>Combination of vegetation and topography is unique, opportunities for solitude and primitive recreation are outstanding. No management conflicts are anticipated on the boundaries that border on private land.</p>	<p>While the area qualifies as wilderness, the values that BLM feels are most important (Naturalness of the canyon, opportunity for primitive recreation on the top of the mountain, and bighorn sheep) can be protected through multiple use management while allowing potential oil and gas development. Representation of the vegetation and topographic features in the NWPS can be at least partially achieved through designation of the Diamond Breaks.</p>

SUMMARY
ANALYSIS AND RECOMMENDATIONS CONT.

WILDERNESS CRITERIA AND QUALITY STANDARDS FOR ANALYSIS AND DOCUMENTATION	ANT HILLS	CHEW WINTER CAMP	PETERSON DRAW
WILDERNESS CRITERIA			
Evaluation of Wilderness Values			
Size-	Does not meet criterion	Far short of meeting the criterion	Meets criterion
Naturalness-	imprints are very minor.	Imprints are extremely minor.	Some mining and logging has occurred along the northern boundary in conjunction with mining claims.
Outstanding Opportunities for Solitude or Primitive and Unconfined Recreation-	Draws and dense piñon-juniper woodlands provide opportunities, but they are not outstanding when the WSA is considered by itself. Because there is opportunity for unconfined movement between Dinosaur National Monument (DNM) and the WSA, opportunities become outstanding when considered with DNM. The WSA does not add to features within DNM.	Draws and dense piñon-juniper woodlands provide opportunities, but they are not outstanding when the WSA is considered by itself. Because there is opportunity for unconfined movement between Dinosaur National Monument (DNM) and the WSA, opportunities become outstanding when considered with DNM. The WSA does not add to features within DNM.	Draws and dense piñon-juniper woodlands provide opportunities, but they are not outstanding when the WSA is considered by itself. Because there is opportunity for unconfined movement between Dinosaur National Monument (DNM) and the WSA, opportunities become outstanding when considered with DNM. The WSA does not add to features within DNM.
Special Features: Presence or Absence of the Quality of Optional Wilderness Characteristics-	No special features are present.	No special features are present.	No special features are present.

SUMMARY
ANALYSIS AND RECOMMENDATIONS CONT.

WILDERNESS CRITERIA AND QUALITY STANDARDS FOR ANALYSIS AND DOCUMENTATION	ANT HILLS	CHEW WINTER CAMP	PETERSON DRAW
Multiple Resource Benefits-	None identified.	None have been identified.	None have been identified.
Diversity in the National Wilderness Preservation System:			
Expansion of Diversity of Natural Systems and Features-	Designation would contribute. This ecosystem is not well represented in designated areas, but is represented in other WSAs and areas recommended or administratively endorsed for wilderness designation.	Designation would contribute. This ecosystem is not well represented in designated areas, but is represented in other WSAs and areas recommended or administratively endorsed for wilderness designation.	Designation would contribute. This ecosystem is not well represented in designated areas, but is represented in other WSAs and areas recommended for administratively endorsed for wilderness designation.
Assessments of Opportunities for Solitude or Primitive Recreation within 5 Hours Driving Time of Major Cities-	Within 5 hours of 4 SMSAs, as are several other WSAs and wilderness areas.	Within 5 hours of 4 SMSAs, as are several other WSAs and wilderness areas.	Within 5 hours of 4 SMSAs, as are several other WSAs and wilderness areas.
Balancing the Geographic Distribution of Wilderness Areas-	While it would add to the distribution, its contribution would be minor when considering other areas being recommended as wilderness.	While it would add to the distribution, its contribution would be minor when considering other areas being recommended as wilderness.	While it would add to the distribution, its contribution would be minor when considering other areas being recommended as wilderness.
Manageability; Capability to Preserve Wilderness Characteristics-	If adjacent areas in DNM are managed as wilderness, boundaries could be easily managed. Potential impact from development of 26 mining claims would be somewhat lessened because they are all in the northeast corner.	If adjacent areas in DNM are managed as wilderness, capability would be increased, but the 10 mining claims in the east half of the WSA could interfere with management.	If adjacent areas in DNM are managed as wilderness boundaries could easily be managed. The 31 mining claims in the northern third of the WSA would interfere with manageability.

SUMMARY
ANALYSIS AND RECOMMENDATIONS CONT.

WILDERNESS CRITERIA AND QUALITY STANDARDS FOR ANALYSIS AND DOCUMENTATION	ANT HILLS	CHEW WINTER CAMP	PETERSON DRAW
QUALITY STANDARDS FOR ANALYSIS AND DOCUMENTATION			
Identified or Potential Energy and Mineral Resource Value-	There are no known developable resources, but there is a high potential for occurrence of base and precious metals, and low to moderate potential for oil and gas.	There are no known developable resources, but there is a high potential for occurrence of base and precious metals, and low to moderate potential for oil and gas.	There are no known developable resources, but there is a high potential for occurrence of base and precious metals, and low to moderate potential for oil and gas.
Extent to Which Other Resource Values of Uses Would be Foregone or Adversely Affected if Area Designated Wilderness-	If mineral resources occur they may be forgone, if the area is designated. No other resources forgone.	If mineral resources occur they may be forgone, if the area is designated. No other resources forgone.	If mineral resources occur they may be forgone, if the area is designated. No other resources forgone.
Effect of Nondesignation on Wilderness Values-	If extensive mineral development occurs, wilderness values would be lost.	If extensive mineral development occurs, wilderness values would be lost.	If extensive mineral development occurs, wilderness values would be lost.
Public Comment-	Mixed for and against.	Very little, mixed for and against.	Very little, mixed for and against.
Local Social and Economic Effects-	None	None	None
Consistency With Other Federal, State, and Local Resource-Related Plans-	No known inconsistencies.	No known inconsistencies.	No known inconsistencies.
PROPOSED ACTION:	Not suitable as wilderness.	Not suitable as wilderness.	Not suitable as wilderness.

SUMMARY
ANALYSIS AND RECOMMENDATIONS CONT.

WILDERNESS CRITERIA AND QUALITY STANDARDS FOR ANALYSIS AND DOCUMENTATION	ANT HILLS	CHEW WINTER CAMP	PETERSON DRAW
<p>RATIONALE</p>	<p>Although many wilderness characteristics are present, this WSA does not in and of itself possess outstanding wilderness values, nor does this area add significantly to values within Dinosaur National Monument. Therefore, it is not suitable for wilderness designation.</p>	<p>Although many wilderness characteristics are present, this WSA does not in and of itself possess outstanding wilderness values nor does this area add significantly to values within Dinosaur National Monument. Therefore, it is not suitable for wilderness designation.</p>	<p>Although many wilderness characteristics are present, this WSA does not in and of itself possess outstanding wilderness values nor does this area add significantly to values within Dinosaur National Monument. Therefore, it is not suitable for wilderness designation.</p>

SUMMARY
ANALYSIS AND RECOMMENDATIONS CONT.

WILDERNESS CRITERIA AND QUALITY STANDARDS FOR ANALYSIS AND DOCUMENTATION	TEPEE DRAW	VALE OF TEARS	COMBINED WSAs*
WILDERNESS CRITERIA			
Evaluation of Wilderness Values			
Size-	Meets the criterion.	Exceeds the criterion.	Exceeds the criterion.
Naturalness-	Only minor imprints exist, including a small way and drift fence.	All intrusions are minor, and are scattered in the western finger of the WSA.	Only minor intrusions would be included (areas in Peterson Draw where mining and logging have occurred would be dropped)
Outstanding Opportunities for Solitude or Primitive and Unconfined Recreation-	Draws and dense piñon-juniper provide opportunities but they are not outstanding when the WSA is considered by itself. They become outstanding when considered with Dinosaur National Monument (DNM) because there is opportunity for unconfined movement between the two areas. The WSA does not add to features within DNM.	Draws and dense piñon-juniper woodlands provide opportunities, but they are not outstanding when the WSA is considered by itself. Because there is opportunity for unconfined movement between Dinosaur National Monument (DNM) and the WSA, opportunities become outstanding when considered with DNM but the WSA does not add to features within DNM.	Opportunities are improved by combining the WSAs (when compared with the WSAs separately) but the opportunity is only marginally outstanding in and of itself because the configuration is such that the center of the WSA is a corridor 1/4-3/4 of a mile wide.
Special Features: Presence or Absence of the Quality of Optional Wilderness Characteristics-	No special features are present.	While there is a canyon about 400 feet deep in the WSA, within the context of northwest Colorado this is not a unique or outstanding feature. Also it should be noted that the canyon does not contain a perennial stream.	No special features are present.

SUMMARY
ANALYSIS AND RECOMMENDATIONS CONT.

WILDERNESS CRITERIA AND QUALITY STANDARDS FOR ANALYSIS AND DOCUMENTATION	TEPEE DRAW	VALE OF TEARS	COMBINED WSAs*
Multiple Resource Benefits-	None have been identified.	None have been identified.	None identified.
Diversity in the National Wilderness Preservation System:			
Expansion of Diversity of Natural Systems and Features-	Designation would contribute. This ecosystem is not well represented in designated areas, but is represented in other WSAs and areas recommended or administratively endorsed for wilderness designation.	Designation would contribute. This ecosystem is not well represented in designated areas, but is represented in other WSAs and areas administratively endorsed or recommended for wilderness designation.	Designation would contribute. This ecosystem is not well represented in designated areas, but is represented in other WSAs and areas administratively endorsed or recommended for wilderness designation.
Assessments of Opportunities for Solitude or Primitive Recreation within 5 Hours Driving Time of Major Cities-	Within 5 hours of 4 SMSAs as are several other WSAs and wilderness areas.	Within 5 hours of 4 SMSAs 4 SMSAs as are several other WSAs and wilderness areas.	Within 5 hours of 4 SMSAs, as are several other WSAs and wilderness areas.
Balancing the Geographic Distribution of Wilderness Areas-	While it would add to the distribution, its contribution would be minor when considering other areas being recommended as wilderness.	While it would add to the distribution, its contribution would be minor when considering other areas being recommended as wilderness.	While it would add to the distribution, its contribution would be minor when considering other areas being recommended as wilderness.
Manageability; Capability to Preserve Wilderness Characteristics-	If adjacent areas in DNM are managed as wilderness, capability is good.	If the adjacent area in Dinosaur National Monument is managed as wilderness, this area would be manageable. Development of mining claims would have little effect on management because they are in the northern finger of the WSA.	The manageability is improved by the larger size, but the middle portion is a corridor 1/4-3/4 of a mile wide. If there is extensive development of the 67 mining claims, manageability could be seriously impaired.

SUMMARY
ANALYSIS AND RECOMMENDATIONS CONT.

WILDERNESS CRITERIA AND QUALITY STANDARDS FOR ANALYSIS AND DOCUMENTATION	TEPEE DRAW	VALE OF TEARS	COMBINED WSA's*
QUALITY STANDARDS FOR ANALYSIS AND DOCUMENTATION			
Identified or Potential Energy and Mineral Resource Value-	There are no known developable resources, but there is a high potential for occurrence of base and precious metals, and low to moderate potential for oil and gas.	There are no known developable resources, but there is a high potential for occurrence of base and precious metals, and low to moderate potential for oil and gas.	There are no known developable resources, but there is a high potential for occurrence of base and precious metals, and low to moderate potential for oil and gas.
Extent to Which Other Resource Values or Uses Would be Foregone or Adversely Affected if Area Designated Wilderness:-	If mineral resources occur they may be forgone, if the area is designated. No other resource of 225 animal unit months (AUMs) forgone (presently 746 AUMs in WSA, 3,460 AUMs in affected allotments) values forgone.	If mineral resources occur they may be forgone, if the area is designated. Potential increase of 225 animal unit months (AUMs) forgone (presently 746 AUMs in WSA, 3,460 AUMs in affected allotments).	If mineral resources occur they may be forgone, if the area is designated. No other resources forgone.
Effect of Nondesignation on Wilderness Values-	If extensive mineral development occurs, wilderness values would be lost.	If extensive mineral development occurs, wilderness values would be lost.	If extensive mineral development occurs, wilderness values would be lost.
Public Comment-	Very little, mixed for and against.	Mixed for and against.	Mixed for and against.
Local Social and Economic Effects-	None	None	None
Consistency With Other Federal, State, and Local Resource-Related Plans-	No known inconsistencies.	No known inconsistencies.	No known inconsistencies.
PROPOSED ACTION:	Not suitable as wilderness.	Not suitable as wilderness.	Not suitable as wilderness.

SUMMARY
ANALYSIS AND RECOMMENDATIONS CONT.

WILDERNESS CRITERIA AND QUALITY STANDARDS FOR ANALYSIS AND DOCUMENTATION	TEPEE DRAW	VALE OF TEARS	COMBINED WSAs*
RATIONALE	<p>Although many wilderness characteristics are present, this WSA does not in and of itself possess outstanding wilderness values, nor does this area add significantly to values within Dinosaur National Monument. Therefore, it is not suitable for wilderness designation.</p>	<p>Although many wilderness characteristics are present, this WSA does not in and of itself possess outstanding wilderness values nor does this area add significantly to values within Dinosaur National Monument. Therefore, it is not suitable for wilderness designation.</p>	<p>Although many wilderness characteristics are present, this WSA does not in and of itself possess outstanding wilderness values nor does this area add significantly to values within Dinosaur National Monument. Therefore, it is not suitable for wilderness designation.</p>

*The Combined WSAs includes the Ant Hills, Chew Winter Camp, and Peterson WSAs

**LITTLE SNAKE RESOURCE AREA -
WILDERNESS TECHNICAL SUPPLEMENT**

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CHAPTER 1

PURPOSE AND NEED

INTRODUCTION

This Wilderness Technical Supplement analyzes the impacts of designating or not designating eight wilderness study areas (WSAs) as wilderness. Alternatives analyzed include designating all, some, or none of each WSA as wilderness. Each WSA is analyzed individually and site-specifically. The wilderness study areas are managed by the Bureau of Land Management (BLM) as part of the Craig District's Little Snake Resource Area in northwest Colorado.

This analysis is intended to be used in conjunction with the Little Snake Resource Management Plan/Environmental Impact Statement (RMP/EIS). It also supplements the analysis in the RMP/EIS.

LEGISLATIVE AUTHORITY

The Bureau of Land Management's wilderness program is a result of the Federal Land Policy and Management Act (FLPMA) of 1976 (Public Law 94-579).

Two sections of this law apply; Section 603 and Section 202.

Section 603

Section 603(a) of FLPMA directs the Secretary of the Interior to review public land areas of 5,000 acres or more determined to have wilderness characteristics. The Secretary then recommends to the President the suitability or nonsuitability of each area for preservation as wilderness.

The Congress will ultimately decide whether to designate or not designate the areas as wilderness. The West Cold Spring, Diamond Breaks, and Cross Mountain Wilderness Study Areas (WSAs) are being studied under the authority of this section of FLPMA.

Section 202

Section 202 of FLPMA provides authority through the land use planning process to study and recommend as wilderness areas not covered under Section 603. While the study process is the same as for WSAs studied under Section 603, if the BLM Colorado State Director determines that the areas are nonsuitable for wilderness designation, he can drop them from further consideration. This would be done in the final land use planning decision. If they are found suitable, Congress must make the final decision to designate or not designate them as wilderness.

Five WSAs (Ant Hills, Chew Winter Camp, Peterson Draw, Tepee Draw, and Vale of Tears) are being studied under this authority.

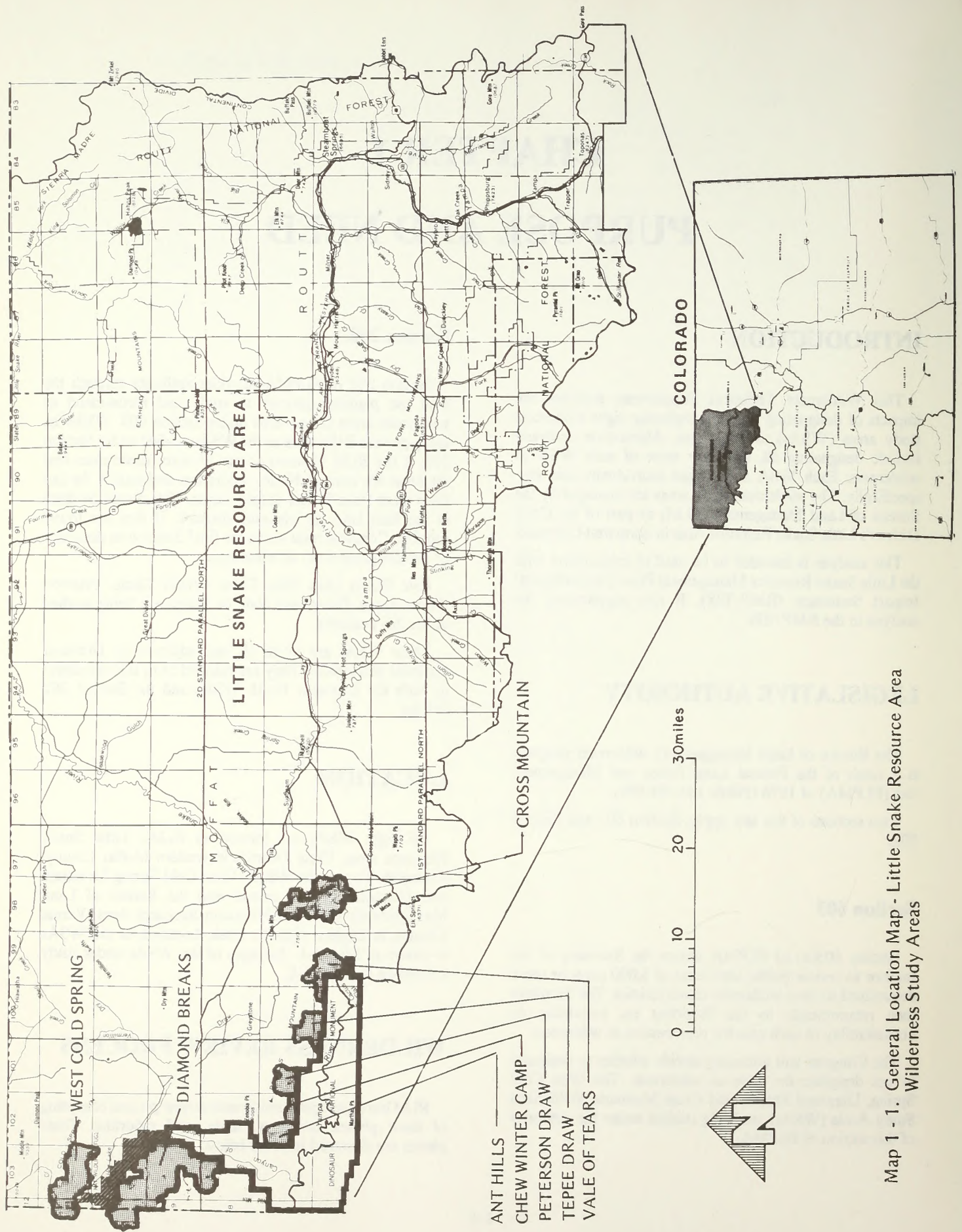
These WSAs are north of, and adjacent to, Dinosaur National Monument. They are referred to in this document as both the Dinosaur North WSAs and the Section 202 WSAs.

LOCATION

All eight WSAs are located in BLM's Little Snake Resource Area, Craig District, in western Moffat County, Colorado. Two of the WSAs, West Cold Spring Mountain and Diamond Breaks, extend into the Bureau of Land Management's Diamond Mountain Resource Area, Vernal District, in Daggett County, Utah. Location of the WSAs is shown in Map 1-1. Acreages of the WSAs under study are shown in Table 1-1.

WILDERNESS REVIEW PROCESS

BLM has developed a wilderness review process consisting of three phases: inventory, study, and reporting. These phases are discussed in detail below.



Map 1 - 1. General Location Map - Little Snake Resource Area
 Wilderness Study Areas

TABLE 1-1
WILDERNESS STUDY AREAS ANALYZED

<u>Wilderness Study Areas</u>	<u>Reference Number*</u>	<u>Size (acres)</u>
<u>Section 603 Areas</u>		
West Cold Spring	CO-010-208	14,482
	UT-080-103	3,200
	Subtotal	17,682
Diamond Breaks	CO-010-214	31,480
	UT-080-113	3,900
	Subtotal	35,380
Cross Mountain	CO-010-230	14,081
<u>Section 202 Areas</u>		
Ant Hills	CO-010-224	4,354
Chew Winter Camp	CO-010-224a	1,320
Peterson Draw	CO-010-226	5,160
Tepee Draw	CO-010-228	5,490
Vale of Tears	CO-010-229d	7,420
	Subtotal	23,744
Total		90,887

* The reference number comes from BLM's Intensive Wilderness Inventory (November, 1980) and is presented so that the material can be referenced if the reader wishes to do so.

Inventory

This phase involved identifying the public lands that contain wilderness characteristics established by Congress. FLPMA directs BLM to use the criteria given by Congress in the Wilderness Act of 1964. Section 2(c) of that Act states, "A Wilderness, in contrast with those areas where man and his own works dominate the landscape, is hereby recognized as an area where the earth and its community of life are untrammled by man, where man himself is a visitor who does not remain." An area of wilderness is further defined in this Act as an area of undeveloped federal land retaining its primeval character and influence, without permanent improvements or human habitation, which is protected and managed so as to preserve its natural conditions and which (1) generally appears to have been affected primarily by the forces of nature, with the imprint of man's work substantially unnoticeable; (2) has outstanding opportunity for solitude or a primitive and unconfined type

of recreation; (3) has at least five thousand acres of land or is of sufficient size as to make practicable its preservation and use in an unimpaired condition; and (4) may also contain ecological, geological, or other features of scientific, education, scenic, or historic value." Areas meeting these criteria were identified as WSAs. (These characteristics are explained in detail in the "Wilderness Inventory Handbook - Policy, Direction, and Procedures and Guidance for Conducting Wilderness Inventory on the Public Lands - September 1978," available from the BLM.)

The inventory phase was completed for the LSRA in November, 1980. Eight WSAs were found to contain wilderness characteristics (USDI, BLM 1980). Three WSAs (Ant Hills, Chew Winter Camp, and Peterson Draw) were less than 5,000 acres, but were included because of public comment and their contiguity to Dinosaur National Monument. Approximately 3,095 acres were added to the West Cold Spring WSA, mostly in the Utah portion, as the result of a protest.

CHAPTER 1

Interior Board of Land Appeals (IBLA) rulings caused further changes to the original inventory acreage and status. IBLA ruled that BLM could not designate public land areas of less than 5,000 acres as WSAs (December 8, 1981), and BLM could not designate a WSA that is contiguous to another federal agency's wilderness or wilderness candidate area unless the BLM unit, on its own merit, met all wilderness criteria (February 3, 1983).

To conform with the IBLA rulings, a Departmental Order was issued that amended the wilderness inventory decisions (*Federal Register*, Vol. 47, No. 251, December 30, 1982). This order excluded the Ant Hills, Chew Winter Camp, and Peterson Draw WSAs from wilderness consideration under Section 603 of FLPMA because each was less than 5,000 acres in size. Later Tepee Draw and Vale of Tears WSAs were also removed from Section 603 consideration (*Federal Register*, Vol. 48, No. 53, March 17, 1983) because they were contiguous to Dinosaur National Monument and lacked wilderness characteristics on their own. However, due to continuing public interest in these five areas, the Secretary of the Interior decided that all five areas be studied for wilderness suitability under the authority of Section 202 of FLPMA. (*Federal Register*, March 17, 1983.)

Since completion of the inventory, the original acreage figures for the Ant Hills, Peterson Draw, Tepee Draw, and Vale of Tears WSAs have been recalculated. Some of the original boundaries contained errors. These new figures show slight increases but more accurately reflect what occurs on the ground. The current acreage figure for the eight WSAs is 90,887 acres as shown in Table 1-1.

Study

This phase recommends WSAs as suitable or unsuitable for wilderness designation. Based on FLPMA, BLM must determine whether an area is more suitable for wilderness designation or more suitable for other uses, considering all values, resources, and uses of the public lands.

Guidance for the Wilderness Study Policy comes from the following sources:

- BLM's Wilderness Study Policy
- National Environmental Policy Act
- Wilderness Act of 1964
- BLM's Wilderness Management Policy
- BLM Planning Regulations

The study phase for the eight WSAs is being conducted in conjunction with the Little Snake Resource Management Plan/Environmental Impact Statement for the LSRA and

includes portions of the Diamond Breaks and West Cold Spring WSAs in Utah. The Resource Management Plan will analyze the impacts of designating or not designating various combinations of WSAs while this Wilderness Technical Supplement analyzes each WSA individually.

The study phase for wilderness includes four major steps: issue identification, application of planning criteria and quality standards for analysis and documentation, formulation of alternatives, and evaluation of environmental consequences.

Issue Identification

Issue identification (scoping) took place to determine issues and associated conflicts to be addressed in the analysis. Issues of national concern were identified during the development of the BLM's Wilderness Study Policy.

At a local level, public meetings were held in Denver, Steamboat Springs, and Craig, Colorado. A public comment period was also held. From input at these meetings, written comments, and BLM staff input, major issues for wilderness were identified. The issues within the scope of this study have been summarized or grouped as follows:

- Impacts to Wilderness Values - potential loss of wilderness values through nondesignation; alternative management of the WSA to maintain or protect wilderness values as opposed to wilderness designation
- Impacts to Air Quality - changes to air quality classification
- Impacts to Mineral Development - restrictions through wilderness or other restrictive designation
- Impacts to Forage Production - restrictions on forage production improvement projects through wilderness designation
- Impacts to Wildlife Values - restrictions on aquatic and terrestrial improvement projects through wilderness designation; protection of wildlife habitat through wilderness designation
- Impacts to Soils - restrictions on erosion control projects; effects of designation or nondesignation on soil stability and productivity
- Impacts to Water Resources - restrictions on watershed improvement projects; effects of designation or nondesignation on water quantity and quality
- Impacts to Timber Production - restrictions on sale of products from woodlands (firewood) and from productive forest lands (sawtimber) through wilderness designation

- Impacts to Recreation - restrictions on motorized use versus nonmotorized use due to wilderness designation or nondesignation
- Impacts to Visual Resources - potential degradation of visual quality through nondesignation
- Impacts to Lands and Realty Actions - restrictions on lands or realty actions due to wilderness designation
- Impacts to Economic Conditions - effects on local, regional, or national economy due to wilderness designation or nondesignation
- Impacts to Social Values - social effects of wilderness designation versus other consumptive uses

Effects of designation/nondesignation on topography, vegetation, cultural resources, and paleontological resources have not been identified as significant issues. Therefore, they have been discussed only briefly in this document.

The Colorado River Water Conservation District has attempted to obtain funding and federal clearance to construct water storage and power generating dams at the mouth of Cross Mountain and Juniper canyons. The environmental, economic, social, and downstream impacts of development of the Juniper-Cross Mountain project were raised as an issue but are beyond the responsibility and authority of this study. There is no current viable proposal for such a project. If and when a project proposal is made, an environmental impact statement for the project will address these concerns.

Planning Criteria and Quality Standards for Analysis and Documentation

Two planning criteria and six quality standards are identified in the BLM’s Wilderness Study Policy.

The planning criteria are:

Criterion No. 1. Evaluation of Wilderness Values

Consider the extent to which each of the following components contributes to the following values:

1. Mandatory wilderness characteristics: The quality of wilderness characteristics—size, naturalness, and outstanding opportunities for solitude or primitive recreation.
2. Special features: The presence or absence, and the quality of, the following optional wilderness characteristics—ecological, geological, or other features of scientific, educational, scenic, or historical value.

3. Multiple resource benefits: The benefits to other resources and uses which wilderness designation of the area would ensure.
4. Diversity in the National Wilderness Preservation System: The extent to which wilderness designation of the area under study would contribute to expanding the diversity of the National Wilderness Preservation System from the standpoint of each of the following factors:
 - Expanding the diversity of natural systems and features, as represented by ecosystems and landforms.
 - Assessing the opportunities for solitude or primitive recreation within a day’s driving time (5 hours) of major population centers.
 - Balancing the geographic distribution of wilderness areas.

Criterion No. 2. Manageability

The area must be capable of being effectively managed to preserve its wilderness character.

The quality standards for analysis and documentation are:

1. Energy and Mineral Resource Values: Consider any identified or potential energy and mineral resource values.
2. Impacts on Other Resources: Consider the extent to which other resource values or uses of the area would be foregone or adversely affected as a result of wilderness designation.
3. Impact of Nondesignation on Wilderness Values: Consider the alternative use of land under study if the area is not designated as wilderness, and the extent to which the wilderness values of the area would be foregone or adversely affected as a result of this use.
4. Public Comment: Consider comments received from interested and affected publics at all levels.
5. Local Social and Economic Effects: Give special attention to adverse or favorable social and economic effects which designation of the area would have on local areas.
6. Consistency with Other Plans: Consider consistency with officially approved and adopted resource-related plans of other federal agencies, state and local governments.

CHAPTER 1

Formulation of Alternatives

Alternatives were developed which looked at designating all, some, or none of each WSA as wilderness. These options correlate to the All Wilderness, Conflict Resolution, and No Action/No Wilderness alternatives. The No Action Alternative allows for development under multiple use, while the No Wilderness Alternative protects each area's potential for backpacking, hiking, and nonmotorized forms of recreation.

Evaluation of Environmental Consequences

The fourth step of the study process is analysis of the environmental impacts of the alternatives. A detailed analysis for each WSA is included in this document for resources which may be impacted by designation or nondesignation.

Both a draft and a final analysis will be prepared. Comments on this Wilderness Technical Supplement and on the Draft Little Snake Resource Management Plan will be used to prepare the Preliminary Final Environmental Impact Statement and the Wilderness Study Report. When the Preliminary Final Environmental Impact Statement and the Wilderness Study Report are approved, the study phase will be completed.

The five Section 202 WSAs may be dropped from further consideration for wilderness by the Colorado State Director through BLM's land use planning process (Little Snake Resource Management Plan/Environmental Impact Statement).

Reporting the Results of the Analysis

The final phase of the wilderness review process is the reporting phase. Upon completion of this study, final recommendations as to whether the WSAs are suitable or nonsuitable for designation as wilderness will be made by BLM through the Secretary of the Interior to the President.

This recommendation will include a mineral survey which will be conducted by the U.S. Geological Survey and Bureau of Mines. This process does not apply to any Section 202 WSAs found nonsuitable by the Colorado State Director.

DESIGNATION/ NONDESIGNATION

Congress has the sole authority for designating any federally administered land as wilderness. Congress will take the recommendations submitted by the President along with any other information it may have obtained through its own sources and will pass legislation that would formally designate WSAs as wilderness or release them for uses other than wilderness.

INTERIM MANAGEMENT POLICY

All eight WSAs are currently managed under BLM's Interim Management Policy and Guidelines for Lands Under Wilderness Review to maintain their suitability for preservation as wilderness. The three Section 603 WSAs will continue to be managed under the Interim Management Policy until Congress either designates them as wilderness or releases them for other uses. The five Section 202 WSAs will be dropped from interim management if the Colorado State Director determines that they are nonsuitable for wilderness designation. If the State Director determines that they are suitable, then they will remain under interim management until Congress decides whether or not to designate them as wilderness. As long as a WSA remains under the Interim Management Policy, the Bureau of Land Management will maintain the WSA's suitability for preservation as wilderness.

CHAPTER 2

DESCRIPTION OF ALTERNATIVES

INTRODUCTION

The alternatives analyzed in this Wilderness Technical Supplement provide a full range of land use choices from those favoring wilderness protection to those favoring resource production. Table 2-1 shows the suitable and nonsuitable acreage figures for each WSA under each alternative. The Preferred Alternative was selected based on planning criteria established in the Wilderness Study Policy, public scoping meetings and comments, and analysis of impacts of designation versus nondesignation.

The basic objective of each alternative is to establish an appropriate allocation of resources consistent with the principles of multiple use. Each alternative provides a different view of what is appropriate and consistent with existing laws and regulations governing land uses and management.

SUMMARY OF THE KINDS OF ALTERNATIVES ANALYZED FOR THE WSAs

See specific wilderness study areas for application of each kind of alternative. Under any alternative, each WSA would continue to be managed under the Interim Management Policy until Congress decides whether to designate the area as wilderness. The Section 202 WSAs would be released from interim management sooner if the Colorado BLM State Director determines that they would not be recommended for wilderness designation.

ALL WILDERNESS ALTERNATIVE

This alternative would recommend the WSA as suitable for inclusion into the National Wilderness Preservation

System. The entire acreage of the WSA would be included. This represents the maximum that could be recommended suitable for wilderness designation.

The objective of this alternative is to preserve all the wilderness resources present in each WSA. Utilization or development of minerals, timber, and other resources in the WSAs would be severely restricted or precluded.

CONFLICT RESOLUTION ALTERNATIVE

This alternative is fully analyzed for the West Cold Spring, Diamond Breaks, Cross Mountain, Ant Hills, and Peterson Draw WSAs. The objective of this alternative, in general, is to preserve wilderness values while eliminating areas where conflicts or manageability problems occur. It is appropriate to consider less than the entire unit in two cases: 1) conflict resolution — where alternatives involving less than the entire WSA are based on an overall objective of resolving existing or potential conflicts between wilderness and certain nonwilderness uses; and 2) wilderness manageability — where less than the entire WSA may be suitable for wilderness designation based on a determination that some portion of the WSA cannot be managed effectively as wilderness over the long run. No Conflict Resolution Alternative was analyzed for the Tepee Draw, Vale of Tears, or Chew Winter Camp WSAs, because no resource conflicts or manageability problems were identified.

COMBINED WSAs ALTERNATIVE

This alternative applies only to the Ant Hills, Chew Winter Camp, and Peterson Draw WSAs, which are adjacent to each other and would be combined into and managed as one unit. The objective of this alternative is to preserve all the wilderness resource that is manageable while eliminating portions of the WSAs which have conflicts or cannot be managed as wilderness.

TABLE 2-1
 SUITABLE AND NONSUITABLE ACREAGE
 FOR EACH WSA UNDER EACH ALTERNATIVE

Wilderness Study Area	Alternatives											
	All Wilderness		Conflict Resolution		Combined WSAs		No Wilderness		No Action			
	Suitable	Nonsuitable	Suitable	Nonsuitable	Suitable	Nonsuitable	Suitable	Nonsuitable	Suitable	Nonsuitable		
West Cold Spring	17,682	0	13,790	3,892	N/A	N/A	0	17,682	0	17,682	0	17,682
Diamond Breaks	35,380	0	35,100	280	N/A	N/A	0	35,380	0	35,380	36,240 ³	340
Cross Mountain	14,081	0	13,465 ¹	631	N/A	N/A	0	14,081	0	14,081	0	14,081
Ant Hills	4,354	0	4,320	34	4,320 ²	34 ²	0	4,354	0	4,354	0	4,354
Chew Winter Camp	1,320	0	N/A	N/A	1,320 ²	0 ²	0	1,320	0	1,320	0	1,320
Peterson Draw	5,160	0	4,580	580	4,580 ²	580 ²	0	5,160	0	5,160	0	5,160
Tepee Draw	5,490	0	N/A	N/A	N/A	N/A	0	5,490	0	5,490	0	5,490
Vale of Tears	7,420	0	N/A	N/A	N/A	N/A	0	7,420	0	7,420	0	7,420

¹ Includes 15 acres of public land adjacent to WSA.
² Ant Hills, Chew Winter Camp, and Peterson Draw combined into one unit (10,220 acres suitable and 614 acres nonsuitable).
³ Includes 1,200 acres of public land added to enhance manageability.
 N/A Not applicable to the WSA.

All acreage figures are approximate.

NO WILDERNESS ALTERNATIVE

This alternative would recommend the WSA as nonsuitable for wilderness designation. The objective is to manage the WSAs primarily to provide for nonmotorized recreation, protect visual and wildlife values, and maintain a natural environment to the extent feasible without wilderness designation.

Restrictions would be placed on other resource uses or developments, such as no surface occupancy on new oil and gas leases, to maintain nonmotorized recreation settings and the natural integrity of the areas. Management prescriptions would be less restrictive than if the area were designated as wilderness but more restrictive than management under the No Action Alternative, which favors other resource uses or developments.

NO ACTION ALTERNATIVE

This alternative would recommend the WSA as nonsuitable for wilderness designation. Management of the public land resources within each WSA would be guided by land use plan decisions, as well as applicable laws, regulations, and policies. The management emphasis would vary from WSA to WSA, but in general most resource uses would be allowed.

PREFERRED ALTERNATIVE

This alternative presents what BLM considers to be the best balance of wilderness values and multiple resource benefits associated with development.

In BLM-initiated actions, such as these wilderness studies, the "proposed action" and the agency "preferred alternative" are the same. For the sake of consistency and ease of understanding, the term "preferred alternative" will be used throughout this document.

ALTERNATIVES CONSIDERED BUT ELIMINATED FROM ANALYSIS

EXPANSION ALTERNATIVE

Several comments have suggested that certain areas outside the boundaries of three WSAs be included to expand the WSAs or add areas back into the WSAs which have wilderness values. Specifically, these areas are as follows: West Cold Spring—the area east of the Matt Trail and portions of northern Beaver Creek Canyon encompassing 8,000 acres; Diamond Breaks—the mountains and ridges west of the Colorado/Utah state line encompassing some 5,320 acres; Cross Mountain—the southern end of the mountain and two areas on the west side of the mountain encompassing some 2,680 acres. All of these areas were dropped from consideration during the intensive inventory phase because it was determined that they did not meet one or more of the wilderness criteria. They will not be considered in this study.

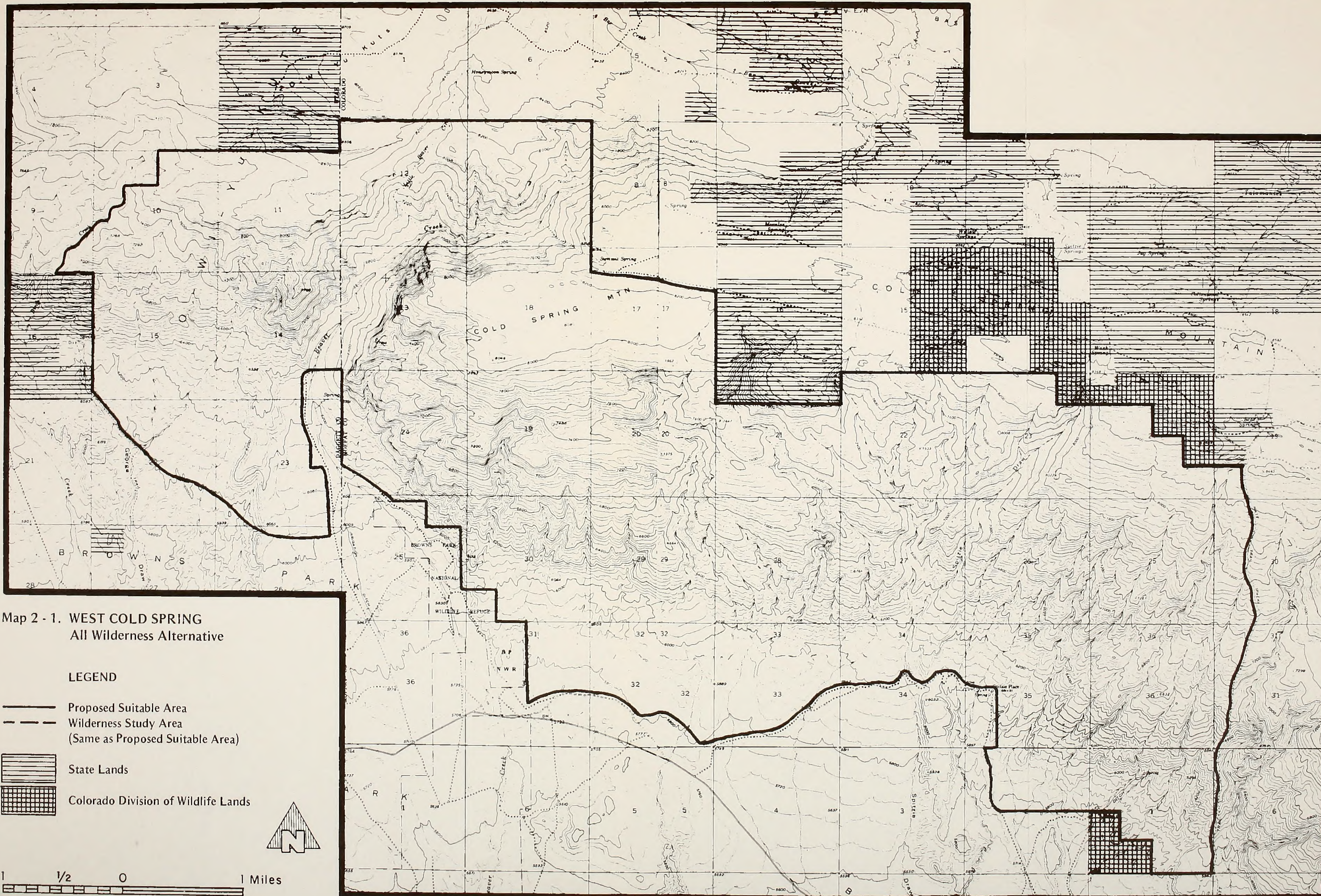
ALTERNATIVES ANALYZED FOR EACH WSA

The alternatives analyzed for each WSA are discussed by WSA below. Each WSA discussion includes maps and tables which summarize proposed management actions and predicted impacts.

WEST COLD SPRING

Under the All Wilderness Alternative, the entire 17,682 acres of the West Cold Spring WSA (Map 2-1) would be recommended as preliminarily suitable for wilderness designation.

Under the Conflict Resolution Alternative, 13,790 acres of the West Cold Spring WSA would be recommended as preliminarily suitable for wilderness designation (See Map 2-2). A total of 3,892 acres would be recommended as nonsuitable.







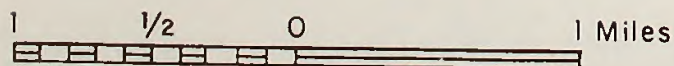
T 11N

T 10N

Map 2 - 1. WEST COLD SPRING
All Wilderness Alternative

LEGEND

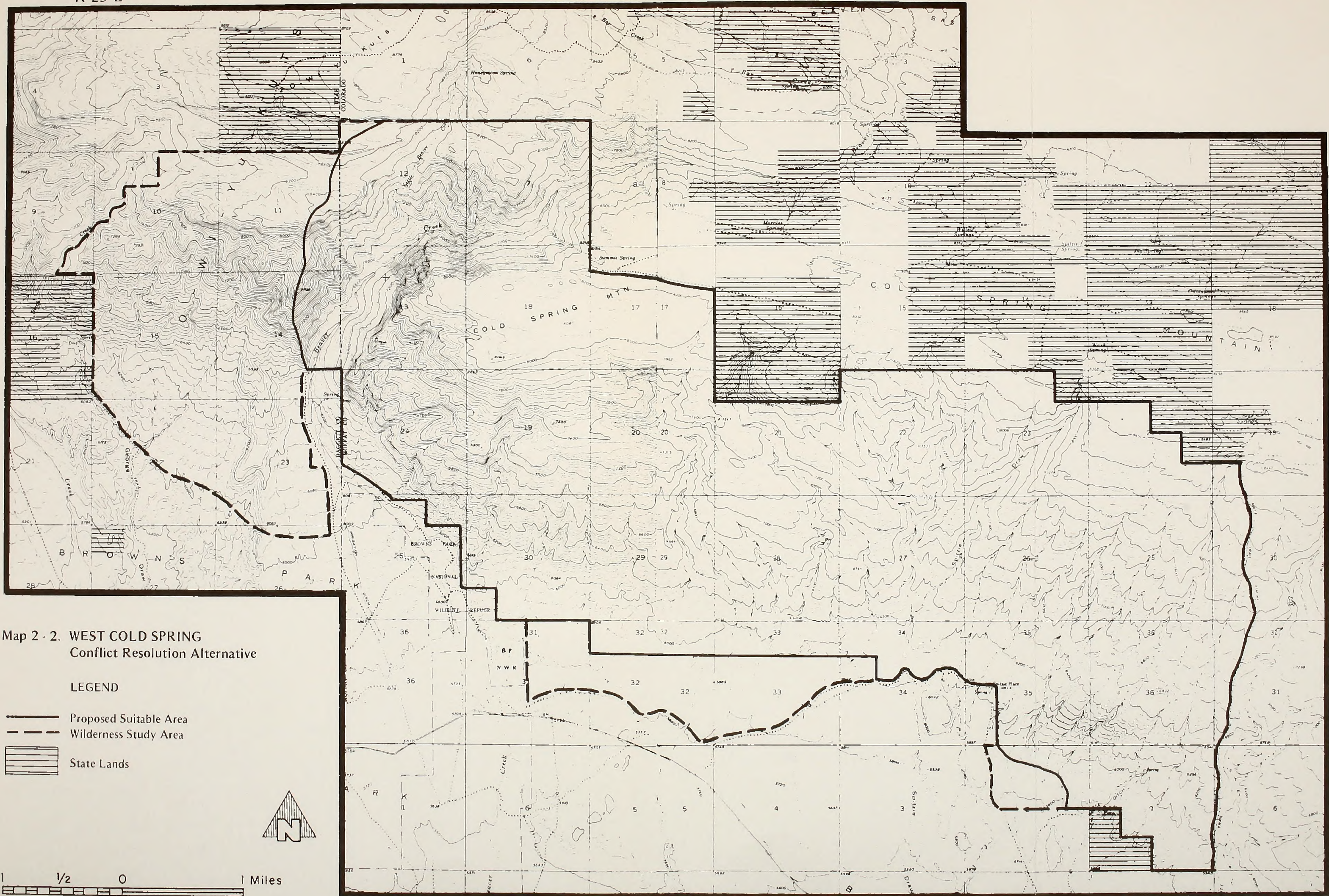
-  Proposed Suitable Area
-  Wilderness Study Area
(Same as Proposed Suitable Area)
-  State Lands
-  Colorado Division of Wildlife Lands



R 25 E




R 104 W

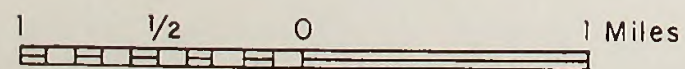
R 103 W



Map 2 - 2. WEST COLD SPRING
Conflict Resolution Alternative

LEGEND

-  Proposed Suitable Area
-  Wilderness Study Area
-  State Lands



DESCRIPTION OF ALTERNATIVES

An estimated 842 acres of the nonsuitable area lies along the southern boundary of the WSA in Colorado. This acreage would be excluded to eliminate open sagebrush areas and avoid possible conflict with intensive grazing management systems.

The remaining 3,050 nonsuitable acres lie west of Beaver Creek Canyon in Utah. The northern portion of this 3,050 acres is within the Middle Mountain oil and gas unit and would be dropped to eliminate conflicts with potential development. The southern portion would then be isolated from the rest of the WSA and also dropped from the WSA. This area would be managed according to the existing decisions of the Browns Park Management Framework Plan (BLM Vernal District). The principal uses occurring within this portion of the WSA are hunting and limited livestock grazing.

Under the No Wilderness Alternative, the entire 17,682 acres of the West Cold Spring WSA would be recommended as nonsuitable for wilderness designation. The Colorado portion of the WSA would be managed primarily for nonmotorized recreation. The Utah portion of the WSA (3,200 acres) would be managed according to the existing decisions of the Browns Park Management Framework Plan, with emphasis on hunting and livestock grazing.

The No Action Alternative would recommend all 17,682 acres of the West Cold Spring WSA as nonsuitable for wilderness designation. The Colorado portion of the WSA would be open to most resource uses, with emphasis on oil and gas development, wildlife habitat, and livestock grazing. The Utah portion of the WSA (3,200 acres, 18 percent of the WSA) would be managed under the Browns Park Management Framework Plan, with emphasis on hunting and livestock grazing.

Under the Preferred Alternative, all 17,682 acres of the West Cold Spring WSA would be recommended as nonsuitable for wilderness designation. The Colorado portion (14,482 acres) would be split into 3 management priority areas.

1. The wildlife priority area would allow intensive management of bighorn sheep, elk, fisheries, and other wildlife habitat in and adjacent to Beaver Creek Canyon. Woodland developments, livestock improvements, and watershed projects would be allowed provided adverse impacts can be mitigated to an acceptable level.
2. The recreation priority area would provide limited management in a semiprimitive motorized setting for big game hunting along the southern slopes between the Matt Trail and Beaver Creek Canyon. Woodland, livestock, watershed and other developments or improvements may be allowed.
3. The livestock priority area along the southern portion of the WSA would be managed to enhance the range and grazing.

Oil and gas leasing, exploration, and development would be allowed in all three priority areas; the "Wilderness Study Area Protection" stipulation would be dropped. (Lease restrictions on existing leases primarily involve seasonal no activity and small areas of no surface occupancy for wildlife mitigation.) The area would remain open to mineral entry.

The Matt Trail will remain closed to vehicle use for safety reasons. The wildlife and recreation priority areas would be managed under the VRM Class II objectives which would constrain but not eliminate development of other resources. The Utah portion of the WSA (3,200 acres) would be managed under the Browns Park Management Framework Plan. The area would remain open to oil and gas leasing/development, mineral entry, and other resource use and development.

Table 2-2 shows the management actions proposed under each alternative for West Cold Spring. Table 2-3 is a comparative summary of the impacts for the WSA.

TABLE 2-2
PROPOSED MANAGEMENT ACTIONS
WEST COLD SPRING WSA (17,682 ACRES)

Resource	All Wilderness Alternative	Conflict Resolution Alternative	Combined WSAs Alternative	No Wilderness Alternative	No Action Alternative	Preferred Alternative
SUMMARY						
(Note: Acreage designated wilderness would be managed according to BUM's Wilderness Management Policy.)						
Preliminarily Suitable (acres)	17,682	13,790	N/A	0	0	0
Nonsuitable (acres)	0	3,892		17,682	17,682	17,682
Primary Management Emphasis	Wilderness	Suitable portion managed as wilderness; nonsuitable portion open to all resource uses	N/A	Normotorized recreation; visual resources; wildlife habitat	Oil and gas development in north 1/4; wildlife habitat in middle; livestock grazing in south 1/4	Colorado portion of nonsuitable area divided into 3 management priority areas: 1. wildlife 2. recreation 3. livestock
OIL AND GAS						
(Note: high potential for occurrence; high potential for development)						
Pre-FLPMA leases which could be developed (no.)	0	0	N/A	0	0	0

TABLE 2-2 (Continued)
PROPOSED MANAGEMENT ACTIONS
WEST COLD SPRING

Resource	All Wilderness Alternative	Conflict Resolution Alternative	Combined WSAs Alternative	No Wilderness Alternative	No Action Alternative	Preferred Alternative
Post-FLPMA Teases which could be developed (no.) (acres)	0 0	Utah: 4* Colo: 3 (part)* Utah: 2,410 w/1,560 acres no surface occupancy (NSO) Colo: 842 (total = 3,252 19% of WSA, all in nonsuitable areas)	N/A	12* 5,047 (29% of WSA, w/1,560 acres NSO)	Same as No Wilderness Alternative*	Same as No Wilderness Alternative*
Post-FLPMA Teases which could not be developed (no.) (acres)	12 5,047	5 1,795	N/A	0	0	0
Unleased areas which could be leased and developed (acres)	0	Utah: 640 (3% of WSA, in nonsuitable area)		Utah: 640 Colo: 11,995, all NSO (total = 12,635, 71% of WSA, w/1,995 acres NSO)	12,635 (71% of WSA)	Same as No Action Alternative
Total area which could be developed (acres)	0	3,892 (22% of WSA)	N/A	17,682 (100% of WSA, w/13,555 acres NSO)	17,682 (100% of WSA, w/1,560 acres NSO)	Same as No Action Alternative
Estimated producing wells (no.)	0	5		7	22	Same as No Action Alternative

TABLE 2-2 (Continued)
PROPOSED MANAGEMENT ACTIONS
WEST COLD SPRING

Resource	All Wilderness Alternative	Conflict Resolution Alternative	Combined WSAs Alternative	No Wilderness Alternative	No Action Alternative	Preferred Alternative
Estimated surface disturbance (acres)	0	Development: 25-40	N/A	Development: 35-56	Development: 110-176	Same as No Action Alternative
LOCATABLE MINERALS						
(Note: No existing mining claims; moderate to high potential for base/precious metals; moderate potential for other localities)						
Estimated potential for development	None	None on 13,790 acres; low to moderate on 3,892 acres	N/A	Low to moderate throughout WSA	Moderate throughout WSA	Same as No Action Alternative
LIVESTOCK MANAGEMENT						
(Note: Grazing would continue at current levels under all alternatives)						
Proposed projects which could be developed: Burning/reseeding (acres)	0	80	N/A	750	Same as No Wilderness Alternative	Same as No Wilderness Alternative
(Note: no projects are proposed in Utah portion of WSA)						

TABLE 2-2 (Continued)
PROPOSED MANAGEMENT ACTIONS
WEST COLD SPRING

Resource	All Wilderness Alternative	Conflict Resolution Alternative	Combined WSAS Alternative	No Wilderness Alternative	No Action Alternative	Preferred Alternative
<u>WILDLIFE MANAGEMENT</u>						
	Allow wildlife to maintain a natural balance w/habitat and each other. Maintain 30 big-horn sheep.	Same as All Wilderness Alternative	N/A	Same as All Wilderness Alternative	Manage Beaver Creek as a fishery. With CDDM, manage to provide quality elk management area. Maintain 30 bighorn sheep.	Same as No Action Alternative
Proposed projects	None	None	N/A	None	Some improvements on Beaver Creek	Same as No Action Alternative
<u>SOIL/WATER RESOURCES</u>						
	No projects planned.	Same as All Wilderness Alternative.	N/A	No projects planned. Projects may be implemented if watershed condition deteriorates significantly.	Same as No Wilderness Alternative	Same as No Wilderness Alternative
<u>FOREST RESOURCES</u>						
Productive woodland which could be developed (acres)	0	0	N/A	0	270	Same as No Action Alternative
<u>NATURAL HISTORY</u>						
	N/A	N/A	N/A	N/A	N/A	N/A

TABLE 2-2 (Continued)
PROPOSED MANAGEMENT ACTIONS
WEST COLD SPRING

Resource	All Wilderness Alternative	Conflict Resolution Alternative	Combined WSAs Alternative	No Wilderness Alternative	No Action Alternative	Preferred Alternative
RECREATION						
Emphasis in suitable areas	Wilderness; semi primitive nonmotorized settings	Same as All Wilderness Alternative	N/A	N/A	N/A	N/A
Emphasis in nonsuitable areas	N/A	Dispersed; motorized and nonmotorized settings	N/A	Utah: Same as Conflict Resolution Alternative Colo.: Nonmotorized settings	Same as Conflict Resolution Alternative	Same as Conflict Resolution Alternative
ORV designations in suitable areas (acres)	17,682, closed except for authorized uses	13,790, closed except for authorized uses	N/A	N/A	N/A	N/A
ORV designations in nonsuitable area (acres)	N/A	3,892, open	N/A	Utah: 3,200, open Colo.: 14,482, closed	17,682, open	Utah: 3,200, open Colo.: 14,482, limited to designated roads/trails, seasonal closures, authorized uses

TABLE 2-2 (Continued)
PROPOSED MANAGEMENT ACTIONS
WEST COLD SPRING

Resource	All Wilderness Alternative	Conflict Resolution Alternative	Combined WSAs Alternative	No Wilderness Alternative	No Action Alternative	Preferred Alternative
<u>LANDS/REALTY ACTIONS</u>						
	WSA would be unsuitable for new rights-of- way except those needed to develop valid prior existing rights	None	N/A	Minor, associated w/mineral development	Same as No Wilderness Alternative	Same as No Wilderness Alternative

* The Wilderness Study Area Protection Stipulation would be dropped.

TABLE 2-3
COMPARATIVE SUMMARY OF IMPACTS
WEST COLD SPRING WSA

Resource	All Wilderness Alternative	Conflict Resolution Alternative	Combined WSAs Alternative	No Wilderness Alternative	No Action Alternative	Preferred Alternative
<u>Wilderness Values</u>	Overall wilderness values maintained, including special features. 200 acres in Utah portion subject to off-road vehicle (ORV) use due to terrain. Expansion of ecological diversity in National Wilderness Preservation System (NWPS): juniper-pinyon woodland and sagebrush-steppe ecosystem.	Wilderness values maintained on 13,790 acres. Natural values lost on 2,000 acres. Opportunities for solitude and primitive, unconfined recreation lost on 3,892 acres. Expansion of ecological diversity in NWPS; juniper-pinyon woodland ecosystem; failure to expand diversity with sagebrush-steppe ecosystem.	Note: There is no Combined WSAs Alternative for West Cold Spring Wilderness Study Area (WSA).	Wilderness values lost on 5,687 acres, mostly west of Beaver Creek Canyon. Moderate protection of opportunities for primitive, unconfined recreation on 11,995 acres in Colorado portion, but no long-term protection for naturalness or opportunities for solitude. Failure to expand diversity of NWPS.	Wilderness values lost on entire 17,682 acres. Failure to expand diversity of National Wilderness Preservation System (NWPS).	Same as No Action Alternative.
<u>Minerals</u>	12 post-FLPMA (Federal Land Policy & Management Act) leases (29% of WSA) not developed. No new leasing/development on 71% of WSA. May be adverse impact in high potential area.	High potential for all or portions of 7 post-FLPMA leases to be developed (21% of WSA); 5 wells occupying 25-40 acres). No WSA; may be adverse impact in high potential area.		High potential for development of 12 post-FLPMA leases (29% of WSA); 7 wells occupying 35-56 acres. No surface occupancy (NSO) on 68% of WSA would probably preclude development; may be adverse impact to high potential area.	High potential for long-term development of entire 17,682 acres (22 wells, occupying 110-176 acres); may be beneficial impact in high potential area.	Same as No Action Alternative.

TABLE 2-3 (continued)
COMPARATIVE SUMMARY OF IMPACTS
WEST COLD SPRING WSA

Resource	All Willdemess Alternative	Conflict Resolution Alternative	Combined MSAs Alternative	No Willdemess Alternative	No Action Alternative	Preferred Alternative
Locatables	Closed to mineral entry. May be adverse impact in moderate to high potential area.	13,790 acres closed to mineral entry. 3,892 acres open to mineral entry with low to moderate potential for long-term development.		Open to mineral entry. Long-term beneficial impact in high potential area. Some constraints due to ORV restrictions.	Same as No Willdemess Alternative, except no ORV constraints.	Same as No Willdemess Alternative.
Livestock Grazing	Loss of potential 75 AUMs/year increase. No direct loss of livestock production. Increased cost of livestock management, due to ORV closures.	Loss of potential 67 AUMs/year increase. Otherwise, same as All Willdemess Alternative.		Range improvement projects constrained. No direct loss of livestock production. Potential increase of 75 AUMs/year. Some increased cost of livestock management due to ORV restrictions.	Potential increase of 75 AUMs/year.	Same as No Action Alternative.

TABLE 2-3 (continued)
COMPARATIVE SUMMARY OF IMPACTS
WEST COLD SPRING WSA

Resource]	All Wilderness Alternative	Conflict Resolution Alternative	Combined WSAs Alternative	No Wilderness Alternative	No Action Alternative	Preferred Alternative
<u>Wildlife</u>	Highly beneficial to 30 bighorn sheep and sensitive raptor species; preservation of proposed trophy elk hunting area. Some benefit to Beaver Creek riparian habitat, but some adverse impacts due to continued livestock grazing. Active development of riparian/fisheries habitat may be restricted.	Same as All Wilderness Alternative on 13,790 acres. On 3,892 acres: potential loss of 42 mule deer (not significant) and significant decrease of elk trophy hunting value in Game Management Unit (GMU) 201, due to mineral development.	On 11,995 acres: benefits similar to All Wilderness Alternative; some potential disturbance from locatable mineral development. On 5,687 acres: up to 2,000 acres big game habitat lost in short term; up to 30 big-horn sheep and 80 mule deer displaced or lost; value of elk trophy hunting in GMU 201 significantly reduced; short-term degradation of Beaver Creek riparian/fisheries habitat.	On 11,995 acres: benefits similar to All Wilderness Alternative; some potential disturbance from locatable mineral development. On 5,687 acres: up to 2,000 acres big game habitat lost in short term; up to 30 big-horn sheep and 80 mule deer displaced or lost; value of elk trophy hunting in GMU 201 significantly reduced; short-term degradation of Beaver Creek riparian/fisheries habitat.	Up to 8,800 acres big game habitat lost in short term; potential disturbance of raptor habitat. Up to 30 bighorn sheep and 170 mule deer displaced or lost. Value of elk trophy hunting in GMU 201 and riparian fisheries habitat significantly reduced. Some possible benefits from wildlife habitat improvement projects.	Significant beneficial impacts to bighorn sheep, raptors, Beaver Creek aquatic habitat, and trophy elk hunting on 9,300 acres. Oil and gas development on 3,000 acres would result in possible loss of 50 mule deer and significant disturbance to raptors and trophy elk hunting.
<u>Soils</u>	Surface-disturbing activities would be reduced; potential sediment sources and soil productivity would stabilize or improve. Methods of correcting existing or potential problems (mainly from livestock grazing) would be limited.	Same as All Wilderness Alternative on 13,790 acres. On 3,892 acres: soil losses of 18-54 tons over 5-year period due to oil/gas development.	On 11,995 acres: soil productivity would stabilize or improve. On 5,687 acres: soil losses of 27-80 tons over 5-year period. Watershed and range improvement projects would be beneficial.	On 11,995 acres: soil productivity would stabilize or improve. On 5,687 acres: soil losses of 27-80 tons over 5-year period. Watershed and range improvement projects would be beneficial.	Soil losses of 80-250 tons over 5-year period. Intensive erosion control measures allowed which would be beneficial.	Same As No Action Alternative.

TABLE 2-3 (continued)
COMPARATIVE SUMMARY OF IMPACTS
WEST COLD SPRING WSA

Resource ¹	All Wilderness Alternative	Conflict Resolution Alternative	Combined WSAs Alternative	No Wilderness Alternative	No Action Alternative	Preferred Alternative
<u>Water Resources</u>	Water quality would remain high. Structural and vegetative watershed treatments may be precluded.	Same as All Wilderness Alternative on 13,790 acres. On 3,892 acres: increased sedimentation (up to 18 - 54 tons over five years) into Willow Creek, George Draw, Birch Creek, Spitzie Draw; potential for accidental contamination and interruption of groundwater.		On 11,995 acres: water quantity/quality maintained. On 5,687 acres: increased sedimentation (up to 27-80 tons over five years) into Willow Creek, George Draw, Birch Creek, Spitzie Draw, Beaver Creek; potential for accidental contamination and interruption of groundwater.	Increased sedimentation (up to 80-250 tons over 5 years) into Willow Creek, George Draw, Birch Draw, Spitzie Draw, Beaver Creek; potential for accidental contamination and interruption of groundwater.	Same as No Action Alternative.
<u>Recreation²</u>	RDS settings maintained: SPM, 80% of WSA; SPM, 18% of WSA; PM, 2% of WSA. Opportunities for primitive recreation enhanced.	SPM settings decreased 20%. Motorized recreation may increase on 3,892 acres. Opportunities for primitive, nonmotorized recreation maintained on 13,790 acres.		SPM settings decreased 11% west of Beaver Creek Canyon. Opportunities for primitive recreation maintained on 11,995 acres. Motorized use may increase on 5,687 acres.	SPM settings decreased 40%, along with associated opportunities for primitive recreation. SPM settings increased 18%; PM setting increased 16%; R settings added (6%).	Same as No Action Alternative.

TABLE 2-3 (continued)
COMPARATIVE SUMMARY OF IMPACTS
WEST COLD SPRING WSA

Resource ¹	All Willdemess Alternative	Conflict Resolution Alternative	Combined WSAs Alternative	No Willdemess Alternative	No Action Alternative	Preferred Alternative
<u>Visual Resources³</u>	Class I objectives and scenic quality maintained on 17,682 acres.	On 13,790 acres: same as All Willdemess Alternative. On 3,692 acres: Class III and IV objectives would allow loss of scenic quality.		On 11,995 acres: Class II objectives and scenic quality maintained. On 5,687: loss of scenic quality.	Landscape potentially altered over much of WSA. Scenic quality compromised or degraded.	Same as No Action Alternative.
<u>Economics</u>	Economic potential associated with mineral resource development would be foregone. Effect on employment, income, infrastructure is unknown.	Similar to All Willdemess Alternative. Economic potential associated with mineral development not foregone on 21% of WSA.		Economic potential associated with oil/gas development foregone on 68% of WSA. Economic potential associated with locatable mineral development not foregone. Effect on employment, income, public revenue, infrastructure is unknown.	Economic potential of mineral development not foregone. Effect on employment, etc., is unknown.	Same as No Action Alternative.

1/ There would be no significant adverse or beneficial impacts to air quality, topography, forest/woodland resources, cultural resources, paleontological resources, lands/realty actions or social values for any WSA under any alternative under consideration. Except for two rare and endemic plant species in Cross Mountain WSA (see Natural History), there would be no significant adverse or beneficial impacts to vegetation for any WSA under any alternative, including threatened, endangered, candidate, and Colorado BLM sensitive plant species.

2/

P = primitive; SPM = semiprimitive nonmotorized; SPN = semiprimitive motorized; RN = roaded natural; R = rural; MU = modern urban. The Recreation Opportunity Spectrum (ROS) Classes are described in Appendix D.

3/

Visual Resource Management (VRM) class objectives are briefly defined in Appendix E.

DIAMOND BREAKS

Under the All Wilderness Alternative, the entire 35,380 acres of the Diamond Breaks WSA (Map 2-3) would be recommended as preliminarily suitable for wilderness designation.

The majority of the Diamond Breaks WSA (35,100 acres) would be recommended as preliminarily suitable for wilderness designation under the Conflict Resolution Alternative. Approximately 280 acres of the area would be eliminated due to a Recreation and Public Purposes Act lease to the Browns Park (Utah) State Wildlife Refuge. The ways in Chokecherry and Yellow Jacket draws would be closed (Refer to Map 2-4).

Under the No Wilderness Alternative, the entire 35,380 acres of the Diamond Breaks WSA would be recommended as nonsuitable for wilderness designation. The Colorado portion of the WSA would be managed primarily for nonmotorized recreation. The Utah portion (3,900 acres, 11 percent of the WSA), managed by the Vernal BLM District, would be managed according to decisions in the existing Browns Park and Diamond Mountain management framework plans.

Under the No Action Alternative, the entire 35,380 acres of the Diamond Breaks WSA would be recommended as nonsuitable for wilderness designation. The Utah portion and that area in Colorado managed under cooperative agreement with the Vernal BLM District (totaling 22,140 acres) would be managed according to decisions in the existing Vernal BLM Browns Park and Diamond Mountain management framework plans. The entire WSA would be open to most resource uses.

Under the Preferred Alternative, 36,240 acres would be recommended as preliminarily suitable and 340 acres would be recommended as nonsuitable for wilderness designation (Map 2-5).

Approximately 280 acres on the north end of the WSA (in Utah) would be excluded to eliminate most of the area under a Recreation and Public Purposes Act lease to the state of Utah. Small boundary adjustments in three places along the west side of the WSA would eliminate approximately 60 acres from the WSA. The boundary would be redrawn along small portions of Dry Creek and Crouse Creek to provide a boundary which can be more easily identified on the ground.

Approximately 1,200 acres encompassing the lower portions of the Chokecherry, Yellow Jacket, and Warren draws would be added to the WSA to enhance manageability.

The boundary would be expanded northward to the Browns Park National Wildlife Refuge boundary which is fenced and easily identified on the ground. The fence forms an effective barrier to indiscriminate ORV use and would eliminate the potential for impacts to the outstanding opportunities for solitude and primitive unconfined recreation in the WSA from resource development activities. The only human imprints within the area are two ways (approximately 3 miles) near Chokecherry and Yellow Jacket draws which are becoming overgrown with vegetation. These ways would rehabilitate through natural processes once closed to vehicle use. (Proposed acreage changes are summarized in Table 2-4.)

TABLE 2-4
DIAMOND BREAKS WSA
PROPOSED ACREAGE CHANGES UNDER
THE PREFERRED ALTERNATIVE

State	Acres in Original WSA	Acres in Preferred Alternative
Colorado	31,480	32,620
Utah	3,900	3,620
Total	35,380	36,240

The potential addition of approximately 190 acres of Utah State school trust lands adjacent to Crouse Canyon has also been identified. This area would be a logical extension of the proposed wilderness area and would enhance manageability by eliminating the potential for impacts to the wilderness values present. The area would make a suitable addition and is recommended here for information purposes only. In addition, an exchange of 635 acres of split estate with the state of Colorado is recommended. Inclusion of state lands or mineral estate would require negotiations with the respective state land boards for exchange of these lands for other income producing federal lands. This would only be initiated should Congress designate the federal lands as

CHAPTER 2

wilderness. The state of Colorado is willing to negotiate and the state of Utah would consider an exchange within 90 days of designation of the area. Potential exchanges are summarized in Table 2-5.

Table 2-6 shows proposed management actions for each alternative. Table 2-7 shows the comparative summary of the impacts for Diamond Breaks WSA.

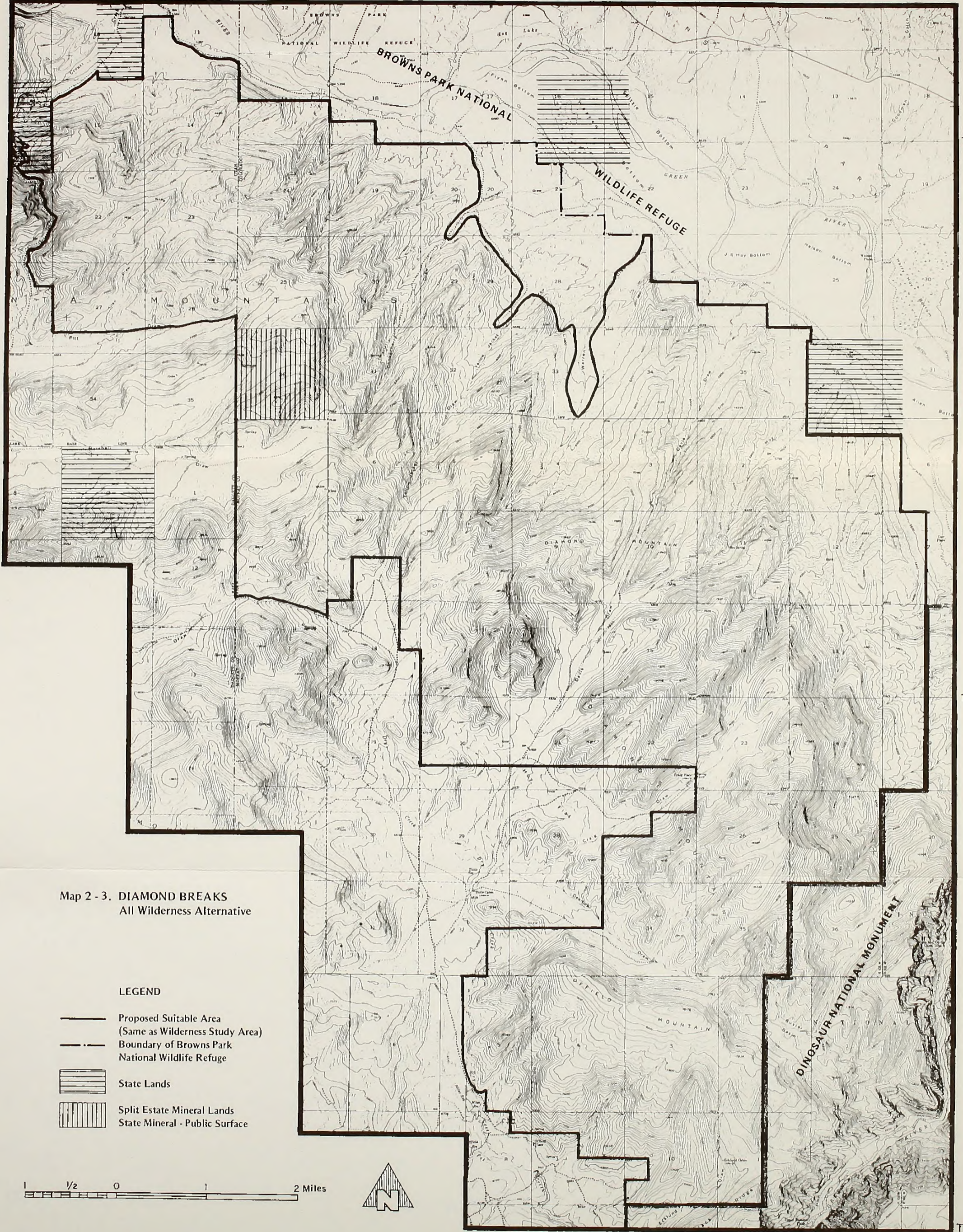
**TABLE 2-5
DIAMOND BREAKS WSA
POTENTIAL EXCHANGES UNDER
THE PREFERRED ALTERNATIVE**

Status	Legal Description	Acres
Colorado State Mineral Ownership	T. 10 N., R. 104 W., Section 36	635
Utah State School Trust Lands	T. 1 N., R. 25 E., Section 16: E1/2	<u>190</u>
Total		<u>825</u>

R 25 E

R 104 W

R 103 W







T 10 N

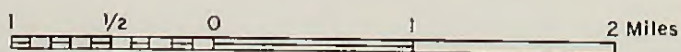
T 9 N

T 8 N

Map 2 - 3. DIAMOND BREAKS
All Wilderness Alternative

LEGEND

-  Proposed Suitable Area
(Same as Wilderness Study Area)
-  Boundary of Browns Park
National Wildlife Refuge
-  State Lands
-  Split Estate Mineral Lands
State Mineral - Public Surface



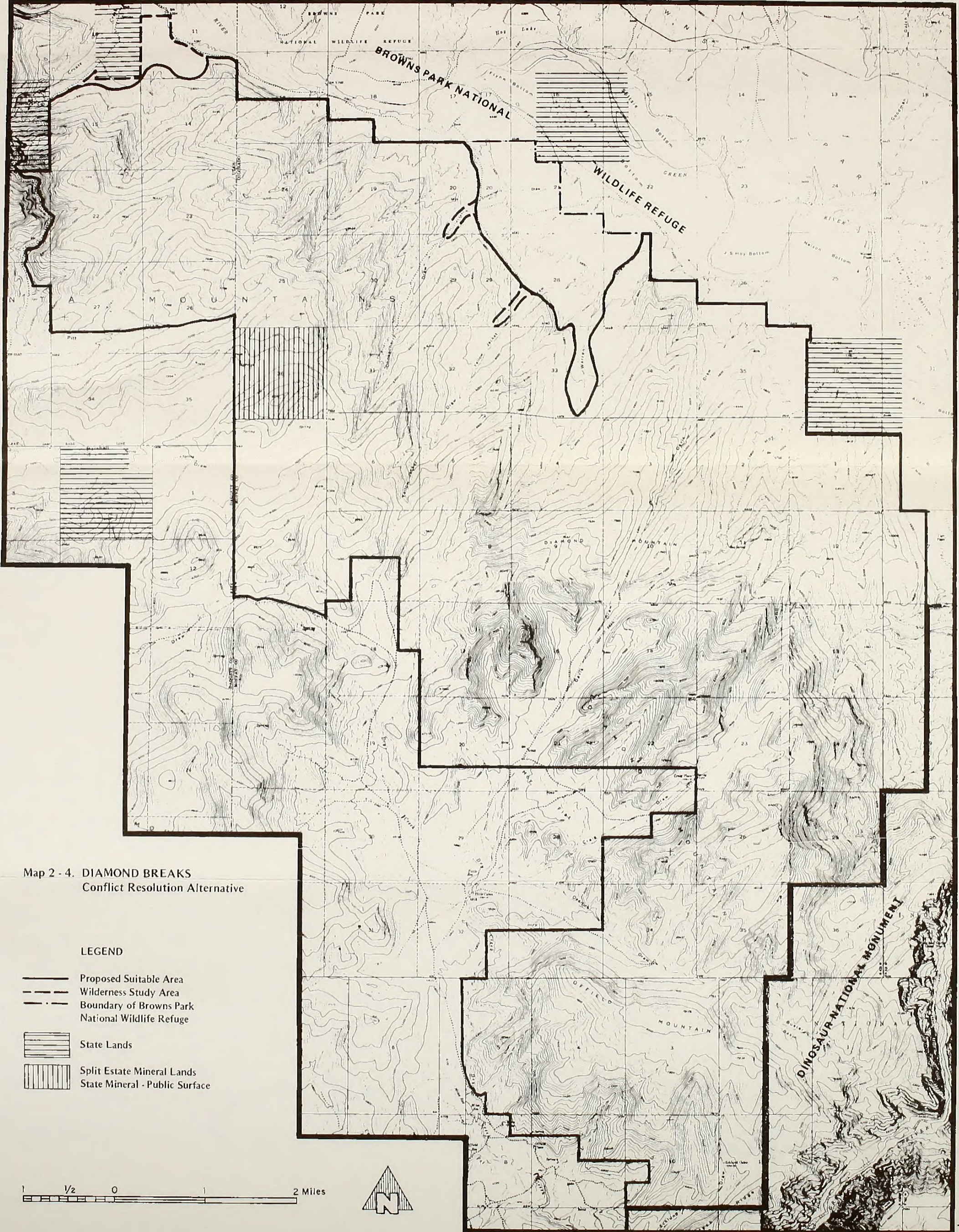
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R 25 E R 104 W R 103 W

T 10 N






T 9 N

T 8 N



Map 2 - 4. DIAMOND BREAKS
Conflict Resolution Alternative

LEGEND

-  Proposed Suitable Area
-  Wilderness Study Area
-  Boundary of Browns Park National Wildlife Refuge
-  State Lands
-  Split Estate Mineral Lands
State Mineral - Public Surface



2-25

R 25 E

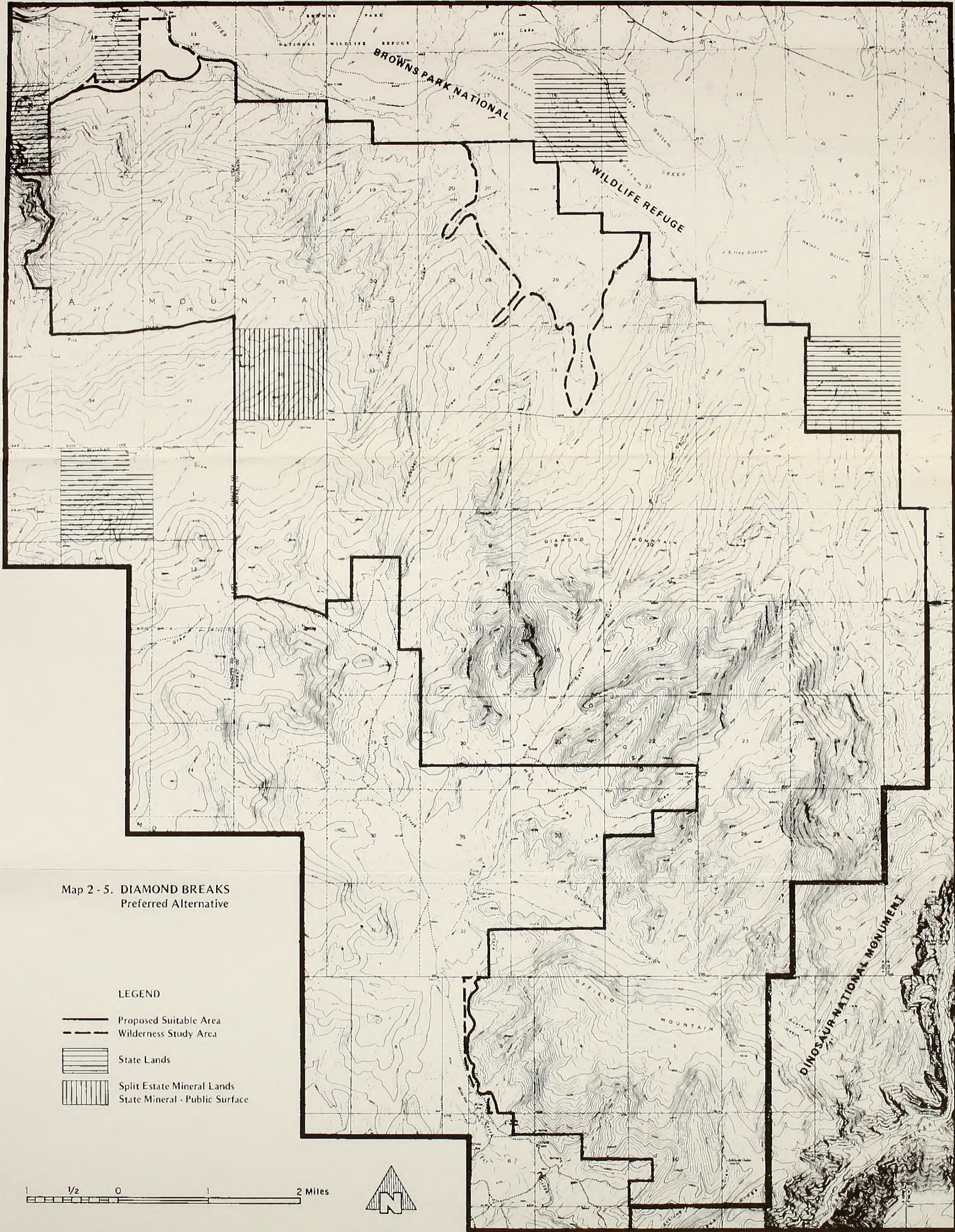
R 104 W

R 103 W

T 10 N

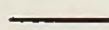



T 9 N

T 8 N



Map 2 - 5. DIAMOND BREAKS Preferred Alternative

LEGEND

-  Proposed Suitable Area
-  Wilderness Study Area
-  State Lands
-  Split Estate Mineral Lands
State Mineral - Public Surface

1/2 0 2 Miles



2-27

TABLE 2-6
PROPOSED MANAGEMENT ACTIONS
DIAMOND BREAKS WSA (35,380 ACRES)

Resource	All Wilderness Alternative	Conflict Resolution Alternative	Combined WSAs Alternative	No Wilderness Alternative	No Action Alternative	Preferred Alternative
SUMMARY						
(Note: Acreage designated wilderness would be managed according to BLM's Wilderness Management Policy.)						
Preliminarily suitable (acres)	35,380	35,100	N/A	0	0	36,240
Non-suitable (acres)	0	280		35,380	35,380	340
Primary Management Emphasis	Wilderness	Suitable portion managed as wilderness; 280 non-suitable acres would remain as R&PP permit	N/A	Visual resources and non-motorized recreation	Same as No Wilderness Alternative	Same as All Wilderness Alternative
OIL AND GAS (Note: Moderate potential for occurrence; moderate potential for development)						
Pre-FLPMA Leases which could be developed	None	None	N/A	None	None	None
Post-FLPMA Leases which could be developed (no. acres)	0	Same as All Wilderness Alternative	N/A	5* 17,544 (50% of WSA, w/200 acres NSO)	Same as No Wilderness Alternative*	1 1,200
(Note: no Leases in Utah)	0					

TABLE 2-6 (Continued)
PROPOSED MANAGEMENT ACTIONS
DIAMOND BREAKS

Resource	All Wilderness Alternative	Conflict Resolution Alternative	Combined WSAs Alternative	No Wilderness Alternative	No Action Alternative	Preferred Alternative
Post-FLPMA leases which could not be developed if development would impair wilderness values (no.) (acres)	5 17,155	5 17,155	N/A	0	0	5 17,544 (50% of WSA)
Split-Estate land along the Utah-Colorado border to remain open to leasing and development (acres)	635 (2% of WSA)	Same as All Wilderness Alternative	N/A	Same as All Wilderness Alternative	Same as All Wilderness Alternative	635, unless an exchange with the State of Colorado is consummated.
Unleased areas which could be leased and developed. Federal minerals (acres)	0	Same as All Wilderness Alternative	N/A	Utah: 3,900 Colo: 13,690, all NSO (total = 17,590, 50% of WSA, w/13,690 acres NSO)	17,585 (50% of WSA)	Same as All Wilderness Alternative
Total area which could be developed (acres)	635 (2% of WSA)	Same as All Wilderness Alternative	N/A	35,380 (100% of WSA, w/13,890 acres NSO)	35,380 (100% of WSA, w/200 acres NSO)	1,835 (5% of WSA)

TABLE 2-6 (Continued)
PROPOSED MANAGEMENT ACTIONS
DIAMOND BREAKS

Resource	All Wilderness Alternative	Conflict Resolution Alternative	Combined WSAs Alternative	No Wilderness Alternative	No Action Alternative	Preferred Alternative
Estimated producing wells (no.)	0	Same as All Wilderness Alternative	N/A	20 Development: 100-160	33 Development: 165-264	1 Development: 5-8
Estimated surface disturbance (acres)	0					
LOCATABLE MINERALS (Note: No existing mining claims; moderate to high potential for base/precious metals; moderate potential for other localities)						
Estimated potential for development	None	None	N/A	Low to moderate throughout WSA	Same as No Wilderness Alternative	Same as No Wilderness Alternative
LIVESTOCK MANAGEMENT (Note: Grazing would continue at current levels under all alternatives)	None	None	N/A	None	None	None
Proposed projects	None	None	N/A	None	None	None
WILDLIFE MANAGEMENT	Allow wildlife to maintain a natural balance w/habitat and each other.	Same as All Wilderness Alternative	N/A	Same as All Wilderness Alternative	Maintain or improve wildlife habitat as appropriate	Same as All Wilderness Alternative
Proposed projects	None	None	N/A	None	None	None

TABLE 2-6 (Continued)
PROPOSED MANAGEMENT ACTIONS
DIAMOND BREAKS

Resource	All Wilderness Alternative	Conflict Resolution Alternative	Combined WSAS Alternative	No Wilderness Alternative	No Action Alternative	Preferred Alternative
<u>SOIL/WATER RESOURCES</u>	No projects planned	Same as All Wilderness Alternative	N/A	No projects planned. Projects may be implemented if watershed condition deteriorates significantly.	Same as No Wilderness Alternative	Same as All Wilderness Alternative
<u>FOREST RESOURCES</u> Productive-operable woodland which could be developed (acres)	0	0	N/A	0	0	0
<u>RECREATION</u> Emphasis in suitable areas	Wilderness; primitive & semiprimitive nonmotorized settings	Same as All Wilderness Alternative	N/A	N/A	N/A	Same as All Wilderness Alternative
Emphasis in nonsuitable areas	N/A	Motorized settings and visual resources	N/A	Utah: Same as Conflict Resolution Alternative Colo: nonmotorized settings	Same as Conflict Resolution Alternative	N/A

TABLE 2-6 (Continued)
PROPOSED MANAGEMENT ACTIONS
DIAMOND BEARS

Resource	All Wilderness Alternative	Conflict Resolution Alternative	Combined WSAs Alternative	No Wilderness Alternative	No Action Alternative	Preferred Alternative
CRV designations in suitable areas (acres)	35,380, closed, except for authorized uses	35,100, closed except for authorized uses	N/A	N/A	N/A	36,240, closed except for authorized uses
OPV designations in nonsuitable areas (acres)	N/A	280, open	N/A	Utah: 3,900, open Colo: 31,480, closed, except for authorized uses	35,380, open	N/A
<u>LANDS/REALTY ACTIONS</u>	No new rights-of-way would be allowed except those necessary to develop prior to existing rights	None	N/A	Minor, associated w/minerals development	Same as No Wilderness Alternative	2 potential exchanges: 635 acres, Colo. State mineral ownership; 190 acres, Utah State School Trust Lands

* The Wilderness Study Area Protection Stipulation would be dropped.

TABLE 2-7
COMPARATIVE SUMMARY OF IMPACTS
DIAMOND BREAKS WSA

Resource	All Wildmess Alternative	Conflict Resolution Alternative	Combined WSAs Alternative	No Wildmess Alternative	No Action Alternative	Preferred Alternative
<u>Wildmess Values</u>	Wildmess values maintained except on approximately 130 acres under a Recreation and Public Purposes (R&PP) lease in Utah portion. R&PP lease area could not be managed as wildmess until lease expires. Potential for outside sights and mineral development to diminish opportunities for solitude and primitive, unconfined recreation near Chokecherry Yellow Jacket, Warren draws. Expansion of ecological diversity in WMS. Major beneficial impact.	Wildmess values maintained on 35,100 acres; lost on 280 acres. R&PP lease excluded. Other impacts same as All Wildmess Alternative.	Note: There is no Combined WSAs Alternative for Diamond Breaks WSA. expire; NSO stipu-	On 3,900 acres: Wildmess values lost. On 31,480 acres: Wildmess values subject to impairment or loss in short term unless 5 post-FLPMA oil and gas leases	Wildmess values on entire 35,380 acres subject to impairment and lost in long term. Failure to expand ecological diversity of 1,200 acres due to oil/gas development. Otherwise same as All Wildmess Alternative.	Wildmess values maintained on up to 36,240 acres. Some potential loss of values on 1,200 acres due to oil/gas development. Otherwise same as All Wildmess Alternative.
<u>Minerals Oil/Gas</u>	5 post-FLPMA leases (48% of WSA) not developed; no new leasing/development on 52% of WSA. Moderate potential area	Same as All Wildmess Alternative.		Moderate potential that 5 post-FLPMA leases developed and Utah portion leased and developed (60% of WSA; 20 wells occupying 100-160 acres). In long term, NSO on at least 13,690 acres and up to 30,845 acres would probably preclude development in a moderate potential area.	Moderate potential for development of entire 36,380 acres (33 wells, occupying 166-264 acres)	Same as All Wildmess Alternative except that 1,200 acres may be developed in short term (1 well occupying 5-8 acres).

TABLE 2-7 (continued)
COMPARATIVE SUMMARY OF IMPACTS
DIAMOND BREAKS WSA

Resource]	All Wilderness Alternative	Conflict Resolution Alternative	Combined WSAs Alternative	No Wilderness Alternative	No Action Alternative	Preferred Alternative
<u>Locatables</u>	Closed to mineral entry. May be adverse impact in moderate to high potential area.	Same as All Wilderness Alternative.		Open to mineral entry; same constraints due to ORV restrictions. Long-term beneficial impact in moderate to high potential area.	Same as No Wilderness Alternative except no ORV constraints.	Same as All Wilderness Alternative.
<u>Livestock Grazing</u>	No loss of livestock production. Increased cost of livestock management due to ORV closures.	Same as All Wilderness Alternative.		Same as All Wilderness Alternative.	No significant impact.	Same as All Wilderness Alternative.
<u>Wildlife</u>	Highly beneficial to critical elk winter range, raptor nesting and breeding habitat. Some decline in species diversity.	Same As All Wilderness Alternative.		If extensive mineral development, up to 10,500 acres wildlife habitat lost; 21,000 acres elk critical winter range disrupted. Loss of 120 mule deer, 12 elk, numerous raptors; disturbance of adjacent elk herds that use WSA in winter. Widespread NSO for oil/gas leases in long term would greatly reduce these impacts.	Extensive loss of wildlife habitat and disruption of elk critical winter range. Loss of 400 mule deer, 12 elk, numerous raptors. Disturbance of adjacent elk herds that use WSA in winter.	Same as All Wilderness Alternative.

TABLE 2-7 (continued)
COMPARATIVE SUMMARY OF IMPACTS
DIAMOND BREAKS NSA

Resource ¹	All Willdemess Alternative	Conflict Resolution Alternative	Combined MSAs Alternative	No Willdemess Alternative	No Action Alternative	Preferred Alternative
<u>Soils</u>	Surface-disturbing activities would be reduced; potential sediment sources and soil productivity would stabilize or improve. Methods of correcting existing or potential problems (mainly from live-stock grazing) would be limited.	Same as All Willdemess Alternative.	On at least 13,690 acres: soil productivity would stabilize or improve. If extensive mineral development on 21,000 acres, then soil losses of 70-225 tons over 5-year period. Widespread NSO for oil/gas leases in long term would greatly reduce impacts. Mitigation and watershed projects would be beneficial.	On at least 13,690 acres: soil productivity would stabilize or improve. If extensive mineral development on 21,000 acres, then soil losses of 70-225 tons over 5-year period. Widespread NSO for oil/gas leases in long term would greatly reduce impacts. Mitigation and watershed projects would be beneficial.	Soil losses of 120-390 tons over 5-year period. Intensive erosion control methods allowed, which would be beneficial.	Same as All Willdemess Alternative.
<u>Water Resources</u>	Degradation and excessive consumption of water would be prevented. Structural and vegetative treatments may be precluded.	Same as All Willdemess Alternative.	On at least 13,690 acres: Water quality maintained. If extensive mineral development, then increased sedimentation (up to 70-225 tons over 5-years) into Crouse Creek and Eckland, Deerlick, Warren, Davis, Hoy and Yellow Jacket draws; potential for accidental contamination and interruption of groundwater. Mitigation, watershed projects, widespread NSO would be beneficial.	On at least 13,690 acres: Water quality maintained. If extensive mineral development, then increased sedimentation (up to 70-225 tons over 5-years) into Crouse Creek and Eckland, Deerlick, Warren, Davis, Hoy and Yellow Jacket draws; potential for accidental contamination and interruption of groundwater. Mitigation, watershed projects, widespread NSO would be beneficial.	Increased sedimentation (up to 120-390 tons over 5 years) into same creeks, draws as No Willdemess; potentially same groundwater impacts.	Same as All Willdemess Alternative.

TABLE 2-7 (continued)
COMPARATIVE SUMMARY OF IMPACTS
DIAMOND BREAKS WSA

Resource ¹	All Wilderness Alternative	Conflict Resolution Alternative	Combined WSAs Alternative	No Wilderness Alternative	No Action Alternative	Preferred Alternative
<u>Recreation²</u>	P and SPM settings protected; SPM setting increased 12%. Primitive forms of recreation enhanced	Same as All Wilderness Alternative.		If extensive mineral development, SPM setting decrease 22%, with negative impacts on primitive forms of recreation but allowing increased motorized use. If extensive NSO, SPM settings increase 12%.	SPM setting decrease by 10-22% (depending on extent/location of mineral development) trending toward SPM, RI, and R. Loss of primitive recreation opportunities.	Same as All Wilderness Alternative.
<u>Visual Resources³</u>	Class I objectives and scenic quality maintained on 35,380 acres.	Class I objectives and scenic quality maintained on 35,100 acres.		Visual quality mitigated within the Colorado portion of the WSA. May decline in Utah portion.	Same VPM Class II landscape permanently altered with any extensive resource development.	Same as All Wilderness Alternative.
<u>Economics</u>	Economic potential associated with potential mineral development would be foregone. Effect on employment, income, public revenue, infrastructure is unknown.	Same as All Wilderness Alternative.		Economic potential associated with oil/gas development foregone on 39-87% of WSA. Economic potential associated with locatable mineral development not foregone. Effect on employment, etc., is unknown.	Economic potential of mineral development not foregone. Effect on employment, etc., is unknown.	Same as All Wilderness Alternative.

TABLE 2-7 (continued)
 COMPARATIVE SUMMARY OF IMPACTS
 DIAMOND BEAKS WSA

<p>1/ There would be no significant adverse or beneficial impacts to air quality, topography, forest/woodland resources, cultural resources, paleontological resources, lands/realty actions or social values for any WSA under any alternative under consideration. Except for two rare and endemic plant species in Cross Mountain WSA (see Natural History), there would be no significant adverse or beneficial impacts to vegetation for any WSA under any alternative, including threatened, endangered, candidate, and Colorado BLM sensitive plant species.</p>	<p>2/ P = primitive; SPM = semiprimitive nonmotorized; SPM = semiprimitive motorized; RN = roaded natural; R = rural; MU = modern urban. The Recreation Opportunity Spectrum (ROS) Classes are described in Appendix D.</p> <p>3/ Visual Resource Management (VRM) class objectives are briefly defined in Appendix E.</p>
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CROSS MOUNTAIN

Under the All Wilderness Alternative, the entire 14,081 acres of the Cross Mountain WSA (Map 2-6) would be recommended as preliminarily suitable for wilderness designation.

Wilderness designation would not necessarily prohibit construction of a powersite (dam). There are suitable locations for dam construction within the canyon. In the event that Congress designates the area as wilderness, BLM would probably recommend that construction of a dam be precluded if construction would impair wilderness values.

Approximately 13,465 acres of the Cross Mountain WSA would be recommended as preliminarily suitable for wilderness designation under the Conflict Resolution Alternative (See Map 2-7).

The southern boundary would be changed to exclude 256 acres and add 15 acres to eliminate conflicts with limestone mining claims. An additional 375 acres of a flat sagebrush area on the east side of the mountain would be excluded to eliminate conflicts with ORV use associated with grazing and hunting.

Under the No Wilderness Alternative, all of the Cross Mountain WSA, 14,081 acres, would be recommended as nonsuitable for wilderness designation. Approximately 12,700 acres of Cross Mountain would be managed as a Special Recreation Management Area (SRMA), including Cross Mountain Canyon (1,200 acres) which would be designated as an Area of Critical Environmental Concern (ACEC).

The entire 14,081 acres of the Cross Mountain WSA would be recommended as nonsuitable for wilderness designation under the No Action Alternative. The area would be open to most resource uses, with emphasis on wildlife habitat.

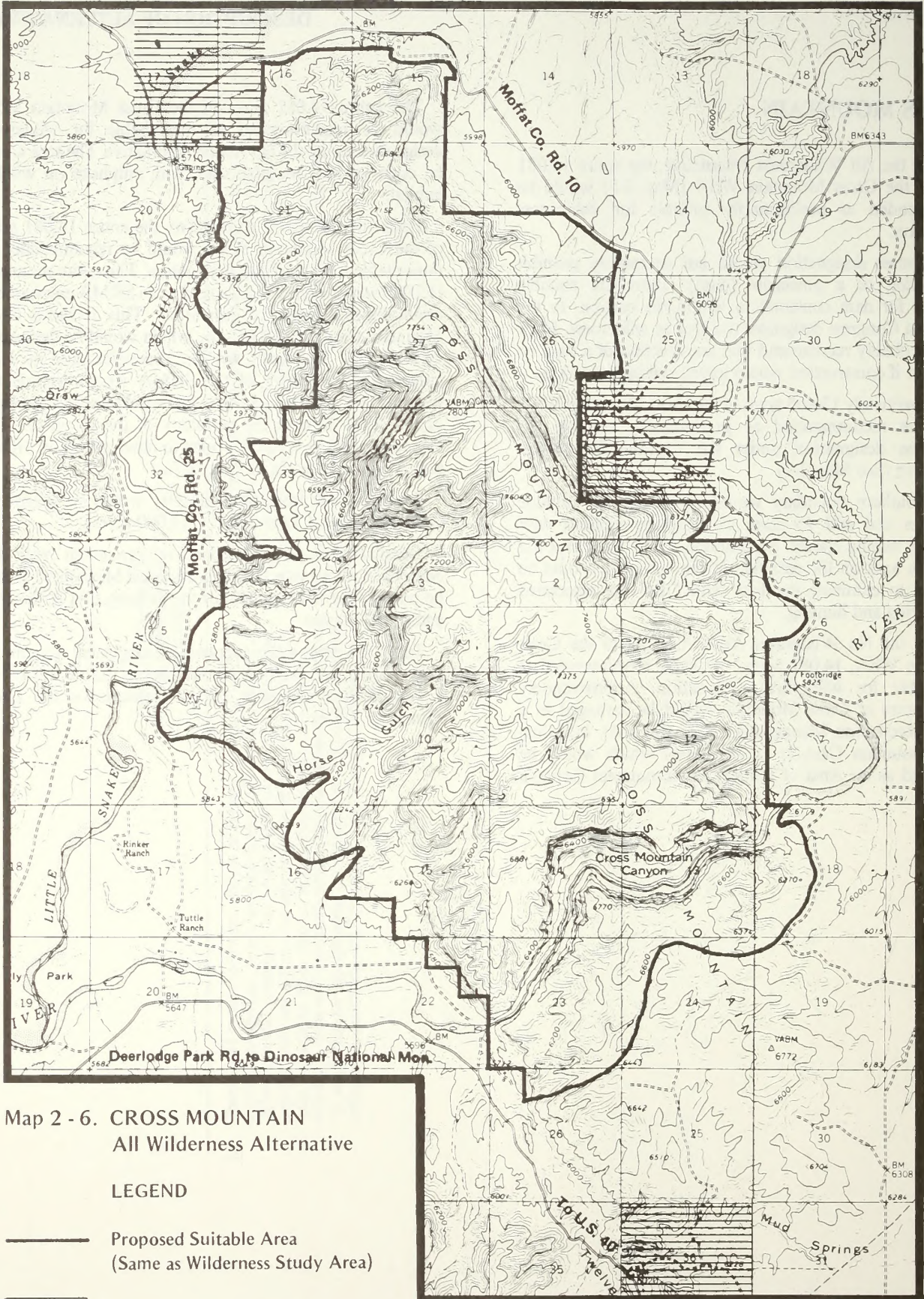
Under the Preferred Alternative, the entire 14,081 acres of the Cross Mountain WSA would be recommended as nonsuitable for wilderness designation. The entire mountain (13,000 acres) would be managed as an SRMA emphasizing nonmotorized forms of recreation. This includes Cross Mountain Canyon, 3,000 acres, which would be designated as an ACEC for scenic, wildlife, recreation, and geologic values. The boundary of the SRMA would include the southern end of the mountain but would exclude portions of the WSA around the periphery of the mountain. The excluded portions would be open to other uses. The SRMA and ACEC are shown on Map 2-7a.

A withdrawal from mineral entry would be sought for Cross Mountain Canyon ACEC (3,000 acres).

Establishment of a cooperative agreement with the National Park Service, Dinosaur National Monument, would be pursued for management of the parking area at the west end of the canyon.

Table 2-8 shows the proposed management actions for this WSA under each of the alternatives. Table 2-9 shows a comparative summary of the impacts for the Cross Mountain WSA.

R 98 W





T 7 N

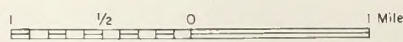
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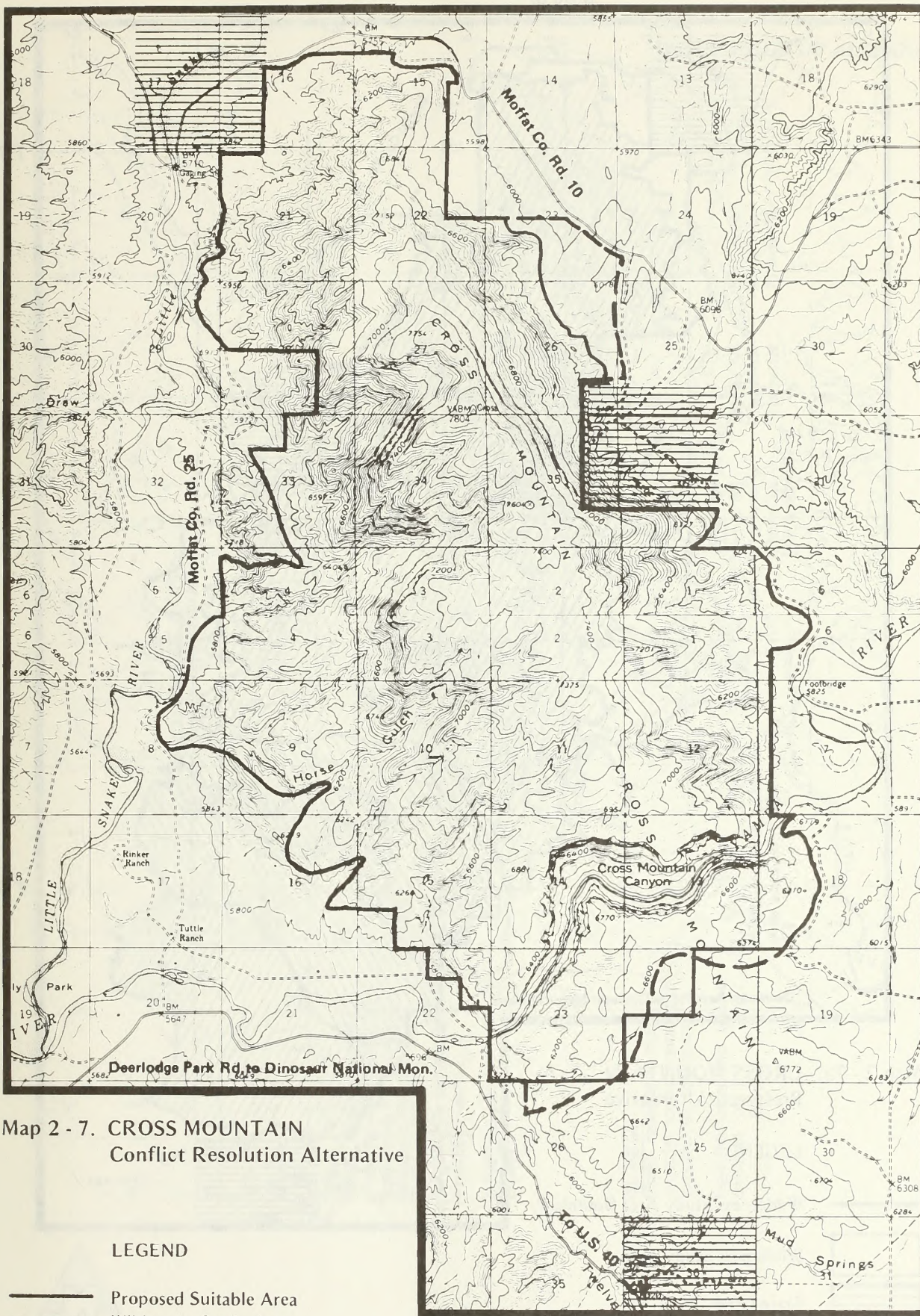
Map 2 - 6. CROSS MOUNTAIN
All Wilderness Alternative

LEGEND

 Proposed Suitable Area
 (Same as Wilderness Study Area)

 State Lands



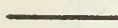
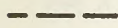
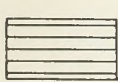


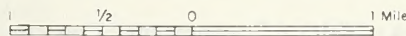
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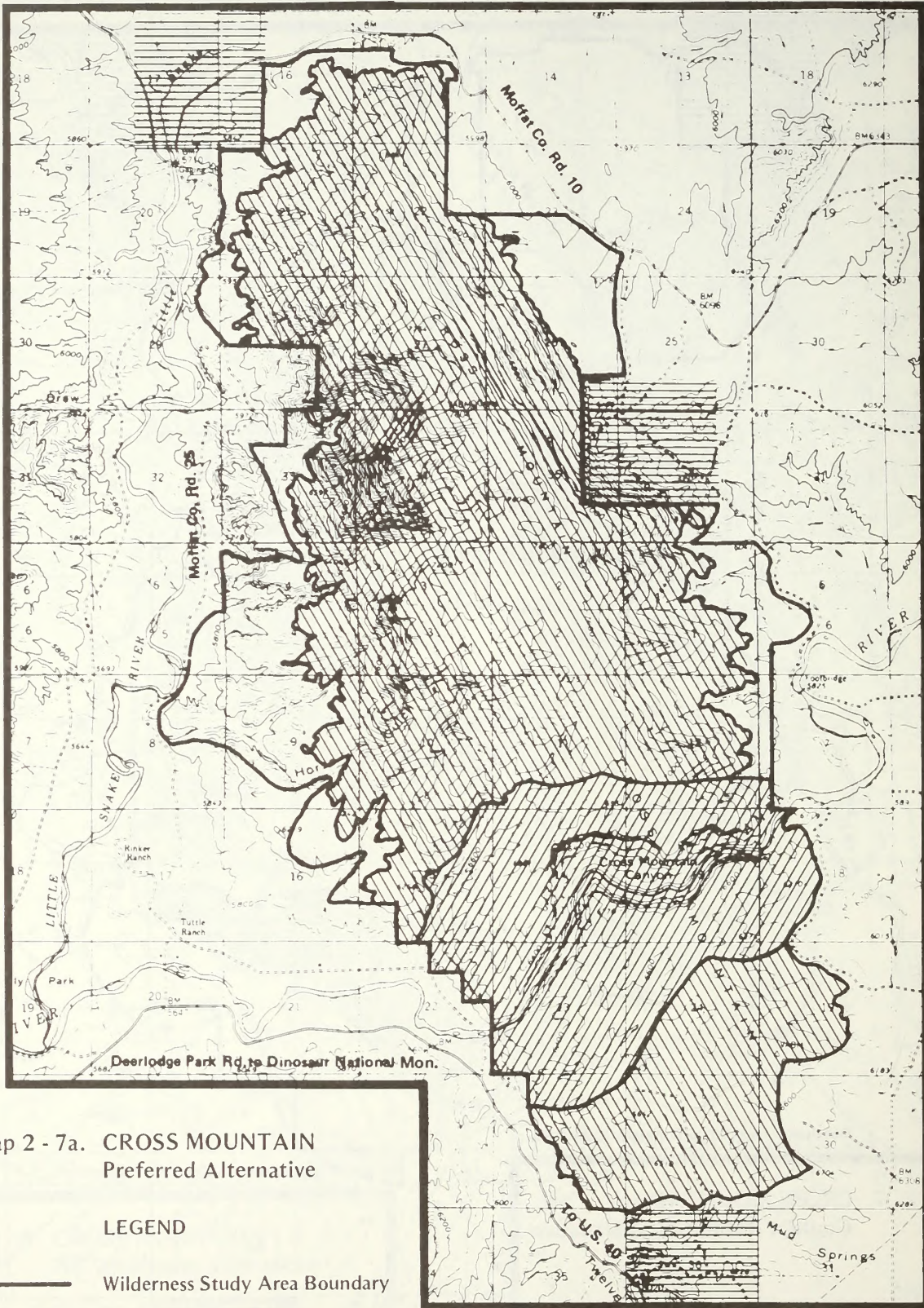
Map 2 - 7. CROSS MOUNTAIN Conflict Resolution Alternative

LEGEND

-  Proposed Suitable Area
-  Wilderness Study Area
-  State Lands



R 98 W



T 7 N

T 6 N

Map 2 - 7a. CROSS MOUNTAIN Preferred Alternative

LEGEND


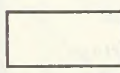
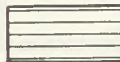


-  Wilderness Study Area Boundary
-  Wilderness Study Area
-  State Land
-  Special Recreation Management Area (SRMA)
-  Area of Critical Environmental Concern (ACEC) and Special Recreation Management Area (SRMA)



TABLE 2-8
PROPOSED MANAGEMENT ACTIONS
CROSS MOUNTAIN WSA (14,081 ACRES)

Resource	All Wilderness Alternative	Conflict Resolution Alternative	Combined WSAs Alternative	No Wilderness Alternative	No Action Alternative	Preferred Alternative
SUMMARY (Note: Acreage designated wilderness would be managed according to BLM's Wilderness Management Policy)						
Preliminarily suitable (acres) Nonsuitable (acres)	14,081 0	13,465 631	N/A	0 14,081	0 14,081	0 14,081
Primary Management Emphasis	Wilderness	Wilderness in suitable area; other resource uses in nonsuitable	N/A	Wildlife; normotized recreation; visual resources	Wildlife habitat	SRMA emphasizing normotized recreation; includes 3,000-acre AEEC for scenic, wildlife, recreation, and geologic values.
OIL AND GAS (Note: moderate to high potential for occurrence; high potential for development)						
Pre-FLPMA leases which could be developed (no.) (acres)	1 1,586 (11% of WSA, w/840 acres NS0)	Same as All Wilderness Alternative	N/A	Same as All Wilderness Alternative (840 acres NS0)	Same as All Wilderness Alternative	Same as All Wilderness Alternative

TABLE 2-8 (Continued)
PROPOSED MANAGEMENT ACTIONS
CROSS MOUNTAIN

Resource	All Wilderness Alternative	Conflict Resolution Alternative	Combined WSAs Alternative	No Wilderness Alternative	No Action Alternative	Preferred Alternative
Post-FLPMA leases which could be developed (no.)	0	1 (in nonsuitable area)*	N/A	9*	Same as No Wilderness Alternative*	Same as No Wilderness Alternative*
(acres)	0	32		10,023 (71% of WSA)		
Post-FLPMA leases which would not be developed if development would impair wilderness values (no.)	9	8	N/A	0	0	0
Unleased areas which could be leased and developed (acres)	0	631	N/A	2,472 (18% of WSA)	2,472 (18% of WSA)	Same as No Wilderness Alternative
Unleased areas which could not be leased and developed (acres)	2,472 (18% of WSA)	1,841 (13% of WSA)	N/A	0	0	0
Total acreage which could be developed	1,586 (11% of WSA, w/840 acres NSO)	2,249 (16% of WSA, w/840 acres NSO)	N/A	14,081 (100% of WSA, w/3,312 acres NSO)	14,081 (100% of WSA, w/840 acres NSO)	Same as No Wilderness Alternative
Estimated wells (no.)	2	2	N/A	12	13	Same as No Wilderness Alternative
Estimated surface disturbance (acres)	Development: 10-16	Development: 10-16	N/A	Development: 60-96	Development: 65-104	

TABLE 2-8 (Continued)
PROPOSED MANAGEMENT ACTIONS
CROSS MOUNTAIN

Resource	All Wilderness Alternative	Conflict Resolution Alternative	Combined WSAs Alternative	No Wilderness Alternative	No Action Alternative	Preferred Alternative
LOCATABLE MINERALS (Note: 4 existing mining claims, extreme southeast end of WSA; moderate to high potential for base/precious metals; moderate potential for other localities) Estimated potential for development	4 claims could be developed	Same as All Wilderness Alternative	N/A	4 claims could be developed, plus moderate potential for development throughout rest of WSA	Same as No Wilderness Alternative	Same as No Wilderness Alternative on 11,081 acres. Proposed withdrawal from mineral entry for Cross Mountain Canyon Area of Critical Environmental Concern (3,000 acres)
LIVESTOCK MANAGEMENT (Grazing would continue at current levels under all alternatives) Proposed spring projects which could be developed: (no.)	1	1	N/A	1	1	Continuing except within any developed recreation sites.

TABLE 2-8 (Continued)
PROPOSED MANAGEMENT ACTIONS
CROSS MOUNTAIN

Resource	All Wilderness Alternative	Conflict Resolution Alternative	Combined WSAs Alternative	No Wilderness Alternative	No Action Alternative	Preferred Alternative
<u>WILDLIFE MANAGEMENT</u>						
	Allow wildlife to maintain a natural balance w/habitat and each other. Maintain 40 big-horn sheep	Same as All Wilderness Alternative	N/A	Improve wildlife habitat	Maintain or improve wildlife habitat as appropriate	Maintain or improve wildlife habitat as appropriate, within constraints of SRMA
Proposed projects: Spring developments (no.)	0	0	N/A	2	2	2
<u>SOIL/WATER RESOURCES</u>						
	No projects planned.	Same as All Wilderness Alternative	N/A	No projects planned. Projects may be implemented if watershed condition deteriorates significantly.	Same as No Wilderness Alternative	Same as No Wilderness Alternative
<u>FOREST RESOURCES</u>						
Productive operable woodland which could be developed (acres)	0	0	N/A	750	750	0
<u>NATURAL HISTORY</u>						
Proposed Cross Mountain Canyon Area of Critical Environmental Concern (acres)	1,200	1,200	N/A	1,200	0	3,000
<u>RECREATION</u>						
Emphasis in suitable areas	Wilderness; semi-primitive nonmotorized settings. VPM Class I.	Same as All Wilderness Alternative	N/A	N/A	N/A	N/A

TABLE 2-8 (Continued)
PROPOSED MANAGEMENT ACTIONS
CROSS MOUNTAIN

Resource	All Wilderness Alternative	Conflict Resolution Alternative	Combined WSAs Alternative	No Wilderness Alternative	No Action Alternative	Preferred Alternative
Emphasis in nonsuitable areas	N/A	Motorized settings	N/A	Special Recreation Management Area: semiprimitive nonmotorized settings (12,700 acres); motorized settings (1,381 acres)	Same as Conflict Resolution Alternative	Special Recreation Management Area: semiprimitive nonmotorized settings
ORV designations in suitable areas (acres)	14,081 closed, except for authorized uses	13,465 closed, except for authorized uses	N/A	N/A	N/A	N/A
ORV designations in nonsuitable areas (acres)	N/A	631, open	N/A	11,000, closed, except for authorized uses 3,081, open	14,081, open	11,000, closed, except for authorized uses 2,000 limited to designated roads and trails.
<u>LANDS/REALTY ACTIONS</u>	None	None	N/A	Minor, associated w/minerals development and prior valid existing rights	Same as No Wilderness Alternative	Same as No Wilderness Alternative

* Wilderness Study Area Protection Stipulation would be dropped.

TABLE 2-9
COMPARATIVE SUMMARY OF IMPACTS
CROSS MOUNTAIN WSA

Resource	All Willderness Alternative	Conflict Resolution Alternative	Combined WSAs Alternative	No Willderness Alternative	No Action Alternative	Preferred Alternative
<u>Willderness Values</u>	Willderness values maintained, including special features. Low potential that 1 pre-FLPMA lease developed, impairing values on 1,586 acres on north slopes of WSA. Development of 4 existing mining claims impair values on 256 acres on south boundary. ORV use difficult to control on 375 acres on east side. Expansion of ecological diversity in WPS.	Similar to All Willderness Alternative. Willderness values maintained on 13,465 acres. If limestone mining occurs just outside southern boundary (moderate potential) it would impair opportunities for solitude and primitive recreation south of the canyon.	Note: There is no Combined WSAs Alternative for Cross Mountain WSA.	Willderness values lost if extensive mineral development occurs. Values may be maintained on up to 12,700 acres if existing oil/gas leases expire; new leases would be NSO. Failure to expand ecological diversity of WPS.	Willderness values impaired or lost on entire 14,081 acres. Failure to expand ecological diversity of WPS.	Willderness values lost if extensive mineral development occurs; very likely to be lost on the west side and south of canyon. Values may be maintained on up to 13,000 acres if existing oil/gas leases expire; new leases would be NSO. Proposed mineral withdrawal in ACEC would protect high quality values on 3,000 acres. Failure to expand ecological diversity of WPS.

TABLE 2-9 (continued)
COMPARATIVE SUMMARY OF IMPACTS
CROSS MOUNTAIN WSA

Resource ¹	All Wilderness Alternative	Conflict Resolution Alternative	Combined WSAs Alternative	No Wilderness Alternative	No Action Alternative	Preferred Alternative
<u>Minerals Oil/Gas</u>	Low potential that 1 pre-FLPMA lease developed (11% of WSA; 2 wells, occupying 10-16 acres); 9 post FLPMA leases not developed (71% of WSA); no new leases/development on 18% of WSA. May be adverse impact in moderate to high potential area.	Similar to All Wilderness Alternative except mineral development allowed on 631 acres.	Low potential that 1 pre-FLPMA lease developed (11% of WSA, 2 wells occupying 10-16 acres). Low to moderate potential that 9 post-FLPMA leases developed (71% of WSA), 10 wells, 50-80 acres). Long-term potential for NSO on 2,472 to 12,700 acres; may be adverse impact in moderate to high potential area.	High long-term potential for development of entire area (13 wells, occupying 65-104 acres). May be beneficial impact in moderate to high potential area.	Similar to No Wilderness Alternative. Larger area (13,000 acres) potentially affected by NSO. Development allowed up draws on west side of WSA.	
<u>Locatables</u>	Closed to new mineral entry. Moderate potential development of 4 existing claims. Overall, moderate to major adverse impact in moderate to high potential area.	13,465 acres closed to new mineral entry. Moderate to major adverse impact. Moderate potential for long-term development of 4 existing claims (outside suitable area); moderate beneficial impact.	Open to mineral entry; Same as No Wilderness Alternative, except to ORV restrictions. Long-term beneficial impact in moderate to high potential area.	Same as No Wilderness Alternative, except no ORV constraints.	3,000 acres potentially closed to mineral entry. Otherwise same as No Wilderness Alternative.	
<u>Livestock Grazing</u>	No loss of livestock production. Increased cost of livestock management due to ORV closures, constraints on proposed spring development.	Same as All Wilderness Alternative.	Same as All Wilderness Alternative.	No significant impacts.	Same as All Wilderness Alternative.	

TABLE 2-9 (continued)
COMPARATIVE SUMMARY OF IMPACTS
CROSS MOUNTAIN WSA

Resource	All Wilderness Alternative	Conflict Resolution Alternative	Combined WSAs Alternative	No Wilderness Alternative	No Action Alternative	Preferred Alternative
<u>Wildlife</u>	Maximum protection for high value habitats for 40 bighorn sheep, as well as mule deer, elk, raptors, nongame species, threatened or endangered species. Water developments for bighorn sheep precluded, which may limit long-term productivity.	Same as All Wilderness Alternative.	reduce adverse impacts	If extensive mineral development: bighorn sheep, other wildlife displaced or lost. Widespread NSO in long term would greatly reduce adverse impacts.	Bighorn sheep habitat eliminated; 40 bighorn sheep, other wildlife displaced or lost.	Same as No Wilderness Alternative.
<u>Soils</u>	Low potential for increased soil losses (35-115 tons over a 5-year period). Surface-disturbing activities would be reduced; potential sediment sources and soil productivity would stabilize or improve. Methods of correcting existing or potential problems (mainly from livestock grazing) would be limited.	Same as All Wilderness Alternative.		If extensive mineral development, then soil losses of 215-680 tons over a 5-year period. Widespread NSO for oil/gas leases in long term would greatly reduce these impacts. Mitigation and watershed projects would be beneficial.	Soil losses of 230-750 tons over a 5-year period. Intensive erosion control measures allowed, which would be beneficial.	Same as No Wilderness Alternative.

TABLE 2-9 (continued)
COMPARATIVE SUMMARY OF IMPACTS
CROSS MOUNTAIN WSA

Resource ¹	All Wilderness Alternative	Conflict Resolution Alternative	Combined WSA Alternative	No Wilderness Alternative	No Action Alternative	Preferred Alternative
<u>Water Resources</u>	Low potential for increased sedimentation (up to 35-115 tons over 5 years) into some intermittent tributaries of Yampa and Little Snake rivers. Water quality would remain high. Structural and vegetative watershed treatments may be precluded.	Same as All Wilderness Alternative.		If extensive mineral development, increased sedimentation (up to 215-680 tons over 5 years) into Horse Gulch, several intermittent tributaries of Yampa and Little Snake rivers. Potential for accidental contamination and interruption of groundwater. Mitigation and watershed projects would be beneficial.	Increased sedimentation (up to 230-750 tons over 5 years) into Horse Gulch and several intermittent tributaries of Yampa and Little Snake rivers. Potential for accidental contamination and interruption of groundwater. Mitigation and watershed projects would be beneficial.	Same as No Wilderness Alternative.
<u>Recreation²</u>	SPM setting increased 2%. Opportunities for primitive forms of recreation maintained. However, nonmotorized opportunities would be lost south of the canyon if the limestone mining claims are developed.	Same as All Wilderness Alternative.		With extensive mineral development: SPM settings decreased 47%; R and MJ added (15%). With low mineral development: SPM increased and SPM decreased 2%.	Same impacts as those associated with extensive mineral development under No Wilderness Alternative.	Same as No Wilderness Alternative.

TABLE 2-9 (continued)
COMPARATIVE SUMMARY OF IMPACTS
GROSS MOUNTAIN WSA

Resource ¹	All Wilderness Alternative	Conflict Resolution Alternative	Combined WSAs Alternative	No Wilderness Alternative	No Action Alternative	Preferred Alternative
<u>Visual Resources³</u>	Class I objectives and visual quality maintained on 14,081 acres unless limestone mining were to occur south of the canyon. Potential permanent loss of about 200 acres of VPM Class II landscape.	Same as All Wilderness Alternative.		Class I and II objectives provide some protection of scenic quality. Potential permanent loss of 200 acres of VPM Class II and 431 acres of VPM Class III.	Possible permanent loss of some high quality visual resources throughout the WSA.	Same as No Wilderness Alternative.
<u>Economics</u>	Economic potential associated with mineral development would be foregone. Long term National Economic Development value from wilderness recreation is \$300,000 by the year 2000. Effect on employment, income, public revenue, infrastructure is unknown.	Same as All Wilderness Alternative.		Economic potential of oil/gas development foregone on 10-90% of WSA. Economic potential of locatable mineral development not foregone. Effect on employment, etc., is unknown.	Economic potential of mineral development not foregone. Effect on employment, etc., is unknown.	Same as No Wilderness Alternative.

TABLE 2-9 (continued)
COMPARATIVE SUMMARY OF IMPACTS
CROSS MOUNTAIN MSA

<p>1/ There would be no significant adverse or beneficial impacts to air quality, topography, forest/woodland resources, cultural resources, paleontological resources, lands/reality actions or social values for any MSA under any alternative under consideration. Except for two rare and endemic plant species in Cross Mountain MSA (see Natural History), there would be no significant adverse or beneficial impacts to vegetation for any MSA under any alternative, including threatened, endangered, candidate, and Colorado BLM sensitive plant species.</p>	<p>2/ P = primitive; SPNM = semiprimitive nonmotorized; SPM = semiprimitive motorized; RM = roaded natural; R = rural; MJ = modern urban. The Recreation Opportunity Spectrum (ROS) Classes are described in Appendix D.</p> <p>3/ Visual Resource Management (VRM) class objectives are briefly defined in Appendix E.</p>
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ANT HILLS

The entire 4,354 acres of the Ant Hills WSA (Map 2-8) would be recommended as preliminarily suitable for wilderness designation under the All Wilderness Alternative.

The majority of the WSA (4,320 acres) would be recommended as preliminarily suitable for wilderness designation under the Conflict Resolution Alternative. Approximately 34 acres in the northeast corner would be recommended as nonsuitable due to a road which cuts off this parcel from the rest of the WSA (Refer to Map 2-9).

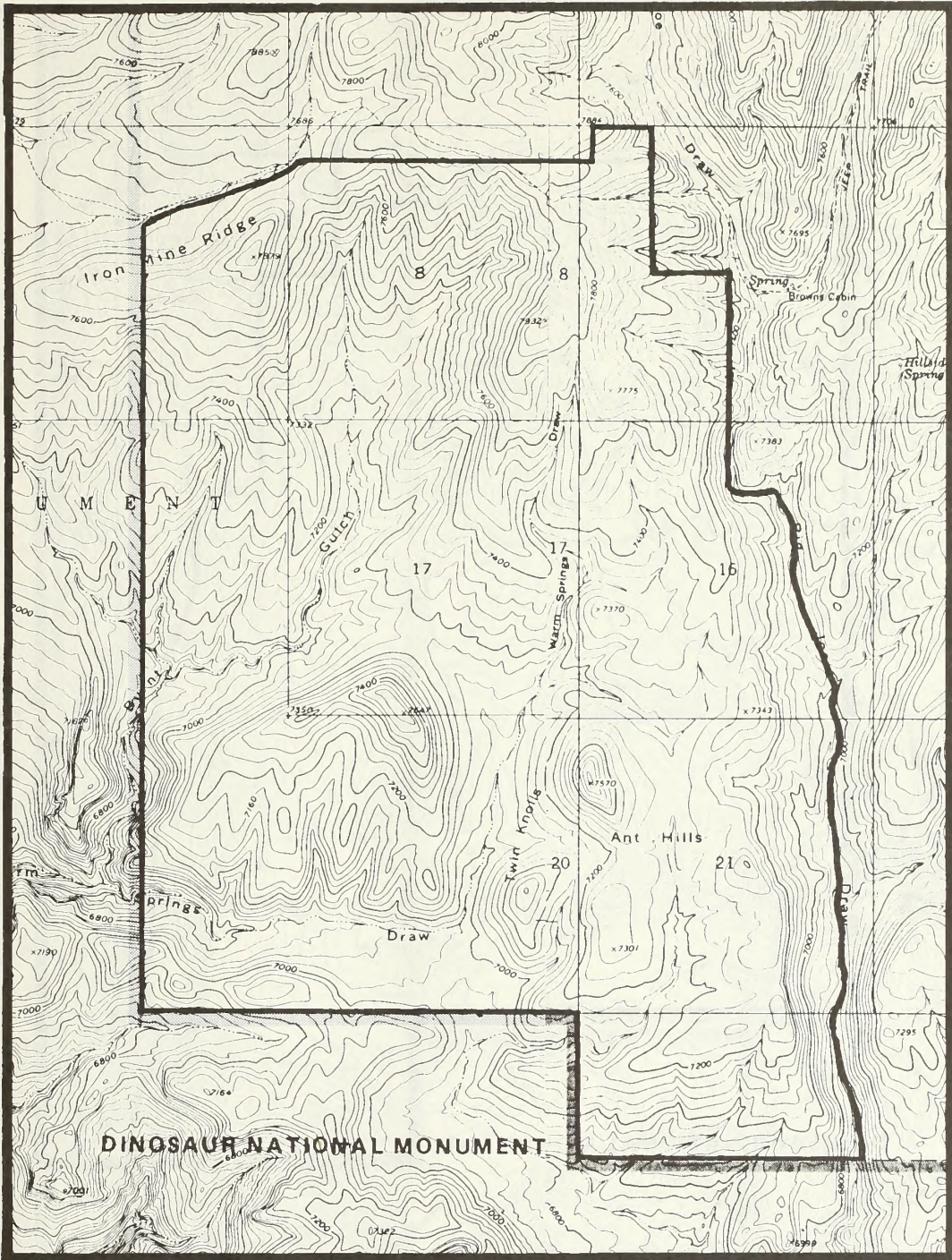
Under the Combined WSAs Alternative, most of Ant Hills, Chew Winter Camp, and Peterson Draw WSAs would be combined and recommended as preliminarily suitable for wilderness designation (10,220 acres; refer to Map 2-10). Approximately 614 acres of the Ant Hills and Peterson Draw areas would be recommended as nonsuitable to eliminate areas which cannot be managed as wilderness due to ORV use and outside sights and sounds from the KT copper mine. These areas would be open to all resource uses, with mineral development as the primary emphasis.

The entire 4,354 acres of the Ant Hills WSA would be recommended as nonsuitable for wilderness designation under the No Wilderness Alternative. Management emphasis would be on nonmotorized recreation.

Under the No Action Alternative, all of the 4,354 acres in the Ant Hills WSA would be recommended as nonsuitable for wilderness designation. Management emphasis would be on forest and mineral development.

The entire Ant Hills WSA (4,354 acres) would be recommended as nonsuitable for wilderness designation under the Preferred Alternative. While the WSA does contain continuations of the Dinosaur National Monument's upland landforms, there are no outstanding or unique features within the WSA, such as a deep or scenic canyon, vistas, mountain peaks or any other special feature, which would justify designation as wilderness.

Table 2-10 shows proposed management actions under all alternatives. Table 2-11 is a comparative summary of impacts.

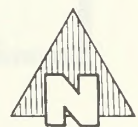


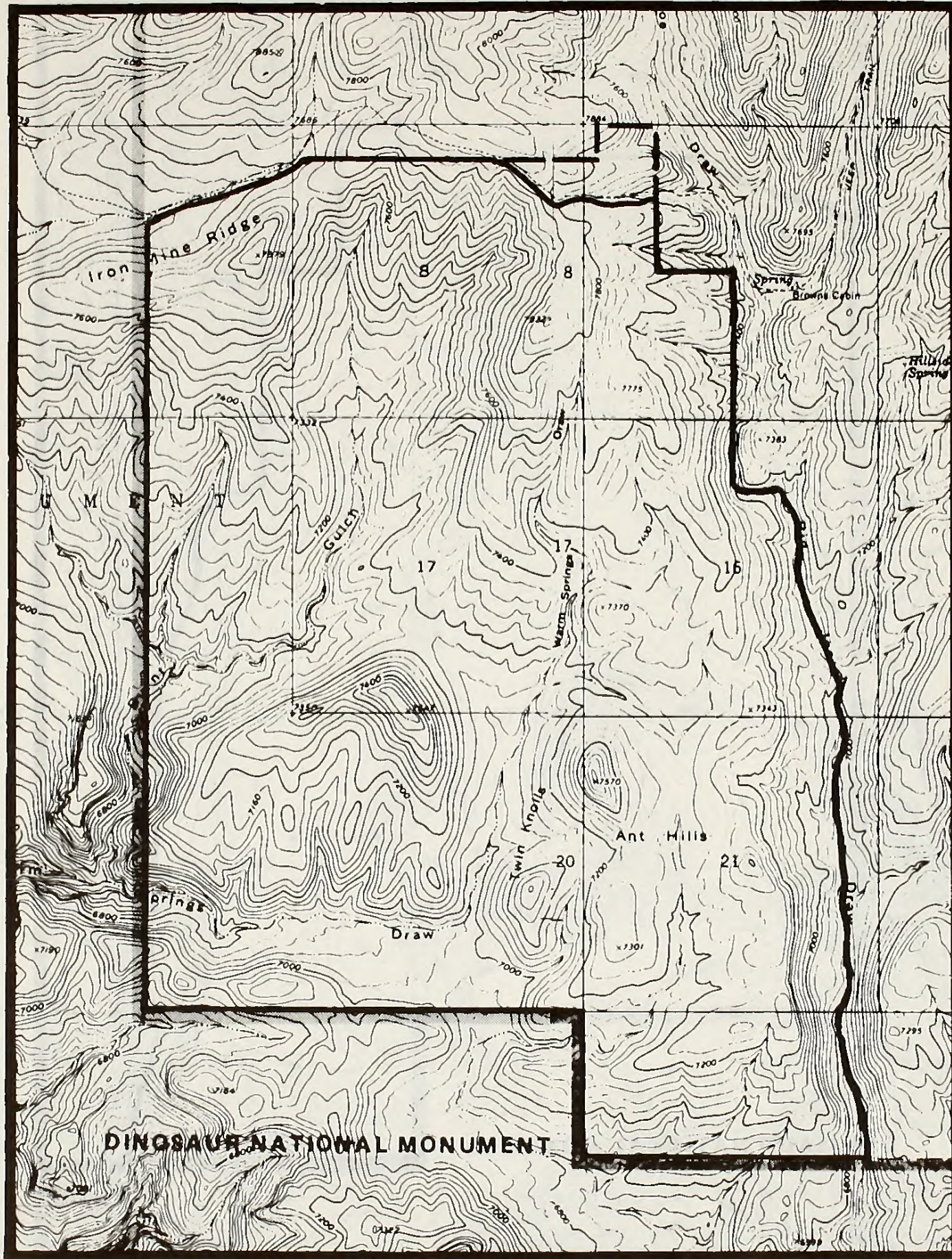
T7N

Map 2 - 8. ANT HILLS
All Wilderness Alternative

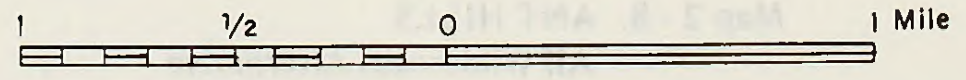
LEGEND

— Proposed Suitable Area
(Same as Wilderness Study Area)





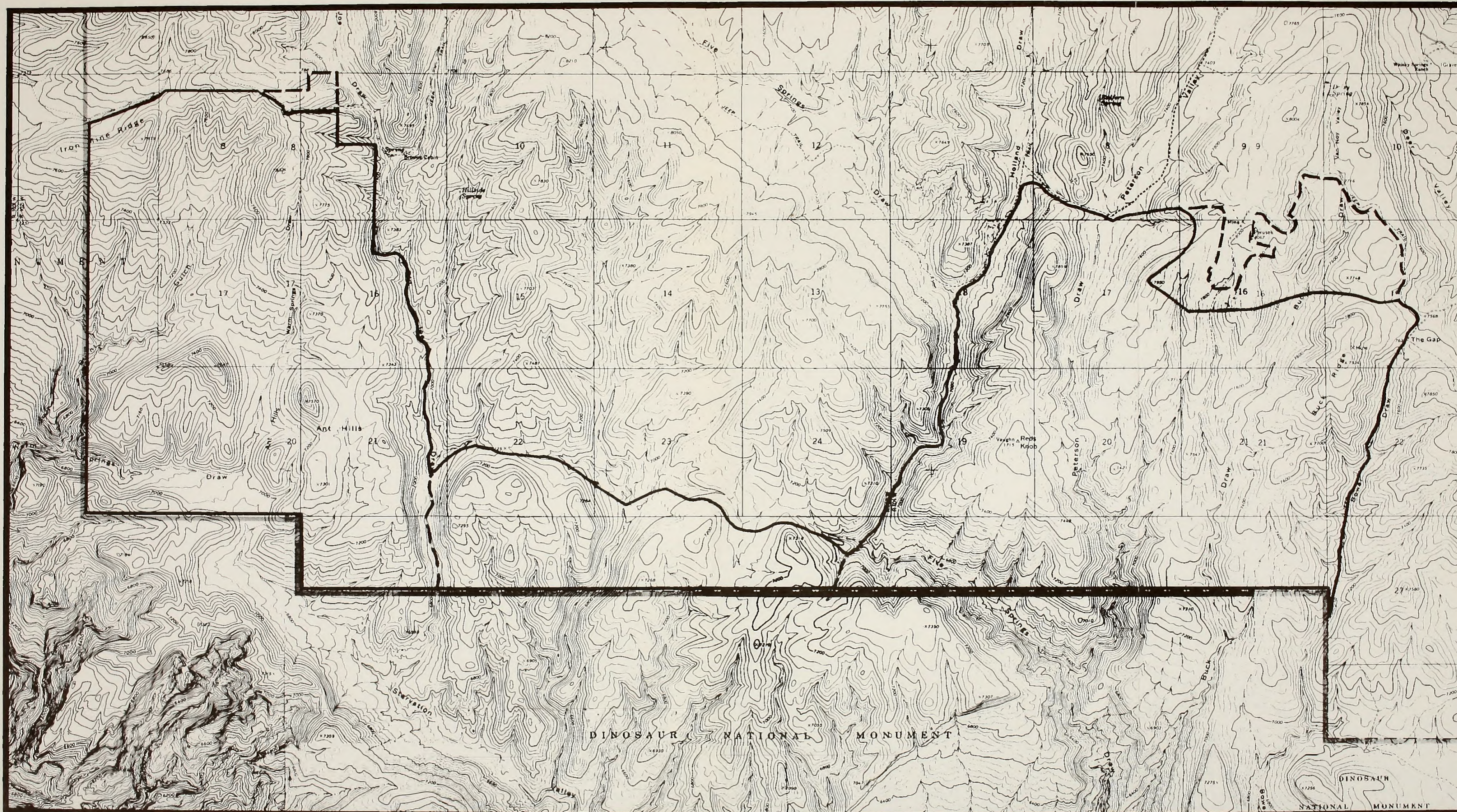
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Map 2 - 9. ANT HILLS
Conflict Resolution Alternative

LEGEND

- Proposed Suitable Area
- - - - - Wilderness Study Area



T 7 N



1 1/2 0 1 Mile

- LEGEND
- Proposed Suitable Area
 - Wilderness Study Area

Map 2 - 10. ANT HILLS, CHEW WINTER CAMP, and PETERSON DRAW WSAs. Combined WSAs Alternative

TABLE 2-10
PROPOSED MANAGEMENT ACTIONS
ANT HILLS WSA (4,354 ACRES)

Resource	All Wilderness Alternative	Conflict Resolution Alternative	Combined WSAs Alternative	No Wilderness Alternative	No Action Alternative	Preferred Alternative
SUMMARY (Note: Acreage designated wilderness would be managed according to BLM's Wilderness Management Policy)						
Preliminarily suitable (acres)	4,354	4,320	10,220	0	0	0
Nonsuitable (acres)	0	34	614 (34 - Ant Hills; 580, Peterson Draw)	4,354	4,354	4,354
Primary Management Emphasis	Wilderness	Wilderness in suitable portion; other resource uses in non- suitable portion	Same as Conflict Resolution Alternative; primarily mineral development in nonsuitable area.	Normotized recreation; protection of natural character	Mineral and forest resources	Same as No Action Alternative

OIL AND GAS

(Note: Low to moderate potential
for occurrence; low potential for
development.)

TABLE 2-10 (Continued)
PROPOSED MANAGEMENT ACTIONS
ANT HILLS

Resource	All Wilderness Alternative	Conflict Resolution Alternative	Combined WSAs Alternative	No Wilderness Alternative	No Action Alternative	Preferred Alternative
Pre-FLPMA leases which could be developed	0	0	0	0	0	0
Post-FLPMA leases which could be developed (no.) (acres)	0 0	1 (part)* 34	2 (part)* 614 (10% of 2 WSAs)	2* 4,354 (100% of WSA)	Same as No Wilderness Alternative*	Same as No Wilderness Alternative*
Post-FLPMA leases which could not be developed if development would impair wilderness values (no.) (acres)	2 4,354 (100% of WSA)	2 (part) 4,320 (99% of WSA)	7 10,220 (94% of 3 WSAs)	0	0	0
Unleased lands which could be leased and developed (acres)	0	0	0	0	0	0
Total area which could be developed (acres)	0	34	614 (10% of WSAs)	4,354 (100% of WSA)	Same as No Wilderness Alternative	Same as No Wilderness Alternative
Estimated wells (no.)	0	0	1	4	4	4
Estimated surface disturbance (acres)	0	0	Development: 5-8	Development: 20-32	Same as No Wilderness Alternative	Same as No Wilderness Alternative

TABLE 2-10 (Continued)
PROPOSED MANAGEMENT ACTIONS
ANT HILLS

Resource	All Willderness Alternative	Conflict Resolution Alternative	Combined WSAs Alternative	No Willderness Alternative	No Action Alternative	Preferred Alternative
<u>LOCATABLE MINERALS</u> (Note: 26 existing mining claims on east 1/3 of WSA; high potential for base/precious metals; low to moderate potential for other localities)						
Estimated potential for development	26 claims could be developed	Same as All Willderness Alternative	67 claims in 3 WSAs could be developed (60 in suitable areas; 7 in nonsuitable areas)	26 claims could be developed; moderate to high potential for development throughout rest of WSA	Same as No Willderness Alternative	Same as No Willderness Alternative
<u>LIVESTOCK MANAGEMENT</u> (Note: Grazing would continue at current levels under all alternatives)	0	0	0	0	0	0
Proposed projects (no.)	0	0	0	0	0	0
<u>WILDLIFE MANAGEMENT</u>	Allow wildlife to maintain a natural balance w/habitat and each other	Same as All Willderness Alternative	Same as All Willderness Alternative	Same as All Willderness Alternative	Maintain or improve wildlife habitat as appropriate	Same as No Action Alternative
Proposed projects (no.)	0	0	0	0	0	0

TABLE 2-10 (Continued)
PROPOSED MANAGEMENT ACTIONS
ANT HILLS

Resource	All Wilderness Alternative	Conflict Resolution Alternative	Combined WSAs Alternative	No Wilderness Alternative	No Action Alternative	Preferred Alternative
<u>SOIL/WATER RESOURCES</u>						
FOREST RESOURCES Productive-operable woodland which could be developed (acres)	0	0	0	0	474	Same as No Wilderness Alternative
NATURAL HISTORY	N/A	N/A	N/A	N/A	N/A	N/A
RECREATION Emphasis in suitable areas	Wilderness; primitive & semiprimitive nonmotorized settings	Same as All Wilderness Alternative	Same as All Wilderness Alternative (on 10,220 acres)	N/A	N/A	N/A
Emphasis in nonsuitable areas	N/A	Motorized Settings	Motorized Settings	Nonmotorized recreation settings	Dispersed; motorized settings	Same as No Action Alternative

TABLE 2-10 (Continued)
PROPOSED MANAGEMENT ACTIONS
ANT HILLS

Resource	All Willdemess Alternative	Conflict Resolution Alternative	Combined WSAs Alternative	No Willdemess Alternative	No Action Alternative	Preferred Alternative
ORV designations in suitable areas (acres)	4,354, closed, except for authorized uses	4,320, closed, except for authorized uses	10,220, closed, except for authorized uses	N/A	N/A	N/A
ORV designations in nonsuitable areas (acres)	N/A	34, open	614, open	4,354, closed, except for authorized uses	4,354, open	4,354, open
<u>LANDS/REALTY ACTIONS</u>	None	None	None	Minor, associated w/mineral development	Same as No Willdemess Alternative	Same as No Willdemess Alternative

* Willdemess Study Area Protection Stipulation would be dropped.

TABLE 2-11
COMPARATIVE SUMMARY OF IMPACTS
ANT HILLS WSA

Resource/	All Willderness Alternative	Conflict Resolution Alternative	Combined WSAs Alternative	No Willderness Alternative	No Action Alternative	Preferred Alternative
<u>Willderness Values</u>	Willderness values maintained. Development of existing mining claims would impair values in east third of WSA. Only slight contribution to ecological diversity in MPPS.	Natural character of 34 acres lost. Impacts on 4,320 acres same as All Willderness Alternative.	Willderness values maintained on 10,220 acres (Ant Hills, Chew Witter Camp, Peterson Draw combined). Values on 614 acres lost. Development of existing claims would impair values in portions of all 3 WSAs. Small contribution to ecological diversity in MPPS.	Willderness values impaired or lost in long-term due to mineral development, although NSO on new oil/gas leases would provide some protection. WSA not a major loss to MPPS.	Willderness values lost in long term. WSA not a major loss to MPPS.	Same as No Action Alternative.
<u>Minerals Oil/Gas</u>	2 post-FLPMA leases not developed; not a major adverse impact in this low to moderate potential area.	Same as All Willderness Alternative.	7 post-FLPMA leases not developed; not a major adverse impact in these low to moderate potential areas.	Low potential for development of 2 post-FLPMA leases (4 wells, occupying 20-32 acres). New leases subject to NSO; not a major adverse impact in a low potential area.	Low potential for long-term development (4 wells, occupying 20-32 acres); low to moderate beneficial impact in a low potential area.	Same as No Action Alternative.
<u>Locatables</u>	Moderate potential for development of 26 existing claims. Closed entry after designation; may be adverse impact in high base/precious metal potential area (low to moderate potential for other locatables).	Same as All Willderness Alternative.	Moderate potential for development of 60 existing mining claims. Closed to new mineral entry. May be adverse impact in high base/precious metal potential area.	Moderate potential for long-term development, even with ORV constraints; beneficial impact.	Moderate to high potential for long-term development; beneficial impact.	Same as No Action Alternative.

TABLE 2-11 (continued)
COMPARATIVE SUMMARY OF IMPACTS
ANT HILLS WSA

Resource	All Wilderness Alternative	Conflict Resolution Alternative	Combined WSAs Alternative	No Wilderness Alternative	No Action Alternative	Preferred Alternative
<u>Livestock Grazing</u>	No loss of livestock production. Increased cost of livestock management due to ORV closures.	Same as All Wilderness Alternative.	Same as All Wilderness Alternative, but affecting 10,200 acres.	Same as All Wilderness Alternative.	No significant impacts.	No significant impacts.
<u>Wildlife</u>	Beneficial to game species, raptors, and other wildlife. Some decline in species diversity.	Same as All Wilderness Alternative.	Same as All Wilderness Alternative, affecting 10,200 acres.	Extensive oil/gas development (low short-term potential) and locatable mineral development (moderate to high long-term potential) would cause local disturbance of habitat and disruption of wildlife. No regionally significant impacts anticipated. Long-term NSO on oil/gas development would greatly reduce adverse impacts.	Same adverse impacts as No Wilderness Alternative.	Same as No Action Alternative.
<u>Soils</u>	Surface-disturbing activities would be reduced. Potential sediment sources and soil productivity should stabilize. Methods for correcting existing or potential problems (mainly from livestock grazing) would be limited.	Same as All Wilderness Alternative.	Same as All Wilderness Alternative, affecting 10,220 acres.	Surface-disturbing activities would increase; most impacts could be corrected through mitigation. Long term NSO would reduce impacts.	Sediment yields and erosion would increase. Intensive methods for rehabilitating problem areas would be allowed.	Same as No Action Alternative.

TABLE 2-11 (continued)
COMPARATIVE SUMMARY OF IMPACTS
ANT HILLS WSA

Resource ¹	All Willemess Alternative	Conflict Resolution Alternative	Combined WSAs Alternative	No Willemess Alternative	No Action Alternative	Preferred Alternative
<u>Water Resources</u>	Sediment yield would be reduced and ground water resources would remain undisturbed.	Same as All Wilderness Alternative.	Same as All Wilderness Alternative, but affecting 10,220 acres.	Sediment yield, turbidity and water consumption would increase; possible disturbance of ground water sources. Mitigation, watershed projects, long-term NSO would be beneficial.	Sediment yield, turbidity and water consumption would increase; possible disruption of ground-water. Mitigation and watershed projects would reduce adverse impacts.	Same as No Action Alternative.
<u>Recreation²</u>	P settings maintained (18% of WSA); SPM increased and SPM decreased 5%	Same as All Wilderness Alternative.	P settings maintained (13% of 3 WSAs); SPMs increased and SPM decreased 5%	P & SPM settings may be impaired or lost with long-term mineral development.	P & SPM settings would be lost with long-term mineral and woodland development.	Same as No Action Alternative.
<u>Visual Resources³</u>	Class I objectives and scenic quality maintained.	Same as All Wilderness Alternative.	Same as All Wilderness Alternative, but affecting 10,220 acres.	Some potential for permanent loss of VPM Class II landscape with extensive development such as on mining claims or existing oil and gas leases. Long-term NSO would be beneficial.	Some permanent loss of VPM Class II landscape with extensive resource development.	Same as No Action Alternative.

TABLE 2-11 (continued)
COMPARATIVE SUMMARY OF IMPACTS
ANT HILLS WSA

Resource	All Wilderness Alternative	Conflict Resolution Alternative	Combined WSAs Alternative	No Wilderness Alternative	No Action Alternative	Preferred Alternative
<u>Economics</u>	Economic potential associated with mineral development foregone. Effect on employment, income, public revenue, infrastructure is unknown.	Same as All Wilderness Alternative.	Economic potential associated with mineral development foregone. Effect on employment, etc., unknown.	Economic potential of oil and gas development probably foregone. Economic potential of locatable mineral development not foregone. Effect on employment, etc., unknown.	Economic potential of mineral development not foregone. Effect on employment, etc., unknown.	Same as No Action Alternative.

1/ There would be no significant adverse or beneficial impacts to air quality, topography, forest/woodland resources, cultural resources, paleontological resources, lands/reality actions or social values for any WSA under any alternative under consideration. Except for two rare and endemic plant species in Cross Mountain WSA (see Natural History), there would be no significant adverse or beneficial impacts to vegetation for any WSA under any alternative, including threatened, endangered, candidate, and Colorado BLM sensitive plant species.

2/ P = primitive; SPM = semiprimitive nonmotorized; SPM = semiprimitive motorized; RN = roaded natural; R = rural; MU = modern urban. The Recreation Opportunity Spectrum (ROS) Classes are described in Appendix D.

3/ Visual Resource Management (VRM) class objectives are briefly defined in Appendix E.

CHEW WINTER CAMP

The entire 1,320 acres of the Chew Winter Camp WSA (Map 2-11) would be recommended as preliminarily suitable for wilderness designation under the All Wilderness Alternative.

For a discussion of the Combined WSAs Alternative, see Ant Hills WSA.

The entire 1,320 acres of the Chew Winter Camp WSA would be recommended as nonsuitable for wilderness designation under the No Wilderness Alternative. The area would be managed primarily for nonmotorized recreation.

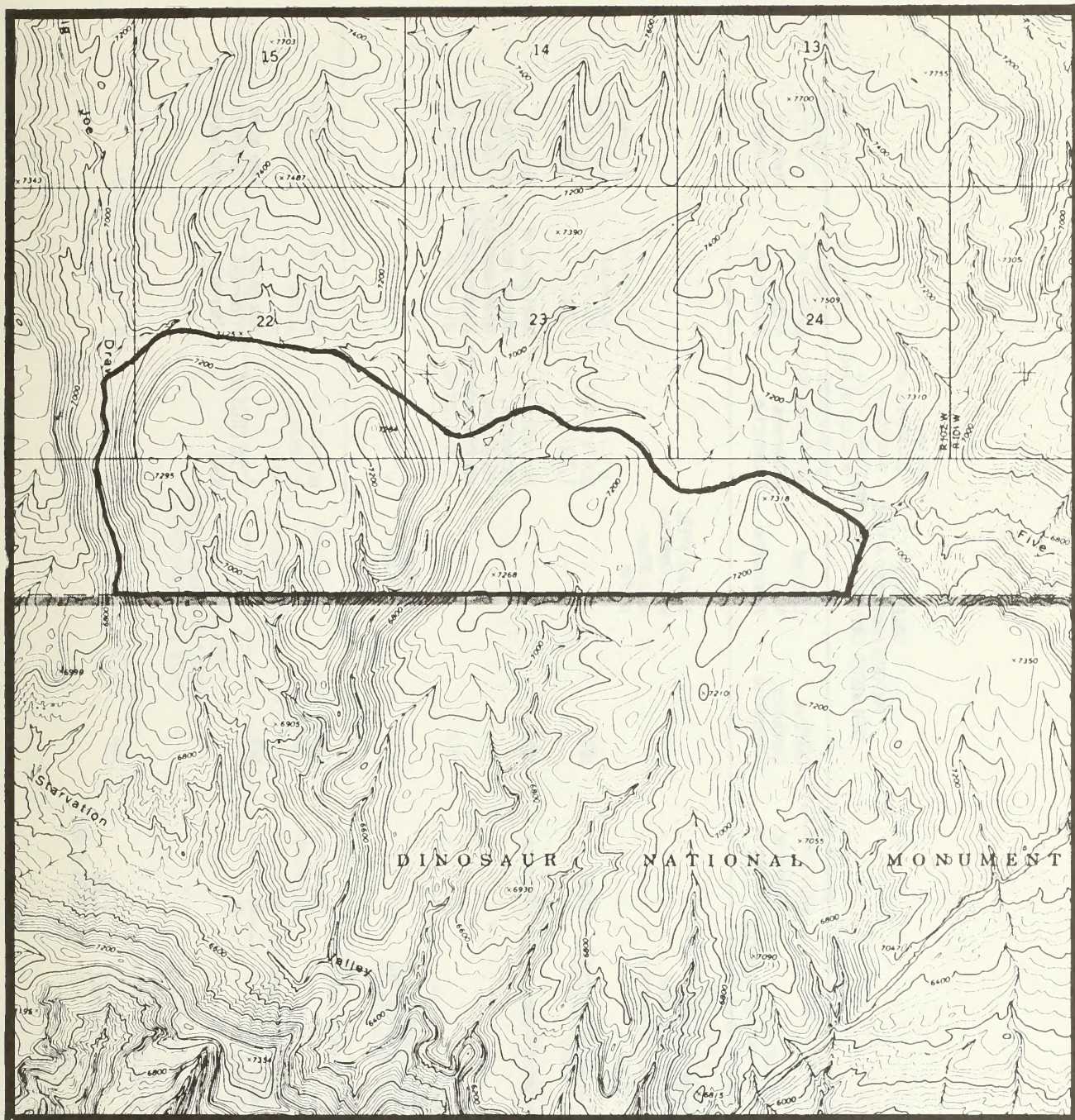
All 1,320 acres of the Chew Winter Camp WSA would be recommended as nonsuitable for wilderness designation

under the No Action Alternative. The area would be open to most resource uses.

Under the Preferred Alternative, the entire Chew Winter Camp WSA (1,320 acres) would be recommended as nonsuitable for wilderness designation. While the WSA does contain continuations of the Dinosaur National Monument's upland landforms, there are no outstanding or unique features within the WSA, such as a deep or scenic canyon, vista, mountain peaks or any other special feature, which would justify protection as wilderness.

See Table 2-12 for a discussion of proposed management actions. Table 2-13 is a comparative summary of the impacts under each alternative.

R 102 W



T 7 N

Map 2 - 11. CHEW WINTER CAMP
All Wilderness Alternative

LEGEND

— Proposed Suitable Area
(Same as Wilderness Study Area)



TABLE 2-12
PROPOSED MANAGEMENT ACTIONS
CHEM WINTER CAMP WSA (1,320 ACRES)

Resource	All Wilderness Alternative	Conflict Resolution Alternative	Combined WSAs Alternative	No Wilderness Alternative	No Action Alternative	Preferred Alternative
SUMMARY (Note: Acreage designated wilderness would be managed according to BLM's Wilderness Management Policy.)						
Preliminarily suitable (acres)	1,320	N/A	See Art Hill's WSA, Combined WSAs Alternative	0	0	0
Nonsuitable (acres)	0	N/A		1,320	1,320	1,320
Primary Management Emphasis	Wilderness	N/A		Protection of recreation, visual, and wildlife resources	Development of mineral resources, forest products, wildlife resources livestock grazing	Minerals priority area
OIL AND GAS (Low to moderate potential for occurrence; low potential for development)						
Pre-FLPMA leases which could be developed	0	N/A	See Art Hill's WSA	0	0	0
Post-FLPMA leases which could be developed (no. acres)	0	N/A		1,320 (100% of WSA)	Same as No Wilderness Alternative	Same as No Wilderness Alternative
Post-FLPMA leases which could not be developed if development would impair wilderness values (no. acres)	1,320 (100% of WSA)	N/A		0	0	0

TABLE 2-12 (Continued)
PROPOSED MANAGEMENT ACTIONS
CHEM WINTER CAMP

Resource	All Wilderness Alternative	Conflict Resolution Alternative	Combined WSAs Alternative	No Wilderness Alternative	No Action Alternative	Preferred Alternative
Unleased lands which could be leased and developed (acres)	0			0	0	0
Total area which could be developed (acres)	0	N/A		1,320 (100% of WSA, w/40 acres NSO)	Same as No Wilderness Alternative	Same as No Wilderness Alternative
Estimated wells (no.)	0	N/A		1	1	1
Estimated surface disturbance (acres)	0	N/A		Development: 5-8	Same as No Wilderness Alternative	Same as No Wilderness Alternative
<u>LOCATABLE MINERALS</u> (Note: 10 existing mining claims on east half of WSA; high potential for base/precious metals; low to moderate potential for other localities)		N/A				
Estimated potential for development	10 claims could be developed	N/A		10 claims could be developed; moderate to high potential for development throughout rest of WSA	Same as No Wilderness Alternative	Same as No Wilderness Alternative

TABLE 2-12 (Continued)
PROPOSED MANAGEMENT ACTIONS
CHEW WINTER CAMP

Resource	All Wilderness Alternative	Conflict Resolution Alternative	Combined WSAs Alternative	No Wilderness Alternative	No Action Alternative	Preferred Alternative
<u>LIVESTOCK MANAGEMENT</u>						
(Note: Grazing would continue at current levels under all alternatives)						
Proposed projects (no.)	0	N/A		0	0	0
<u>WILDLIFE MANAGEMENT</u>						
Proposed projects (no.)	Allow wildlife to maintain a natural balance w/habitat and each other	N/A		Same as All Wilderness Alternative	Maintain or improve wildlife habitat as appropriate	Same as No Action Alternative
<u>SOIL/WATER RESOURCES</u>						
Proposed projects (no.)	0	N/A		0	0	0
No projects planned. Projects may be implemented if watershed condition deteriorates significantly.						
<u>FOREST RESOURCES</u>						
Productive operable woodland which could be developed (acres)	0	N/A		0	54	54

TABLE 2-12 (Continued)
PROPOSED MANAGEMENT ACTIONS
CHEW WINTER CAMP

Resource	All Willderness Alternative	Conflict Resolution Alternative	Combined WSAs Alternative	No Willderness Alternative	No Action Alternative	Preferred Alternative
<u>NATURAL HISTORY</u>	N/A	N/A	N/A	N/A	N/A	N/A
<u>RECREATION</u> Emphasis in suitable areas	Willderness; semiprimitive nonmotorized settings	N/A	N/A	N/A	N/A	N/A
Emphasis in nonsuitable areas	N/A	N/A	Nonmotorized settings	Nonmotorized settings	Motorized settings	Same as No Action Alternative
ORV designations in suitable areas (acres)	1,320, closed except for authorized uses	N/A	N/A	N/A	N/A	N/A
ORV designations in nonsuitable areas (acres)	N/A	N/A	1,320, closed, except for authorized uses	1,320, closed, except for authorized uses	1,320 open	1,320, open
<u>LANDS/REALTY ACTIONS</u>	Only those necessary for valid prior existing rights	N/A	Minor, associated w/minerals development	Same as No Willderness Alternative	Same as No Willderness Alternative	Same as No Willderness Alternative

* Willderness Study Area Protection Stipulation would be dropped.

TABLE 2-13
COMPARATIVE SUMMARY OF IMPACTS
CHEW WINTER CAMP WSA

Resource	All Wilderness Alternative	Conflict Resolution Alternative	Combined WSAs Alternative	No Wilderness Alternative	No Action Alternative	Preferred Alternative
<u>Wilderness Values</u>	Wilderness values maintained. Development of existing mining claims would impair values in east half of WSA.	Note: There is no Conflict Resolution Alternative for Chew Winter Camp WSA.	Wilderness values maintained on 10,220 acres (Art Hills, Chew Winter Camp, Peterson Draw, combined). Values on 614 acres lost. Development of existing claims would impair values in portions of all 3 WSAs. Small contribution to ecological diversity in MPS.	Wilderness values impaired or lost in long-term due to mineral development, although NSO on new oil/gas leases would provide some protection. WSA not a major loss to MPS.	Wilderness values lost in long term. WSA not a major loss to MPS.	Same as No Action Alternative.
<u>Minerals Oil/Gas</u>	The post-FLPMA lease not developed; not a major adverse impact in this low to moderate potential area.	7 post-FLPMA leases not developed; not a major adverse impact in these low to moderate potential areas.	Low potential for development of post-FLPMA lease (1 well occupying 5-8 acres). New leases subject to NSO; not a major adverse impact in a low potential area.	Low potential for development of post-FLPMA lease (1 well occupying 5-8 acres). New leases subject to NSO; not a major adverse impact in a low potential area.	Low potential for long-term development (1 well, occupying 5-8 acres); low to moderate beneficial impact in a low potential area.	Same as No Action Alternative.
<u>Locatables</u>	Moderate potential for development of 10 existing claims. Closed to mineral entry after designation; may be adverse impact in high base/precious metal area (low to moderate) potential for other locatables).	Low potential for development of 60 existing mining claims. Closed to new mineral entry. May be adverse impact in high base/precious metal potential area.	Moderate potential for long-term development, even with ORV constraints; beneficial impact.	Moderate to high potential for long-term development; beneficial impact.	Moderate to high potential for long-term development; beneficial impact.	Same as No Action Alternative.

TABLE 2-13 (Continued)
COMPARATIVE SUMMARY OF IMPACTS
CHEV WINTER CAMP NSA

Resource ¹	All Wilderness Alternative	Conflict Resolution Alternative	Combined WSAs Alternative	No Wilderness Alternative	No Action Alternative	Preferred Alternative
<u>Livestock</u>	No loss of livestock production. Increased cost of livestock management due to ORV closures.		Same as All Wilderness Alternative, but affecting 10,220 acres.	Same as All Wilderness Alternative	No significant impact	No significant impacts.
<u>Wildlife</u>	Beneficial to game species, raptors, and other wildlife. Some decline in species diversity.		Same as All Wilderness Alternative, but affecting 10,220 acres.	Extensive oil/gas development (low short-term potential and locatable mineral development (moderate to high long-term potential) would cause local disturbance of habitat and disruption of wildlife. No regionally significant impacts anticipated. Long-term NSO on oil/gas development would greatly reduce adverse impacts.	Same adverse impacts as No Wilderness Alternative.	Same as No Action Alternative.
<u>Soils</u>	Surface-disturbing activities would be reduced. Potential sediment sources and soil productivity should stabilize. Methods of correcting existing or potential problems (mainly from livestock grazing) would be limited.		Same as All Wilderness Alternative, but affecting 10,220 acres.	Surface-disturbing activities would increase; most impacts could be corrected through mitigation. Long-term NSO would reduce impacts.	Sediment yields and erosion would increase. Intensive methods for rehabilitating problem areas would be allowed.	Same as No Action Alternative.

TABLE 2-13 (continued)
COMPARATIVE SUMMARY OF IMPACTS
CHEM WINTER CAMP WSA

Resource ¹	All Wilderness Alternative	Conflict Resolution Alternative	Combined WSAs Alternative	No Wilderness Alternative	No Action Alternative	Preferred Alternative
<u>Water Resources</u>	Sediment yield would be reduced and groundwater resources would remain undisturbed.		Same as All Wilderness, but affecting 10,220 acres.	Sediment yield, turbidity and water consumption could increase; possible disturbance of groundwater sources. Mitigation, watershed projects, long-term NSO would be beneficial.	Sediment yield, turbidity and water consumption would increase; possible disruption and contamination of groundwater. Mitigation and watershed projects would reduce adverse impacts.	Same as No Action Alternative.
<u>Recreation²</u>	SPNM setting maintained (90% of WSA).		P settings maintained (13% of 3 WSAs); SPNM increased and SPM decreased 5%.	SPNM settings may be impaired or lost with long-term mineral development.	SPNM settings would be lost with long-term mineral and woodland development.	Same as No Action Alternative.
<u>Visual Resources³</u>	Class I objectives and scenic quality maintained.		Same as All Wilderness Alternative, but affecting 10,220 acres.	Potential for some permanent loss of VPM Class II landscape with any extensive development such as on mining claims or existing oil or gas leases. Long-term NSO would be beneficial.	Some permanent loss of VPM Class II landscape with extensive resource development.	Same as No Action Alternative.

TABLE 2-13 (continued)
COMPARATIVE SUMMARY OF IMPACTS
CHEY MOUNTAIN CAMP WSA

Resource ¹	All Wilderness Alternative	Conflict Resolution Alternative	Combined WSAs Alternative	No Wilderness Alternative	No Action Alternative	Preferred Alternative
<u>Economics</u>	Economic potential associated with mineral development foregone. Effect on employment, income, public revenue, infrastructure is unknown.	Conflict Resolution Alternative	Economic potential associated with mineral development foregone. Effect on employment, etc., is unknown	Economic potential of oil and gas development probably foregone. Economic potential of locatable mineral development not foregone. Effect on employment, etc. is unknown.	Economic potential of mineral development not foregone. Effect on employment, etc., is unknown.	Same as No Action Alternative.
<u>1/</u>	There would be no significant adverse or beneficial impacts to air quality, topography, forest/woodland resources, cultural resources, paleontological resources, lands/reality actions or social values for any WSA under any alternative under consideration. Except for two rare and endemic plant species in Cross Mountain WSA (see Natural History), there would be no significant adverse or beneficial impacts to vegetation for any WSA under any alternative, including threatened, endangered, candidate, and Colorado BLM sensitive plant species.					
<u>2/</u>	P = primitive; SPM = semiprimitive nonmotorized; SPM = semiprimitive motorized; RN = roaded natural; R = rural; MU = modern urban. The Recreation Opportunity Spectrum (ROS) Classes are described in Appendix D.					
<u>3/</u>	Visual Resource Management (VRM) class objectives are briefly defined in Appendix E.					

PETERSON DRAW

Under the All Wilderness Alternative, the entire 5,160 acres of the Peterson Draw WSA (Map 2-12) would be recommended as preliminarily suitable for wilderness designation.

A portion of the Peterson Draw WSA (4,580 acres) would be recommended as preliminarily suitable for wilderness designation under the Conflict Resolution Alternative (See Map 2-13).

Approximately 580 acres around the KT copper mine would be recommended as nonsuitable because of impairing outside sights (and sounds if the mine becomes operational again) and to eliminate the developed Buck Spring.

For a discussion of the Combined WSAs Alternative, see Ant Hills.

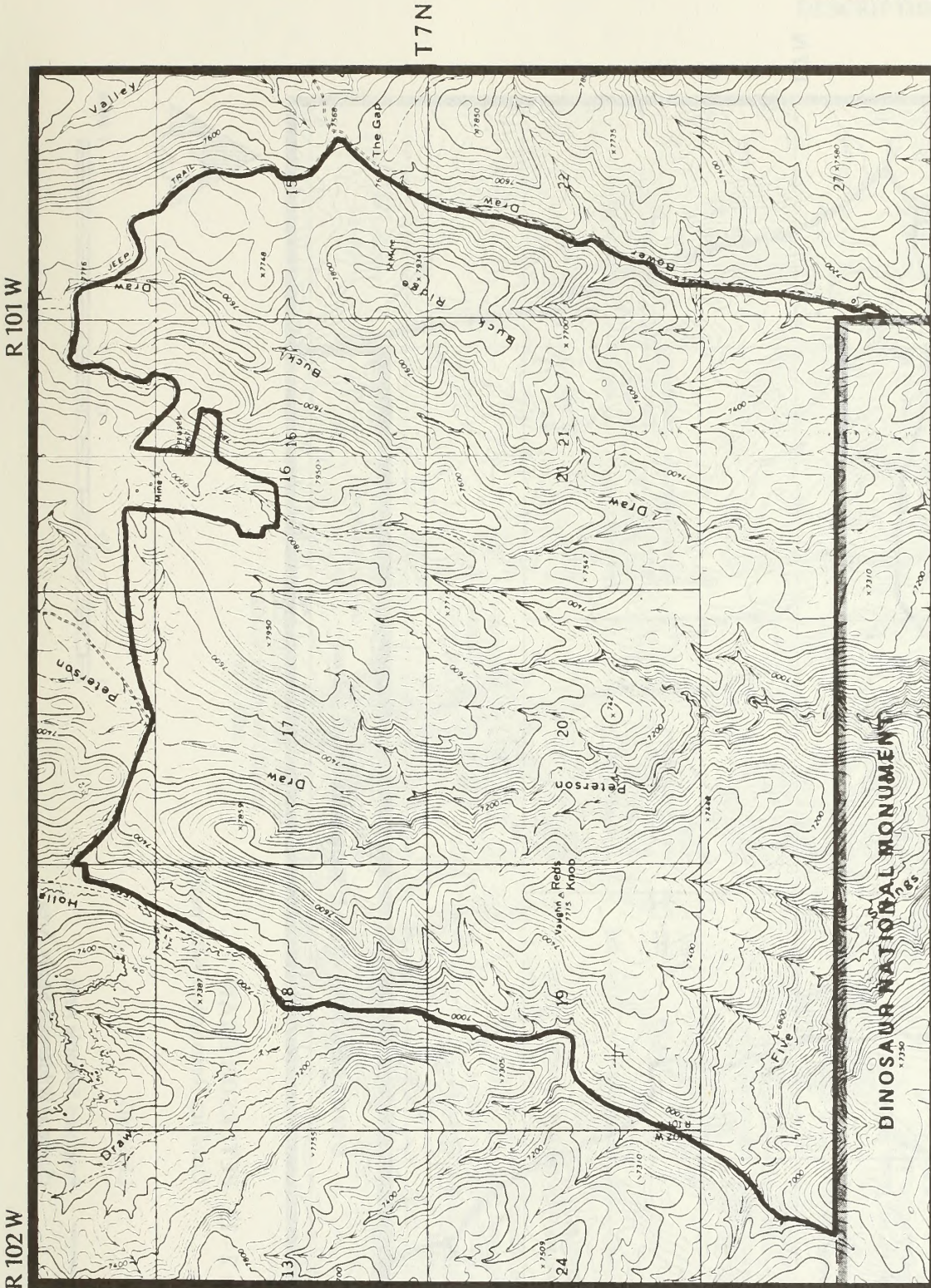
Under the No Wilderness Alternative, the entire 5,160 acres of the Peterson Draw WSA would be recommended as nonsuitable for wilderness designation. The area would

be managed primarily for nonmotorized recreation. Restrictions on forest resource development would involve stipulations to protect visual and recreation resources.

The entire 5,160 acres of the Peterson Draw WSA would be recommended as nonsuitable for wilderness designation under the No Action Alternative. The area would be open to most resource uses, with emphasis on mineral and forest resource production.

Under the Preferred Alternative, the entire Peterson Draw WSA (5,160 acres) would be recommended as nonsuitable for wilderness designation. While the WSA does contain continuations of the Dinosaur National Monument's upland land forms, there are no outstanding or unique features within the WSA, such as a deep or scenic canyon, vista, mountain peak or any other special feature, which would justify protection as wilderness.

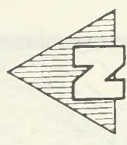
Table 2-14 shows proposed management actions for Peterson Draw WSA. Table 2-15 shows the comparative summary of the impacts of each alternative.

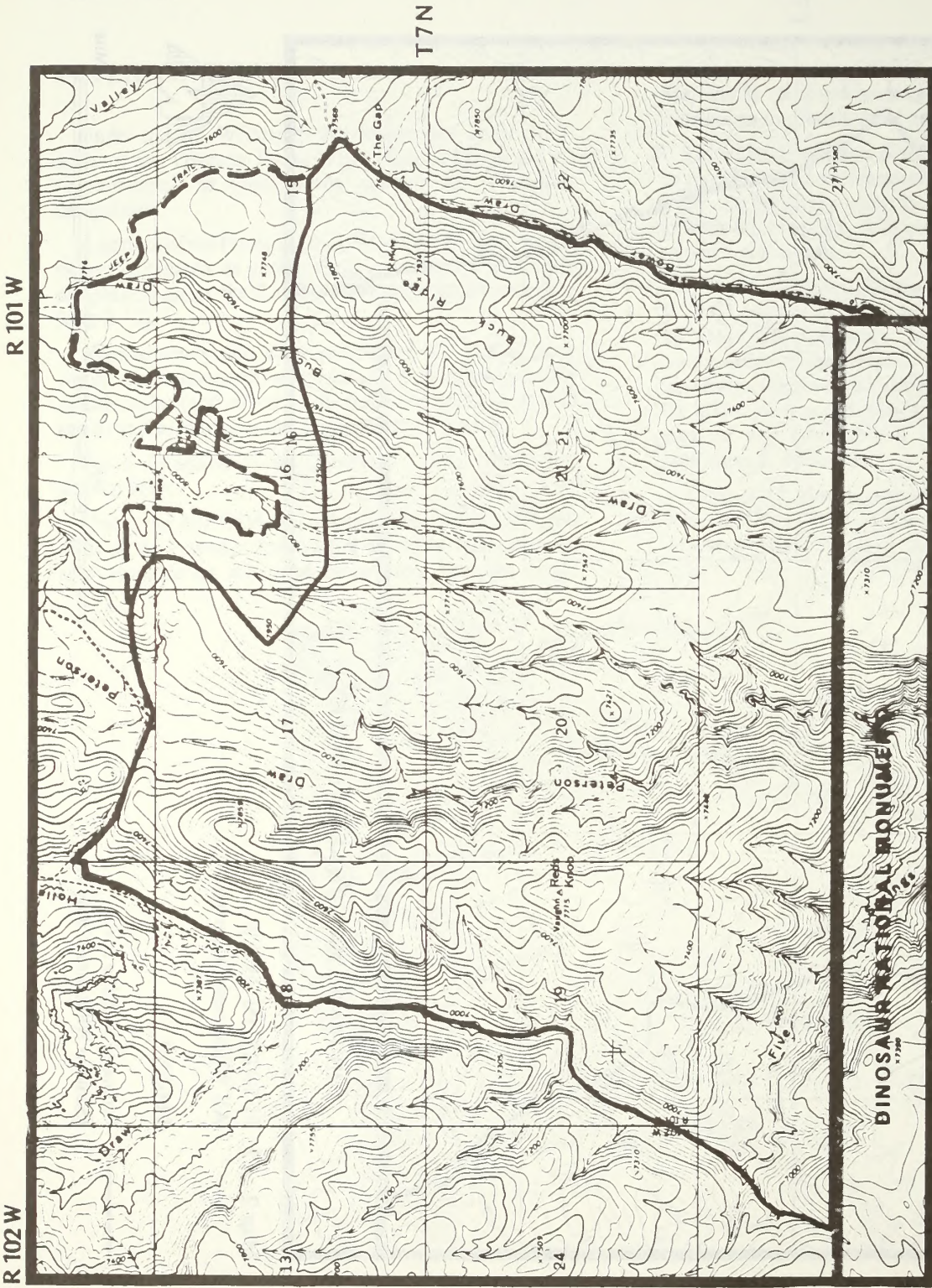


Map 2 - 12. PETERSON DRAW
All Wilderness Alternative

LEGEND

- Proposed Suitable Area
(Same as Wilderness Study Area)





Map 2 - 13. PETERSON DRAW
Conflict Resolution Alternative

LEGEND

- Proposed Suitable Area
(Same as Wilderness Study Area)

TABLE 2-14
PROPOSED MANAGEMENT ACTIONS
PETERSON DRAW WSA (5,160 ACRES)

Resource	All Wilderness Alternative	Conflict Resolution Alternative	Combined WSAs Alternative	No Wilderness Alternative	No Action Alternative	Preferred Alternative
SUMMARY						
(Note: Acreage designated wilderness could be managed according to BLM's Wilderness Management Policy.)			See Art. HT11s WSA, combined WSAs Alternative			
Preliminarily suitable (acres)	5,160	4,580		0	0	0
Nonsuitable lease	0	580		5,160	5,160	5,160
Primary Management Emphasis	Wilderness	Wilderness in suitable portion; primarily minerals in nonsuitable area		Nonmotorized recreation, protection of visual resources	Oil and gas leasing; intensive forest management	Same as No Action Alternative
OIL AND GAS						
(Note: Low to moderate potential for occurrence; low potential for development)						
Pre-FLPMA leases which could be developed	0	0		0	0	0
Post-FLPMA leases which could be developed (no.) (acres)	0	1 (part)* 580 (11% of WSA)		4* 5,160 (100% of WSA)	Same as No Wilderness Alternative*	Same as No Wilderness Alternative*

TABLE 2-14 (Continued)
PROPOSED MANAGEMENT ACTIONS
PETERSON DRAW

Resource	All Wilderness Alternative	Conflict Resolution Alternative	Combined WSAs Alternative	No Wilderness Alternative	No Action Alternative	Preferred Alternative
Post-FLPMA leases which could not be developed if development would impair wilderness values (no.)	4	4	0	0	0	0
(acres)	5,160 (100% of WSA)	4,580 (89% of WSA)				
Unleased lands which could be leased and developed (acres)	0	0	0	0	0	0
Total area which could be developed (acres)	0	580 (11% of WSA)		5,160 (100% of WSA)	Same as No Wilderness Alternative	Same as No Wilderness Alternative
Estimated wells (no.)	0	1	5	5	5	5
Estimated surface disturbance (acres)	0	Development: 5-8		Development: 25-40	Same as No Wilderness	Same as No Wilderness

LOCATABLE MINERALS

(Note: 31 existing mining claims on north third of WSA; high potential for base/precious metals; low to moderate potential for other locatables)

TABLE 2-14 (Continued)
PROPOSED MANAGEMENT ACTIONS
PETERSON DRAW

Resource	All Wilderness Alternative	Conflict Resolution Alternative	Combined WSAs Alternative	No Wilderness Alternative	No Action Alternative	Preferred Alternative
Estimated potential for development	31 claims could be developed	31 claims could be developed (24 in suitable area; 7 in nonsuitable area)		31 claims could be developed; moderate to high potential for additional development throughout the WSA	Same as No Wilderness Alternative	Same as No Wilderness Alternative
<u>LIVESTOCK MANAGEMENT</u> (Note: Grazing would continue at current levels under all alternatives)	0	0		0	0	0
<u>WILDLIFE MANAGEMENT</u>	Allow wildlife to maintain a natural balance w/habitat and each other	Same as All Wilderness Alternative		Same as All Wilderness	Maintain or improve wildlife habitat as appropriate	Same as No Action Alternative
Proposed projects (no.)	0	0		0	0	0
<u>SOIL/WATER RESOURCES</u>	No projects planned	Same as All Wilderness Alternative		No projects planned. Projects may be implemented if watershed condition deteriorates significantly	Same as No Wilderness Alternative	Same as No Wilderness Alternative

TABLE 2-14 (Continued)
PROPOSED MANAGEMENT ACTIONS
PETERSON DRAW

Resource	All Wilderness Alternative	Conflict Resolution Alternative	Combined WSAs Alternative	No Wilderness Alternative	No Action Alternative	Preferred Alternative
FOREST RESOURCES Commercial forest land which could be developed (acres)	0	0		0	380	Same as No Action Alternative
NATURAL HISTORY	N/A	N/A		N/A	N/A	N/A
RECREATION Emphasis in suitable areas	Wilderness; primitive & semi primitive nonmotorized settings	Same as All Wilderness Alternative		N/A	N/A	N/A
Emphasis in nonsuitable areas	N/A	Motorized and nonmotorized settings		Normotorized recreation settings	Motorized or nonmotorized settings	Same as No Action Alternative
ORV designations in suitable areas (acres)	5,160, closed, except for authorized uses	4,580, closed, except for authorized uses		N/A	N/A	N/A
ORV designations in nonsuitable areas (acres)	N/A	580, open		5,160, closed, except for authorized uses	5,160, open	5,160, open
LANDS/REALTY ACTIONS	None except when necessary to develop valid existing rights.	None		Minor, associated w/mineral development	Same as No Wilderness Alternative	Same as No Wilderness Alternative

* Wilderness Study Area Protection Stipulation would be dropped.

TABLE 2-15
COMPARATIVE SUMMARY OF IMPACTS
PETERSON DRAW WSA

Resource	All Wilderness Alternative	Conflict Resolution Alternative	Combined WSA Alternative	No Wilderness Alternative	No Action Alternative	Preferred Alternative
<u>Wilderness Values</u>	Wilderness values maintained. Development of existing mining claims would impair values in north third of WSA. Only slight contribution to ecological diversity in NPS.	Natural character of 580 acres lost. Impacts on 4,580 acres same as All Wilderness Alternative.	Wilderness values maintained on 10,220 acres (Ant Hills, Chew Winter Camp, Peterson Draw combined). Values on 614 acres lost. Development of existing claims would impair values in portions of all 3 WSAs. Small contribution to ecological diversity in NPS.	Wilderness values impaired or lost in long-term due to mineral development, although NSO on new oil/gas leases would provide some protection. WSA not a major loss to NPS.	Wilderness values lost in long term. WSA not a major loss to NPS.	Same as No Action Alternative.
<u>Minerals Oil/Gas</u>	4 post-FLPMA leases not developed; not a major adverse impact in this low to moderate potential area.	Similar to All Wilderness Alternative, except 580 acres open to oil/gas development (low potential; 1 well occupying 5-8 acres).	7 post-FLPMA leases not developed; not a major adverse impact in these low to moderate potential areas.	Low potential for development of 3 post-FLPMA leases (5 wells, occupying 25-40 acres). New leases subject to NSO; not a major adverse impact in a low potential area.	Low potential for long-term development (5 wells, occupying 25-40 acres); low to moderate beneficial impact in a low potential area.	Same as No Action Alternative.
<u>Locatables</u>	Moderate potential for development of 31 existing claims. Closed to mineral entry after designation, may be adverse impact in high base/precious metal potential area (low to moderate potential for other locatables).	Similar to All Wilderness Alternative, except that 580 acres open to locatable mineral development (moderate potential).	Moderate potential for development of 60 existing mining claims. Closed to new mineral entry. May be adverse impact in high base/precious metal potential area.	Moderate potential for long-term development, even with ORY constraints; may be beneficial impact.	Moderate to high potential for long-term development; may be beneficial impacts.	Same as No Action Alternative.

TABLE 2-15 (continued)
COMPARATIVE SUMMARY OF IMPACTS
PETERSON DRAW WSA

Resource	All Wilderness Alternative	Conflict Resolution Alternative	Combined WSAs Alternative	No Wilderness Alternative	No Action Alternative	Preferred Alternative
<u>Livestock</u>	No loss of livestock production. Increased cost of livestock management due to ORV closures.	Same as All Wilderness Alternative.	Same as All Wilderness Alternative, but affecting 10,220 acres.	Same as All Wilderness Alternative.	No significant impacts.	No significant impacts.
<u>Wildlife</u>	Beneficial to game species, raptors, and other wildlife. Some decline in species diversity.	Same as All Wilderness Alternative.	Same as All Wilderness Alternative, but affecting 10,220 acres.	Extensive oil/gas development (low short-term potential) and locatable mineral development (moderate to high long-term potential) would cause local disturbance of habitat and disruption of wildlife. No regionally significant impacts anticipated. Long-term NSO on oil/gas development would greatly reduce adverse impacts.	Same adverse impacts as No Wilderness Alternative.	Same as No Wilderness Alternative.
<u>Soils</u>	Surface-disturbing activities would be reduced. Potential sediment sources and soil productivity should stabilize. Methods of correcting existing or potential problems (mainly from livestock grazing) would be limited.	Same as All Wilderness Alternative.	Same as All Wilderness Alternative, but affecting 10,220 acres.	Surface-disturbing activities would increase; most impacts could be corrected through mitigation. Long-term NSO would reduce impacts.	Sediment yields and erosion would increase. Intensive methods for rehabilitating problem areas would be allowed.	Same as No Action Alternative.

TABLE 2-15 (Continued)
COMPARATIVE SUMMARY OF IMPACTS
PETERSON DRAW WSA

Resource ¹	All Wilderness Alternative	Conflict Resolution Alternative	Combined WSAs Alternative	No Wilderness Alternative	No Action Alternative	Preferred Alternative
<u>Water Resources</u>	Sediment yield would be reduced and ground water resources would remain undisturbed.	Same as All Wilderness Alternative.	Same as All Wilderness, but affecting 10,220 acres.	Sediment yield, turbidity and water consumption could increase; possible disturbance of groundwater sources. Mitigation, watershed projects, long-term NSO would be beneficial.	Sediment yield, turbidity, and water consumption would increase; possible disruption or contamination of groundwater. Mitigation and watershed projects would reduce adverse impacts.	Same as No Action Alternative.
<u>Recreation²</u>	P setting maintained; (8% of WSA); SPM increased and SPM decreased 10%.	Same as All Wilderness Alternative.	P settings maintained (13% of 3 WSAs); SPM increased and SPM decreased 5%.	P & SPM settings may be impaired or lost with long-term mineral development.	P & SPM settings would be lost with long-term mineral and woodland development.	Same as No Action Alternative.
<u>Visual Resources³</u>	Class I objectives and scenic quality maintained.	Same as All Wilderness Alternative.	Same as All Wilderness Alternative, but affecting 10,220 acres.	Potential for some permanent loss of VPM Class II landscape with any extensive development such as on mining claims or existing oil and gas leases. Long-term NSO would be beneficial.	Some permanent loss of VPM Class II landscape with extensive resource development.	Same as No Action Alternative.

TABLE 2-15 (Continued)
COMPAPTIVE SUMMARY OF IMPACTS
PETERSON DRAW WSA

Resource ¹	All Wilderness Alternative	Conflict Resolution Alternative	Combined WSAs Alternative	No Wilderness Alternative	No Action Alternative	Preferred Alternative
<u>Economics</u>	Economic potential associated with mineral development foregone. Effect on employment, income, public revenue, infrastructure is unknown.	Same as All Wilderness Alternative.	Economic potential associated with mineral development foregone. Effect on employment, etc., is unknown.	Economic potential of oil and gas development probably foregone. Economic potential of locatable mineral development not foregone. Effect on employment, etc., is unknown.	Economic potential of mineral development not foregone. Effect on employment, etc., is unknown.	Same as No Action Alternative.

1/ There would be no significant adverse or beneficial impacts to air quality, topography, forest/woodland resources, cultural resources, paleontological resources, lands/realty actions or social values for any WSA under any alternative under consideration. Except for two rare and endemic plant species in Cross Mountain WSA (see Natural History), there would be no significant adverse or beneficial impacts to vegetation for any WSA under any alternative, including threatened, endangered, candidate, and Colorado BLM sensitive plant species.

2/ P = primitive; SPM = semiprimitive nomotorized; SPM = semiprimitive motorized; RN = roaded natural; R = rural; MU = modern urban. The Recreation Opportunity Spectrum (ROS) Classes are described in Appendix D.

3/ Visual Resource Management (VRM) class objectives are briefly defined in Appendix E.

TEPEE DRAW

The entire 5,490 acres of the Tepee Draw WSA (Map 2-14) would be recommended as preliminarily suitable for wilderness designation under the All Wilderness Alternative.

No resource conflicts were identified; therefore, no Conflict Resolution Alternative was analyzed. The Combined WSAs Alternative does not apply to this WSA.

Under the No Wilderness Alternative, the entire 5,490 acres of the Tepee Draw WSA would be recommended as nonsuitable for wilderness designation. The area would be managed primarily for nonmotorized recreation.

Under the No Action Alternative, the entire 5,490 acres of the Tepee Draw WSA would be recommended as

nonsuitable for wilderness designation. The area would be open to most resource uses, with emphasis on mineral and forest resource development.

All of Tepee Draw WSA (5,490 acres) would be recommended as nonsuitable for wilderness designation under the Preferred Alternative. While the WSA does contain continuations of the Dinosaur National Monument's upland landforms, there are no outstanding or unique features within the WSA, such as a deep or scenic canyon, mountain peak or any other special feature, which would justify protection as wilderness.

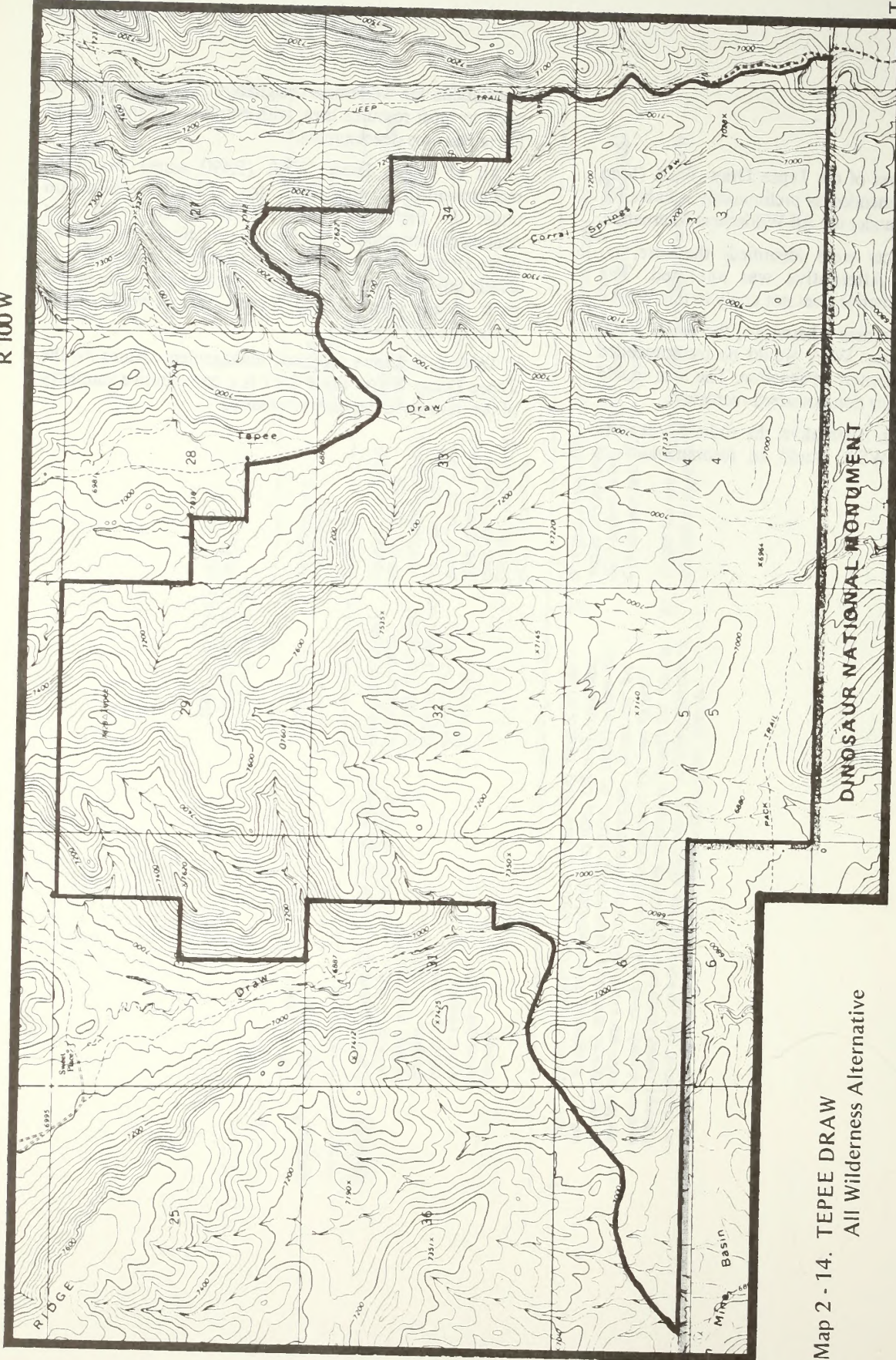
Table 2-16 shows proposed management actions for the Tepee Draw WSA. Table 2-17 is a comparative summary of the impacts under each alternative.

R 101 W

R 100 W

T 7 N

T 6 N



Map 2 - 14. TEEPEE DRAW
All Wilderness Alternative

LEGEND

- Proposed Suitable Area
(Same as Wilderness Study Area)

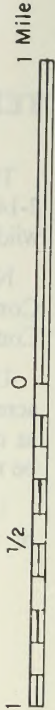
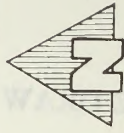


TABLE 2-16
PROPOSED MANAGEMENT ACTIONS
TEPEE DRAW WSA (5,490 ACRES)

Resource	All Wilderness Alternative	Conflict Resolution Alternative	Combined WSAs Alternative	No Wilderness Alternative	No Action Alternative	Preferred Alternative
SUMMARY (Note: Acreage designated wilderness would be managed according to BLM's Wilderness Management Policy.)						
Preliminarily suitable (acres)	5,490	N/A	N/A	0	0	0
Nonsuitable (acres)	0	N/A	N/A	5,490	5,490	5,490
Primary Management Emphasis	Wilderness	N/A	N/A	Nonmotorized recreation; protection of visual resources and wildlife resources	Intensive forest management; oil and gas development; mineral entry	Same as No Action Alternative
OIL AND GAS (Note: Low to moderate potential for occurrence; low potential for development.)						
Pre-FLPMA leases which could be developed	0	N/A	N/A	0	0	0
Post-FLPMA leases which could be developed (no. acres)	0	N/A	N/A	4* 5,490 (100% of WSA) with 140 acres of NSO	Same as No Wilderness Alternative*	Same as No Wilderness Alternative*

TABLE 2-16 (Continued)
PROPOSED MANAGEMENT ACTIONS
TEPEE DRAM

Resource	All Wilderness Alternative	Conflict Resolution Alternative	Combined WSAs Alternative	No Wilderness Alternative	No Action Alternative	Preferred Alternative
Post-FLPMA leases which could not be developed if development would impair wilderness values (no.) (acres)	4 5,490 (100% of WSA)	N/A	N/A	0	0	0
Unleased lands which could be leased and developed (acres)	0	N/A	N/A	0	0	0
Total area which could be developed (acres)	0	N/A	N/A	5,490 (100% of WSA) with 140 acres NSO	Same as No Wilderness Alternative	Same as No Wilderness Alternative
Estimated wells (no.)	0	N/A	N/A	5	5	5
Estimated surface disturbance (acres)	0	N/A	N/A	Development: 25-40	Same as No Wilderness Alternative	Same as No Wilderness Alternative
LOCATABLE MINERALS (Note: No existing mining claims; high potential for base/precious metals; low to moderate potential for other locatables.)						
Estimated potential for development	None	N/A	N/A	Low to moderate throughout WSA	Same as No Wilderness Alternative	Same as No Wilderness Alternative

TABLE 2-16 (Continued)
PROPOSED MANAGEMENT ACTIONS
TEPEE DRAW

Resource	All Wilderness Alternative	Conflict Resolution Alternative	Combined WSAs Alternative	No Wilderness Alternative	No Action Alternative	Preferred Alternative
<u>LIVESTOCK MANAGEMENT</u>						
(Note: Grazing would continue at current levels under all alternatives.)						
Proposed projects (no.)	0	N/A	N/A	0	0	0
<u>WILDLIFE MANAGEMENT</u>						
Proposed projects (no.)	Allow wildlife to maintain a natural balance w/habitat and each other	N/A	N/A	Same as All Wilderness Alternative	Maintain or improve wildlife habitat as appropriate	Same as No Action Alternative
<u>SOIL/WATER RESOURCES</u>						
Proposed projects (no.)	0	N/A	N/A	0	0	0
<u>FOREST RESOURCES</u>						
Proposed projects (no.)	No projects planned	N/A	N/A	No projects planned. Projects may be implemented if watershed condition deteriorates significantly	Same as No Wilderness Alternative	Same as No Wilderness Alternative
<u>NATURAL HISTORY</u>						
Proposed projects (no.)	0	N/A	N/A	0	220	Same as No Action Alternative
<u>NATURAL HISTORY</u>						
Proposed projects (no.)	N/A	N/A	N/A	N/A	N/A	N/A

TABLE 2-16 (Continued)
PROPOSED MANAGEMENT ACTIONS
TEPEE DRAW

Resource	All Wilderness Alternative	Conflict Resolution Alternative	Combined WSAs Alternative	No Wilderness Alternative	No Action Alternative	Preferred Alternative
RECREATION Emphasis in suitable areas	Wilderness; primitive & normotized settings	N/A	N/A	N/A	N/A	N/A
Emphasis in nonsuitable areas	N/A	N/A	N/A	Normotized recreation settings	Motorized and normotized settings	Same as No Action Alternative
ORV designations in suitable areas (acres)	5,490, closed, except for authorized uses	N/A	N/A	N/A	N/A	N/A
ORV designations in nonsuitable areas (acres)	N/A	N/A	N/A	5,490, closed, except for authorized uses	5,490, open	5,490, open
LANDS/REALTY ACTIONS	None except those necessary to develop valid existing rights	N/A	N/A	Minor, associated with mineral development	Same as No Wilderness Alternative	Same as No Wilderness Alternative

* Wilderness Study Area Protection Stipulation would be dropped.

NOTE: No resource conflicts were identified; therefore, no Conflict Resolution Alternative was analyzed for this WSA.

TABLE 2-17
COMPARATIVE SUMMARY OF IMPACTS
TEPEE DRAW WSA

Resource]	All Wilderness Alternative	Conflict Resolution Alternative	Combined WSAs Alternative	No Wilderness Alternative	No Action Alternative	Preferred Alternative
<u>Wilderness Values</u>	Wilderness values maintained. Only slight contribution to ecological diversity in NWPS.	Note: There is no Conflict Resolution Alternative for Tepee Draw WSA.	Note: There is no Combined WSAs Alternative for Tepee Draw WSA.	Wilderness values impaired or lost in long-term due to mineral development, although NSO on new oil/gas leases would provide some protection. WSA not a major loss to NWPS.	Wilderness values lost in long-term. WSA not a major loss to NWPS.	Same as No Action Alternative.
<u>Minerals Oil/Gas</u>	4 post-FLPMA leases not developed; not a major adverse impact in this low to moderate potential area.			Low potential for development of 4 post-FLPMA leases (5 wells, occupying 25-40 acres). New leases subject to NSO; not a major adverse impact in a low potential area.	Low potential for long-term development (5 wells, occupying 25-40 acres); low to moderate beneficial impact in a low potential area.	Same as No Action Alternative.
<u>Locatables</u>	Closed to mineral entry; may be adverse impact in high base/precious metal potential area (low to moderate potential for other locatables).			Low to moderate potential for long-term development, even with ORV constraints; beneficial impact.	Low to moderate potential for long-term development; beneficial impact.	Same as No Action Alternative.
<u>Livestock Grazing</u>	No loss of livestock production. Increased cost of livestock management due to ORV closures.			Same as All Wilderness Alternative.	No significant impacts.	No significant impacts.

TABLE 2-17 (continued)
COMPARATIVE SUMMARY OF IMPACTS
TEPEE DRAW NSA

Resource	All Wilderness Alternative	Conflict Resolution Alternative	Combined NSAs Alternative	No Wilderness Alternative	No Action Alternative	Preferred Alternative
<u>Wildlife</u>	Beneficial to game species, raptors, and other wildlife. Some decline in species diversity.			Extensive oil/gas development (low-short-term potential) and locatable mineral development (low to moderate long-term potential) would cause local disturbance of habitat and disruption of wildlife. No regionally significant impacts anticipated. Long-term NSO on oil/gas development would greatly reduce adverse impacts.	Same adverse impacts as No Wilderness Alternative.	Same as No Action Alternative.
<u>Soils</u>	Surface-disturbing activities would be reduced. Potential sediment sources and soil productivity should stabilize. Methods of correcting existing or potential problems (mainly from livestock grazing) would be limited.			Surface-disturbing activities would increase. Most impacts could be corrected through mitigation. Long-term NSO would reduce impacts.	Sediment yields and erosion would increase. Methods for rehabilitating problem areas would be allowed.	Same as No Action Alternative.

TABLE 2-17 (continued)
COMPARATIVE SUMMARY OF IMPACTS
TEPEE DRAW WSA

Resource ¹	All Wildmess Alternative	Conflict Resolution Alternative	Combined WSAs Alternative	No Wildmess Alternative	No Action Alternative	Preferred Alternative
<u>Water Resources</u>	Sediment yield would be reduced and groundwater resources would remain undisturbed.			Sediment yield, turbidity and water consumption could increase; possible disturbance of groundwater sources. Mitigation, watershed projects, long-term NSO would be beneficial.	Sediment yield, turbidity, and water consumption would increase; possible disruption or contamination of groundwater. Mitigation and watershed projects would reduce adverse impacts.	Same as No Action Alternative.
<u>Recreation²</u>	P settings maintained (2% of WSA); SPM increased and SPM decreased 9%.			P & SPM settings may be impaired or lost with long-term mineral development.	P & SPM settings would be lost with long-term mineral and woodland development.	Same as No Action Alternative.
<u>Visual Resources³</u>	Class I objectives and scenic quality maintained.			Potential for some permanent loss of VRM Class II landscape with any extensive development such as mining claims or existing oil and gas leases. Long-term NSO would be beneficial.	Some permanent loss of VRM Class II landscape with extensive resource development.	Same as No Action Alternative.

TABLE 2-17 (continued)
COMPARATIVE SUMMARY OF IMPACTS
TEPEE DRAW NSA

Resource ¹	All Wilderness Alternative	Conflict Resolution Alternative	Combined KSAs Alternative	No Wilderness Alternative	No Action Alternative	Preferred Alternative
<u>Economics</u>	Economic potential associated with mineral development foregone. Effect on employment, income, public revenue, infrastructure is unknown.			Economic potential of oil and gas development probably foregone. Economic potential of locatable mineral development not foregone. Effect on employment, etc., unknown.	Economic potential of mineral development not foregone. Effect on employment, etc., unknown.	Same as No Action Alternative.
<u>1/</u>	There would be no significant adverse or beneficial impacts to air quality, topography, forest/woodland resources, cultural resources, paleontological resources, lands/realty actions or social values for any KSA under any alternative under consideration. Except for two rare and endemic plant species in Cross Mountain KSA (see Natural History), there would be no significant adverse or beneficial impacts to vegetation for any KSA under any alternative, including threatened, endangered, candidate, and Colorado BLM sensitive plant species.					
<u>2/</u>	P = primitive; SPM = semiprimitive motorized; SPM = semiprimitive motorized; RN = roaded natural; R = rural; MU = modern urban. The Recreation Opportunity Spectrum (ROS) Classes are described in Appendix D.					
<u>3/</u>	Visual Resource Management (VRM) class objectives are briefly defined in Appendix E.					

VALE OF TEARS

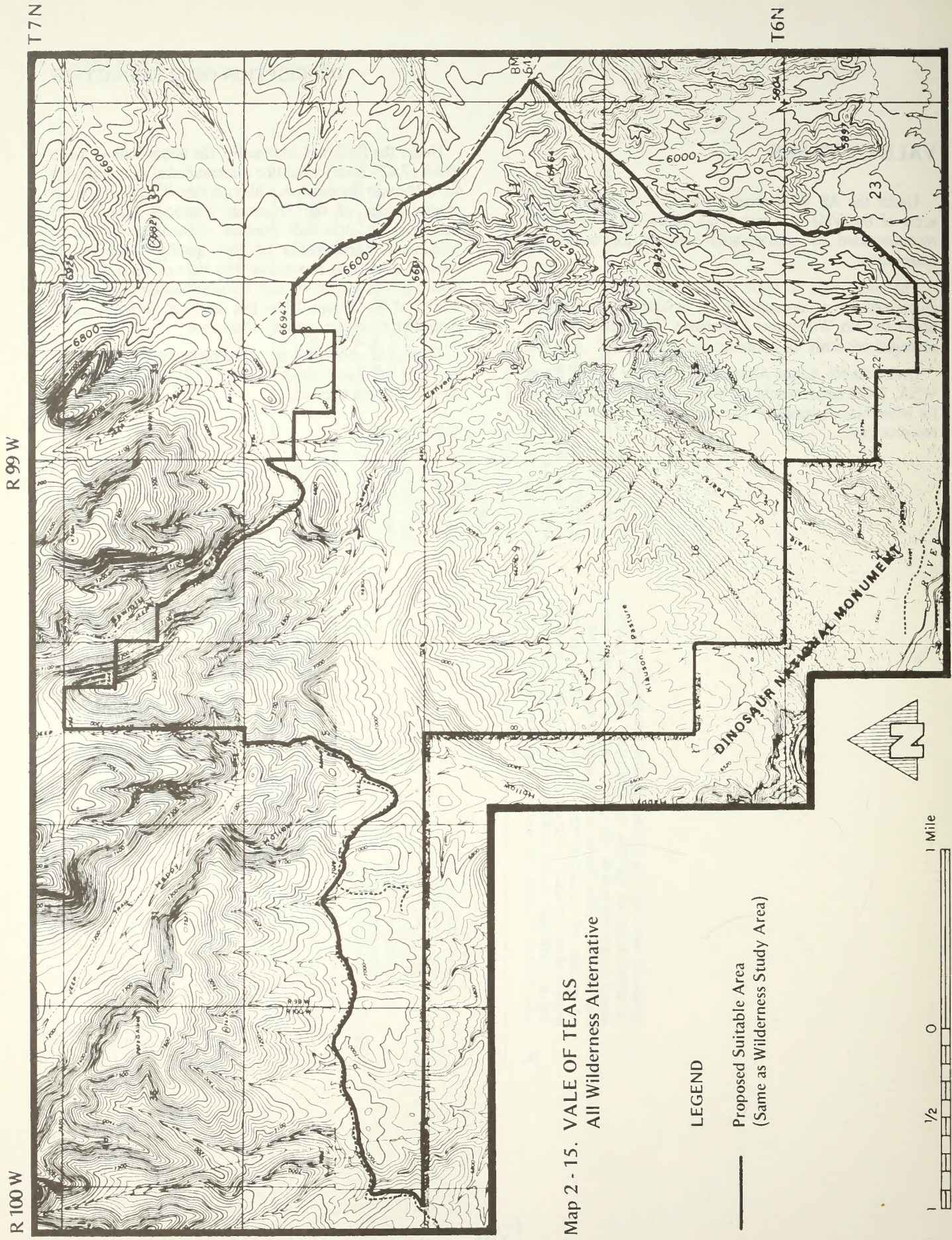
Under the All Wilderness Alternative, the entire 7,420 acres of the Vale of Tears WSA (Map 2-15) would be recommended as preliminarily suitable for wilderness designation.

The entire Vale of Tears WSA (7,420 acres) would be recommended as nonsuitable for wilderness designation under the No Wilderness Alternative. The area would be managed primarily for nonmotorized recreation.

Under the No Action Alternative, the entire Vale of Tears WSA, 7,420 acres, would be recommended as nonsuitable for wilderness designation. The area would be open to most resource uses.

Under the Preferred Alternative, the entire Vale of Tears WSA (7,420 acres) would be recommended as nonsuitable for wilderness designation. Although this WSA does contain continuations of the Dinosaur National Monument's landforms, it does not contain outstanding values or wilderness characteristics of high quality which would warrant wilderness protection. The Vale of Tears drainage does offer an interesting and colorful landform within 1/2 mile of the Yampa River but does not, in itself, justify protection by designation as wilderness.

Table 2-18 shows the proposed management actions for the Vale of Tears WSA. Table 2-19 is a comparative summary of the impacts.



Map 2 - 15. VALE OF TEARS
All Wilderness Alternative

LEGEND
 Proposed Suitable Area
 (Same as Wilderness Study Area)



TABLE 2-18
PROPOSED MANAGEMENT ACTIONS
VALE OF TEARS WSA (7,420 ACRES)

Resource	All Wilderness Alternative	Conflict Resolution Alternative	Combined WSAs Alternative	No Wilderness Alternative	No Action Alternative	Preferred Alternative
<p>SUMMARY (Note: Acreage designated wilderness would be managed according to BLM's Wilderness Management Policy.)</p>						
Preliminarily suitable (acres)	7,420	N/A	N/A	0	0	0
Nonsuitable (acres)	0			7,420	7,420	7,420
Primary Management Emphasis	Wilderness	N/A	N/A	Normotorized recreation; protection of visual resources and wildlife habitat.	Livestock grazing; production of forest/woodlands and mineral resources.	Same as No Action with 630-acre mineral priority area, 1,080 acre forest woodlands priority area; 720 acre-soils/water priority area; and 4,990-acre livestock priority area.
<p>OIL AND GAS (Note: moderate potential for occurrence; moderate potential for development)</p>						
Pre-FLPMA leases which could be developed (no. acres)	2 2,863 (39% of WSA)	N/A	N/A	Same as All Wilderness Alternative	Same as All Wilderness Alternative	Same as All Wilderness Alternative

TABLE 2-18 (Continued)
PROPOSED MANAGEMENT ACTIONS
VALU OF TEARS

Resource	All Wilderness Alternative	Conflict Resolution Alternative	Combined WSAs Alternative	No Wilderness Alternative	No Action Alternative	Preferred Alternative
Post-FLPMA leases which could be developed (no.) (acres)	0 0	N/A	N/A	5* 3,760 (51% of WSA)	Same as No Wilderness Alternative*	Same as No Wilderness Alternative*
Post-FLPMA leases which could not be developed if development would impair wilderness values. (no.) (acres)	5 3,760 (51% of WSA)	N/A	N/A	0	0	0
Unleased lands which could be leased and developed (acres)	0	N/A	N/A	797, all NSO (10% of WSA)	797 (10% of WSA)	797 (10% of WSA)
Total area which could be developed (acres)	2,863 (39% of WSA)	N/A	N/A	7,420 (100% of WSA), with 797 acres NSO	7,420 (100% of WSA)	Same as No Action Alternative
Estimated wells (no.)	4	N/A	N/A	7		
Estimated surface disturbance (acres)	Development: 20-32	N/A	N/A	Development: 36-56	Same as No Wilderness Alternative	Same as No Wilderness Alternative

TABLE 2-18 (Continued)
PROPOSED MANAGEMENT ACTIONS
VALE OF TEARS

Resource	All Wilderness Alternative	Conflict Resolution Alternative	Combined WSAs Alternative	No Wilderness Alternative	No Action Alternative	Preferred Alternative
<u>LOCATABLE MINERALS</u>						
(Note: 23 existing mining claims on extreme north of WSA; high potential for base/precious metals; low to moderate potential for other locatables)						
Estimated potential for development	23 claims could be developed	N/A	N/A	23 claims could be developed; moderate potential for development elsewhere in WSA	Same as No Action Alternative	Same as No Wilderness Alternative
<u>LIVESTOCK MANAGEMENT</u>						
(Note: Grazing would continue at current levels under all alternatives.)						
Proposed projects which could be developed:						
Burning/reseeding (acres)	0	N/A	N/A	1,300	Same as No Wilderness Alternative	Same as No Wilderness Alternative
Chemical spraying (acres)	0			500		
Reservoirs (no.)	6			6		
Spring developments (no.)	3			3		
Fence/line (miles)	3			3		
<u>WILDLIFE MANAGEMENT</u>	Allow wildlife to maintain a natural balance w/habitat and each other	N/A	N/A	Same as All Wilderness Alternative	Maintain or improve wildlife habitat as appropriate	Same as No Action Alternative

TABLE 2-18 (Continued)
PROPOSED MANAGEMENT ACTIONS
VALE OF TEAS

Resource	All Wilderness Alternative	Conflict Resolution Alternative	Combined WSAs Alternative	No Wilderness Alternative	No Action Alternative	Preferred Alternative
Proposed projects (no.)	0	N/A	N/A	0	0	0
<u>SOIL/WATER RESOURCES</u>						
Productive-operable woodland which could be developed (acres)	No projects planned	N/A	N/A	No projects planned. Projects may be implemented if watershed condition deteriorates significantly	Same as No Wilderness Alternative	Same as No Wilderness Alternative
<u>FOREST RESOURCES</u>						
Productive-operable woodland which could be developed (acres)	0	N/A	N/A	0	380	Same as No Action Alternative
<u>NATURAL HISTORY</u>						
Emphasis in suitable areas	N/A	N/A	N/A	N/A	N/A	N/A
<u>RECREATION</u>						
Emphasis in suitable areas	Wilderness: semi primitive nonmotorized settings	N/A	N/A	N/A	N/A	N/A
Emphasis in nonsuitable areas	N/A	N/A	N/A	Normotorized recreation settings	Motorized or nonmotorized settings	Same as No Action Alternative

TABLE 2-18 (Continued)
PROPOSED MANAGEMENT ACTIONS
VALE OF TEARS

Resource	All Wilderness Alternative	Conflict Resolution Alternative	Combined WSAs Alternative	No Wilderness Alternative	No Action Alternative	Preferred Alternative
ORV designations in suitable areas (acres)	7,420, closed, except for authorized uses	N/A	N/A	N/A	N/A	N/A
ORV designation in nonsuitable areas (acres)	N/A	N/A	N/A	7,420, closed, except for authorized uses	7,420, open	7,420, open
<u>LANDS/REALTY ACTIONS</u>	None except those needed to develop valid prior existing rights.	N/A	N/A	Minor, associated w/mineral development	Same as No Wilderness Alternative	Same as No Wilderness Alternative

* Wilderness Study Area Protection Stipulation would be dropped.

TABLE 2-19
COMPARATIVE SUMMARY OF IMPACTS
VALE OF TEARS WSA

Resource	All Wilderness Alternative	Conflict Resolution Alternative	Combined WSAs Alternative	No Wilderness Alternative	No Action Alternative	Preferred Alternative
<u>Wilderness</u>	Wilderness values maintained. development of existing mining claims would impair values in northwest corner of WSA. Low potential that 2 pre-FLPMA leases developed which would impair values of 51% of WSA. Small contribution to ecological diversity in NPS.	Note: There is no Conflict Resolution Alternative for Vale of Tears WSA.	Note: There is no Combined WSAs Alternative for Vale of Tears WSA.	Wilderness values impaired or lost in long-term due to mineral development, although NSO on new oil/gas leases would provide some protection on 49% of WSA. WSA not a major loss to NPS.	Wilderness values lost in long term. WSA not a major loss to NPS.	Same as No Action Alternative
<u>Minerals Oil/Gas</u>	Low potential that 2 pre-FLPMA leases developed; 5 post-FLPMA leases not developed. May be adverse impacts in moderate potential area.			5 post FLPMA leases developed (51% of WSA; 3 wells, acres). NSO likely in long-term on 49% of WSA (pre-FLPMA leases expire 1986). Overall, only a low beneficial impact to oil/gas development.	Moderate potential for development throughout WSA in occupying 15-24 occupying 35-56 acres); beneficial impact.	Same as No Action Alternative. Long term (7 wells,

TABLE 2-19 (continued)
COMPARATIVE SUMMARY OF IMPACTS
VALE OF TEARS WSA

Resource	All Wilderness Alternative	Conflict Resolution Alternative	Combined WSAs Alternative	No Wilderness Alternative	No Action Alternative	Preferred Alternative
<u>Locatables</u>	Moderate potential for development of 23 existing claims. Closed to new mineral entry. May be adverse impact to high base/precious metal potential area (low to moderate potential for other locatables).	Conflict Resolution Alternative	Combined WSAs Alternative	No Wilderness Alternative	No Action Alternative	Preferred Alternative
					Moderate potential for long-term development in spite of ORV constraints. Beneficial impact.	Moderate potential for long-term development; beneficial impact. Same as No Action Alternative.
<u>Livestock</u>	No direct loss of livestock production. Increased cost of livestock management due to ORV closures and constraints on projects. Loss of potential 225 AUMs/year increase.	Conflict Resolution Alternative	Combined WSAs Alternative	No Wilderness Alternative	Potential 225 AUMs/year increase.	Same as No Action Alternative.
					Similar to All Wilderness Alternative, except that 225 AUMs/year potential increase would occur.	Same as No Action Alternative.
<u>Wildlife</u>	Beneficial to game species, raptors, and other wildlife. Some decline in species diversity. Low potential that development of pre-FLPMA leases would disturb some wildlife.	Conflict Resolution Alternative	Combined WSAs Alternative	No Wilderness Alternative	Same adverse impacts as No Wilderness Alternative.	Same as No Action Alternative.
					Extensive mineral development (moderate potential) would cause local disturbance of habitat and disruption of wildlife. No regionally anticipated. Long-term NSD on oil/gas development would greatly reduce adverse impacts on 49% of WSA.	Same as No Action Alternative.

TABLE 2-19 (continued)
COMPARATIVE SUMMARY OF IMPACTS
VALE OF TEARS WSA

Resource ¹	All Wilderness Alternative	Conflict Resolution Alternative	Combined WSAs Alternative	No Wilderness Alternative	No Action Alternative	Preferred Alternative
<u>Soils</u>	Low potential for soil losses of 30-115 tons over a 5-year period (pre-FLPMA oil/gas leases). Surface-disturbing activities would be reduced. Potential sediment sources and soil productivity would stabilize. Methods of correcting existing or potential problems (mainly from livestock grazing) would be limited.	Conflict Resolution Alternative	Combined WSAs Alternative	No Wilderness Alternative	No Action Alternative	Preferred Alternative
				Soil losses of 50-170 tons over 5-year period. Long-term protection on 49% of WSA. Mitigation and watershed/range projects would reduce adverse impacts and help stabilize soil.	Soil losses of 125-400 tons over 5-year period. Intensive methods for rehabilitating problem areas would be allowed.	Same as No Action Alternative.
<u>Water Resources</u>	Low potential for increased sedimentation (30-115 tons over 5-year period). Sediment yield would be reduced and groundwater resources would remain undisturbed.	Conflict Resolution Alternative	Combined WSAs Alternative	No Wilderness Alternative	No Action Alternative	Preferred Alternative
				Increased sedimentation (up to 50-170 tons over 5 years). NSO for oil/gas on 49% of WSA, ORV restrictions, watershed projects, range improvement projects would help reduce adverse impacts.	Increased sedimentation (up to 125-400 tons over 5 years). Potential for accidental contamination of groundwater. Mitigation and watershed projects would be beneficial.	Same as No Action Alternative.
<u>Recreation²</u>	ROS settings maintained: 82% SPM, 13% SPM.	Conflict Resolution Alternative	Combined WSAs Alternative	No Wilderness Alternative	No Action Alternative	Preferred Alternative
				Moderate benefits to nonmotorized recreation opportunities, but over long term SPM settings would trend to SPM and RI settings.	SPM settings decreased 68%; SPM increased 1%; RN and R added (68% of WSA).	Same as No Action Alternative.

TABLE 2-19 (continued)
COMPARATIVE SUMMARY OF IMPACTS
VALU OF YEARS WSA

Resource ¹	All Wilderness Alternative	Conflict Resolution Alternative	Combined WSAs Alternative	No Wilderness Alternative	No Action Alternative	Preferred Alternative
<u>Visual Resources³</u>	Class I objectives and scenic quality maintained.			Potential for some permanent loss of VPM Class II landscape with any extensive development such as mining claims or existing oil and gas leases. Long-term oil/gas NSO would be beneficial on 49% of WSA.	Some permanent loss of VPM Class II landscape with extensive resource development.	Same as No Action Alternative.
<u>Economics</u>	Economic potential associated with mineral development foregone. Effect on employment, income, public revenue, infrastructure is unknown.			Economic potential of oil and gas development foregone on 49% of WSA. Economic potential of locatable mineral development not foregone. Effect on employment, etc., is unknown.	Economic potential of mineral development not foregone. Effect on employment, etc., is unknown.	Same as No Action Alternative.

1/ There would be no significant adverse or beneficial impacts to air quality, topography, forest/woodland resources, cultural resources, paleontological resources, lands/realty actions or social values for any WSA under any alternative under consideration. Except for two rare and endemic plant species in Cross Mountain WSA (see Natural History), there would be no significant adverse or beneficial impacts to vegetation for any WSA under any alternative, including threatened, endangered, candidate, and Colorado BLM sensitive plant species.

2/ P = primitive; SPM = semiprimitive nonmotorized; SPM = semiprimitive motorized; RN = roaded natural; R = rural; MU = modern urban. The Recreation Opportunity Spectrum (ROS) Classes are described in Appendix D.

3/ Visual Resource Management (VRM) class objectives are briefly defined in Appendix E.

WILDERNESS MANAGEABILITY

Manageability means the wilderness area must be capable of being effectively managed to preserve its wilderness character. Effectively managed means that an area can be managed to maintain the public benefits which justified wilderness designation. Therefore, a wilderness area must be capable of being managed over the long term to preserve its wilderness character, both to maintain the quality of its wilderness characteristics and to ensure continuation of its uses and multiple resource benefits.

For an area to be recommended as "suitable" BLM must be reasonably certain that the entire area can be managed as wilderness over the long term. This determination is based on the present knowledge of the resources or uses as described in Chapter 3 and the potential impact of these activities on preservation of an area's wilderness character as described in Chapter 4.

The following is a determination of manageability for each WSA and alternative. None of the WSAs could be managed as wilderness under the No Wilderness or No Action alternatives; therefore, only alternatives with a suitable recommendation are considered below.

The West Cold Spring WSA is considered manageable as wilderness under the All Wilderness and Conflict Resolution alternatives. The area along the northern boundary may be subject to outside sights and sounds from oil and gas development or other uses not compatible with wilderness, which would diminish solitude and primitive unconfined recreation in this area only in the short term during development.

The majority of the Diamond Breaks WSA is considered manageable as wilderness under the All Wilderness Alternative. The 130 acres under a Recreation and Public Purposes Act lease to the state of Utah could not be managed as wilderness until the lease expires. Although no developments are planned, this area is subject to prior existing rights. The cherrystem ways in Chokecherry and Yellow Jacket draws would be subject to ORV use causing manageability problems in a small portion of the WSA.

The Diamond Breaks WSA is considered manageable as wilderness under the Conflict Resolution Alternative. However, a small portion near Chokecherry, Yellow Jacket, and Warren draws would be subject to possible ORV use and developments which would impair the quality of the wilderness characteristics in adjacent portions of the WSA.

The majority of the Cross Mountain WSA is considered manageable as wilderness under the All Wilderness Alternative. Approximately 200 acres along the southern boundary would be subject to potential mineral development which could cause a loss of naturalness. Although this

development is unlikely within the WSA, it could occur adjacent to the southern boundary. In addition, the relatively flat area between Moffat County Road 10 and the east side of the mountain could not be managed as wilderness because the area cannot effectively be closed to ORV use, unless the area is fenced and patrolled to prevent unauthorized use. The Conflict Resolution Alternative would eliminate these potential conflicts and manageability would be enhanced under this alternative. The ways within and adjacent to the WSA would be closed to vehicle use.

All five Dinosaur Adjacent North Section 202 WSAs can only be managed as wilderness if the adjacent Dinosaur National Monument lands are also managed as wilderness. The adjacent Monument lands have been administratively endorsed as wilderness but are not designated.

The National Park Service (NPS) prepared the *Preliminary Resource Assessment for Wilderness Study Areas Contained in H.R. 1214*, July 1984, which contains an assessment of the Ant Hills, Chew Winter Camp, and Peterson Draw WSAs. H.R. 1214 was introduced in the House of Representatives "to provide for the transfer of administrative jurisdiction of certain public lands and for other purposes." In its preliminary assessment the National Park Service found in summary: "Ultimately should such lands be added to the park units they would only be considered minor buffer additions to the current park boundary. Such additions would be insignificant in terms of their value and contribution to the NPS area." The WSAs were found (1) not to possess significant scenic, scientific, cultural, and recreational values that importantly supplement or complement those within the current Monument boundary and (2) not to fill a management or administrative need for resource protection or public use in relation to the Monument.

For the above reasons and due to the hunting and grazing taking place in the Ant Hills, Chew Winter Camp, and Peterson Draw WSAs, as well as the oil and gas leases and mining claims within the areas, these WSAs could be more effectively managed by BLM rather than transferring administration to the National Park Service.

The Ant Hills, Chew Winter Camp, Tepee Draw, and Vale of Tears WSAs are considered manageable as wilderness under the All Wilderness Alternative with closure of all of the ways protruding into these areas. The portion of the Peterson Draw WSA adjacent to the KT copper mine could not be managed as wilderness due to outside sights and sounds from the copper mine.

The Ant Hills and Peterson Draw WSAs are considered manageable as wilderness under the Conflict Resolution Alternative. The Ant Hills, Chew Winter Camp, and Peterson Draw WSAs would be manageable as one unit under the Combined WSAs Alternative.

CHAPTER 3

AFFECTED ENVIRONMENT

INTRODUCTION

This chapter describes the environmental setting of the areas to be affected by the alternatives under consideration. The environment described in this chapter includes 90,887 acres in eight Wilderness Study Areas (WSAs) in the Little Snake Resource Area (portions of two WSAs extend into the Diamond Mountain Resource Area in Utah). The description is specific to the issues described in Chapter 1.

Aspects common to all of the WSAs are discussed in a context of a regional affected environment. Aspects specific to a certain WSA are discussed individually in this chapter and also analyzed later in Chapter 4, on an individual basis. The three areas being studied under the authority of Section 603 of the Federal Land Policy and Management Act of 1976 are discussed first. The five areas being studied under the authority of Section 202 of the Federal Land Policy and Management Act are then presented.

REGIONAL AFFECTED ENVIRONMENT

CLIMATE

Precipitation

The five Section 202 WSAs adjacent to Dinosaur National Monument show the least elevational change and, therefore, show minimal differences in precipitation. These units receive 15 to 18 inches of precipitation annually, with 50 percent of this occurring as snowfall.

However, the West Cold Spring and Diamond Breaks WSAs include both relatively low and high elevations, resulting in greater climatic differences within the areas themselves than between the two units. The lower elevations along the Green River, present in both areas, are arid and

normally receive 7 to 9 inches of precipitation annually, with 40 percent occurring as snowfall. The mid-elevations typically receive 10 to 14 inches, while the high elevations normally have 15 to 18 inches of precipitation annually. The amount of precipitation as snowfall in both instances is approximately 50 percent.

The Cross Mountain WSA shows the same pattern of precipitation. Lower elevations (6,000 feet) receive 10 to 14 inches of annual precipitation and higher elevations (7,600 feet) 15 to 18 inches.

Temperature

Temperature values must be stated even more generally than precipitation figures because the landscape, which provides different exposures to solar radiation and wind, influences temperature. Generally, air temperature decreases with increasing elevation. The frost-free days (length of time temperatures are greater than 32 degrees F) would probably average from slightly over 100 days at lower elevations to less than 60 days at elevations over 8,000 feet. The mean annual temperature at Dinosaur National Monument Headquarters is 46.5 degrees F. The region that encompasses the eight WSAs is characterized by good solar heating and clear skies.

AIR QUALITY

All eight WSAs are managed under Prevention of Significant Deterioration Class II Air Quality Standards according to the Bureau of Land Management's (BLM's) Wilderness Management Policy (*Federal Register*, Vol. 47, No. 23, Feb. 3, 1982). Prevention of Significant Deterioration Class II allows moderate deterioration associated with average, well controlled industrial and population growth. Designation of any or all of these WSAs as wilderness would not change the air quality standards unless the state of Colorado deemed it appropriate to reclassify them to Class I attainment areas.

CHAPTER 3

Based on what is known of air quality across northwest Colorado, the air quality of the eight wilderness study areas meets National Ambient Air Quality Standards.

WILDERNESS

The majority of the existing wilderness areas located in the contiguous United States is found within the mountainous portions of the western United States. As identified by the Bailey-Kuchler Ecosystem map of ecoregions in the United States, the wilderness areas are primarily located in the Pacific, Sierran, or the Rocky Mountain Forest Province. The WSAs contain some dominant physical and biological characteristics which can be integrated and classified into regional land units called ecosystems. These systems and landforms will be considered, as will the other considerations in the wilderness resource portions of this chapter. The classification of ecosystems is based on an integration of the natural factors of climate, vegetation, soils, and landforms. Wilderness designation presents an opportunity to preserve, in an unimpaired condition for future generations, examples of the basic ecosystems and landforms present in the United States.

The BLM has selected the Bailey-Kuchler Ecosystem of the United States land classification system utilized by the U.S. Forest Service in its RARE II and "further planning" wilderness studies (Bailey 1976 and Kuchler 1966). The Bailey-Kuchler system was selected because it is a land classification system which facilitates planning at the national level and provides a broad synthesis of current knowledge about the ecosystem geography of the country.

It also serves as a useful reference for those who desire an overview on a comparable basis of ecosystem and landform representation in existing and potential National Wilderness Preservation System (NWPS) units.

Land areas providing ecosystem and landform representations within the NWPS should be greater than 1,000 acres in size to typify the dynamics of an ecosystem. On a site specific basis, the Bailey-Kuchler system may be further refined to reflect the presence of unique ecosystems or landforms within WSAs at a finer level of detail than a nationwide land classification system can provide.

All of the WSAs are located in the Rocky Mountain Forest Province Ecoregion and are classified as either juniper-pinyon woodland, sagebrush steppe, or mountain mahogany-oak scrub. A portion of the West Cold Spring WSA appears to fall into a transition zone between the Rocky Mountain Forest Province and Wyoming Basin Province.

The only designated wilderness area in Colorado with a similar type of ecoregion/ecosystem is 11,180 acres of juniper-pinyon woodland in the Black Canyon of the Gunnison National Monument. No other designated areas in Colorado or Utah have Rocky Mountain Forest/juniper-pinyon or sagebrush steppe classifications. Three designated wilderness areas in Utah totaling 70,388 acres are classified as mountain mahogany-oak scrub. In addition, 232,692 acres in Dinosaur National Monument and the Colorado National Monument have been administratively endorsed for wilderness designation.

This acreage is almost evenly divided between juniper-pinyon woodland and sagebrush steppe vegetation. One area (14,880 acres) in the Wyoming Basin province classified as sagebrush steppe is designated wilderness in Wyoming.

Appendix A gives a listing of areas designated, administratively endorsed, or currently under study within a 200 mile radius of the planning area.

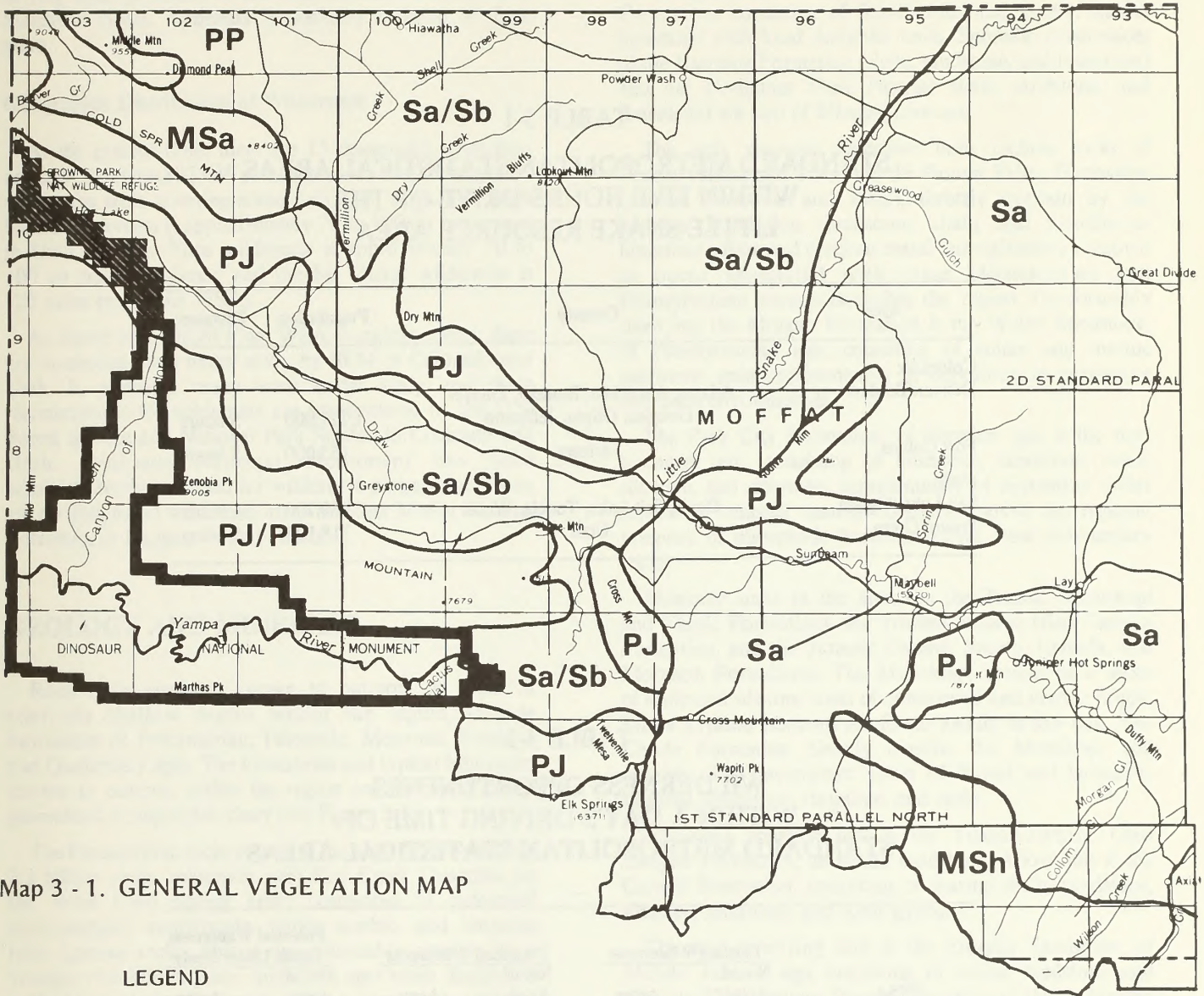
Map 3-1 displays the WSA region and a general map of vegetation types found in the surrounding areas.

Opportunities for Solitude or Primitive Recreation Within a Day's Driving Time (5 hours) of Major Population Centers

The House report on the Endangered American Wilderness Act of 1978 states that one of the goals of Congress is "... locating wilderness areas in close proximity to population centers." To help meet this goal, the wilderness study policy dictates an analysis of the number of population centers within a day's drive (5 hours) of a study area in order "to acquire a relative measure of the potential demand being placed on wilderness areas." These population centers are defined as standard metropolitan statistical areas (SMSAs). A SMSA is defined by the U.S. Bureau of the Census as a county containing at least one city of 50,000 inhabitants or more, plus as many adjacent counties as are metropolitan in character and are socially integrated with that central city or cities, the entire area having at least 100,000 inhabitants. SMSAs within 5 hours drive of the Little Snake Resource Area are shown in Table 3-1.

In addition, other areas have significant populations although they are not SMSAs. Grand Junction, Colorado, and its surrounding area has an estimated (1984) population of 83,000 and Casper, Wyoming, and its surrounding area has an estimated population of 69,600. The WSAs are within a day's drive of an estimated four million people in three states.

Table 3-2 summarizes the amount of wilderness under existing, proposed, and potential categories within a day's



Map 3 - 1. GENERAL VEGETATION MAP

LEGEND

- PP Ponderosa Pine
- PJ Pinyon Juniper
- PJ/PP Pinyon Juniper with Scattered Stands of Ponderosa Pine
- MSh Mountain Shrub - Oakbrush - Serviceberry
- MSa Mountain Sage
- Sa/Sb Wyoming Sage and Saltbrush
- Sa Wyoming Sage

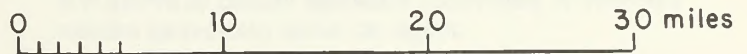
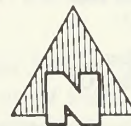


TABLE 3-1
STANDARD METROPOLITAN STATISTICAL AREAS
WITHIN FIVE HOURS DRIVE OF THE
LITTLE SNAKE RESOURCE AREA

Area	County	Population	Distance
Colorado: Denver/Boulder	Adams, Arapahoe, Boulder, Denver, Douglas, Gilpin, Jefferson	1,721,000	5 hours
Fort Collins	Larimer	155,000	5 hours
Utah: Salt Lake/Ogden	Davis, Salt Lake, Tooele, Weber	969,700	4 hours
Provo/Orem	Utah	218,106	5 hours

TABLE 3-2
WILDERNESS OPPORTUNITIES
WITHIN A DAY'S DRIVING TIME OF
STANDARD METROPOLITAN STATISTICAL AREAS

SMSA	Existing Wilderness		Proposed Wilderness		Potential Wilderness Lands Under Study	
	No. of Areas	Acres	No. of Areas	Acres	No. of Areas	Acres
Denver/Boulder and Ft. Collins, CO	29	2,663,734	11	920,553	37	687,667
Salt Lake/Ogden and Provo/Orem, UT	14	1,840,520	11	1,279,703	87	4,013,722

driving time (5 hours) of the four Standard Metropolitan Statistical Areas. Appendix B provides a listing of these areas.

Geographic Distribution of Wilderness

At the present time, there are 15 designated wilderness areas in Utah with 802,639 acres. Colorado has 27 designated wilderness areas covering some 2,633,300 acres. The High Uintas wilderness is approximately 70 to 100 air miles west in Utah, the Flat Tops wilderness is approximately 70 to 100 air miles southeast, and the Mt. Zirkel wilderness is 125 miles east of the WSAs.

As shown in the BLM Final WSA Inventory report, there are numerous areas under study by BLM in Colorado and Utah. In addition, many areas under study and those recommended for wilderness are administered by the U.S. Forest Service and National Park Service in Colorado and Utah. Dinosaur National Monument has been administratively endorsed for wilderness designation. There are no designated wilderness areas in either Moffat County, Colorado, or Daggett County, Utah.

GEOLOGY AND MINERALS

Rock units presently known to outcrop, or occur at relatively shallow depths within the region, include formations of Precambrian, Paleozoic, Mesozoic, Tertiary, and Quaternary ages. The formations and typical lithologies known to outcrop within the region are described in the generalized stratigraphic chart (see Figure 3-1).

The Precambrian rocks consist of the older (approximately 2.3 billion years, minimum age) Red Creek Quartzite (in the West Cold Spring area) composed of deformed metaquartzite, amphibolite, minor marble, and intrusive felsic igneous rocks. This is unconformably overlain by a younger (1.6 billion years, minimum age) series designated as the Uinta Mountain Group, which is composed of marine sandstone, silty shale, and conglomerate.

These strata, as well as the younger and overlying Paleozoic and Mesozoic units, are inclined from their originally horizontal-subhorizontal depositional attitudes and dip variably as a function of the structural relationships within each WSA.

The Paleozoic rocks which outcrop within the areas, in order of decreasing age, include several units. The oldest is the Lodore Formation, of Cambrian age, consisting of marine sandstone, shale, and conglomerate. Unconformably

overlying the Lodore is the Mississippian Madison/Leadville Formation, consisting of fossiliferous and cherty marine limestone with local dolomite units. Sporadic occurrences of the Humbug Formation (shale, sandstone, and limestone) and the Doughnut Shale (marine shale, sandstone, and limestone) are also of Mississippian age.

The next youngest Paleozoic units include rocks of Pennsylvanian age. These are the Round Valley Formation (marine limestone and shale), directly overlain by the Morgan Formation (sandstone, shale, and fossiliferous limestone). Base and precious metal mineralization is known to occur associated with these Mississippian and Pennsylvanian sequences within the region. Conformably overlying the Morgan Formation is the Weber Sandstone, of Pennsylvanian age, consisting of eolian and marine sandstone units representative of deposition in near-shore and dune environments.

The Park City Formation, of Permian age, is the next youngest unit, consisting of limestone, sandstone, shale, siltstone, and dolomite, representative of deposition under somewhat unusual marine conditions, given the regional presence of phosphatic horizons within these sedimentary rocks.

Mesozoic units in the area are the Triassic Moenkopi and Chinle Formations, the Triassic-Jurassic Glen Canyon Formation, and the Jurassic Carmel, Stump, Entrada, and Morrison Formations. The Moenkopi consists of a series of shale and siltstone units of continental and marine origin. Minor gypsum horizons are found locally in this unit. The Chinle Formation directly overlies the Moenkopi and consists of a fine-grained series of fluvial and lacustrine siltstone, sandstone, claystone, and shale.

The next youngest unit is the Triassic-Jurassic Glen Canyon Formation, an eolian sandstone. Above this is the Carmel Formation, consisting of marine shale, sandstone, siltstone, mudstone, and some gypsum.

The next overlying unit is the Entrada Sandstone, of Middle Jurassic age, consisting of eolian sandstone and siltstone. The overlying Stump Formation, of Upper Jurassic age, consists of marine shale, sandstone, siltstone, and limestone.

The uppermost Jurassic unit is the Morrison Formation, which is made up of shale, claystone, siltstone, sandstone, and bentonite, principally of continental aspect. This unit is noteworthy for its potential paleontological interest, since it is known to contain significant occurrences of vertebrate remains sporadically across the region.

The overlying Cretaceous units include the Cedar Mountain, Dakota, Mowry, Frontier, and Mancos sequences.

SYSTEM	SERIES	FORMATION OR GROUP	DESCRIPTION
QUATERNARY & TERTIARY	Holocene-Oligocene	Surficial deposits	1. Mud, silt, sand, gravel, and rock debris.
	Miocene	Brown's Park Formation	2. Light-gray to light-brown, mostly crossbedded locally tuffaceous sandstone, conglomerate, claystone, and white volcanic ash.
TERTIARY	Oligocene	Bishop Conglomerate	3. Light-gray conglomerate, and sandstone: some tuff and tuffaceous sandstone.
		Bridger Formation	4. Brown and lavender crossbedded sandstone, brown and gray tuffaceous claystone, gray coquinal limestone.
	Eocene	Green River Formation	5. Light-gray marlstone, oil shale, gray claystone, and clay shale; light-gray to brown siltstone, and sandstone; minor limestone.
		Wasatch Formation	6. Varicolored claystone, mudstone, and siltstone; brown to gray lenticular sandstone; lesser conglomeratic sandstone and conglomerate; sparse carbonaceous shale.
		Fort Union Formation	7. Gray to brown sandstone, varicolored claystone and shale, carbonaceous shale with a few thin coal beds; lesser siltstone, mudstone, and conglomerate.

Figure 3 - 1. Generalized Stratigraphic Column of the Little Snake Resource Area

SYSTEM	SERIES	GROUP	FORMATION	DESCRIPTION		
CRETACEOUS	Upper	Mesaverde	Lance Formation	1. Gray shale, light-brown sandstone, and coal;		
			Lewis Shale	2. Dark-gray homogeneous marine shale;		
			Williams Fork Formation	3. Light-brown to white sandstone, gray shale, and coal;		
			Iles Formation	4. Massive beds of light-brown to white sandstone and interbedded gray shale and coal;		
			Mancos Shale	5. Gray to dark-gray marine shale; sandstone beds near top; lower part includes calcareous sandstone of Upper Cretaceous Frontier Sandstone Member and silver-gray siliceous shale of Lower Cretaceous Mowry Shale Member, which are distinguished only locally on west side of Park Range.		
		Lower	Colorado	Niobrara Formation	6. Calcareous shale and marly limestone (Upper Partly age equivalent Cretaceous). to Mancos Shale Dark bentonitic shale; calcareous sandstone and siliceous shale near base.	
				Benton Shale		
			Dakota Sandstone	7. Light-gray and tan sandstone; interbedded dark shale and shaly sandstone.		
		JURASSIC	Upper		Morrison Formation	8. Variegated shale and mudstone in upper part (Brushy Basin Mbr.); light-gray sandstone and minor gray limestone in lower part, locally conglomeratic near base (Salt Wash Mbr.);
					Sundance and Curtis Formations and Entrada Sandstone	9. Sundance (Upper and Middle Jurassic): yellowish- and brownish-gray limestone and sandstone, olive-gray shale, and crossbedded light-gray to orange sandstone; Curtis (Middle Jurassic): yellowish-gray to pale-green glauconitic oolitic marine limestone and sandstone; Entrada (Middle Jurassic): crossbedded light-gray to orange sandstone;
Lower			Glen Canyon Sandstone	10. Crossbedded light-brown to light-gray sandstone; locally similar to overlying Entrada;		
			Chinle Formation	11. Brownish- and purplish-red calcareous siltstone, mudstone, and sandstone; limestone-pellet conglomerate in lower part. Grayish-purple to white coarse-grained sandstone and conglomeratic sandstone, to 25 ft thick, of Cartra Sandstone Member, generally at base.		
TRIASSIC	Upper					

Figure 3 - 1. Cont.

SYSTEM	SERIES	FORMATION OR GROUP	DESCRIPTION
JURASSIC	Upper	Morrison Formation	1. Varicolored bentonitic shale, claystone, and mudstone; discontinuous beds of gray siltstone, sandstone, and conglomerate. In much of quadrangle, upper part is Brushy Basin Member, dominantly varicolored bentonitic mudstone with minor sandstone beds. Lower part is Salt Wash Member, dominantly sandstone alternating with red mudstone.
	Upper and Middle	Stump Formation	2. Greenish-gray shale, glauconitic sandstone, oolitic limestone. May include Curtis Member.
		Entrada Sandstone	3. Light-gray to reddish-orange, very fine to medium-grained, massive to crossbedded sandstone; some siltstone.
	Middle	Carmel Formation	4. Red to green shale, siltstone, fine-grained sandstone, and interbedded gypsum; some oolitic and coquinal limestone.
	Lower Jurassic & Upper Triassic	Glen Canyon Sandstone	5. Light-gray to light-brown, fine-grained, cross-bedded sandstone.
TRIASSIC	Upper	Chinle Formation	6. Red to reddish-brown siltstone, fine- to coarse-grained sandstone, and shale, conglomeratic sandstone, and conglomerate.
	Lower	Moenkopi Formation	7. Red shale, thin-bedded red siltstone and fine-grained sandstone; lesser brown and gray sandstone; gypsiferous.

Figure 3 - 1. Cont.

SYSTEM	SERIES	FORMATION OR GROUP	DESCRIPTION	
PERMIAN		Park City Formation	1. Gray cherty limestone, gray dolomite, brown sandstone, mudstone, and varicolored shale; includes tongue of Meade Peak Phosphatic Shale Mbr. of Phosphoria Fm.	
	PENNSYLVANIAN	Middle	Weber Sandstone	2. Gray, fine- to medium-grained, thickly bedded to massive, crossbedded sandstone; locally contains gray cherty limestone.
		Middle	Morgan Formation	3. Gray limestone, cherty limestone, red shale and siltstone, fine- to medium-grained tan and red sandstone
	Lower	Round Valley Limestone	4. Gray cherty limestone.	
MISSISSIPPIAN	Upper and Lower	Mississippian rocks, undivided	5. Black and red shale, limestone, and sandstone (Doughnut and Humbug Formations). Limestone, dolomitic limestone, and dolomite, variably cherty; lesser red and yellow sandstone (Madison-Leadville Limestone).	
CAMBRIAN	Upper	Ladore Formation	6. Green and red, glauconitic, sandy shale, siltstone, and sandstone; varicolored arkosic and conglomeratic sandstone.	
	Precambrian Y	Uinta Mountain Group	7. Tan to red, fine- to coarse-grained sandstone and quartzite; varicolored shale; lesser conglomerate or conglomeratic sandstone.	
PRECAMBRIAN	Precambrian W	Red Creek Quartzite	8. White, gray, tan, and pale green quartzite; lesser quartz-mica schist, and amphibolite; minor diorite, marble, and pegmatite.	

Figure 3 - 1. Cont.

The Cedar Mountain Formation consists of a series of mudstone, shale, siltstone, conglomerate, and limestone strata. The overlying Dakota Sandstone consists of sandstone, shale, and conglomerate, with thin beds of carbonaceous shale and coal. The coal units of the Dakota may be locally important across the region, but are generally rather thin and discontinuous. The Mowry Shale is a siliceous shale member of the Mancos Shale Formation, frequently quite fossiliferous (especially for fish scales). The Frontier Sandstone Member of the Mancos Shale Formation is a sandstone unit which contains minor carbonaceous shale and coal beds. These coal beds are of some minor economic significance locally across the region. The overlying Mancos Shale Formation proper is a thick marine shale unit, with minor siltstone and sandstone intervals.

The Bishop Conglomerate, of Tertiary age, consists of sandstone, conglomerate, siltstone, rhyolitic tuff, and limestone strata, representative of sedimentary and volcanic material that was reworked in a fluvial-eolian environment. Relationships are somewhat obscure, but materials which most likely should be assigned to the Browns Park Formation, of Tertiary age, overlie the Bishop Conglomerate within the region.

The Browns Park consists of sandstone, tuff, and limestone, representative of volcanic and associated sedimentary environments during late Tertiary time. The clastic sediments are in part reworked volcanic material and contain uranium and vanadium mineralization associated with devitrified tuffaceous materials sporadically across the region. Piedmont, alluvial, landslide, and river terrace deposits of Quaternary age occur sporadically across the area, overlying exposed older rocks.

Regional structural relationships are complex and incompletely understood. Major faults, joint systems, and shear zones strike north-northeast. These lie essentially at right angles to regionally dominant east-southeast trending structures, including folds and faults. The northeast trend parallels a mapped anticlinal structure identified in the vicinity of Sugar Loaf Butte in T. 11 N., R. 101 W. This anticline has influenced the localization of oil and gas accumulations in the Sugar Loaf Gas Field, and the structure is believed to persist to the southwest into the Diamond Breaks area. This may be of speculative significance in terms of oil and gas resource potential within the Diamond Breaks study area, but data are not available to develop this theme. The thrust-faulting across the region is believed to have involved deformation which caused older rocks (Precambrian and portions of the Paleozoic units) to be juxtaposed above younger rocks, some of which may have potential as petroleum reservoir rocks.

The Precambrian rocks of the region have undergone several episodes of structural deformation subsequent to their original formation, with attendant metamorphism and development of structural complexities. They have been uplifted, deformed, and eroded supplying material for the Bishop Conglomerate of Tertiary age, which unconformably overlies exposed Precambrian rocks in scattered localities across the region. Quaternary fluvial and eolian deposits occur upon outcropping Precambrian and Tertiary rocks, subject to local physiographic circumstances.

The study areas are not known to be prospectively valuable for coal. Thermal springs are known in areas of Utah adjacent to Diamond Breaks and West Cold Spring. The region contains major east-west structures. For these reasons these two WSAs may have potential for geothermal resources (see Table 3-3).

Sand and gravel deposits occur throughout the study area. They consist principally of alluvial and colluvial deposits. The former are found along major and tributary drainage courses, as well as on benches and terraces above the present drainages. Colluvial deposits are to be found at the base of essentially any bedrock outcrop of any appreciable relief, as well as within alluvial fans associated with the larger drainages. Construction stone also exists within the study area. Other than for local use, consideration of the resource potential for such commodities within the study area does not seem to be warranted at this time.

More specifically, in the region of the five Section 202 WSAs, major high angle fault and joint systems have been delineated. They are generally west-northwest and east-northeast striking fractures which parallel the axes of major anticlinal and synclinal structures also known in the region. These major structural features are associated with known base and precious metal mineralization across the region.

The Paleozoic sequences within the the WSA, in particular the Lodore, Leadville/Madison, and Morgan Formations, encompassing clastic and carbonate sedimentary rocks, are of types not uncommonly associated with base and precious metal deposits (especially lead-zinc, manganese, plus/minus copper, silver, cadmium, cobalt) elsewhere, worldwide. These stratigraphic sequences, of similar character to those present within the area of the five Section 202 WSAs are associated with known occurrences—of undetermined significance—of these types of mineralization elsewhere within the immediate region. These are “sediment-hosted” types of deposits, generally occurring within carbonate rock sequences, often where juxtaposed with clastic sedimentary rocks, and not uncommonly in regional association with hydrocarbon source and reservoir rocks. The regional associations, including the five Section 202 WSAs, are apparently quite favorable for such deposit types to occur.

TABLE 3-3
 POTENTIAL FOR ENERGY AND
 MINERAL RESOURCES WITHIN THE WSAs

Resource	West Cold Springs	Diamond Breaks	Cross Mountain	All Five Section 202 WSAs
oil and gas	unknown; potentially high	unknown; potentially moderate	unknown; potentially moderate-high	unknown; potentially low to moderate
coal	unfavorable	unfavorable	unfavorable	unfavorable
geothermal	unknown; potentially low	unknown; potentially low	unfavorable	unknown; potentially low
precious metals	unknown; potentially moderate to high	unknown; potentially moderate to high	unknown; potentially moderate to high	high
base metals	unknown; potentially moderate to high	unknown; potentially moderate to high	unknown; potentially moderate to high	high
locatable energy minerals	unknown; potentially moderate	unknown; potentially moderate	unknown; potentially moderate	unknown; potentially low to moderate
sand and gravel	high	high	moderate	moderate
dimension stone	moderate	high	moderate	high
cement rock	low	low	moderate	high
high calcium limestone	low	low	high	high
mineral pigment	moderate	moderate	low-moderate	moderate

The mineralization of interest includes base and precious metals—in particular copper, lead, zinc, iron, manganese, gold, and silver—in part at least associated with faults. There may be additional mineralization associated with the Cambrian Lodore Formation and/or Precambrian Uinta Mountain Group rocks in the subsurface within the study area. In addition to the base and precious metals cited, uranium-vanadium potential exists in the Uinta Mountain Group. Extensive and intensive geologic, geophysical, and geochemical investigations are required to thoroughly evaluate this potential. The required work, using modern concepts and technologies, remains to be done in order to assess the mineral resource potential of the area in a technically substantive manner.

A large proportion of the clastic Precambrian rocks is similar in character and age(s) to sequences associated with a variety of types of sediment-hosted (“stratabound”, perhaps “stratiform”) base (copper, lead, zinc, especially) and/or precious (gold, silver, especially) metal deposits elsewhere

in the world. Other elements commonly associated in economic amounts with such mineralization include but are not limited to cobalt, cadmium, uranium and vanadium. Other Precambrian rock-types within the region are similar in character to sequences associated with gold-uranium ores in clastic (most frequently conglomeratic) sedimentary sequences elsewhere in the world. Additionally, given the geologic relationships, characteristics, and the large volume of the Precambrian rocks within the region, iron and/or manganese mineralization of potential significance could occur, by analogy with known deposits elsewhere in the world.

Current exploration activities for metallic mineral resources worldwide emphasize the increased awareness of the high potential for significant mineralization in sediment-hosted types of deposits. Rock sequences of Precambrian age seem to be particularly favorable for the occurrence of such deposits in clastic sedimentary rocks representative of continental-marginal marine-nearshore marine

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depositional environments. The Uinta Mountain group, as well as the Red Creek Quartzite in West Cold Spring, thus represent particularly attractive geologic settings for the potential occurrence of such mineral deposits, but remain to be evaluated with any thoroughness using modern exploration concepts and methods.

Due to an inadequate geologic data base (surface as well as subsurface, and areally as well as in terms of modern techniques and concepts) the energy and mineral resource potential of the eight WSAs is very difficult to assess in a technically substantive manner at the present time. However, for planning purposes, qualified attempts are essayed, as follows.

Synthesis of GEMS Reports, Witherbee, 1984, public response (e.g., private industry), and other available information suggests the estimated levels of geologic potential for the existence of energy and mineral resources within the WSAs presented in Table 3-3.

Table 3-3 includes an attempt to rate the geologic potential of occurrence of different energy and mineral resources as unfavorable, low, moderate, and high potential. These ratings concern potential for occurrence only and do not attempt to consider economics of potential extraction of the resource.

An unfavorable potential of occurrence is based upon the belief that the geologic characteristics do not indicate favorability for accumulation of mineral resources. A low favorability or potential rating indicates there are very few geologic characteristics favorable for the accumulation of a given resource known to be present. Areas in which only a few geologic characteristics that suggest the occurrence of a given resource are known to be present were given a moderate potential rating. If mineral deposits are known to exist on or adjacent to an area and the area has many geologic characteristics suggesting the occurrence of mineral resources, the area was rated as having high geologic potential of occurrence. The word "unknown" was included in a rating to indicate a very limited data base from which these estimates were derived. This rating scheme is based upon the GEMS Assessment Report (MSME/Wallaby, 1983) and industry response.

The foregoing attempt to qualify the likely level of geologic potential for each of these resources follows the guidelines presented in the GEMS Reports and the responses to the solicitation of public comment put forth by BLM in the initial phases of the Little Snake Resource Management Plan. These guidelines are included in Appendix C. These rating guidelines are consistent with other accepted methods, including those used or proposed by the U.S. Geological Survey, U.S. Bureau of Mines, and Rocky Mountain Oil and Gas Association. For additional information, refer to

the appropriate GEMS Report for the study area, available for review at the Craig District Office.

The hydrocarbon resources which may or may not be present in the WSAs are graphically represented in Figure 3-2. This figure has been constructed from the U.S. Geological Survey Bulletin 1450-A as presented in Appendix F. Please note this figure only indicates the presence of hydrocarbons and is not an indicator of quantity.

The GEMS reports covering the three Section 603 WSAs offer recommendations for further work. These recommendations are listed in Appendix G.

Scenarios were developed for each WSA on the speculation of maximum development of an oil and gas field within the WSA. No known fields exist in the WSA but as described above, geologic conditions indicate the possibility of hydrocarbon deposits. Working from the geologic conditions a list of parameters was prepared which lead to the scenarios in Appendix F. The reader is advised to carefully study the Appendix F to understand the assumptions behind Figure 3-2, scenarios, and economic projections.

THREATENED AND ENDANGERED PLANTS

Habitat and known locations for *Oenothera acutissima* occur on Douglas Mountain close to both the Diamond Breaks and West Cold Spring study areas. Further surveys could disclose further occurrences. *Oenothera acutissima* is listed as a candidate category 2 species and is known to exist in northwest Colorado only at Douglas Mountain and Cold Spring Mountain. It is also known from the Flaming Gorge area in Utah and at Stuntz Reservoir in Colorado.

No information on the remnant plant associations from these areas is available. No inventories have been done.

WILDLIFE HABITAT

Maps 3-2, 3-3, 3-4, 3-5, 3-6, and 3-7 show the major seasonal ranges for pronghorn, mule deer, and elk and the location of potential endangered or threatened species habitat in relation to the WSAs. As shown on Map 3-6, bighorn sheep occur in Cross Mountain and West Cold Spring WSAs.

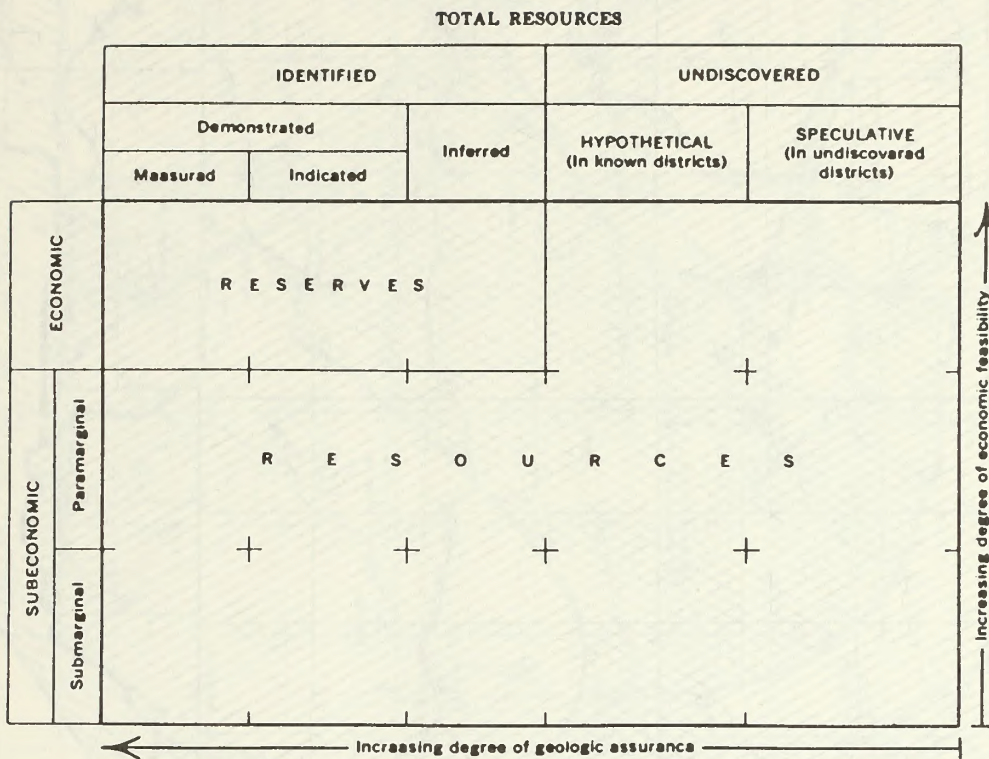


Figure 3 - 2. Classification of Mineral Resources

Potential habitat for endangered or threatened species, Map 3-7, occurs in the Cross Mountain and Diamond Breaks WSAs. Critical winter range for mule deer, Map 3-3, occurs only within the Cross Mountain WSA and is confined to the lowest foothills at the base of Cross Mountain. In general, no unique wildlife habitat occurs in the Section 202 WSAs but they are valuable as refuges that offer protection to wildlife from hunting and other activities.

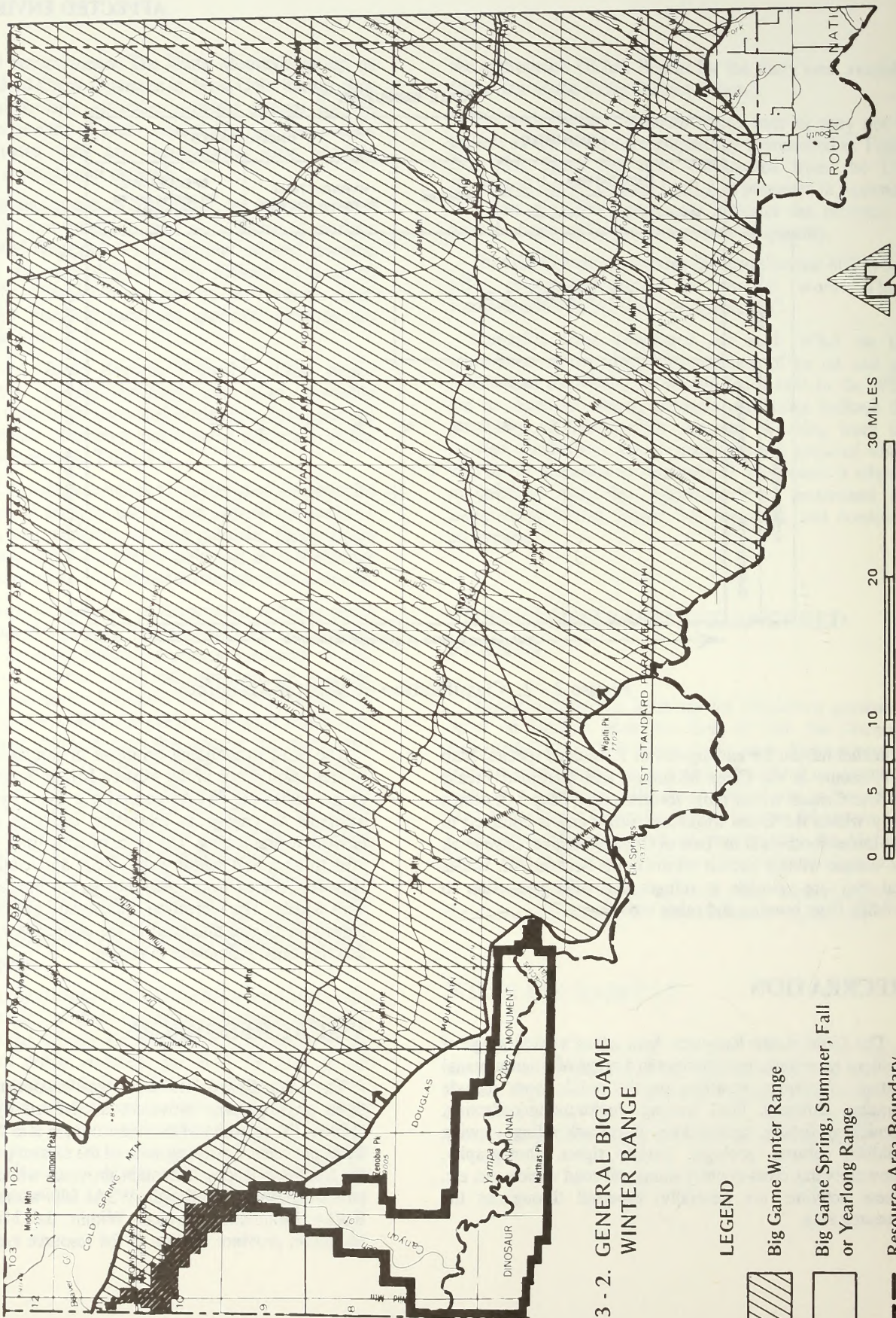
RECREATION

The Little Snake Resource Area offers a wide range of outdoor recreation opportunities in a range of environmental settings. Activities occurring on the public lands include hunting, camping, float boating, rockhunting/collecting, picnicking, fishing, backpacking, horseback riding, viewing wildlife, cultural, geologic, historic sights, photography, snowmobiling, cross-country skiing, off-road vehicle use, etc. These activities are generally dispersed throughout the resource area.




The most outstanding primitive or nonmotorized forms of recreation occur in the western half of the resource area. In particular the WSAs comprise a majority of the area available to engage in recreation activities in a natural environmental setting. The types of activities available from area to area and within each WSA are relatively similar. However, the environmental settings for these activities may vary widely. The recreation opportunity classes (defined in Appendix D and discussed in the sections for each WSA) describe these differences in setting.

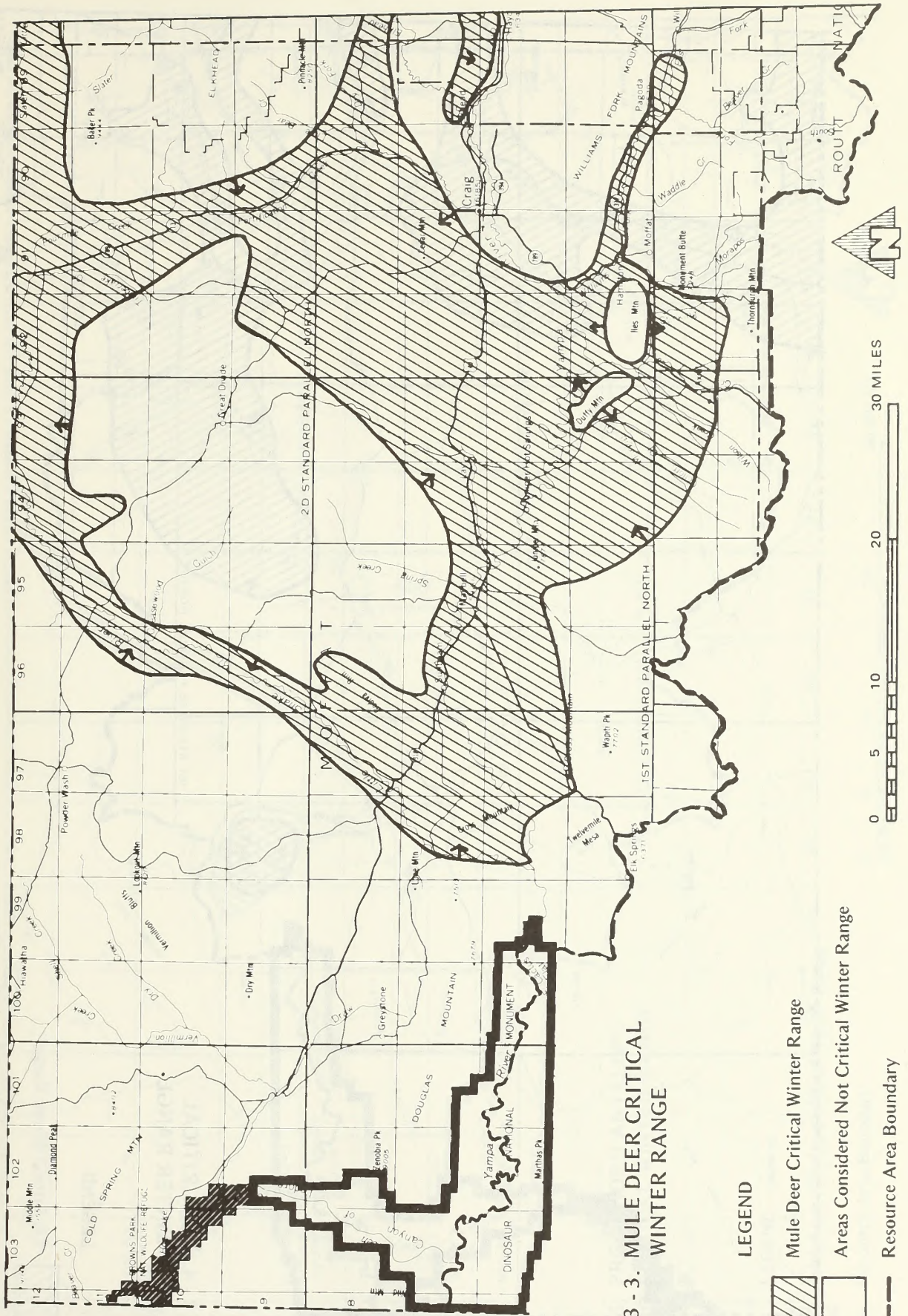
VISUAL RESOURCES

The Little Snake Resource Area encompasses parts of three physiographic provinces as defined by Fenneman (1946). The majority of the resource area is in the Wyoming Basin province. Small segments of the eastern part fall within the Southern Rocky Mountain province while the western part which includes all eight WSAs falls within the Middle Rocky Mountain province. Within the Middle Rocky Mountain province portion of the resource area the WSAs



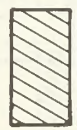
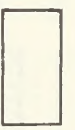

Map 3 - 2. GENERAL BIG GAME WINTER RANGE

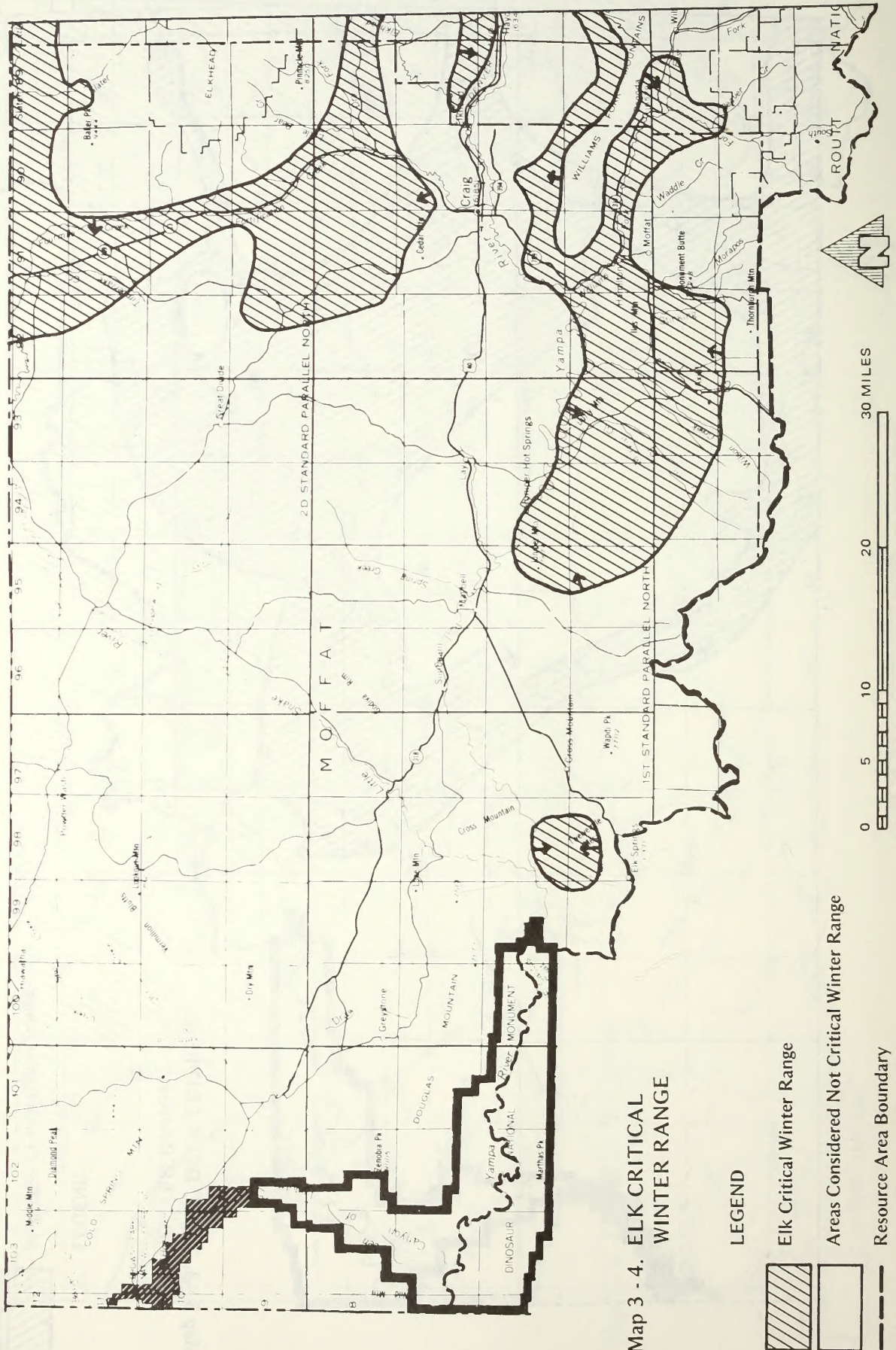
- LEGEND**
-  Big Game Winter Range
 -  Big Game Spring, Summer, Fall or Yearlong Range
 -  Resource Area Boundary



Map 3 - 3. MULE DEER CRITICAL WINTER RANGE




LEGEND

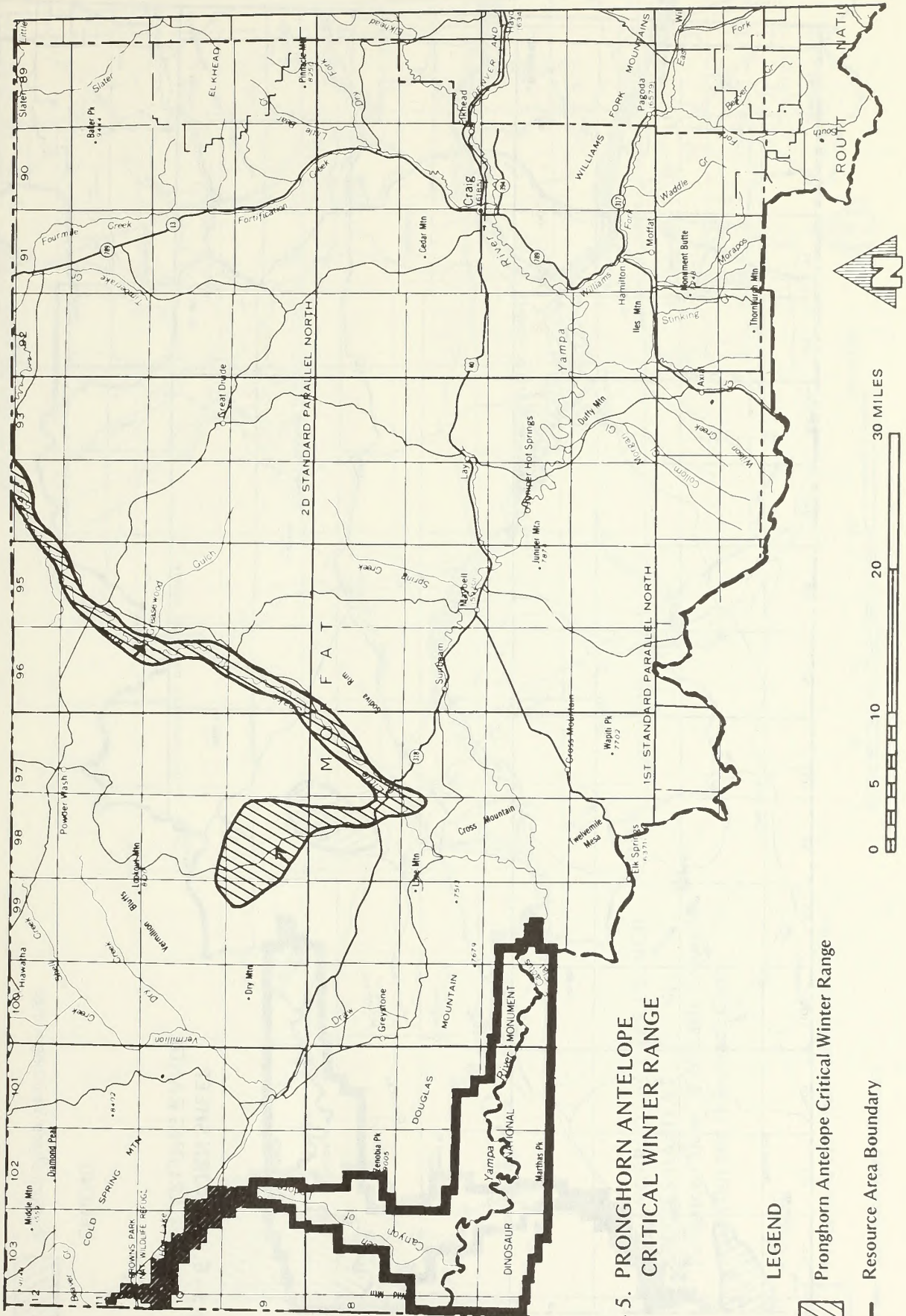
-  Mule Deer Critical Winter Range
-  Areas Considered Not Critical Winter Range
-  Resource Area Boundary





Map 3 - 4. ELK CRITICAL WINTER RANGE

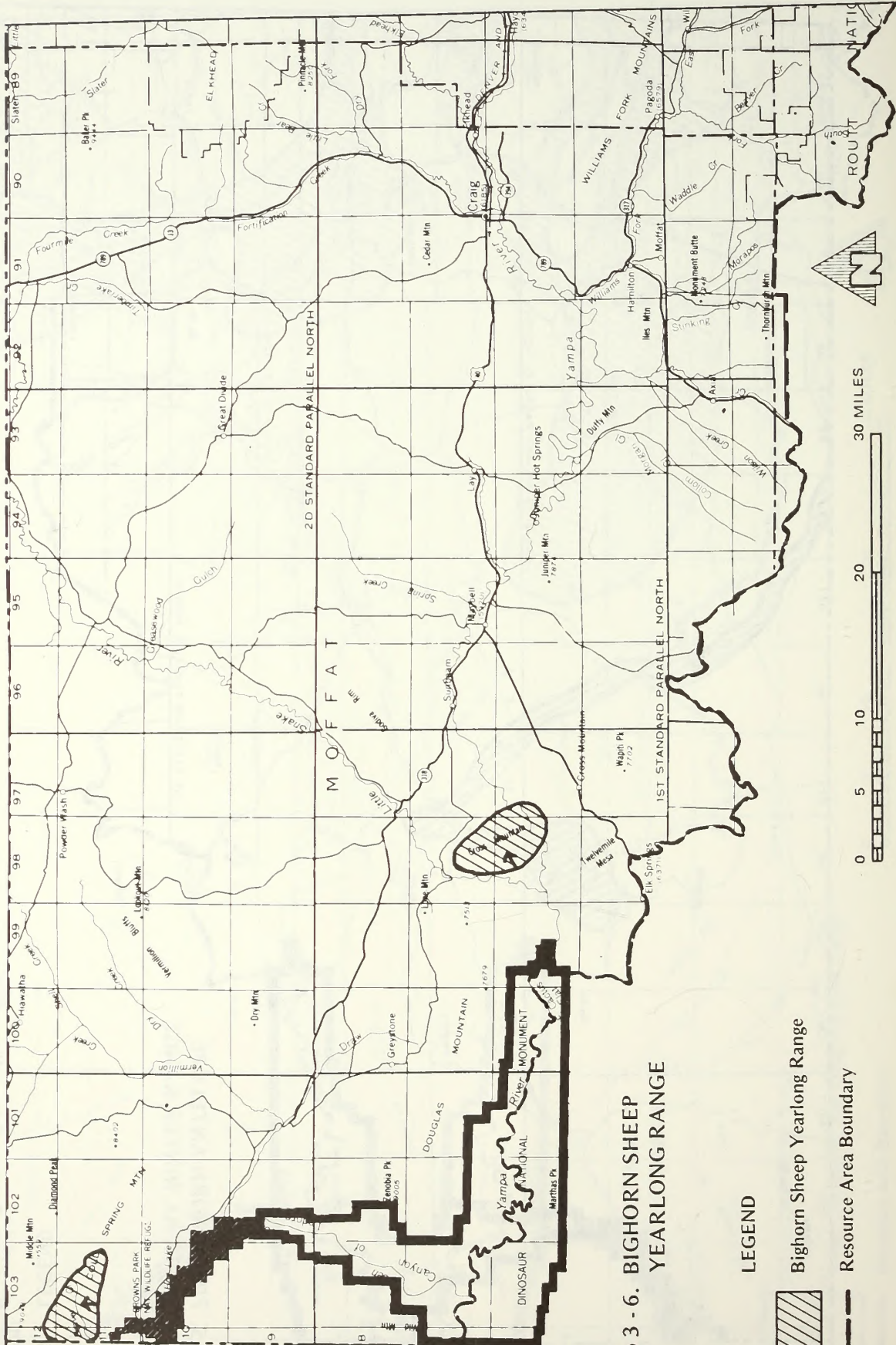
LEGEND

-  Elk Critical Winter Range
-  Areas Considered Not Critical Winter Range
-  Resource Area Boundary





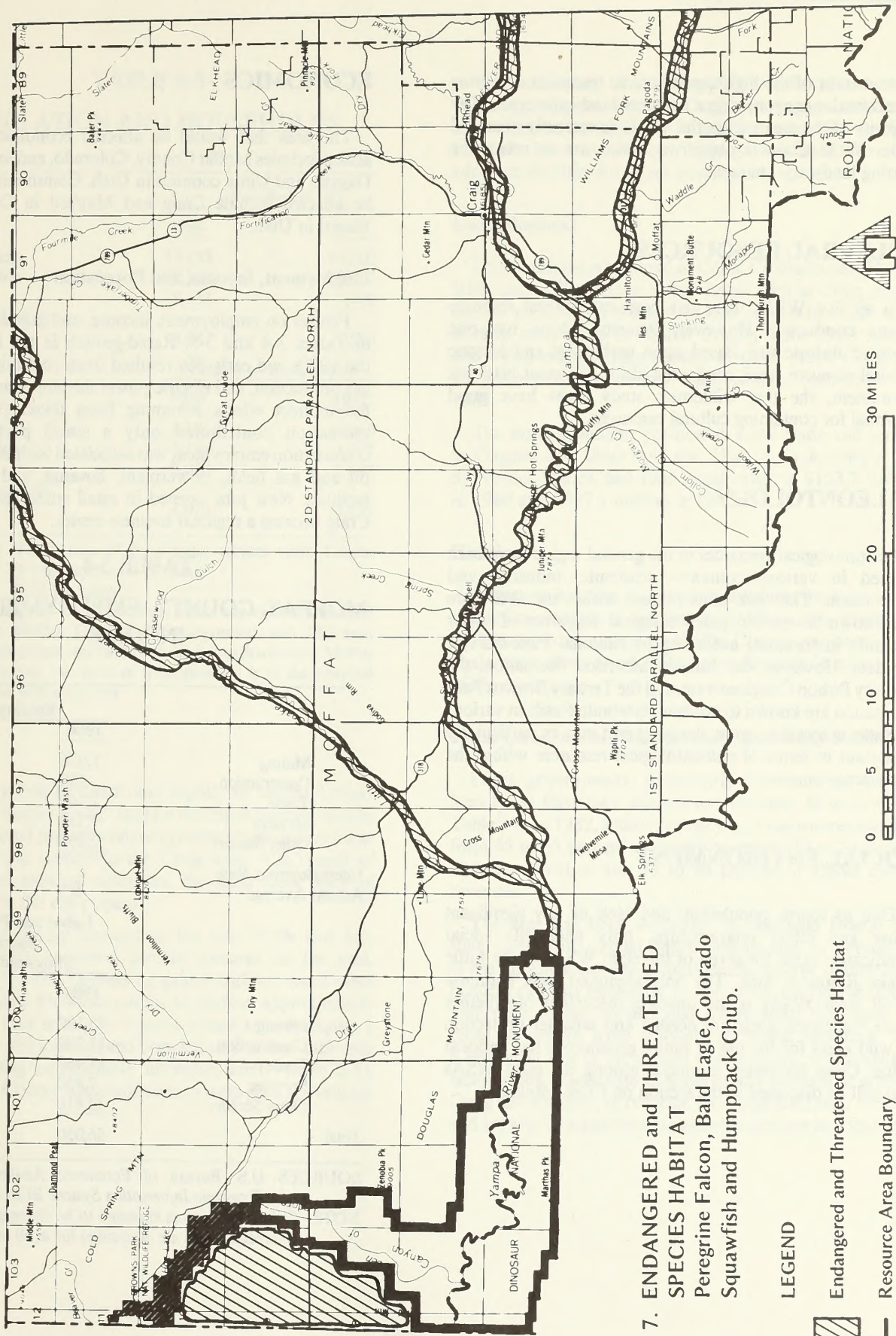
Map 3 - 5. PRONGHORN ANTELOPE CRITICAL WINTER RANGE

- LEGEND**
-  Pronghorn Antelope Critical Winter Range
 -  Resource Area Boundary





Map 3 - 6. BIGHORN SHEEP YEARLONG RANGE

- LEGEND**
-  Bighorn Sheep Yearlong Range
 -  Resource Area Boundary



Map 3 - 7. ENDANGERED and THREATENED SPECIES HABITAT
 Peregrine Falcon, Bald Eagle, Colorado Squawfish and Humpback Chub.

- LEGEND**
-  Endangered and Threatened Species Habitat
 -  Resource Area Boundary

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contain most of the high quality scenic resources comprising of mountain, canyon, ridges and rim landscape types. The majority of the area within the WSAs is currently managed under VRM Class II objectives which are to retain the existing landscape character.

CULTURAL RESOURCES

In all five WSAs there has been no cultural resource survey conducted. However, Peterson Draw has one recorded historic site. Based upon prehistoric and historic cultural resource work conducted inside Dinosaur National Monument, the five wilderness study areas have good potential for containing cultural resources.

PALEONTOLOGY

Paleontological resources in the general region have been studied in various contexts—academic, industry, and government. The rock units present within the WSA are not known to contain paleontological resources of major scientific importance, according to National Park Service file data. However, the Jurassic Morrison Formation, the Tertiary Bishop Conglomerate, and the Tertiary Browns Park Formation are known to contain vertebrate fossils in various localities across the region; the latter unit may be particularly important in terms of paleontological resources within the study area.

SOCIAL ENVIRONMENT

Due to sparse population, and lack of any significant cause and effect relationships, only negligible social significance exists for seven of the eight WSAs in the Little Snake Resource Area. The only identified issue common to all eight WSAs is the ongoing discussion of whether more wilderness areas are needed and whether protection of wild areas for the use of future generations has national value. Cross Mountain is unique among the eight WSAs and will be discussed in the section on Cross Mountain.

ECONOMICS

The area that would be affected economically by this action includes Moffat County, Colorado, and to some extent Daggett and Uinta counties in Utah. Communities that may be affected include Craig and Maybell in Colorado and Vernal in Utah.

Employment, Income, and Population

Figures on employment, income, and population appear in Tables 3-4 and 3-5. Rapid-growth in the latter half of the 1970s and early 80s resulted from coal mining, oil and gas production, and electric power development, along with the indirect effects stemming from these. At this time, recreation contributed only a small part. Increased construction employment was associated with the coal mines, oil and gas fields, powerplant, housing, and commercial facilities. New jobs opened in retail trade and services as Craig became a regional business center.

TABLE 3-4
MOFFAT COUNTY EMPLOYMENT AND
INCOME

	Employment	
	1980	1982
Mining	1,076	600
Construction	559	413
Trade	1,360	1,306
Services	519	661
Other Sectors	2,958	3,051
Unemployment Rate Annual Average	8.3	8.4
Labor and Proprietors' Income (thousand dollars)		
	1980	1982
Mining	25,100	19,648
Construction	13,230	9,241
Trade	17,460	12,363
Services	7,850	8,642
Other Sectors	32,410	27,866
Total	96,050	77,760

SOURCES: U.S. Bureau of Economic Analysis. *Regional Economic Information System*. BLM estimates.

NOTE: Only those sectors expected to be impacted are shown. Indirect impacts are accounted for in all sectors.

TABLE 3-5
POPULATION AND HOUSEHOLDS

	Population	
	1980	1982
Moffat County	13,133	14,500
Craig Division	12,257	10,000
Craig	8,133	7,700
Unincorporated & Dinosaur	4,687	4,500
	Number of Households	
	1980	1982
Moffat County	4,880	4,260
Craig Division	4,560	3,997
Craig	3,020	2,647
Unincorporated & Dinosaur	4,070	3,985

SOURCES: U.S. Bureau of the Census, various years. Census of Population and Housing. BLM estimates.

NOTES: Craig Division comprises about the eastern one-third of Moffat County. Unincorporated and Dinosaur comprises northcentral and northwestern Moffat County, but most of its population is in the Maybell and Dinosaur area.

Unemployment declined only slightly in Moffat County during the "energy boom" despite the rapid increase in jobs because national publicity on energy development drew large numbers of job seekers to the Craig area. Also, many of the new jobs required skills that the local labor force of the late 1970s did not possess.

Continued energy demand in the late 1970s and into the early 1980s created a growth scenario for the area. However, by 1982, decreasing prices and increased costs caused demand for local output to decline approximately 20 percent, thus setting in motion events accompanying a downturn in employment and population. Presently, the area is experiencing considerable unemployment (Table 3-5); thus, Moffat County has a moderate to large pool of available labor.

The availability of shopping facilities has drawn most of the incoming population to Craig, resulting in considerable long distance commuting. Smaller communities, such as Maybell, have experienced little growth and often lack adequate facilities for larger populations.

Local Business

Local business is centered in Craig, Colorado, and Vernal, Utah, and will continue to be. Retail sales in Craig totaled \$129.2 million in 1980 and \$139.0 million in 1982, while sales in other parts of Moffat County were \$32.1 million and \$49.0 million, respectively, in those years. Craig had 80 percent of total county retail sales in both 1980 and 1982.

The same dominant position in retail trade and service in Daggett and Uinta counties, Utah, is undoubtedly held by Vernal, which had total retail sales of \$153.7 million in 1980 and \$327.1 million in 1982.

Housing

Adequate housing is currently available in most areas, and prices continue to decrease in the Craig area. Practically all housing construction in Moffat County has been in the Craig area; there is very little new housing in other parts of the county.

Local Government Finances and Community Facilities

Local governments, particularly communities, depend heavily on their own sources for revenues, as is shown in Table 3-6. In 1982, a fairly typical year, local sources supplied from 48 to 57 percent of county revenues, 64 to 84 percent of town revenues, and 79 to 94 percent of school district revenues.

The area has been successful in obtaining federal and state revenue for capital improvements and, as a result, all of the jurisdictions have a considerable reserve of their legal bonding capacity remaining. Nevertheless, they are obviously vulnerable to any impacts that would affect their local tax bases or require large amounts of capital spending. This is especially true of the smaller communities, whose existing facilities are inadequate to support any substantial growth. Craig and Rangely, in contrast, have upgraded their facilities and are able to accommodate a sizable increase in population.

TABLE 3-6
LOCAL GOVERNMENT REVENUES
(thousand dollars)

	1982
Moffat County	
Property Taxes	4,722
Other local sources	5,027
Federal mineral revenues	599
Other intergovernmental sources	6,855
Total	17,203
Craig	
Local sources	3,364
Intergovernmental sources	2,142
Total	5,506
Moffat County School District	
Property taxes	7,498
Other local sources	1,482
Intergovernmental sources	1,504
Total	10,484

SOURCES: Colorado Division of Local Government. *Local Government Financial Compendium*.
Colorado Division of Property Taxation. *Annual Report*.
Data from local governments.

NOTE: Data includes enterprise funds and special districts providing water and sewer services, etc.

UNIT BY UNIT AFFECTED ENVIRONMENT

WEST COLD SPRING

WILDERNESS VALUES

Mandatory Wilderness Characteristics

Size. The West Cold Spring WSA contains 17,682 acres of public land administered by BLM. The final WSA decision in November, 1980 proposed an area of 14,587 acres. As a result of a protest, 3,095 acres on the west end of the

area in Utah were added back in and are included in this study.

Naturalness. The West Cold Spring WSA consists primarily of the western portion of the rough and steep south-facing slopes of Cold Spring Mountain. The gently sloping surface of the top of the mountain, which is part of the O-Wi-Yu-Kuts Plateau, is only partially in the unit along the northern boundary. Much of the area is characterized by draws and canyons that have cut the prominent O-Wi-Yu-Kuts Plateau, forming a series of plateaus and ridges along the northern margin of the Green River Valley (Browns Park). Cold Spring Mountain is transected by several prominent south-southwest trending drainages, the major ones being Beaver Creek Canyon and Spitzie Draw. Portions of the relatively flat to gently rolling topography of Browns Park make up the lower, southern portions of the study area. The majority of this area is covered with sagebrush. Elevations vary from 5,800 feet in the south to 8,500 feet in the northwest.

The WSA boundary was drawn along state, private, and legal public land boundaries to the north; roads and other imprints, as well as private and state lands, to the west and south; and the Matt Trail to the east. The Matt Trail was originally a stock trail and was bulldozed down the mountain for use as a seismic trail approximately 20 years ago. This trail has been closed and vehicles do not use this extremely rough trail which is becoming overgrown with vegetation.

The study area is in a high quality natural condition and has only minor imprints of man, all related to grazing.

Minor imprints exist but do not represent major surface or vegetation disturbances. They are small, few in number, and well screened by surrounding vegetation and topography. Visual contrast is slight and overall, the area exhibits a high quality natural condition, with man's imprint substantially unnoticeable.

Approximately 2 miles of ways occur near the southern boundary both east and west of Spitzie Draw. A way enters the area from the top of Cold Spring Mountain and traverses approximately 3/4 mile to the west toward Beaver Creek Canyon. A spring development exists near the Calloway Place on the southern boundary and consists of approximately 2,000 feet of black plastic pipe above ground and a small stockwater tank. A second spring development was constructed in 1983, without prior approval, but has since been brought into compliance with the Interim Management Policy. This development consists of approximately 1 mile of small black plastic pipe above ground leading to a small stockwater tank and overflow pit to the west of Spitzie Draw and near the southern boundary. In addition, approximately 1 mile of fence line

exists within the area near the southern boundary in two locations, near the Spitzie place and near Spitzie Draw.

The sights and sounds from man's activities outside of the area are limited to those occurring in Browns Park and are associated with ranching and vehicles traveling Colorado State Highway 318. Because of the distance from these activities, their limited and intermittent occurrence, and the rural nature of the outside environment, these influences neither degrade nor enhance the quality of naturalness within the WSA.

Outstanding Opportunities for Solitude or Primitive and Unconfined Recreation. The area offers outstanding opportunities for both solitude and primitive unconfined recreation. The varied topography and dense pinyon-juniper vegetation offers excellent screening from activities of others within the area. The large size and long, blocked configuration also enhance the variety and extent of places in which to find isolation and experience solitude.

The various draws and canyons, especially Beaver Creek Canyon and Spitzie Draw, provide a secluded environment where users are truly isolated. A sense of vastness is present because of the area's size and the high elevations that provide numerous vistas to the west, overlooking Browns Park, the Diamond Breaks WSA, and the high Uinta Mountains in Utah. These vistas can enhance a feeling of solitude.

The presence of diverse topography and vegetation, water, and a variety of wildlife results in outstanding opportunities for primitive and unconfined recreation. The canyons, draws, colorful red rock outcrops, and moderate to steep slopes of the mountain offer excellent opportunities for backpacking, hiking, photography, scenic viewing, fishing, and other activities. The variety of vegetation—pinyon-juniper woodlands, sagebrush openings, scattered Douglas fir and limber pine, riparian zones in the draws and canyons, mountain shrub communities, and abundant wild flowers—provides opportunities for botanic study.

The vegetation and topography of the WSA also provide habitat for a variety of wildlife, including bighorn sheep, elk, deer, mountain lion, bobcat, black bear, numerous raptors, chukar partridge, prairie dogs, sagegrouse, beaver, and other wildlife species. These offer excellent opportunities for viewing and hunting. Perennial Beaver Creek flows through scenic Beaver Creek Canyon and provides fishing opportunities for brook, brown, and Yellowstone cutthroat trout. The Canyon also provides a hiking corridor along a stock trail from the top to the bottom of the mountain. A portion of the public lands encompassing the canyon is outside the WSA thus confining movement within the WSA as does a section of undeveloped state land which protrudes into the WSA along the northern boundary.

The number and quality of activities available provide West Cold Spring with outstanding opportunities for primitive and relatively unconfined recreation.

The size and blocked configuration of the area enhances the variety and number of places for a high quality primitive type recreation experience and allows virtually unrestricted movement. The rugged terrain restricts use to foot and horseback. Eighty percent of the area is in the semiprimitive nonmotorized Recreation Opportunity Spectrum class. This setting provides opportunities to experience isolation and to have a high degree of interaction with the natural environment, with moderate to high challenge and risk and no motorized use present.

Special Features

Few supplemental values have been recorded because of the area's ruggedness, remote location, and limited inventory work. The area is known to possess historic and prehistoric cultural values varying from Paleo-Indian to the Ute and Shoshoni tribes. The area is part of the Cold Springs quality elk management area designated by the Colorado Division of Wildlife. A herd of bighorn sheep now resides within the area after being reintroduced in 1983. Beaver Creek provides aquatic and riparian habitat for fish and other wildlife species and provides some botanic diversity within the area. Habitat for *Oenothera acutissima*, a candidate for listing as a threatened or endangered plant species, occurs within the area. No other special features are known to occur within the area.

Diversity in the National Wilderness Preservation System

Based on the Bailey-Kuchler vegetation classification system, the area appears to fall into a transition zone between two physiographic regions: Rocky Mountain Forest Province and Wyoming Basin Province. The potential natural vegetation and estimated acreages are summarized in Table 3-7.

Variations in vegetation occur within these potential natural vegetation types that are not suggested by the names. Riparian vegetation (i.e., cottonwood, willows, boxelder, dogwood, cattails, etc.) occurs in Beaver Creek Canyon and Spitzie Draw and in other drainages near streams and springs. The north slopes of Beaver Creek Canyon and the area along the north boundary of the study area have Douglas fir, limber pine, mountain mahogany, chokecherry, aspen, and other plant species.

TABLE 3-7

POTENTIAL NATURAL VEGETATION
IN WEST COLD SPRING WSA

Province	Potential Natural Vegetation	Acres
Rocky Mountain	Juniper-Pinyon Woodland (M3110-21)	12,682
Wyoming Basin	Sagebrush-Steppe (A3140-49)	5,000

GEOLOGY AND MINERALS

Only the Precambrian, Red Creek Quartzite and Uinta Mountain Group, the Tertiary Bishop Conglomerate and Browns Park Formation, and Quaternary rocks occur within the West Cold Spring WSA. Refer to the Regional Affected Environment for detailed descriptions of these rock units and their relationships.

A list of oil and gas leases within the West Cold Spring WSA, with dates of issuance, is shown in Table 3-8. Leases are shown on Map 3-8.

Proprietary geophysical data and geologic modeling of subsurface relationships indicate high potential for the existence of hydrocarbon accumulation, in economically viable amounts, at economically feasible depths, within the entire area of the WSA. The structural geology, stratigraphy, and sedimentology, known and inferred, are all quite favorable, and represent, at least in part, extensions of known subsurface geology from areas of significant oil and gas production adjacent to the WSA, along well defined regional trends. Potential hydrocarbon reservoir rock horizons include the Precambrian Uinta Mountain group, as well as numerous stratigraphic intervals in Mesozoic and Paleozoic sequences. Structural complexities, including imbricate faulting and stratigraphic overturning, add to the potential for oil and gas accumulations, by repetition of stratigraphic intervals, and attendant hydrocarbon trapping and/or sealing effects.

Additionally, there are numerous thick and areally extensive sedimentary rocks present regionally which could have acted as petroleum source materials, and the thermal-geochemical-maturation characteristics are favorable as well for the generation of oil and gas.

There is an oil and gas well (Champlin Federal 31-19, Bear Springs) which penetrates Precambrian rocks adjacent to the northeast corner of the WSA. This well penetrated

subjacent, structurally complex younger sedimentary rocks of Mesozoic and Paleozoic ages, with significant shows of hydrocarbons in several horizons. Another exploratory oil and gas well (McMoran-Freeport 43-2A State) was drilled in 1984, just to the northwest of the WSA, in Daggett County, Utah. This well encountered subsurface lithologies, stratigraphic and structural relationships similar to those discussed in the Champlin well, with certain significant differences. The major structural and stratigraphic relationships are indicated to extend under the study area, with hydrocarbon resource potential inferred to be high. This is part of a currently active major "exploration play" for oil and gas across the Rocky Mountain region, consisting conceptually of subsurface prospecting beneath "foreland thrust plates" (Gries 1983; Brown 1984).

There are thermal springs adjacent to the study area in Utah and the area contains major east-west structures, both of which suggest some potential—probably low—for geothermal resources.

As of July 1984, there were no patented or unpatented mining claims within the unit. Numerous unpatented claims are located west, south, and southeast of the study area in Daggett County, Utah, and Moffat County, Colorado. As discussed in the Regional Affected Environment, the Precambrian Uinta Mountain Group, as well as the Red Creek Quartzite, represent particularly attractive geologic settings for the potential occurrence of base and precious metal deposits and the Tertiary Browns Park Formation may be host to uranium and vanadium deposits. Anomalous concentrations of copper and molybdenum were identified in stream sediments by a reconnaissance geochemical survey conducted during the summer of 1983 (Witherbee and Low 1984), indicating a potential for base and precious metal deposits.

See Table 3-3 in the Regional Affected Environment for estimated levels of geologic potential for the energy and mineral resources.

The GEMS report (MSME/Wallaby, 1983, Section V, Recommendations for Further Study) covering this WSA offers recommendation for further work. These recommendations are listed in Appendix G.

VEGETATION

The black sagebrush community comprises large areas of broken lands on O-Wi-Yu-Kuts Mountain, extending into the extreme northern part of the study area. Within this community, small inclusions of big sagebrush, curlleaf mountain mahogany, aspen, and Douglas fir exist. The black sagebrush is on the shallow, stony soils on sidehills and ridgetops. It is replaced by big sagebrush and isolated patches

TABLE 3-8
OIL AND GAS LEASES IN
WEST COLD SPRING WSA

<u>Lease</u>	<u>Date of Issuance</u>	<u>Acres in WSA</u>	<u>Special Stipulations¹</u>
A = C36585	Pending	5,160	Pending
B = C27051	9/12/78	320	None
C = C39170	Suspended	352	Pending
D = C27056	9/12/78	120	None
E = C27054	2/14/79	70	Wilderness Study Area Protection
F = C25731	9/20/77	240	None
G = C26954	9/12/78	1,199	None
H = C19724	Expired	1,280	Pending
I = C36586	Pending	921	Pending
J = C30689	5/5/81	190	None
K = C19723	Expired	1,760	Pending
L = C19721	Expired	640	Pending
M = C23010	Expired	440	Pending
N = C19719	Expired	640	Pending
O = C19729	Expired	1,290	Pending
P = C30688	6/22/82	62	Wilderness Study Area Protection
Q = U44385	9/1/82	315	Wilderness Study Area Protection
R = U41154	12/1/78	1,231	1,120 acres No Surface Occupancy; Wilderness Study Area Protection
S = U44257	2/1/80	440	440 acres No Surface Occupancy; Wilderness Study Area Protection
T = U21504	Expired	640	Pending
U = U37298	9/1/77	574	None
V = C-36577	5/26/83	15	None

¹ Does not include seasonal or standard stipulations. The "Wilderness Study Area Protection" stipulation applies only during interim management. If the WSA is not designated as wilderness, the stipulation would no longer apply.

* Expired

Status as of August, 1985; updated information may be obtained through BLM, Colorado State Office, Mineral Leasing Section (CO-943), 2020 Arapahoe, Denver, Colorado.

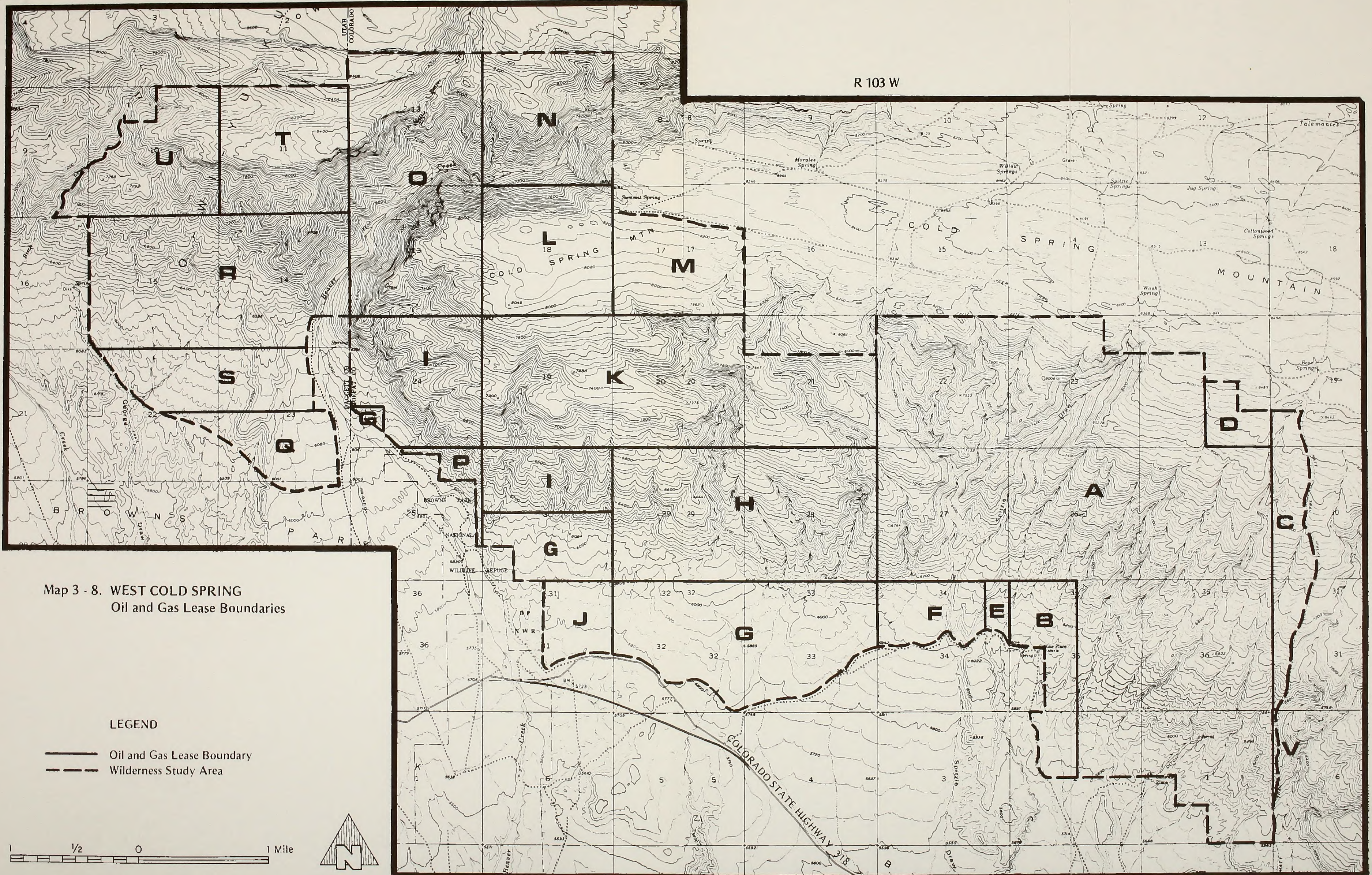
R 25 E

R 104 W

R 103 W



T 11 N

T 10 N



Map 3 - 8. WEST COLD SPRING
Oil and Gas Lease Boundaries

LEGEND

-  Oil and Gas Lease Boundary
-  Wilderness Study Area

1 1/2 0 1 Mile



of small, open grassy areas in the moderate-moisture, concave areas. Curlleaf mountain mahogany and aspen occur in small, scattered islands near the ridgetops. Douglas fir, mixed with limber pine, occurs in small, isolated islands on the exposed bedrock flattops of O-Wi-Yu-Kuts Mountain and along the northern slopes and bottom of Beaver Creek Canyon.

A closed juniper woodland exists as a broad band on the cobbly side slopes and out onto the major terrace in Browns Park. This woodland is the major community type in the Utah portion of the study area. Indian ricegrass and cool season perennial forbs exist as individuals within the moisture-limited understory.

The juniper woodland gives way to a big sagebrush-mixed shrub community as the soils deepen on and below the major terrace in Browns Park. Cold desert shrubs include rabbitbrush, horsebrush, shadscale, and winterfat. Needleandthread grass, Indian ricegrass, and various forbs are included in this community's understory.

Riparian vegetation also exists. Willows and cottonwoods occur in thick stands in severely restricted areas along the four drainages traversing the juniper woodland.

Habitat for *Oenothera acutissima* occurs within the WSA. A known location also occurs at Cold Spring, but it is located outside the study area. *O. acutissima* is a "candidate" for listing as a threatened or endangered species and appears on the *Federal Register* Notice of Review as a category 2 entry. Its habitat is seasonally moist to wet sandy and gravelly soils in meadows (depressions or stream courses) and springs in mixed conifer forests and sagebrush scrub.

Ecological surveys have not been conducted; therefore, no information is available regarding remnant plant associations from this area.

LIVESTOCK GRAZING

The study area is located within three different allotments, two in Colorado and the other in Utah. These three allotments are Cold Springs #4325, Spitzie Draw #4335, and Willow Creek #4801. The first two allotments are used by only one permittee; the other allotment is used by four permittees. Three of these operators have cattle operations from May 15 through November 30 and one operator has a year-round cattle operation. The three allotments contain 63,978 acres of public land and 7,772 animal unit months (AUMs) (see Table 3-9).

A total of 5,200 acres of allotted public lands and 661 AUMs are located within West Cold Spring WSA. A portion of the federal acreage in the study area is located inside an area that has been closed to livestock grazing because of roughness of terrain. The forage percentages affected in each of the allotments within the study area are listed in Table 3-9.

Existing management facilities within the three allotments include six spring developments, one reservoir, 12-1/4 miles of fence, and three cattleguards. There are no agricultural croplands within the study area.

WILDLIFE HABITAT

Game Animals

Mule deer are the most abundant game animal residing in the study area. Population levels have increased steadily since reaching a low point in the early 1970s. The WSA falls within Game Management Unit (GMU) 201 which has an estimated overall mule deer density of 6 deer per

TABLE 3-9
ALLOTMENTS IN WEST COLD SPRING WSA

<u>Allotment Name</u>	<u>Acres in Allotment</u>	<u>WSA Acres</u>	<u>AUMs in Allotment</u>	<u>AUMs in WSA</u>	<u>% AUMs Affected</u>
Cold Springs	35,989	1,210	4,614	151	3
Spitzie Draw	13,999	3,420	1,927	449	23
Willow Creek	13,990	570	1,231	61	5

square mile and an estimated winter density of 12 deer per square mile.

The WSA is mostly winter range with a small amount of summer range at higher elevations. These habitats are considered to be generally in good condition. There are no areas classified as critical range for mule deer.

Elk are also found in the study area in limited numbers. The total elk population within GMU 201, of which the WSA is part, is estimated at 445 animals. Elk in this area are generally stable in numbers and range between Utah, Colorado, and Wyoming. Wyoming desires to hold the herd to its present size and to allow hunters to take either males or females. Because of Wyoming's regulations the herd remains stable in Utah and Colorado as well.

The study area is part of the Cold Spring quality elk management area. Colorado Division of Wildlife intends to manage this for trophy, quality hunting by limiting licenses and attempting to control vehicle traffic and campsite use through agreement with BLM.

The WSA is both winter range and yearlong range for elk; both habitats are considered to be in good condition. None of the study area is considered to be critical elk range.

A total of 21 Rocky Mountain bighorn sheep were released into the study area in February, 1983. It is estimated that approximately 30 sheep presently occupy the Beaver Creek drainage. The area is thought to be a year-round habitat, although currently the sheep have not been in the area long enough to establish a pattern. The entire study area should be considered critical sheep habitat. Sheep are very sensitive to human presence; thus, roadless tracts are needed to minimize this presence, especially during the period when the animals are becoming established.

Other game species found in the study area include black bear, mountain lion, sage grouse, cottontail rabbit, and mourning dove. No special habitat delineations or management recommendations apply to these species.

Nongame Mammals

Specific population history data is not available for the nongame mammals present in the study area. The distribution of characteristic nongame mammals is described according to the following biotic community associations. No crucial areas have been identified for nongame mammals.

Aquatic furbearing mammals in permanent streams are the beaver, mink, and muskrat.

Predatory mammals include the coyote in all habitats throughout the unit; bobcat, and gray fox in rim-rock,

pinyon-juniper, and brushland habitat; and the striped skunk and badger in grasslands and open brushlands.

Nongame mammals characteristic of the streamside and wet meadow habitats include the vagrant shrew, long-tailed vole, mountain vole, northern pocket gopher, and western harvest mouse. The ringtail is also characteristic of rock areas near water. Typical nongame mammals of the sagebrush-grassland community include the white-tailed jackrabbit, sagebrush vole, and long-tailed vole. The bushy-tailed woodrat, pinyon mouse, porcupine, and cliff chipmunk (in rock areas) are characteristic of the pinyon-juniper woodlands. Small mammals found throughout the study area include the deer mouse, which is widespread in all terrestrial habitats, and the golden-mantled ground squirrel and least chipmunk in all rocky areas.

Nongame Birds

Specific population history data is not available for the nongame birds present in the WSA. The distributions of characteristic nongame birds in the study area are described according to the following biotic community associations. No crucial areas have been identified for nongame birds.

Several birds-of-prey species are found in West Cold Spring WSA. The golden eagle, red-tailed hawk, ferruginous hawk, marsh hawk, goshawk, Cooper's hawk, great-horned owl, and prairie falcon are year-round residents. The Kestrel and sharp-shinned hawk are summer residents and the rough-legged hawk is a winter resident. Cliffs and precipitous rock formations are used as nesting and perching sites by the golden eagle, red-tailed hawk, and prairie falcon, while the Kestrel, red-tailed hawk, and great-horned owl nest in streamside trees. The goshawk, Cooper's hawk, and sharp-shinned hawk prefer dense woodlands for nesting. Raptor population densities are considered to be significant.

The American peregrine falcon and the bald eagle, both federally endangered bird species, are potential inhabitants of the study area.

Typical nongame birds of the riparian woodland community include the broad-tailed hummingbird, red-shafted flicker, black-billed magpie, western wood pewee, yellow warbler, and rufous-sided towhee. The white-throated swift and cliff swallow are also common near cliffs close to water.

Characteristic nongame birds of the sagebrush-grassland community include the loggerhead shrike, sage thrasher, green-tailed towhee, vesper sparrow, and Brewer's sparrow. The Brewer's blackbird and brown-headed cowbird are also common in open rangelands throughout the study area, and the horned lark and western meadowlark are common where

grasslands predominate. The pinyon jay, mountain chickadee, white-breasted nuthatch, Bewick's wren, and black-throated gray warbler are typical of juniper woodlands. Other nongame birds which may be seen throughout the study area include the turkey vulture, common nighthawk, common raven, and the rock wren (in rocky areas).

A gamebird, the sage grouse, occurs in the WSA. Hunting of this species takes place, but hunter days have not been quantified within this area.

Fish

Beaver Creek is defined as Class II, High Priority Fishery Resource by the Colorado Division of Wildlife. Class II fisheries have probable occurrence of, documented past occurrence of, and probable continued existence of state or federal threatened species. They also contain habitat that is intensively used by highly valued fish populations. Beaver Creek presently is inhabited by Yellowstone cutthroat, brook trout, and brown trout. The upper reaches of the drainage once contained a pure strain of Colorado River cutthroat, formerly a state listed threatened species. Aquatic and riparian habitats of Beaver Creek are presently in above average condition and have great potential for management.

SOILS

Soils in the Utah portion of this WSA vary from shallow to deep non-gravelly to extremely gravelly and from sandy loams to clay loam textures. The soils in the southern part on moderate slopes are deep and well drained, with loam to loamy fine sand surface layers. Subsoils vary from sandy loams to clay loams and very gravelly or cobbly sandy loam to clay loam. The steep sloping central part of the area has very gravelly, cobbly, or stony surface soils. Subsoils are very cobbly or stony, sandy clay loam or clay loam soils. The northern part of the study area, which is drained by Birch Creek, consists of moderate slopes, is primarily shallow and well drained, and has very gravelly or cobbly loam and sandy loam surface and subsoil layers.

The major soil units found within the Colorado portion of this WSA have sandy loam surfaces and sandy clay loam subsurfaces, are well drained, and have depths varying from shallow to moderately deep. The shallow loamy soils over hard red sandstone occupy planar or convex mountain tops. The loamy moderately deep soils are associated with concave mountaintops and slopes. Approximately one-third of the area is associated with rock outcrops of massive red sandstone which occur on mountain tops, sides, and repeating cliffs. Erosion hazard is considered to be moderate and the runoff is medium for the majority of the area.

WATER

The only perennial stream within the study area is Beaver Creek, which drains the western portion of Cold Spring Mountain and flows into the Green River. The WSA also contains numerous intermittent tributaries which flow into Willow Creek and the Green River. Ten perennial springs are known to exist in the unit, five of which lie within grazing allotment boundaries and five of which are on land used primarily by wildlife.

The water quality of this area is typical of a generally undeveloped area, with relatively neutral pHs and very low measurement of total dissolved solids. There is little comprehensive groundwater information for this area, but it appears that groundwater sources are derived from Precambrian Uinta Mountain Group and Tertiary Browns Park formation.

The BLM is currently in the process of obtaining water rights on several springs within the study area for stock, wildlife, and recreation purposes. First priority rights will not belong to the BLM for several of these water sources.

Members of the public have been decreed water rights to three ditches, one pipeline, and five springs. Three of the springs have been developed for stock purposes.

The ownership of a water right to a source located on public land administered by BLM does not necessarily guarantee the owner access to and use of the water source. BLM has the authority to deny the owner access, development, and use of the water source if it is determined that such use is not in the best interests of multiple-use resource management.

FOREST RESOURCES

Douglas-fir occurs in scattered stands along the north face of Beaver Creek Canyon. The entire acreage is considered to be noncommercial because of the low volume per acre and steep topography, both of which make harvesting economically infeasible. Aspen and lodgepole pine exist within the study area. Aspen is becoming a commercial species in the region.

Pinyon-juniper woodlands make up the dominant forest type within this study area, occupying approximately 10,880 acres. However, given steep slopes (greater than 35 percent), unstable soils, low site productivity, and access limitations, only 270 acres are considered commercially manageable for woodland products, which include fuelwood, posts, and Christmas trees.

Because of the remote location of this unit and the greater availability of these products elsewhere, it is unlikely that any of these stands would be offered for sale in the foreseeable future.

RECREATION

No recreation-use data is available for the area. Use is estimated to be low but increasing, based on observations and correspondence. Hunting, hiking, backpacking, sightseeing, photography, fishing, and wildlife viewing are the predominant activities now occurring.

Hunting for deer, antelope, and elk historically has been the primary recreation activity in and near the area. On top of Cold Spring Mountain, north of the study area, are numerous hunter camps which serve as takeoff points into the area. While there is motorized access along the northern and southern boundaries of the area, hunting activity in the study area itself is primarily by nonmotorized means because of the steep, rugged topography.

Beaver Creek provides opportunities for trout fishing. Beaver Creek Canyon, Spitzie Draw, and other drainages provide opportunities for hiking, scenic viewing, and rock scrambling.

The only known trails in the area suitable for hiking are the closed/primitive Matt Trail (which forms the eastern boundary) and a livestock trail (which follows Beaver Creek). Numerous game trails occur throughout the area. Access to the area is available from the top and at the base of Cold Spring Mountain.

An annual mountainman rendezvous is held along Beaver Creek at the mouth of Beaver Creek Canyon in Utah and adjacent to the study area. Approximately 25 families participate in this annual gathering to camp, fish, socialize, and reenact the lifestyle of mountain men of the mid 19th century.

The Recreation Opportunity Spectrum (ROS) inventory identified three setting opportunity classes within the area as shown in Table 3-10. ROS classes are defined in Appendix D.

Eighty percent of the area offers nonmotorized forms of recreation opportunities. This class offers opportunities to experience solitude and to have a high degree of interaction with the natural environment. There is moderate to high challenge and risk, and no motorized types of use occur.

Twenty percent of the area falls into the motorized classes, which also allow, to a lesser extent, for opportunities to experience isolation and to have a high degree of interaction

with the natural environment with some challenge and risk. These motorized settings are on the periphery near vehicle access points.

**TABLE 3-10
ROS CLASSES
IN WEST COLD SPRING WSA**

Class	Acreage	Percent of Area
Semiprimitive Nonmotorized	14,137	80
Semiprimitive Motorized	3,100	18
Roaded Natural	445	2

VISUAL RESOURCES

The WSA lies within the Middle Rocky Mountain physiographic province as defined by Fenneman, 1946. The area consists primarily of the southwestern slopes of Cold Spring Mountain. The character of this area is the result of its complex geologic structure. The side slopes have areas of exposed Precambrian red quartzite sandstone covered predominantly with dense pinyon-juniper woodlands, providing contrasts with the red bedrock. Spitzie Draw, Beaver Creek Canyon, and other numerous drainages provide topographic relief and thus greater visual variety.

The lower portions of the area in Browns Park are flatter and covered with sagebrush and grasses, with some lighter colored sandstones, limestones, and soils. These provide dramatic contrasts with the backdrop of red sandstones and dark green woodlands on the slopes of Cold Spring Mountain.

The majority of the area is highly visible from Colorado State Highway 318 and Daggett County Road 318 in Utah. The area is viewed as foreground/midleground from the route, which has moderate to high recreation traffic. Other portions on top of the mountain and in Beaver Creek Canyon are in the seldom seen distance zone. Visual sensitivity is considered to be medium to high in the Colorado portion and low in the Utah portion. The majority of the area has Class B scenic quality, with some Class C in the lower Utah portion. The Colorado side of the unit is rated primarily Class II with some Class III in the lower portions in Browns

Park. The Utah portion of the WSA is classified as Class III at the mouth of Beaver Creek Canyon and the remaining is rated as Class IV. (A description of the Visual Resource Management (VRM) classes can be found in Appendix E.)

CULTURAL RESOURCES

No systematic cultural resource survey has been carried out within the unit. However, several prehistoric sites and one historic site are known. Prehistoric site types here include isolated finds, resource procurement sites, base camps, and Fremont rock art. The historic site Matt Trail, which is the east boundary of the WSA. At the present level of interpretation, it is hypothesized that this area may well exhibit the full span of prehistoric human occupation, from Paleo-Indian to Ute-Shoshoni. The Browns Park area, directly to the south of the unit, does exhibit this occupation span. Historic use and occupation of the area started in the early 1800s and continues to the present day.

LANDS AND REALTY

There are no realty-related land use authorizations in the West Cold Spring WSA. The surface and mineral estates are in federal ownership. There are no known private or state inholdings.

Approximately 185 acres of public water reserve lie within the study area. No related developments exist.

Given this unit's location and topography, along with current and anticipated land use in the area and the location of service areas, the potential for realty-related authorizations within the unit is minimal, except as might be related to oil/gas developments, should they take place. The potential for development of the public water reserve is not known.

DIAMOND BREAKS

WILDERNESS VALUES

Mandatory Wilderness Characteristics

Size. The Diamond Breaks WSA contains 35,380 acres of public land administered by BLM. Part of the study area, 3,900 acres, extends into Utah. The area is well blocked and somewhat linear from northwest to southeast. It is contiguous with the north end of the proposed wilderness in Dinosaur National Monument.

Naturalness. The study area consists of a broken land mass known as the Diamond Mountains, part of the eastern extension of the Uinta Range. A dominant feature of the area is a system of northwest-southeast trending mountain tops, with ridges, draws, and canyons trending north and south-southwest. The canyons and draws have been incised by northeast flowing intermittent streams which are tributary to the Green River on the north and east sides and Crouse and Pot creeks on the west side. The draws are generally broad and open at lower elevations and become narrow as elevations rise. A series of colorful pinyon-juniper covered red sandstone ridges, known as the Diamond Breaks, divide the drainages and break toward the Green River to the north in Browns Park.

The area exhibits a high degree of naturalness. There is a diverse mixture of vegetation, varying from sagebrush flats to pinyon-juniper woodlands to aspen, mountain mahogany, Douglas fir, limber pine, and ponderosa pine in the higher elevations. Elevations vary from 5,400 to 8,600 feet.

The northern study area boundary is the southern border of the Browns Park National Wildlife Refuge; the eastern boundary is Dinosaur National Monument.

The south-southwest boundary of the study area is formed by private ownership of flat-bottomed draws that extend into the Diamond Breaks. The north and west boundaries are defined by Crouse Canyon road and by private, state, and public land. Portions of two ridges extending west into Utah were originally excluded from the study area because they represent narrow fingers of public land and created erratic boundaries with intervening private lands. These ridges are visible from many high points within the study area.

The imprints of man are scattered and substantially unnoticeable and do not significantly detract from the naturalness of the area. Approximately 13 miles of ways protrude into the wilderness study area. These are related primarily to grazing, with some use by hunters on the east side.

All of the ways follow various draws into the area. On the west side, these ways are in Deerlick, Craig, Davis, Yellow Jacket, Marshall, Pitt, and Ecklund draws. On the east side, these ways follow portions of Yellow Jacket, Chochecherry, Davis, and Hoy draws. None of these ways traverse entirely through the wilderness study area; they generally follow draws through sagebrush vegetation, ending abruptly at steep slopes or where the terrain is too rugged for off-road vehicle travel.

During the summer of 1983, one of the ways in Davis Draw was bladed with a grader from the west side boundary.

This way was bladed approximately 2 miles, without authorization from BLM, to provide easier access to a spring development and salt lick. Impacts resulting from this unauthorized use do not disqualify the area from wilderness study area status.

Four stockwater tanks and four small reservoirs exist within the area. The Hoy Flat and Julian Spring developments were authorized and constructed by BLM in 1982. The Hoy Flat development consists of a 38-foot diameter tank and a small overflow pit fed by approximately 500 feet of buried pipeline. The Julian Spring development consists of two small stock tanks and small overflow pits fed by approximately 150 feet of buried pipeline. Both developments have been brought into compliance with the Interim Management Policy guidelines. Two additional stockwater tanks exist, one in a secluded draw on the west side north of Yellow Jacket Draw and one in Ecklund Draw near the southern boundary. Four small reservoirs occur in draws scattered along the western boundary. All are substantially unnoticeable.

Approximately 3.2 miles of fence occur inside the study area in four separate locations: Hoy Flat on the western boundary, Chokecherry Draw (two locations), and Yellow Jacket Draw. Fencing also occurs along the eastern and northern portions of the study area, marking the boundaries with Browns Park National Wildlife Refuge and Dinosaur National Monument. Another fence parallels a portion of the west boundary.

Two abandoned homesteads with cabins in ruins occur in the southern portion of the area. In Chokecherry Draw, there is a burned homestead.

All of these imprints are minor, few in number, and widely distributed. They do not detract from the overall high quality natural state exhibited. The minor imprints remaining in the area can be returned to a more natural appearance either by natural processes or by hand labor to aid natural processes.

Outstanding Opportunities for Solitude or Primitive and Unconfined Recreation. The large size of this study area, combined with the diversity in terrain (represented by mountain peaks and meadows, small valleys, and steep-sloped draws) and vegetation cover, provides for outstanding opportunities for solitude. The numerous draws, including Chokecherry, Yellow Jacket, Warren, Hoy, Davis, and Ecklund, offer many opportunities for a visitor to become truly isolated within the area. Many areas are covered with dense pinyon-juniper woodlands, mountain brush, or ponderosa pine, which provides excellent screening from activities of others. The mountain peaks, draws, and ridges also provide screening from others or from any outside sights and sounds of man's activity. Outside sights and sounds

are minimal to non-existent, given the rural, isolated, and relatively uninhabited nature of Browns Park and the surrounding area. Any sights and sounds would be related to ranching on the west side and recreation or other activities in Browns Park National Wildlife Refuge on the north side.

Although several roads, cultivated fields, and associated ranching developments are visible to the west from some portions of the study area, they do not significantly detract from the overall naturalness of the area, the experience of isolation, or the recreation opportunities available. There are many natural features outside the study area (e.g., ridges, draws, and mountain peaks) which intermingle with the somewhat rural nature of the relatively flat valleys; these features break up the landscape and greatly diminish any impact the imprints would have upon the character of the wilderness study area. The roads and fields cannot all be viewed at one time. The natural features and broken landscape allow the ranching activities or fields to blend in with the natural surroundings or to be completely screened from view; the observer is generally far removed.

The expansive views both within and outside the area further enhance the feeling of solitude. Wide vistas give a view of the ruggedness of the study area, the adjacent Dinosaur National Monument, Browns Park, Hoy Mountain, Wild Mountain, Cold Spring Mountain, and other surrounding lands from the higher elevations (7,600 to 8,600 feet). Numerous high points or peaks occur, including Offield Mountain, Diamond Mountain, Baldy Peak, and other unnamed points.

The large size of the study area, along with the diversity of terrain, geologic formations, diverse vegetation, abundant wildlife, and cultural resources, offers outstanding opportunities for a variety of primitive and unconfined types of recreation activities. Opportunities are available for hiking, backpacking, scenic viewing, photography, hunting, nature study, cultural resources viewing, and wildlife viewing, among other activities.

The study area shares a common boundary to the east with Dinosaur National Monument, which further enhances opportunities for solitude, primitive recreation, and unconfined movement. These two areas complement each other. The study area provides recreational opportunities which contrast with those available in the canyons of the Monument. These two landforms, river canyons of the Monument and the semiarid, dissected mountain topography of the study area, give the hiker or backpacker an opportunity to experience real variety. It should be noted that the proposed wilderness designation for Dinosaur National Monument is intended to protect only the canyon core of the area.

Offield Mountain, on the southern end of the area adjacent to the Monument, provides interesting botanic features, with open ponderosa pine parks on its gentle south slope and impressive views of the monument. Douglas fir forest covers the abrupt north slopes, while pinyon pine, juniper, mountain mahogany, an abundance of wildflowers, and small pockets of aspen, among other species, are found scattered throughout the area. Colorful red sandstone outcrops, cliffs, and slickrock areas provide an interesting contrast and opportunities for climbing and exploring. This variety of vegetation and proximity to water supports a wide variety of birds and other wildlife for viewing opportunities.

A total of 79 percent of the study area is classified in the primitive or semiprimitive nonmotorized ROS classes. These areas offer the most primitive opportunities in a nonmotorized setting available within the study area. The primitive setting offers opportunities to experience isolation from the sights and sounds of man, to feel as though one is a part of the natural environment, to have a high degree of challenge and risk, and to use outdoor skills. The semiprimitive nonmotorized setting offers isolation and a high degree of interaction with the natural environment, moderate to high challenge and risk, a chance to use outdoor skills, and other opportunities. The semiprimitive motorized class offers similar opportunities but to a lesser degree.

The variety of ROS classes offer a range of choice to the visitor, depending upon individual preferences. Opportunities for recreation in the area range from truly primitive experiences within the study area to more passive opportunities, such as dayhiking or sightseeing near the periphery. All of the settings offer opportunities to experience a high degree of interaction with the natural environment.

Access to the area is readily available from the east side by a maintained county road from Browns Park. Dirt trails or ways provide 4-wheel drive vehicle access along a portion of the east boundary and from Browns Park National Wildlife Refuge. Continued public access is ensured because of these public roads. Access along the west side of the study area is hampered by private lands.

Special Features

While no extensive cultural resource inventories have been conducted in the study area, it is known that numerous sites exist in the area. Cultural sites consist of rock art, granaries, rockshelters, and lithic scatter related to both prehistoric and historic occupation, which may have ranged from Paleo-Indian through the Archaic and Fremont to protohistoric and historic Ute-Shoshone; these were followed by fur trappers, traders, and rancher-settlers.

Approximately 1,750 acres of the WSA in Utah is part of the Green River Scenic Corridor, Area of Critical Environmental Concern (ACEC). This is designed to protect the scenic, historic, archaeological, recreational, and scientific values present within the area. The focal point of the ACEC is the Green River and not the scenic quality of the surrounding country within the WSA. The Green River through Browns Park is pending Congressional action for designation as a "scenic" river under the Wild and Scenic Rivers Act.

Because the area has a generally semiarid climate (12 to 16 inches of precipitation per year), each of the springs in the WSA can be considered to be a special feature. The endangered American peregrine falcon and the bald eagle are potential inhabitants of the study area.

Diversity in the National Wilderness Preservation System

Based on *Ecosystems of the United States* (Bailey and Kuchler, 1966), the entire study area falls into the Rocky Mountain Forest Province physiographic region. The potential natural vegetation and estimated acreages are shown in Table 3-11.

TABLE 3-11
POTENTIAL NATURAL VEGETATION
IN DIAMOND BREAKS WSA

Potential Natural Vegetation	Acres	Percent of Area
Juniper-Pinyon Woodland (M3110-21)	22,000	62
Mountain Mahogany-Oak Scrub (M3110-31)	8,885	25
Sagebrush-Steppe (M3110-49)	4,495	13

There are variations in vegetation found in the study area which are not indicated by the above names. Ponderosa pine forest cover the gentle south slopes of Offield Mountain. Chokecherry and other mountain brush species, as well as scattered stands of aspen, occur throughout the study area.

Small riparian areas around springs and draws support willows, boxelder, dogwood, cattail, aspen, cottonwood, Douglas fir, and other associated species. Small stands of Douglas fir, lodgepole pine, and limber pine occur on other

north-facing slopes. Overall, the study area supports a wide variety of vegetation types and displays notable species diversity.

The study area is a semiarid, dissected mountainous landform which contrasts with the adjacent Dinosaur National Monument river canyons. The areas complement each other by spanning a continuous range of semiarid landforms and ecosystems.

GEOLOGY AND MINERALS

Only the Precambrian Uinta Mountain Group, the Tertiary Bishop Conglomerate and the Browns Park Formation, and Quaternary deposits are known to outcrop within the WSA. Refer to the Regional Affected Environment for lithologic descriptions of these units.

The study area appears to have some favorability for oil and gas resources, although subsurface structural interpretations are uncertain because of scanty available data.

A list of oil and gas leases within the study area, with dates of issuance, is shown in Table 3-12. Leases are shown on Map 3-9.

The subsurface geology and petroleum resource potential of this area are essentially unknown, although at least two exploration organizations with extensive experience in the region estimate such potential to be at least moderate. Only appreciable geophysical exploration, together with geologic modeling and exploratory drilling, will resolve the matter in a technically substantive manner.

There are thermal springs adjacent to the area in Utah, and the region contains major east-west structures, which suggests some potential for geothermal resources. As of July 1984, there were no patented or unpatented mining claims within the study area. Mineralization of principal interest includes base and precious metals and uranium in Precambrian rocks. The Sugarloaf Butte-Diamond Mountain structural trend suggests potential for such mineralization within the study area. Elsewhere across the region, the

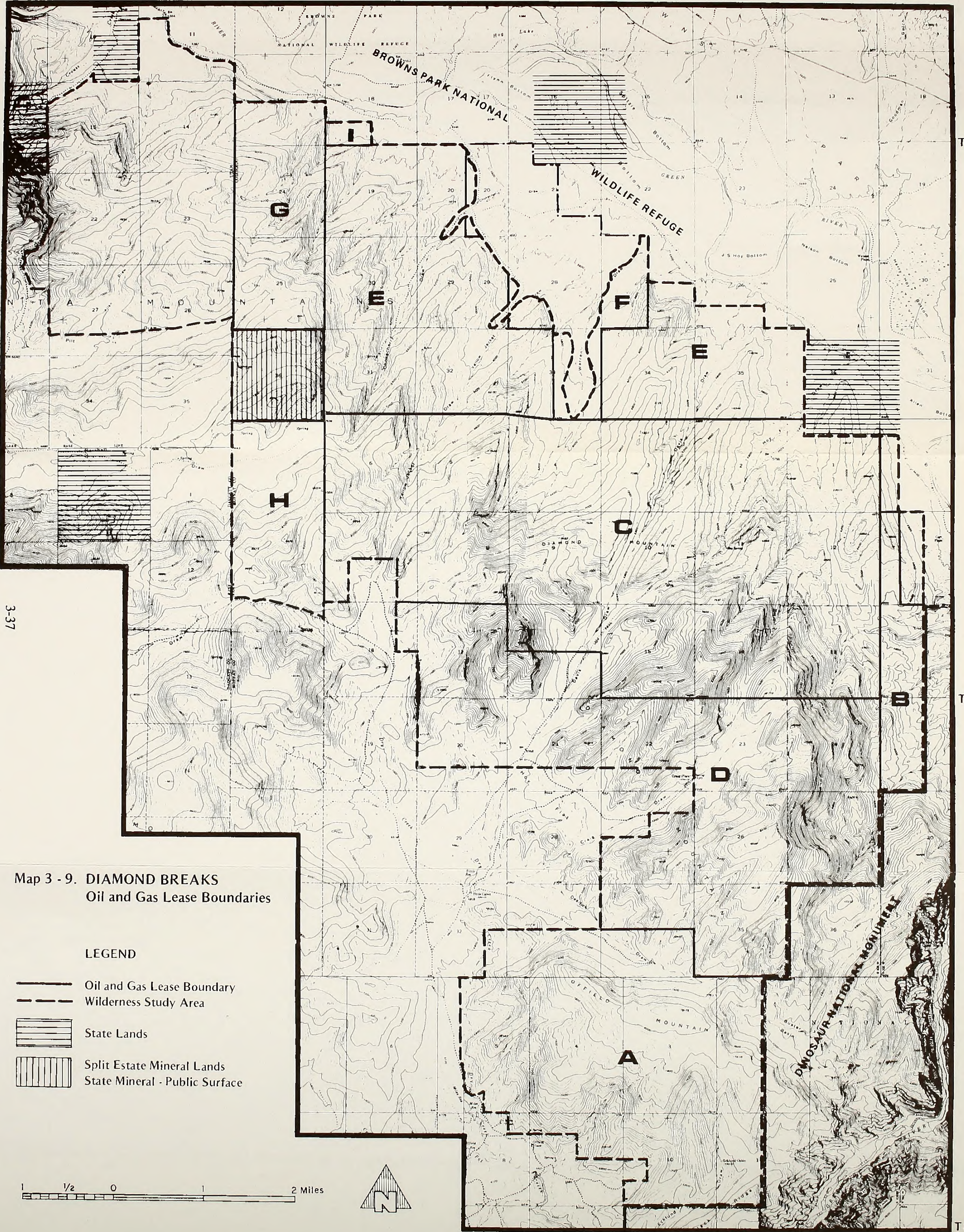
**TABLE 3-12
OIL AND GAS LEASES IN DIAMOND BREAKS WSA**

<u>Lease</u>	<u>Date of Issuance</u>	<u>Acres in WSA</u>	<u>Special Stipulations¹</u>
A = C34363	10/13/82	4,943	Wilderness Study Area Protection
B = C35353	7/26/82	790	Wilderness Study Area Protection
C = C35354	8/9/82	9,721	Wilderness Study Area Protection; 120 acres No Surface Occupancy
D = C35355	Pending	6,520	Pending
E = C38446	Pending	5,470	Pending
F = C35836	8/13/82	790 ²	Wilderness Study Area Protection
G = C38448	Pending	1,580	Pending
H = C35356	9/15/82	1,300	Wilderness Study Area Protection; 40 acres No Surface Occupancy
I = C38445	Pending	80	Pending

¹ Does not include seasonal or standard stipulations. The "Wilderness Study Area Protection" stipulation applies only during interim management. If the WSA is not designated as wilderness, the stipulation would no longer apply.





² 1,990 acres under the Preferred Alternative.

Status as of August, 1985; updated information may be obtained through BLM, Colorado State Office, Mineral Leasing Section (CO-943), 2020 Arapahoe, Denver, Colorado.



Map 3 - 9. DIAMOND BREAKS
Oil and Gas Lease Boundaries

LEGEND

-  Oil and Gas Lease Boundary
-  Wilderness Study Area
-  State Lands
-  Split Estate Mineral Lands
State Mineral - Public Surface



Browns Park Formation locally contains concentrations of uranium-vanadium deposits, although no such occurrences have yet been reported within the study area. Anomalous concentrations of copper, zinc, vanadium, and iron were identified in stream sediments by a reconnaissance geochemical survey conducted during the summer of 1983 (Witherbee and Low 1984), indicating a potential for the occurrence of base and precious metal deposits within the study area.

See Table 3-3 in the Regional Affected Environment for estimated levels of geologic potential for the energy and mineral resources.

The GEMS report (MSME/Wallaby, 1983, Section V, Recommendations for Further Study) covering the Diamond Breaks WSA offers recommendations for further work. These recommendations are listed in Appendix G.

VEGETATION

Big sagebrush and black sagebrush occur on the drier valley bottoms and as inclusions in the pinyon-juniper woodlands. Mountain shrub (curlleaf mountain mahogany) occurs in small areas on shallow soils on sidehills above the sagebrush communities. The pinyon-juniper woodlands community is by far the most extensive in the study area; it exists on east, south, and west slopes having shallow, rocky soils. The conifer community is located at the higher, more moderate moisture elevations. Douglas fir subtype generally is limited to the north-facing slopes and deeper soils. Aspen is included in this subtype. The ponderosa pine subtype is generally limited to the more sandy, rocky soils.

Grasslands occur as small inclusions in the sagebrush community in the more moderate moisture, deeper soils

at the valley bottoms. Available data and field surveys would indicate few, if any riparian communities occur within the study area.

Nothing is known concerning the presence of threatened, endangered, or rare plant species. There is also no information regarding remnant plant associations.

LIVESTOCK GRAZING

The Diamond Breaks WSA extends into five grazing allotments administered by the Vernal District BLM. A total of 35,380 acres of public land and 845 AUMs are located within the study area. A portion of the study area containing approximately 13,475 acres is not permitted for livestock grazing due to roughness of the topography. Table 3-13 outlines the five allotments, the public land acres and AUMs, and the percent of the total federal acres and AUMs.

WILDLIFE HABITAT

Game Animals

Mule deer are the most abundant game animal residing in the study area. Population levels have increased steadily since reaching a low point in the early 1970s. Deer populations in Game Management Unit #1, which roughly corresponds to the study area, were estimated at 588 deer in 1984. This converts to approximately 7 deer per square mile within the WSA.

Summer, spring/fall, and a small amount of winter range are supplied by the study area for deer. These habitats are considered to be generally in good condition.

**TABLE 3-13
ALLOTMENTS IN DIAMOND BREAKS WSA**

<u>Allotment Name</u>	<u>Acres in Allotment</u>	<u>WSA Acres</u>	<u>AUMs in Allotment</u>	<u>AUMs in WSA</u>	<u>% AUMs Affected</u>
Watson*	6,446	1,934	136	42	31
Marshall Draw*	5,440	1,966	512	122	24
Hoy Flat	10,090	9,060	295	292	99
Offield Mountain	6,930	4,418	252	156	62
Dry Creek	6,147	3,889	369	233	63

* Utah

Approximately 1,400 acres of deer winter range, classified as critical range, lies at the extreme southern portion of the study area in Colorado. This area consists of south-facing ridges. Many animals concentrate here during the winter period.

Elk are also found in the study area in limited numbers. Very few elk occur in the Utah portion; most animals are in the Colorado portion. The estimated summer population is estimated at 12 animals with an increasing population trend. It is estimated that 40 elk occur during winter. Colorado regulates hunting through a permit system in the study area, and Utah allows harvest only of male animals as a method of encouraging these increases.

The study area provides year-round elk range and the entire study area has been classed as critical elk winter range. Elk from both Colorado and Utah spend the winter on windswept ridges and south-facing slopes in the study area.

Other game species occurring in the study area include black bear, mountain lion, blue grouse, cottontail rabbit, and mourning dove. No special habitat delineation or management recommendations apply to these species.

Nongame Mammals

Species population history data is not available for the nongame animals present in the WSA. The distributions of characteristic nongame mammals in the study area are described according to the following biotic community associations. No crucial areas have been identified for nongame mammals.

Predatory mammals include the coyote in all habitats throughout the unit; bobcat, and gray fox in rim-rock, pinyon-juniper, and brushland habitat; and the striped skunk and badger in grasslands and open brushlands.

Typical nongame mammals of the sagebrush-grassland community include the white-tailed jackrabbit, sagebrush vole, and long-tailed vole. The white-tailed prairie dog is also found in limited numbers in this type in the southwestern corner of the study area, so the endangered black-footed ferret is a hypothetical resident associated with the prairie dogs.

The bushy-tailed woodrat, pinyon mouse, porcupine, and cliff chipmunk (in rock areas) are characteristic of the pinyon-juniper woodlands in the WSA. Small mammals include the deer mouse which is widespread in all terrestrial habitats and the golden-mantled ground squirrel and least chipmunk in all rocky areas.

Nongame Birds

Specific population history data is not available for the nongame birds present in the WSA. The distributions of characteristic nongame birds in the study area are described according to the following biotic community associations. No crucial areas have been identified for nongame birds.

Several birds-of-prey species are found in the study area. The golden eagle, red-tailed hawk, ferruginous hawk, marsh hawk, goshawk, Cooper's hawk, great-horned owl, and prairie falcon are year-round residents. The sparrow hawk and sharp-shinned hawk are summer residents and the rough-legged hawk is a winter resident. Cliffs and precipitous rock formations are used as nesting and perching sites by the golden eagle, red-tailed hawk, and prairie falcon. The goshawk, Cooper's hawk, and sharp-shinned hawk prefer dense woodlands for nesting. Raptor population densities are unknown.

Two endangered bird species are potential inhabitants of the study area. They are the American peregrine falcon and the bald eagle.

Typical nongame birds of the riparian woodland community include the broad-tailed hummingbird, red-shafted flicker, black-billed magpie, western wood pewee, yellow warbler, and rufous-sided towhee. The white-throated swift and cliff swallow are also common near cliffs close to water.

Characteristic nongame birds of the sagebrush-grassland community include the loggerhead shrike, sage thrasher, green-tailed towhee, vesper sparrow, sage sparrow, and Brewer's sparrow. The Brewer's blackbird and brown-headed cowbird are also common in open rangelands throughout the area, and the horned lark and western meadowlark are common where grasslands predominate.

The pinyon jay, mountain chickadee, white-breasted nuthatch, Bewick's wren, and black-throated gray warbler are typical of juniper woodlands in the study area. Other nongame birds which may be seen include the turkey vulture, common nighthawk, common raven, and rock wren (in rocky areas).

SOILS

Soils in this unit are generally deep and well drained with high quantities of large rock fragments on the soil surface and in the soil profile. The hill and mountain areas have extremely stony and bouldery loam surface soils. The underlying layers are very cobbly or stony to extremely cobbly or stony clay loam, loam, or sandy clay loam. About 15 percent of this area has shallow, well-drained, extremely

cobbly sandy loam surface and subsurface soils under ponderosa pine. Sandstone rock outcrops occupy approximately 25 percent of the area and are associated with highly dissected drainageways and mountaintops.

The drainage and valley bottom soils are deep and well drained with loam and cobbly loam to loamy fine sand surface layers. Underlying layers are loam to loamy fine sand or cobbly loam to extremely cobbly loamy fine sand.

Erosion studies have been made on only a small part of the study area in Utah. These studies completed on adjacent similar soils and landforms on Diamond Mountain indicate that the hill and mountain-slope areas and most of the valley bottoms have slight current erosion condition.

WATER

The intermittent tributaries in the WSA flow either north or east to the Green River, south to Dry and Pot creeks, or west to Crouse Creek. Fourteen perennial springs are known to exist in the unit, and the BLM is currently in the process of obtaining water rights on the majority of them for stock, wildlife, and recreation purposes.

Members of the public own water rights on five springs and one pipeline. Two of the springs have been developed for stock, domestic, and/or irrigation purposes. The other three springs remain undeveloped. The ownership of a water right to a source located on public land does not necessarily guarantee the owner access to and use of the water source. BLM has the authority to deny the owner access, development, and use of the water source if it is determined that such use is not in the best interests of resource management.

Several other springs are known to exist in the unit. BLM is currently in the process of obtaining water rights on them for stock, wildlife, and recreation purposes.

Groundwater sources in the WSA are derived from fractures in the Precambrian Uinta Mountain Group.

FOREST RESOURCES

Douglas-fir occurs in scattered stands on steep northern aspects throughout the unit. Given low volumes per acre, steep topography, and the fragile sites on which these stands occur, all stands have been withdrawn from the commercial forest land base.

Ponderosa pine occupies approximately 1,300 acres in this unit. However, poor stocking, high percentages of surface rock, and poor regeneration capabilities prohibit any

management activities in these stands now or in the foreseeable future.

Pinyon-juniper forests cover the Diamond Breaks WSA. Virtually the entire acreage has been classified as nonproductive woodland because of extremely steep and rocky topography that restricts any future management activities in the area.

RECREATION

No recreation use data is available for the area, except for hunting. However, use is estimated to be low but increasing in Colorado based on observations and correspondence. Uses now occurring in the area include hunting, hiking, backpacking, scenic viewing, photography, and viewing wildlife and cultural sites. Limited off-road vehicle use related to hunting occurs on existing ways but is restricted by the steep, rugged topography of this mountainous area.

Use data for hunting is available from the Colorado Division of Wildlife and Utah Division of Wildlife Resources. An average over the past 5 years (1978 through 1982) shows approximately 700 recreation days for deer hunting, 40 recreation days for elk, and 3 for mountain lion. Some hunting for bear and small game and trapping also occur.

Hiking and backpacking occur throughout the area. The draws, canyons, game trails, and Hoy Trail provide foot or horseback access into the area. Numerous opportunities for panoramic vistas of Ladore Canyon in Dinosaur National Monument, the High Uintas in Utah, Cold Spring Mountain, and other landscapes are available from the many high points and peaks.

An abundance of wildlife and diversity of vegetation and geology provide opportunities for viewing and nature study. Crouse Canyon along the northern border of the area in Utah provides opportunities for pleasure driving through this small scenic canyon and picnicking along Crouse Creek.

A portion of the Green River Scenic Corridor ACEC extends into the study area between the Crouse Canyon road in Utah and the Utah-Colorado state line. This encompasses approximately 1,750 acres of the study area. The ACEC was designated to protect the Green River corridor from adverse development and visual intrusions which would impact the scenic, historical, archaeological, recreational, and scientific values present. That portion of the Green River in Browns Park has been recommended for "scenic" designation under the Wild and Scenic Rivers Act and is pending Congressional action.

The ROS inventory identified four setting opportunity classes within the area as shown in Table 3-14. ROS classes are defined in Appendix D.

TABLE 3-14
ROS CLASSES
IN DIAMOND BREAKS WSA

Class	Acreage	Percent of Area
Primitive	1,020	3
Semiprimitive Nonmotorized	26,940	76
Semiprimitive Motorized	6,240	18
Roaded Natural	1,180	3

Slightly over 79 percent of the area provides a nonmotorized setting for recreation activities, which would result in opportunities for primitive types of recreation experiences. The primitive and semiprimitive nonmotorized classes offer opportunities to become isolated from the sights and sounds of man, to have a high degree of interaction with the natural environment, and to experience moderate to high challenge and risk. The motorized classes offer the same opportunities but to a lesser degree.

VISUAL RESOURCES

The study area falls into the Middle Rocky Mountain physiographic province as defined by Fenneman, 1946. The area consists of a series of very steep ridges and somewhat narrow valleys that fan out toward the Green River. Rock outcrops of red sandstone dominate the area and are in uplifted solid bands that cover all of the ridges. The landforms and rock outcrops are very distinct and visually interesting because of their sharp angles.

The ridges and mountains jut out of Browns Park and dominate visual elements when viewed from the park floor. The north-northeastern half of the area is viewed as foreground/middle ground from Colorado State Highway 318, which carries moderate to high recreation traffic during the summer and fall.

Approximately 30,000 annual visitors to the Gates of Ladore Ranger Station in Dinosaur National Monument view the area from Moffat County Road #34 as do visitors to the Browns Park National Wildlife Refuge.

Vegetation is primarily sagebrush at the toe of the slopes and valleys to the Green River and to the west. Dense pinyon-juniper dominates the lower slopes. As the elevation increases, mountain shrub species appear as well as open ponderosa pine parks, with Douglas-fir forest on many north-facing slopes. Many of the slopes are covered completely, except for sheer rock walls; this provides interesting color contrasts with the dark greens and grays of the vegetation set against the dark shades of red rock outcrops.

There are no significant modifications present within the area, so its natural rugged beauty is preserved. Overall, the area is very dramatic and dominates the visual experience for those who travel through Browns Park to Dinosaur National Monument or on their way to Flaming Gorge National Recreation Area.

This is an interesting area, with high, predominantly Class A, scenic quality and moderate sensitivity to change lending the area a Class II rating in the Colorado portion facing Browns Park.

Utah has rated the remainder of the unit in Colorado (to the west) and the Utah portion as primarily Class IV with B scenic quality with low sensitivity to change. Essentially the landscapes are the same regardless of the rating. The Class II and IV areas are divided by legal subdivision boundaries and not based on landscape changes. (A description of the VRM classes can be found in Appendix E.)

CULTURAL RESOURCES

No extensive systematic cultural resource survey has been conducted within the study area for historic or prehistoric sites. However, several prehistoric site types have been identified within the unit. These are open lithic sites, rockshelter sites, granaries, and rock art sites. Using regional data dealing with prehistoric human occupation of northwest Colorado, it is hypothesized that human habitation of the study area ranged from late Paleo-Indian through the Archaic and Fremont to protohistoric and historic Ute-Shoshoni.

The trapper and frontier period, 1800 to 1880, as well as the last 100 years, is documented for the Browns Park Area and some other local areas. However, little on-the-ground work has been conducted to establish historic activities within the study area.

LANDS AND REALTY

There is one realty-related land use authorization within the Diamond Breaks WSA. Approximately 130 acres of the area are leased to the state of Utah under the authority

of the Recreation and Public Purposes Act. This lease was issued for expansion of the Browns Park State Waterfowl Management Area, which lies adjacent to the northern boundary of the Utah portion of this unit. While most of the leased area is used for nesting habitat, approximately 75 acres of that portion of the lease within the WSA is or has been used for cultivation of grains for feed for several years.

The surface estate is entirely under federal ownership. The only private/state inholdings are the Recreation and Public Purposes Act lease noted above and 635 acres of split estate (federal surface; state of Colorado minerals).

Approximately 1,635 acres of land withdrawn under a powersite classification and 270 acres of public water reserves (without related developments) lie within the unit.

Given the area's location and topography, as well as surrounding topography and land use and the location of service areas, the potential for further realty-related actions within the study area is minimal. Potential for developments related to the powersite classification also appears minimal, while potential for development of the public water reserves is unknown.

CROSS MOUNTAIN

WILDERNESS VALUES

Mandatory Wilderness Characteristics

Size. The Cross Mountain WSA contains 14,081 acres of public land administered by BLM. Its blocked configuration encompasses most of Cross Mountain proper.

Naturalness. Cross Mountain is an oblong, flat-topped land mass rising over 2,200 feet above the floodplain of the Yampa and Little Snake rivers, making it easily distinguishable as a landmark. The mountain is approximately 9 miles long by 4 miles wide and reaches 7,804 feet in elevation in the northern part of the WSA. The Yampa River has cut an 800 to 1,200-foot gorge through the mountain. Erosion has worked on the mountain's east and west flanks, exposing colorful rocky rims. The eastern portion of the mountain is relatively uniform, with steep slopes and a few side canyons and ridges. The southern part is dissected by small drainages and has both steep slopes and rolling hills. The western portion of Cross Mountain differs from the eastern slope in that it is more diverse, containing many outcrops with vertical cliffs and overhangs. This area is highly dissected by side drainages and canyons. The main ridge of Cross Mountain is relatively flat, with a long narrow "meadow" sloping to the south.

The area is in a high quality natural state, having been affected primarily by the forces of nature. This is because the rugged, steep, rocky topography of the mountain, as well as past management, has prohibited disturbance and development.

All known significant imprints of man were eliminated from the study area by boundary adjustments during the inventory phase. The remaining minor imprints are few and substantially unnoticeable within the unit. The overall influence of the minor imprints on the wilderness characteristics of the area as perceived by the average visitor is negligible.

The minor imprints remaining in the study area are as follows: A jeep trail enters the southern part of Cross Mountain and courses north toward the canyon. This trail was eliminated by boundary adjustments during the inventory phase. The trail turns into a way as it enters the study area. It is maintained solely by the passage of four-wheel drive vehicles related to hunting and sightseeing as it meanders through the pinyon and juniper trees to the canyon rim. The nature of this imprint is minor, with adequate screening provided by the woodland vegetation and topography. A small amount of illegal firewood cutting has taken place; however, it is substantially unnoticeable and rehabilitation will occur through natural processes. Therefore, no adverse impacts to the naturalness or wilderness values occur because of this minor imprint.

An old trail on the west side of the mountain was used by vehicles before the area was designated as a WSA to allow access to a spring near Horse Gulch. The small spring was developed, without authorization by BLM, with a short buried pipeline and small metal stock tank. Rehabilitation has occurred through natural processes, and this minor imprint is substantially unnoticeable within the WSA.

Two short ways occur on the west side of the mountain. They are used primarily by hunters during the fall deer hunting season. Together, the ways traverse less than one-quarter mile of the study area and do not represent a significant impact.

Portions of Moffat County Road #25 on the west boundary of Cross Mountain were upgraded and rerouted in August of 1984 without authorization. This has only a minor effect on the WSA because it occurs adjacent to the boundary and is screened by topography.

Outstanding Opportunities for Solitude or Primitive and Unconfined Recreation. The study area has the size, location, and configuration needed to provide many opportunities to experience solitude. The rugged, highly dissected topographic relief, including Cross Mountain Canyon and the numerous side canyons around the mountain, offers many

outstanding opportunities to become isolated and truly alone. The pinyon-juniper woodlands and many massive rock outcrops provide excellent screening. There are many vantage points on the sides of the mountain and across the top that allow grand vistas of the surrounding landscape in all directions as well as within the study area. These vast expansive views of the northwest part of the state provoke a feeling of solitude, of being alone or isolated. Finding seclusion within the area is quite easy. Outside sights and sounds of man's activities are related primarily to ranching, intermittent traffic on county roads near the study area, and traffic from U.S. Highway 40 to the south.

These outside sights and sounds affect only peripheral areas of the study area and are not so imposing as to diminish any wilderness values. Distance, topographic and vegetative screening, and the intermittent nature of the disturbances diminish any adverse effect on the solitude within the Cross Mountain Wilderness Study Area as a whole.

The size, rugged mountainous terrain, and variety of vegetation and wildlife provides numerous opportunities for primitive and unconfined recreation. The study area encompasses most of Cross Mountain itself and, coupled with the blocked configuration, enables unconfined movement over the mountain or through Cross Mountain Canyon.

The canyon does divide the study area into a large northern portion and smaller southern portion. While the canyon prohibits movement between the north and south areas, each still offers a primitive type of recreation experience, although unconfined movement is somewhat restricted on the south end. Views into Cross Mountain Canyon from either the north or south rim inspire feelings of true isolation. The south end of the unit is of sufficient size to allow excellent opportunities for dayhikes or overnight backpacking but movement is restricted to a narrow area parallel to the canyon.

Cross Mountain Canyon provides an awe-inspiring experience because of its vertical walls and views of colorful geology, wildlife, and the cascading Yampa River itself. The river offers fishing opportunities at moderate to low water levels and expert kayaking at moderate river flow levels.

Cross Mountain provides numerous panoramic vistas of the surrounding landscape in all directions. Opportunities are also available for viewing varied botanic, cultural, geologic, and wildlife resources.

Hunting is a major activity occurring within the area. In the 1984 season, bighorn sheep were hunted on the mountain for the first time. This provides a unique opportunity in northwest Colorado.

Because of the semiarid climate, the study area offers excellent hiking and backpacking earlier and later in the year than the typical designated high altitude wilderness areas. This allows use of the unit for primitive recreation well before heavy snows have melted in many of the region's established wilderness areas. Other activities occurring include rockhounding, rock scrambling, nature study, and horseback riding.

Experiences associated with the numerous opportunities for primitive and unconfined types of recreation now available would include such things as challenge, adventure, escape from personal/social pressures, risk taking, experiencing relationships with nature, reflecting on personal values, escaping physical pressure (tranquility/serenity), or keeping physically fit. Overall, the study area provides a variety of outstanding opportunities for primitive and unconfined recreation activities in environmental settings which inspire memorable experiences.

Special Features

The Cross Mountain WSA contains a number of special features considered to be of scientific, educational, scenic, and historical value. These special features greatly enhance the wilderness values of the mountain.

Cross Mountain is a faulted asymmetric anticline. The rock outcrops represent a span of about one billion years of geologic history. The most outstanding geologic features are found in Cross Mountain Canyon. The canyon consists of a superimposed stream on Cross Mountain Anticline, where the Yampa River formed incised meanders, a geomorphic erosional product, within the canyon. Fossil remains are also found in the unit, representing some 500 million years of time.

The study area supports threatened or endangered species. The Yampa River in Cross Mountain Canyon is habitat for the federally endangered Colorado squawfish and humpback chub. In addition, the Colorado listed threatened razorback sucker is suspected to occur.

The endangered bald eagle and other raptors migrate through and use this area. Golden eagle nests and a possible prairie falcon eyrie have been identified in the canyon. The endangered peregrine falcon is known to hunt in the area. A herd of bighorn sheep range year-round throughout the study area both in and north of Cross Mountain Canyon, providing the only sheep hunting opportunity in northwest Colorado. River otter historically occurred in the area.

Cross Mountain is habitat for *Penstemon yampaensis* and *Leptodactylon watsonii*, both of which are rare endemic plant

species. A small stand of ponderosa pine occurs on the east side, which adds vegetative contrast to the area.

Several small caves or alcoves have been identified, most of which need to be located and researched further to identify any recreational, historical, and archaeological values. One was mapped by spelunkers in 1983.

There are numerous vantage points providing vistas both in and out of the study area as well as of Cross Mountain Canyon. These scenic views are considered to be of high quality and important to the area; the canyon has been identified as a potential ACEC for scenic values.

There is high potential for the cultural resources on Cross Mountain to contribute significant information on prehistoric use and occupation in northwest Colorado. This is because of the somewhat unique combination of environmental and topographic factors on and near Cross Mountain that are likely to have attracted prehistoric peoples throughout the past 12,000 years.

Diversity in the National Wilderness Preservation System

Cross Mountain is classified by Bailey-Kuchler, 1966, as having potential natural vegetation of juniper-pinyon woodland (12,000 acres) and sagebrush-steppe (2,081 acres). Unlike the classic wilderness designation of either high alpine country or slickrock deserts, sagebrush-steppe represents a semiarid, high country scrubland. Pinyon-juniper woodland also falls somewhere in between these two classic concepts of wilderness.

The potential natural vegetation names give no indication that other vegetation or plant communities exist in the study area. However, there are pockets of aspen scattered around the mountain as well as small areas of riparian vegetation (cottonwood, willows, cattails, etc.) and a small stand of ponderosa pine set in red sandstone on the east side of the mountain. Various species of mountain shrubs also inhabit much of the area. Wild flowers are found throughout the area, especially on top of the mountain in early summer. These variations contribute botanic diversity and add much interest to the study area.

The high country desert wilderness, which includes pinyon-juniper woodlands and sagebrush steppe, offers new diversity to the regional wilderness natural vegetation, which is typically alpine meadows (Eagles Nest Wilderness Area) or western spruce-fir forests (Flat Tops Wilderness Area). Cross Mountain's ecoregion is the same as for the established regional wilderness areas—Rocky Mountain Forest Province.

Cross Mountain would expand the opportunities for solitude or primitive recreation within a day's driving time

of major population centers. It lies about five hours from four Standard Metropolitan Statistical Areas. These areas are Denver-Boulder and Ft. Collins in Colorado; and Salt Lake City-Ogden and Provo-Orem, Utah. Cross Mountain does in fact receive recreation use from these areas. The area is easily accessible from U.S. Highway 40, which lies 3-1/2 miles to the south; this major east-west highway linking these large metropolitan areas receives much tourist traffic during the summer.

It is estimated that approximately 35,000 to 40,000 visitors annually view or stop at the west end of Cross Mountain Canyon on their way to Deerlodge Park in the eastern end of Dinosaur National Monument. The study area is within a day's drive of approximately 4 million people in three states. If energy development expands in the region, Cross Mountain would become more important as a refuge for the natural environmental settings required to experience true isolation and outstanding primitive recreation experiences.

GEOLOGY AND MINERALS

Cross Mountain is a structural uplift as well as a positive, elongate topographic feature. The 1,200-foot deep Cross Mountain Canyon is representative of a superimposed stream developed on the Cross Mountain anticline. The westward flowing Yampa River entrenched resistant rocks to form incised meanders within the canyon.

The Paleozoic rocks, in order of decreasing age, include several units. The Lodore Formation, of Cambrian age, the Mississippian Madison/Leadville Formation, and the scattered occurrences of the Humbug Formation and/or the Doughnut Shale, are also of Mississippian age.

The next youngest Paleozoic units include the Pennsylvanian age Morgan Formation and the Weber Sandstone, of Pennsylvanian-Permian age.

The Park City Formation/Phosphoria Formation, of Permian age, is the next youngest unit.

Lower Mesozoic units that occur within or immediately adjacent to the study area are the Triassic Moenkopi and Chinle formations, the Triassic-Jurassic Glen Canyon Formation, and the Jurassic Carmel, Entrada, Curtis, and Morrison formations.

The overlying Cretaceous units include the Dakota, Mowry, Frontier, and Mancos sequences.

Unconformably overlying portions of the older rocks within the study area is the Browns Park Formation of Tertiary age.

Rock units presently known to outcrop within or immediately adjacent to the wilderness study area include materials of Precambrian, Paleozoic, Mesozoic, Tertiary, and Quaternary ages. The Precambrian rocks are designated as the Uinta Mountain Group; piedmont, alluvial, landslide, and river terrace deposits of Quaternary age occur intermittently across the area, overlying exposed older rocks. Refer to the Regional Affected Environment for lithologic descriptions and their relationships.

Major structural disturbances, including prolonged intervals of erosion, are manifested within the study area by angular unconformities in the sedimentary sequence exposed. A lower angular unconformity separates the Uinta Mountain Group from the overlying Lodore Formation, and an upper angular unconformity marks orogenic activity just prior to deposition of the Browns Park Formation.

Cross Mountain occurs as a north-south trending structural feature transverse to these major regional east-west structural trends. The latter are subparallel to the general aspect of the Uinta Mountains.

Cross Mountain is considered to be at or near the easternmost end of the Uinta Mountains. It is a doubly plunging anticline, bordered on the east and west by faults. On the west side, in the Little Snake River Valley, a complementary syncline, the Lily Park Syncline, is found. Both of these faults appear to be essentially vertical at the surface. The western fault is apparently normal at the surface, dipping to the west, with an interpreted stratigraphic throw varying from approximately 100 feet at the south to about 300 feet at the northern end.

The northern end of the mountain is cut by transverse faults, resulting in a series of fault blocks. Apparent displacement is small, seldom exceeding 100 feet.

Thrust-faulting across the region is believed to have involved deformation which caused older rocks (Precambrian and portions of the Paleozoic units) to be juxtaposed above younger ones, some of which may have prospective potential as petroleum reservoir rocks.

The Cross Mountain structure lies astride the Axial Basin anticline, a predominant, generally east-west trending regional structural feature associated with significant hydrocarbon accumulations elsewhere in northwestern Colorado. Geophysical evidence suggests that geologic relationships in the subsurface within and adjacent to the Cross Mountain area may be favorable for similar oil and/or gas accumulations.

Known fields with commercial production of oil and gas exist near the study area. The Elk Springs-Winter Valley

Field is about 6 miles to the southwest, while the Danforth Hills Gas Field is about 10 miles to the southeast.

A list of oil and gas leases within the WSA, with dates of issuance, is shown in Table 3-15. Leases are shown on Map 3-10. Paleozoic and Mesozoic rocks within the study area include numerous horizons of potential significance as petroleum source and/or reservoir rocks; the complex structural relationships may be favorable for accumulations of hydrocarbons.

There is current exploration activity, including drilling, in the Cedar Springs area near the southeast, as well as immediately adjacent to Cross Mountain to the north and northeast. One of the current working hypotheses concerns the potential for subthrust occurrences of oil and gas in the context of "foreland thrust-faulting" as discussed by Gries (1983) and by Brown (1984).

Proprietary geophysical data has been interpreted as indicating that structural relationships below all of the Cross Mountain WSA may be discordant to visible surface structures, and, corollary to this, that geologic potential exists for the presence of undiscovered oil and/or gas accumulations at depth across the entire WSA.

The structural geology, stratigraphy, and sedimentology, known and inferred, are all quite favorable, and represent, at least in part, extensions of known subsurface geology from areas of significant oil and gas production adjacent to the WSA, along defined regional trends. Potential hydrocarbon reservoir rock horizons include the Precambrian Uinta Mountain group, as well as numerous stratigraphic intervals in Mesozoic and Paleozoic sequences.

Structural complexities, including imbricate faulting and stratigraphic overturning add to the potential for oil and gas accumulations, by repetition of stratigraphic intervals, and attendant hydrocarbon trapping and/or sealing effects. Additionally, there are numerous, thick and areally extensive sedimentary rocks present regionally which could have acted as petroleum source materials, and the thermal-geochemical-maturation characteristics are favorable as well for the generation of oil and gas.

Mining claims within the study area are listed in Table 3-16. The presence of anomalous concentrations of lead, zinc, vanadium, arsenic, and molybdenum in stream sediments indicates a potential for base and precious metal deposits within the study area. These were identified by a reconnaissance geochemical survey (Wetherbee and Low, 1983).

On the basis of such comparisons, rock units of interest with regard to base and precious metals include the Pennsylvanian, Mississippian, Cambrian, and Precambrian

TABLE 3-15
OIL AND GAS LEASES IN CROSS MOUNTAIN WSA

<u>Lease</u>	<u>Date of Issuance</u>	<u>Acres in WSA</u>	<u>Special Stipulation¹</u>
A = C25763	5/7/81	222	Wilderness Study Area Protection
B = C39553	Pending	320	Pending
C = C29009	7/19/82	1,839	Wilderness Study Area Protection
D = C36551	Pending	640	Pending
E = C29006	7/19/82	1,970	Wilderness Study Area Protection
F = C18723	Expired	369	Pending
G = C29008	7/19/82	2,480	Wilderness Study Area Protection
H = C29007	7/19/82	2,568	Wilderness Study Area Protection
I = C29072	7/19/82	854	Wilderness Study Area Protection
J = C23249	4/1/76	1,586	840 acres; No Surface Occupancy
K = C22614	Expired	100	None
L = C21422	Expired	510	None
M = C22414	Expired	50	None
N = C27032	9/11/78	9	None
O = C14499	Expired	60	None
P = C18723A	Expired	222	Pending
Q = C18257A	Expired	51	Pending
R = C23248	3/6/79	40	Wilderness Study Area Protection
S = C21949	Expired	140	None
T = C23250	3/6/79	78	Wilderness Study Area Protection

¹ Does not include seasonal or standard stipulations. The "Wilderness Study Area Protection" stipulation applies only during interim management. If the WSA is not designated as wilderness, the stipulation would no longer apply.

Status as of August, 1985; updated information may be obtained through BLM, Colorado State Office, Mineral Leasing Section (CO-943), 2020 Arapahoe, Denver, Colorado.

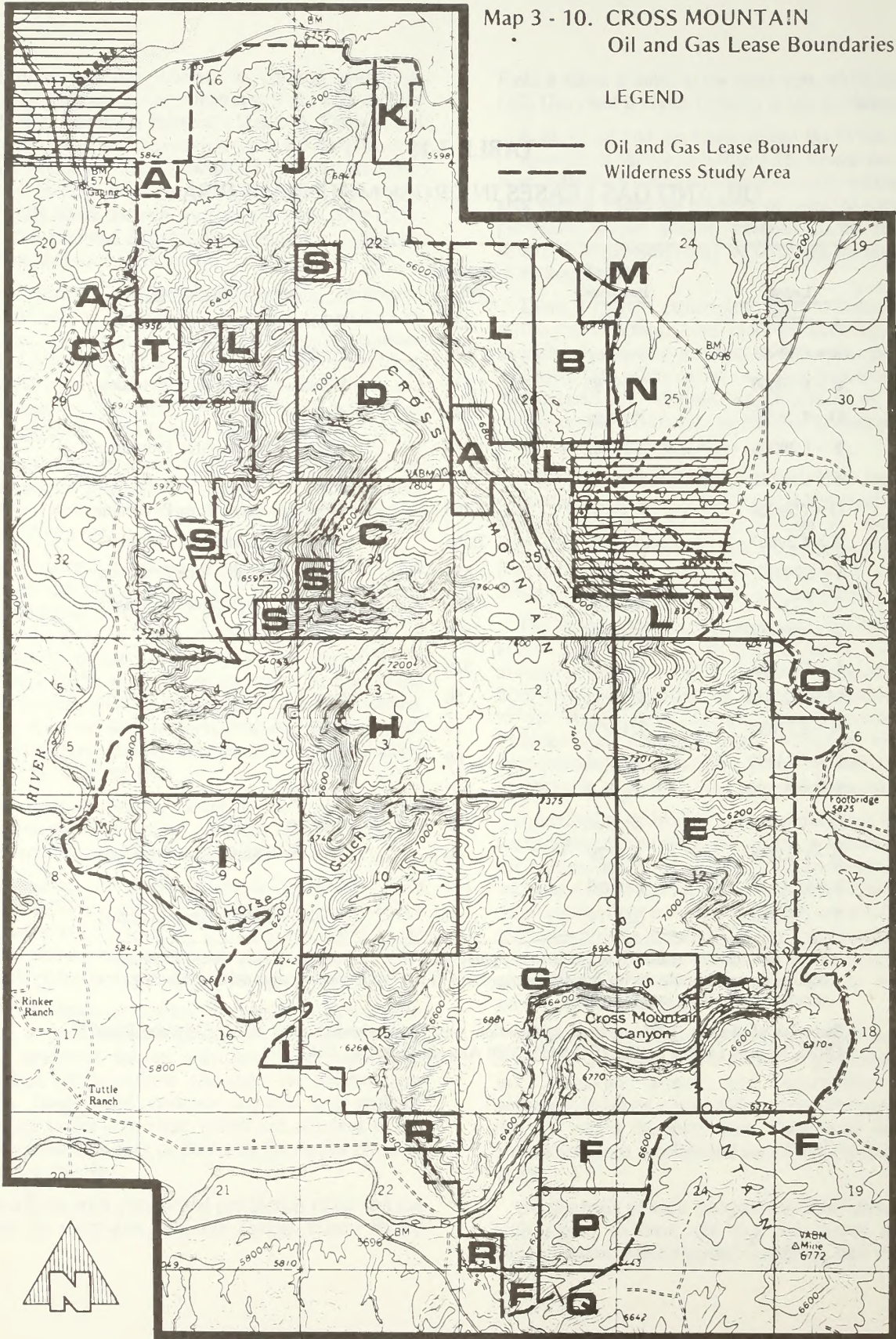
Map 3 - 10. CROSS MOUNTAIN
Oil and Gas Lease Boundaries

LEGEND

- Oil and Gas Lease Boundary
- - - Wilderness Study Area

T7N

T6N



R 98 W



TABLE 3-16
MINING CLAIMS IN THE CROSS MOUNTAIN WSA

Location	Serial Number	Location Date
T. 6 N., R. 97 W., sec. 19	191944 PL	4/28/82
T. 6 N., R. 98 W., sec. 24	191946 PL 194547 PL	4/27/82 9/9/82
T. 6 N., R. 98 W., sec. 26	191949 PL	4/28/82

sequences, with additional potential for uranium-vanadium in the Uinta Mountain Group and the Browns Park Formation as well.

The Paleozoic sequences, in particular the Lodore, Leadville/Madison, and Morgan Formations, are of types not uncommonly associated with base and precious metal deposits (especially lead-zinc, manganese, plus/minus copper, silver, cadmium, cobalt) elsewhere worldwide. These stratigraphic sequences are associated with known occurrences of these types of mineralization immediately to the west. Thus, the entire WSA is underlain by rocks prospectively valuable for base and/or precious metal occurrences.

Dimension stone resources occur within the Uinta Mountain Group, the Lodore Formation, Leadville Limestone, and Weber Sandstone. Cement rock resources exist in the Lodore Formation, Leadville Limestone, and Park City Formation.

Mineral pigments occur in the Lodore Formation and Leadville Limestone, and high calcium limestone is another potential nonmetallic resource from the latter unit as well. Other than for local use, consideration of the resource potential for these latter commodities within the study area would be speculative and, perhaps unlikely, at present. There have been expressions of interest from the private sector regarding high-calcium limestone.

Refer to Table 3-3 in the Regional Affected Environment for estimated levels of geologic potential for energy and mineral resources. The GEMS report (Witherbee, 1984) covering this WSA offers recommendations for further work. These recommendations are listed in Appendix G.

VEGETATION

Sagebrush and pinyon-juniper are the two dominant communities covering Cross Mountain. Both grow in similar

precipitation zones, their specific locations being determined by soil type and conditions. Pinyon and juniper grow in shallow, coarse, porous soils. Sagebrush is found where the soil is deeper and well drained.

The sagebrush communities are found on the rolling hills and open meadows at lower elevations on Cross Mountain. Some extend along the top of the mountain as well as along some of the higher, steep slopes below the crest of the main ridge. Pinyon-juniper covers the hillsides, valleys, and slopes of the mountain, forming an 8- to 20-foot canopy. Intermixed with the sage and trees and along the top of the wide ridge of Cross Mountain are found several different grass species.

The sagebrush type community occurs mostly along the northern and eastern edges of the study area. This type consists of an overstory of big sagebrush with an understory of needle-and-thread grass, western wheatgrass, Indian ricegrass, bluebunch wheatgrass, big sagebrush, and mountain mahogany. Most of the land associated with the pinyon-juniper vegetation type is very unproductive because of the steep and rocky topography.

Two rare or sensitive plant species are known to occur in or adjacent to the Cross Mountain study area, *Penstemon yampaensis* and *Leptoductylon watsonii*.

There have been no remnant plant associations identified within the study area boundaries. Based on an aerial reconnaissance survey conducted by BLM in 1981, the study area does not appear to harbor significant natural plant associations.

LIVESTOCK GRAZING

Five different grazing allotments are located within the WSA: Cross Mountain #4307, Disappointment #4400, Cedar Springs Draw #4402, Grounds #4222, and Sawmill Canyon #4308. These five allotments are used by five different operators. All of these are cattle operations except

CHAPTER 3

one sheep operation. The five operators graze their livestock year-round.

The five allotments contain 84,756 acres of public land and 10,479 AUMs; however, a total of 14,081 acres of public land and 1,985 AUMs are located within this study area. There are no existing rangeland management facilities within this WSA. The forage percentages affected in each of the allotments within the study area are listed in Table 3-17.

WILDLIFE HABITAT

The study area supports a varied and diverse fauna. Unique as well as common species interact to form a natural, dynamic ecosystem. Threatened and endangered species, big game, small game, nongame birds and mammals, and raptors, are present. Animal populations of the study area are of significant recreational, aesthetic, scientific, and educational value.

Approximately three miles of the Yampa River, which flows through the study area, supports a variety of game and nongame fish, amphibians, invertebrates, and vegetation. The river is classified as a warmwater fishery. Terrestrial mammals such as bighorn sheep are dependent upon this valuable water source. The scarcity of water in the region and occurrence of threatened and endangered species in the area make it highly important habitat.

Game Animals

Bighorn sheep, introduced in 1977 by the Colorado Division of Wildlife and BLM, inhabit the upper slopes and grassy areas of the mountain. They use the Yampa

River in Cross Mountain Canyon as a water source and the north canyon rim as a lambing area. A minimum of 13 sheep—mature rams, ewes, and lambs—make up one of only two herds in northwest Colorado outside Dinosaur National Monument. The present population is estimated to be 40 animals. Colorado Division of Wildlife's goal is to increase this herd to 50 animals to allow a harvest of up to 10 sheep. During 1984, they were hunted for the first time; two permits were issued. Bighorn sheep are sensitive to human disturbances—construction, harassment, and vegetation manipulation. Maintenance of solitude, water sources, and grassland/mountain shrub vegetation is vital if bighorn sheep are to survive and increase.

Mule deer and elk are also found in the study area. None of the study area is considered critical habitat for either species; however, the lack of roads and rugged terrain make the area a valuable natural refuge.

Nongame Mammals

Specific population history data is not available for the nongame mammals present in the study area. The distribution of characteristic nongame mammals is described according to the following biotic community associations. No crucial areas have been identified for nongame mammals.

Nongame mammals characteristic of the streamside habitat along the Yampa River include the vagrant shrew, long-tailed vole, mountain vole, and western harvest mouse. The ringtail is also characteristic of rock areas near water. The bushy-tailed woodrat, pinyon mouse, porcupine, and cliff chipmunk (in rock areas) are characteristic of the pinyon-juniper woodlands. Small mammals found throughout the study area include the deer mouse which is widespread in

TABLE 3-17
ALLOTMENTS IN CROSS MOUNTAIN WSA

<u>Allotment Name</u>	<u>Acres in Allotment</u>	<u>WSA Acres</u>	<u>AUMs in Allotment</u>	<u>AUMs in WSA</u>	<u>% AUMs Affected</u>
Cross Mountain	15,464.00	5,261	2,010	658	33
Disappointment	22,918.67	960	3,841	161	4
Cedar Springs Draw	22,408.60	480	3,641	78	2
Grounds	7,402.68	1,660	987	221	22
Sawmill Canyon	16,562.00	5,720	2,505	867	35

all terrestrial habitats and the golden-mantled ground squirrel and least chipmunk in all rocky areas.

Predatory mammals common to the study area include coyote, gray fox, long-tailed weasel, and bobcat in all habitats and mink, striped skunk, and short-tailed weasel usually near water. The Yampa River is historic range for the river otter and the potential exists for reestablishment in the canyon.

Nongame Birds

Cross Mountain Canyon, with its isolated rocky outcrops, offers excellent nesting and roosting areas for golden eagle, red-tailed hawk, kestrel, and turkey vulture. These birds are commonly observed. The first three species are known to nest in the study area. The turkey vulture may also nest there.

Bald eagle occur as winter residents. Peregrine falcon that nest in Dinosaur National Monument are known to hunt in the study area and could nest there.

Typical nongame birds of the riparian woodland community include the broad-tailed hummingbird, red-shafted flicker, black-billed magpie, western wood pewee, yellow warbler, and rofous-sided towhee. The white-throated swift and cliff swallow are also common near cliffs close to water.

The pinyon jay, mountain chickadee, white-breasted nuthatch, Bewick's wren, and black-throated gray warbler are typical of juniper woodlands. Other nongame birds which may be seen throughout the study area include the common nighthawk, common raven, and rock wren (in rocky areas).

Fish

Threatened and endangered game and nongame fish inhabit the Yampa River within the study area. Colorado squawfish and humpback chub, both federal and Colorado listed endangered fish, are found within and migrate through Cross Mountain Canyon. The razorback sucker, a Colorado listed threatened species, has been found just downstream of the canyon in Lily Park.

Channel catfish is the most common gamefish. The mouth of Cross Mountain Canyon is often used as a fishing area for this species. Nongame fish include carp, suckers, shiners, and dace. A complete inventory is not available.

SOILS

A large portion of the WSA consists of rock outcrop (mostly sandstone) on escarpments and mountain ridges.

These areas are very steep and usually have no soil development.

The major soil types within the WSA are on steep sideslopes. These soils are shallow to moderately deep and are excessively to well drained. Surface soil layers commonly are extremely stony and extremely cobbly loams and sandy loams. The underlying layers include extremely stony and extremely cobbly sandy clay loams, loams, sandy loams, and loamy sands. Runoff on these soils is usually rapid, and the hazard of water erosion is high. The hazard of wind erosion varies from slight to high.

Minor types of soil within the WSA occur on moderate to steep slopes. These soils range from shallow to deep and are excessively to well drained. Surface soil textures are generally coarse, including loamy sands, and loams, while subsoils may consist of sandy loams, fine sands, loams, gravelly loamy sands, or gravelly clay loams. Runoff on these soils is medium to rapid, and the hazard of water erosion is moderate to high. The hazard of wind erosion is also moderate to high.

WATER

The most significant water resource in the Cross Mountain unit is the Yampa River. At Maybell, Colorado, approximately 17 miles upstream from the Cross Mountain study area, U.S. Geological Survey records indicate that the flow averages 1,542 cubic feet per second and 1,117,000 acre-feet per year. Flow records for water year 1981 show a peak flow of 10,200 cubic feet per second recorded on May 5, 1982, and a low flow of 43 cubic feet per second recorded on October 2, 1981.

The Colorado River Water Conservancy District has been decreed surface and storage water rights on the Yampa River in the NW1/4 SW1/4, Section 23, T. 6 N., R. 98 W., 6th P.M. A conditional storage right has been decreed for 208,000 acre-feet and a conditional surface water right has been decreed for 2,200 cubic feet per second. The Conservancy District has requested the water for irrigation, municipal, commercial, industrial, recreation, piscatorial, domestic, and stock purposes. These water rights are associated with the proposed Cross Mountain Dam.

Fifteen springs are known to exist in the Cross Mountain WSA. The BLM is currently in the process of obtaining water rights on most of these sources for wildlife, livestock, recreation, and other purposes.

FOREST RESOURCES

One 200-acre stand of ponderosa pine occurs on the northeast side of Cross Mountain. This stand, together with the ponderosa pine stands endemic to Douglas Mountain to the west, represent a contiguous ecological feature relatively unique in northwestern Colorado. Given the adverse location of this stand and the fragile site on which it occurs, this stand has been classified as noncommercial forestland. There is presently a severe infestation of mountain pine beetle in and around this area.

Pinyon-juniper is the dominant forest type within this unit. Approximately 750 acres of the total have been tentatively classified as productive-operable woodland sites. By definition, these sites are capable of bearing wood products of commercial character and are economically available now or in the near future for commercial use. Commercial demand for woodland products has increased in this area during recent years. However, sufficient quantities exist in adjacent areas to supply present and future demand.

RECREATION

Cross Mountain offers many opportunities for primitive types of recreation activities such as hiking, backpacking, rock scrambling, hunting, photography and viewing scenic, botanic, geologic, zoologic, and cultural resources. Secondary opportunities are available for fishing, snowshoeing, horseback riding, and kayaking.

Cross Mountain Canyon offers some of the most outstanding forms of primitive recreation in the study area. Kayaking on the Yampa River through the canyon, at times other than high flows, has been accomplished by experts and is considered to be very technical, representing a great risk and challenge to whitewater enthusiasts. This short 3-1/2-mile whitewater run is becoming well known in the region. Some groups of expert kayakers from Salt Lake City and Denver consider this run to be one of the best in the region. Rafting should not be attempted.

At times other than high water, it is possible to hike through the canyon. This deep, colorful gorge provides dramatic viewing opportunities because of the diverse geology, wildlife, and the cascading river. Hiking in the canyon is very difficult, requiring one to scramble over large rocks and boulders.

Bighorn sheep frequent the canyon as do golden eagle, prairie and peregrine falcon, turkey vulture, other raptors, and birds. All of these offer viewing opportunities.

The high points on Cross Mountain offer numerous expansive vistas of the surrounding landscape in all

directions, including Douglas Mountain and Dinosaur National Monument to the west and the vast expanse of northwest Colorado, as well as the Yampa River floodplains east to the Continental Divide.

The study area contains a variety of wildlife, both large and small, which provide many opportunities for both hunting and viewing. Deer, elk, and antelope are available for hunting. Many hunters camp at the base of Cross Mountain (eight locations) during deer season. In 1984, permits for bighorn sheep hunting were issued. This marks the first time the reintroduced herd has been hunted, creating a unique opportunity in northwest Colorado. An abundance of small game and nongame birds and mammals exist throughout the study area, offering good opportunities for hunting or viewing.

Hiking and backpacking are increasing within the study area. There are no developed trails, but many routes are available to the mountaintop via numerous game trails, side canyons, and draws. The side canyons, draws, rock outcrops, and steep sideslopes offer numerous opportunities to explore as well as view numerous cultural resources (i.e., rock art, granaries, lithic scatters, camps, etc.). Several small caves or alcoves may exist on the mountain. One was mapped by spelunkers in 1983.

Fishing, picnicking, swimming, and some floatboating occur at low water in the summer on the Yampa River at the west end of Cross Mountain Canyon both within and outside of the study area. Most of these visitors use the parking area constructed by the National Park Service along Deerlodge Park road, which leads into the east end of Dinosaur National Monument and ends at Deerlodge Park campground.

The campground is the put-in for whitewater boat trips on the Yampa in the Monument. Approximately 35,000 to 40,000 visitors travel this paved road annually, and many stop at Cross Mountain to view the canyon and river and participate in the other activities. This has become a popular trailhead point for dayhikes up to the southern rim of the canyon. Visitor use data is not available for the area and the following numbers used are only estimates. However, use is considered to be moderate and appears to be increasing, based on observations and correspondence.

Some off-road vehicle use occurs on the periphery of the study area. This takes place in conjunction with hunting. However, off-road vehicle use is not important to this area and is restricted by the steep, rugged terrain.

The ROS was used to inventory the study area. Three setting opportunity classes were identified (see Table 3-18). ROS classes are defined in Appendix D.

TABLE 3-18
ROS CLASSES
IN CROSS MOUNTAIN WSA

Class	Acreage	Percent of Area
Semiprimitive Nonmotorized	11,481	82
Semiprimitive Motorized	1,130	8
Roaded Natural	1,470	10

Eighty-two percent of the study area offers the most primitive type of outdoor recreation experiences available in the area. This class offers opportunities to experience isolation, have a high degree of interaction with the natural environment, experience moderate to high risk and challenge, and use outdoor skills.

Because of the proximity of roads outside the study area, 18 percent of the area is in a motorized setting. Motorized use does occur in a few locations on the periphery of the unit, but, for the most part, the class implies that some areas are close to vehicle access points and roads. These peripheral areas provide fewer remote forms of primitive recreation but still offer some opportunities for isolation. One can have a high degree of interaction with the natural environment, with some challenge and risk, in the motorized classes.

VISUAL RESOURCES

Cross Mountain is considered to have outstanding scenic qualities (Class A), especially the area encompassing Cross Mountain Canyon. Many opportunities are available for panoramic views both in and out of the study area in all directions. These scenic views are important to the area and enhance both solitude and recreation opportunities.

The entire mountain has a high sensitivity to any changes in the existing natural landscape character because it is highly visible from adjacent areas and dominates the lesser surrounding geographic features. Portions of the eastern and southern end of the mountain are visible from U.S. Highway 40. Portions of the western side are viewed from the Deerlodge Park Road, which is a major access route into Dinosaur National Monument. Protection of these scenic values has been an objective of past and present management of the area.

The majority of Cross Mountain is categorized in Visual Resource Management Class II, where any changes in the basic elements (line, form, color, and texture) caused by management activity should not be evident or attract attention in the landscape. Other small portions of the study area are in Classes III and IV. (A description of the VRM classes can be found in Appendix E.)

The 1979 Visual Resource Management Inventory identified Cross Mountain Canyon as a potential ACEC for scenic values. This is based on the Class A scenery and the relative scarcity of the feature within the Middle Rocky Mountain physiographic region. The canyon is a result of the Yampa River cutting through the mountain to create a short, spectacular canyon. A variety of colorful geologic formations are displayed throughout the vertical sidewalls. The river dominates the scene with cascading drops and a series of rapids.

CULTURAL RESOURCES

A systematic cultural resource survey has not been carried out within the study area. However, several prehistoric sites are known. Site types vary from isolated finds, resource procurement sites, and quarry-base camps to Fremont and Ute-Shoshoni rock art. It is estimated that prehistoric human habitation of the area varied from late Paleo-Indian through the Archaic and Fremont to the Ute-Shoshoni.

LANDS AND REALTY

There is one realty-related land use authorization within the Cross Mountain Wilderness Study Area. In 1907, an irrigation ditch right-of-way was authorized, pursuant to the Act of March 3, 1891, for the White Bear Ditches (Nos. 1 and 2). The approved location of the headgate appears to be near the section line between Sections 13 and 14, T. 6 N., R. 98 W., 6th P.M. Although the actual location is difficult to pinpoint (the right-of-way survey was tied to section corners based on the original survey of 1882, which was later suspended), historical documents indicate that the headgate (and, apparently, a reservoir) was to be located in the canyon. The ditches were to run along either side of the Yampa River to the west end of Lily Park.

The authority for this right-of-way required all construction to be completed within a 5-year period. There appears to be no evidence that the system was ever built. In 1923, the Colorado State General Land Office issued a decision requiring proof of construction or relinquishment. No subsequent documents are available, however, and this authorization will remain on paper until actively terminated by BLM.

CHAPTER 3

The surface and mineral estates are in federal ownership. Mining claims, and possibly the above noted right-of-way, are the only known private or state inholdings.

Approximately 1,375 acres in this unit are withdrawn under a powersite reservation. Approximately 230 acres are withdrawn for reclamation purposes, and 40 acres are in a public water reserve.

Given the area's location and topography, as well as surrounding topography and land use and the location of service areas, the potential for development as a result of realty-related land use authorizations is minimal. The potential for development for water power purposes is based on current economic considerations; and while the potential is low, it does exist. The potential for development for reclamation purposes is low (the withdrawal is being processed for revocation), and the potential for development of the public water reserve is unknown.

SOCIAL VALUES

The Cross Mountain Wilderness Study Area has considerable social significance for the local area and the region. For many years, the Colorado River Water Conservation District has tried unsuccessfully to obtain funding and federal approval to construct a water storage and power dam at the mouth of Cross Mountain Canyon, which would inundate the Yampa Valley upstream almost to Maybell. Federal approval, of course, would be partially contingent upon whether the wilderness study area was eventually approved by Congress as a wilderness area. The President does have authority to authorize a dam project within a designated wilderness area.

During the Craig boom, around 1979 to 1981, the dam was an important local issue. Colorado Ute was expected to finance the dam (and a sister dam in Juniper Canyon a few miles upstream) for electric power, with recreational use of the lakes as an auxiliary regional benefit, if Federal Energy Regulatory Commission approval could be obtained and if Congress did not prohibit building the dam in specific legislation for the area. The post-boom slump caused abandonment of the larger plan by Colorado Ute, and the current local effort is toward only the Juniper Canyon Dam. The entire dam project has consistently been opposed by wilderness and other environmental preservation interests all around the region.

The Cross Mountain WSA is about halfway between Denver and Salt Lake City, near U.S. Highway 40. It currently provides opportunities for sightseeing, hiking, fishing, whitewater kayaking, and hunting. Local ranchers hold grazing permits for some of the acreages; other minor economic potential exists.

Local opinion toward the Cross Mountain WSA in Craig is mixed. The business community in particular strongly opposes wilderness designation because of interest in the dam. Other citizens apparently are more strongly against than for wilderness designation, though some do support wilderness, according to informal discussions with persons in the town.

Maybell is the community nearest the study area, and Sunbeam is in the valley northwest of Maybell that would be inundated by the lake if the Cross Mountain dam were built. Informal but detailed interviews with 21 residents in Maybell and Sunbeam communities in December, 1981, showed that about one-half of families in Sunbeam, and one-third of families in Maybell supported wilderness designation. The interviewer reported that explanations given for such support reflected a lack of information and a belief that wilderness designation was the only alternative to the dam. Thus, it is clear that the Cross Mountain WSA has social significance at the local and regional levels.

ANT HILLS

WILDERNESS VALUES

Mandatory Wilderness Characteristics

Size. The study area contains 4,354 acres of public land administered by BLM.

Naturalness. The Ant Hills Wilderness Study Area consists of hills and valleys on the southern slopes of Douglas Mountain. The rolling to steep terrain has ridges and draws which are generally sagebrush covered and open. Other areas are covered with pinyon-juniper woodland vegetation. The topography along the western boundary comprises ridges and intervening valleys. Starvation Valley terminates at the southern boundary and blends into the upper part of Warm Springs Draw. The upper end of Burnt Gulch and other minor drainages are within the area. All of the drainages trend southward into the Monument and the Yampa River.

The Ant Hills consist of several hills rising 400 to 500 feet above the draws in the southeastern part of the study area. Elevations vary from 6,800 feet in the south to 7,900 feet in the north.

The area has a natural appearance with only a few minor human imprints. These consist of two reservoirs currently in use in the Burnt Gulch drainage, a small stockwater tank located in the north portion of Big Joe Draw adjacent to the boundary road, a way approximately 1 mile long proceeding north to south to the two reservoirs in Burnt

Gulch, and approximately 200 yards of fenceline bisecting the northeast corner of the unit. All of these imprints are minor and scattered. They do not detract from the overall naturalness exhibited by the area.

Outstanding Opportunities for Solitude or Primitive and Unconfined Recreation. Given the small size of this and other 202 areas, the opportunities to become isolated or remote from others is limited in the area itself. The study areas depend on Dinosaur National Monument to have adequate area to meet the outstanding opportunities criterion. Some screening is provided by ridges, drainages, the Ant Hills, and, in a few locations, by pinyon-juniper woodlands. The numerous drainages provide unrestricted movement through the area and into the Monument. The opportunities for primitive recreation are not outstanding unless considered in conjunction with the adjoining Monument lands.

The rolling to steep terrain in these areas, with many open ridges and draws, provides minimal screening. There are several high points in the study areas which provide views of the surrounding country, including small portions of the Yampa River Canyon. The opportunity to become truly isolated, however, would not be outstanding without the contiguous Monument, where the topography becomes extremely rugged and steep. There are no outside sights or sounds which would diminish opportunities for solitude within the study areas except as noted in the Peterson Draw WSA description.

Hunting and related activities would continue to be the primary recreational opportunities in these units. The other activities taking place—backpacking, horseback riding, and scenic viewing—would be confined because of the small size and intervening private lands and roads between the areas. Because of the topography along the Monument boundary, few of the high points provide vistas of the river canyons, which make up the core of the wilderness proposal for the Monuments. Only in conjunction with the Monument do these study areas have outstanding opportunities for primitive recreation and allow unconfined movement.

The National Park Service wilderness proposal for Dinosaur National Monument recognizes the Yampa River canyons as the heart of the opportunities for a wilderness experience (both recreation and solitude). The upland areas of the Monument are proposed as wilderness in order to protect the canyon areas from influences and development that would detract from the wilderness experience. In this context the adjacent BLM wilderness study areas do contribute somewhat to the outstanding opportunities for a wilderness experience present in the Monument. However, they do not have such outstanding opportunities in their own right.

Special Features

The peregrine falcon probably hunts in all five of the study areas, but no nesting sites have been recorded. The mountain lion occurs throughout the study areas. Data is inadequate to identify any cultural resources within the areas. The potential exists for these areas to contain cultural resources, based on historic and prehistoric work conducted inside Dinosaur National Monument. Ponderosa pine adds interest in these areas. There are no other known special features within these five study areas.

Diversity in the National Wilderness Preservation System

Based on the Bailey-Kuchler vegetation classification system, the five Section 202 WSAs are in the Rocky Mountain Forest Province. The potential natural vegetation and estimated acreages for each wilderness study area are presented in Table 3-19.

The potential natural vegetation classifications indicate what vegetation types would exist if plant succession were allowed to reach climax without any human interference. There are, however, variations of these types found within some of the study areas not indicated by these classifications. Scattered ponderosa pine, as well as mountain shrub species, are found in the northern part of Units 226 and 228. While pinyon-juniper woodlands dominate the majority of the five areas, sagebrush-grass plant communities occur on south slopes, on some ridgetops, and in many of the draws and drainages.

GEOLOGY AND MINERALS

Rock units known to outcrop at present within Ant Hills WSA include materials of Paleozoic and Quaternary ages. The oldest of these units is designated as the Leadville/Madison Limestone, of Mississippian age.

Other Mississippian age units of somewhat more sporadic occurrence include the Humbug Formation and the Doughnut Shale. Overlying the Mississippian strata are the Pennsylvanian Round Valley Formation and the Morgan Formation conformably overlain by the Weber Sandstone of Pennsylvanian-Permian age. The WSA is underlain by the Precambrian Uinta Mountain Group, as well as the Cambrian Lodore Formation. Deposits of Quaternary age occur intermittently across the area, overlying exposed Paleozoic rocks. Refer to the Regional Affected Environment for a lithologic description of these rock units and their relationships.

As of August 1985, the entire study area had been leased for oil and gas. A list of these leases, with dates of issuance, is shown in Table 3-20. Map 3-11 shows where they occur.

TABLE 3-19
POTENTIAL NATURAL VEGETATION
IN SECTION 202 WSAs

<u>Wilderness Study Area</u>	<u>Potential Natural Vegetation</u>	<u>Acres</u>	<u>Percent of Area</u>
Ant Hills-224	Juniper-Pinyon Woodland (M3110-21)	3,000	69
	Sagebrush-Steppe (M3110-49)	1,354	31
Chew Winter Camp-224a	Juniper-Pinyon Woodland (M3110-21)	1,320	100
Peterson Draw-226	Juniper-Pinyon Woodland (M3110-21)	4,160	81
	Sagebrush-Steppe (M3110-49)	1,000	19
Tepee Draw-228	Juniper-Pinyon Woodland (M3110-21)	4,290	78
	Sagebrush-Steppe (M3110-49)	1,200	22
Vale of Tears-229d	Juniper-Pinyon Woodland (M3110-21)	7,420	100

TABLE 3-20
OIL AND GAS LEASES IN THE ANT HILLS WSA

<u>Leases</u>	<u>Date of Issuance</u>	<u>Acres in WSA</u>	<u>Special Stipulations¹</u>
A = C34238	12/6/82	3,498	Wilderness Study Area Protection
B = C34356	10/8/82	856	Wilderness Study Area Protection

¹ Does not include seasonal or standard stipulations. The "Wilderness Study Area Protection" stipulation applies only during interim management. If the WSA is not designated as wilderness, the stipulation would no longer apply.

Status as of August, 1985; updated information may be obtained through BLM, Colorado State Office, Mineral Leasing Section (C0-943), 2020 Arapahoe, Denver, Colorado.

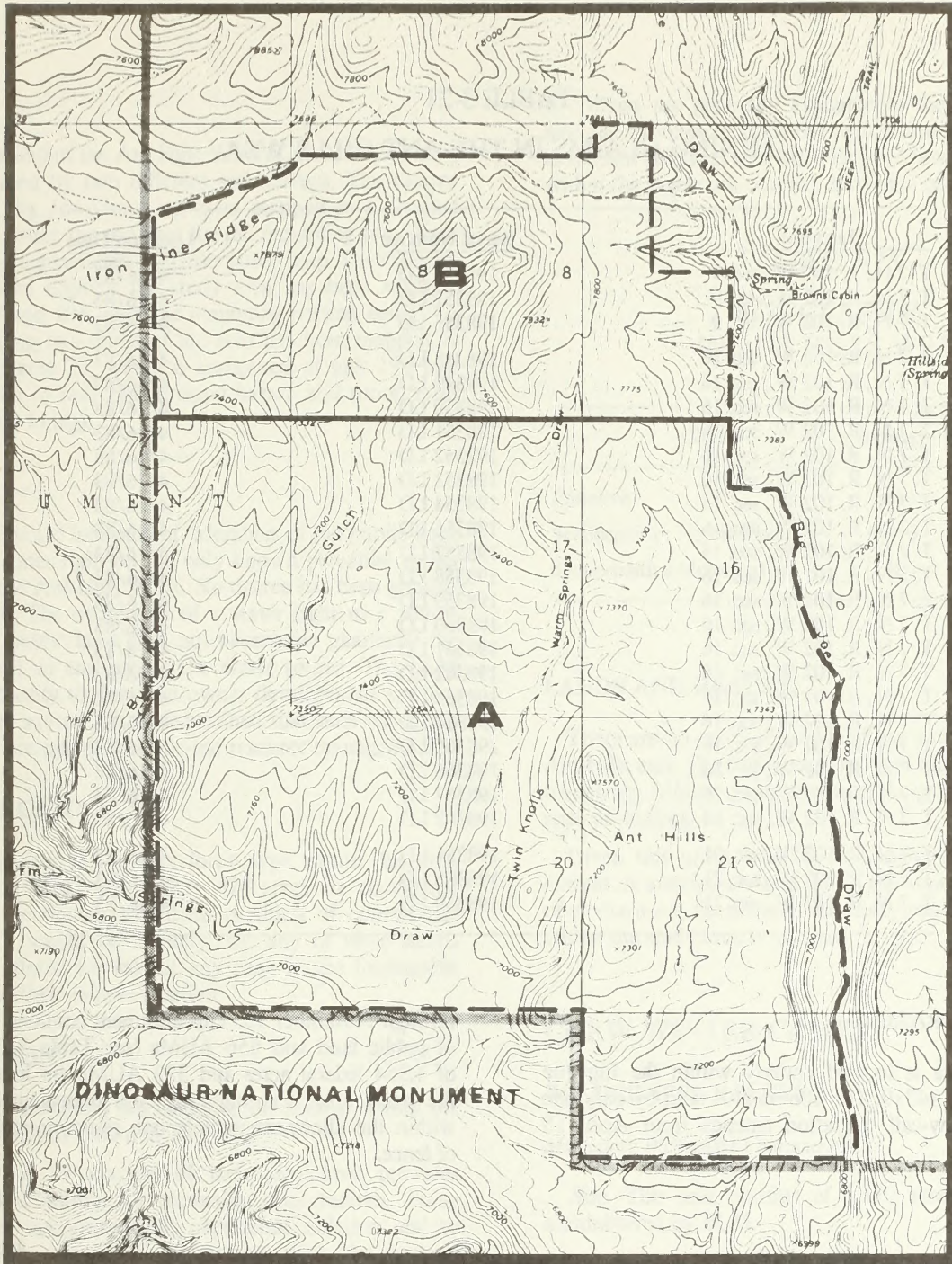
As discussed in the Regional Affected Environment, base and precious metal mineralization is associated with geologic structural features located in the vicinity of the five Section 202 WSAs. Similar mineralization is known within the study area. There has been past production, but the character, extent, and resource significance remain to be fully determined.

Mining claims in the study area are listed in Table 3-21. The mineralization of interest includes base and precious metals—in particular copper, lead, zinc, iron, manganese, gold, and silver—partly associated with faults. There may be additional mineralization associated with the Cambrian Lodore Formation and/or Precambrian Uinta Mountain

Group rocks in the subsurface within the study area. In addition to the base and precious metals cited, uranium-vanadium potential exists in the Uinta Mountain Group. The entire WSA is underlain by rocks prospectively valuable for base and/or precious metal occurrences.

VEGETATION

The north-facing slopes in the northern section of Ant Hills WSA consist of predominantly juniper-ponderosa pine vegetative cover. The ridgetop and remaining slopes are predominantly pinyon and juniper, with grasses and sage on the lower slopes. Sagebrush and grass dominate the draws, with the sagebrush growing thickly.



T7N



Map 3 - 11. ANT HILLS
Oil and Gas Lease Boundaries

LEGEND

- Oil and Gas Lease Boundary
- - - Wilderness Study Area

TABLE 3-21
MINING CLAIMS IN THE ANT HILLS WSA

<u>Location</u>	<u>Serial Number</u>	<u>Location Date</u>
T. 7 N., R. 102 W., sec. 9	198348 LD	4/16/83
T. 7 N., R. 102 W., sec. 9	198352 LD	4/16/83
T. 7 N., R. 102 W., sec. 9	198356 LD	4/16/83
T. 7 N., R. 102 W., sec. 16	198348 LD	4/16/83
T. 7 N., R. 102 W., sec. 16	198349 LD	4/16/83
T. 7 N., R. 102 W., sec. 16	198350 LD	4/16/83
T. 7 N., R. 102 W., sec. 16	198351 LD	4/16/83
T. 7 N., R. 102 W., sec. 16	198352 LD	4/16/83
T. 7 N., R. 102 W., sec. 16	198353 LD	4/16/83
T. 7 N., R. 102 W., sec. 16	198354 LD	4/16/83
T. 7 N., R. 102 W., sec. 16	198356 LD	4/16/83
T. 7 N., R. 102 W., sec. 16	198357 LD	4/16/83
T. 7 N., R. 102 W., sec. 16	198358 LD	4/16/83
T. 7 N., R. 102 W., sec. 16	198359 LD	4/16/83
T. 7 N., R. 102 W., sec. 16	198360 LD	4/16/83
T. 7 N., R. 102 W., sec. 16	198361 LD	4/16/83
T. 7 N., R. 102 W., sec. 16	198362 LD	4/16/83
T. 7 N., R. 102 W., sec. 16	198363 LD	4/16/83
T. 7 N., R. 102 W., sec. 16	198364 LD	4/16/83
T. 7 N., R. 102 W., sec. 16	198365 LD	4/16/83
T. 7 N., R. 102 W., sec. 16	198366 LD	4/16/83
T. 7 N., R. 102 W., sec. 16	198367 LD	4/16/83
T. 7 N., R. 102 W., sec. 16	198368 LD	4/16/83
T. 7 N., R. 102 W., sec. 21	198351 LD	4/16/83
T. 7 N., R. 102 W., sec. 21	198355 LD	4/16/83
T. 7 N., R. 102 W., sec. 21	198359 LD	4/16/83

LIVESTOCK GRAZING

The study area is located entirely within the Big Joe Draw Allotment #4319. The allotment is used by only one permittee. A cow-calf operation extends from April 15

through November 15. This allotment contains 7,640 acres of public land and 556 AUMs (see Table 3-22). A total of 4,354 federal acres and 322 AUMs are located within the study area. Existing rangeland management facilities within the allotment include one reservoir and 5.5 miles of fence.

TABLE 3-22
ALLOTMENTS IN ANT HILLS WSA

<u>Allotment Name</u>	<u>Acres in Allotment</u>	<u>WSA Acres</u>	<u>AUMs in Allotment</u>	<u>AUMs in WSA</u>	<u>% AUMs Affected</u>
Big Joe Draw	7,640	4,354	556	322	58

SOILS

The soils within the Ant Hills WSA (CO-010-224) have been described by two different soil surveys. The eastern third from Big Joe Draw has been mapped as a detailed soil survey, while the soil data for the remaining two-thirds is covered by a generalized soil association map. The majority of the eastern edge of the study area has been mapped as unit 167 and 194, with the remaining portion being 7C. The remaining two-thirds of the area has been mapped as general soil area 23, which is composed of unit 194 and a unit similar to unit 164. Erosion hazard and runoff rates are moderate to high.

WATER

All streams are intermittent. Members of the public have filed for a water right on the only known perennial spring located in the Ant Hills WSA. No decree has been granted at this time. The ownership of a water right to a source located on public land does not necessarily guarantee the owner access to and use of the water source. The BLM has the authority to deny the owner development and use of the water source if it is determined that such use is not in the best interests of multiple-use resource management.

FOREST RESOURCES

Pinyon-juniper is the only forest type within this unit, occurring on 1,732 acres. Only 474 acres are considered capable of producing woodland products of commercial character. It would be unlikely that any of these stands would be offered for sale at any time in the foreseeable future, given their remote location.

RECREATION

The ROS inventory has classified the settings within the Ant Hills WSA as shown in Table 3-23.

A total of 89 percent of the study area provides nonmotorized settings for recreation opportunities. These classes offer opportunities to experience isolation and to have a high degree of interaction with the natural environment. They provide challenge and risk, among other opportunities. These experiences are present in the motorized class as well but are of less importance.

VISUAL RESOURCES

The entire area has an A scenic quality rating and is in Visual Resource Management Class II (see Appendix

E). Views are generally available to the west and south into the Monument from the high points in the area, such as the Ant Hills and Iron Mine Ridge. Views of the landscape within the sagebrush covered draws are confined.

TABLE 3-23
ROS CLASSES
IN ANT HILLS WSA

Class	Acres	Percent of Area
Primitive	564	13
Semiprimitive Nonmotorized	3,310	76
Semiprimitive Motorized	480	11

LANDS AND REALTY

There are no realty-related land use authorizations in the Ant Hills unit. The surface and mineral estates are in federal ownership. Mining claims represent the only known private/state inholdings.

Given this unit's location and topography, along with current or anticipated land use in the area and the location of service areas, the potential for realty-related authorizations within the study area is minimal.

CHEW WINTER CAMP

WILDERNESS VALUES

Mandatory Wilderness Characteristics

Size. This area consists of 1,320 acres of public land administered by BLM.

Naturalness. The Chew Winter Camp WSA consists primarily of ridgetops and intervening drainages which trend generally southward, leading ultimately into Dinosaur National Monument and the Yampa River. The area is located at approximately the midpoint of these drainages; a road forms the northern boundary of the unit. The eastern portion of the area consists primarily of a sagebrush-covered

valley bounded by ridges on either side. A steep drainage cuts through the middle of the unit. The western end comprises a series of ridges and minor drainages. Elevations vary from 6,700 to 7,300 feet.

The area remains in a high quality natural state, with only two minor imprints of man. One reservoir is located in the northwest portion of the unit adjacent to the boundary road. An abandoned fence line approximately 600 feet long is located in the northern portion; it crosses the north boundary road.

Outstanding Opportunities for Solitude or Primitive and Unconfined Recreation. The opportunities for solitude or primitive recreation are not outstanding because of the small size of the area. However, when the adjoining Monument lands are considered, the area does meet this criterion. Movement would be restricted within the area itself; however, when the Monument lands are considered, unrestricted travel is available across the southern boundary of the study area and into the Monument itself. (See this section under Ant Hills WSA for additional information.)

Diversity in the National Wilderness Preservation System. See this section under Ant Hills WSA.

GEOLOGY AND MINERALS

Rock units known to outcrop at present within this study area include materials of Paleozoic and Quaternary ages.

The Paleozoic units are rocks of Pennsylvanian age, including the Round Valley Formation and the younger Morgan Formation.

As a result of the structural folding discussed in the Regional Affected Environment, the study area is underlain by units older than the Pennsylvanian rocks including, in order of increasing age: Mississippian age Madison/Leadville Limestone, the Humbug Formation and the Doughnut Shale, Cambrian age Lodore Formation and Precambrian age Uinta Mountain Group. Quaternary age deposits occur intermittently across the area, overlying exposed older rocks. Refer to the Regional Affected Environment for detailed descriptions of the lithology of these units and their relationships.

As of August 1985, all 1,320 acres within the study area had been leased for oil and gas. The lease, with date of issuance, is shown in Table 3-24.

The Regional Affected Environment discusses fault and joint systems in the region. One of these major east-northeast trending faults lies partially within the study area, as does known base and precious metal mineralization whose character, extent, and resource significance remain to be more fully determined.

Mining claims in the study areas are listed in Table 3-25. The entire WSA is underlain by rocks prospectively valuable for base and/or precious metal occurrences.

**TABLE 3-24
OIL AND GAS LEASES IN THE
CHEW WINTER CAMP WSA**

<u>Leases</u>	<u>Date of Issuance</u>	<u>Acres in WSA</u>	<u>Special Stipulations¹</u>
C34238	12/6/82	1,320	Wilderness Study Area Protection; 40 acres No Surface Occupancy

¹ Does not include seasonal or standard stipulations. The "Wilderness Study Area Protection" stipulation applies only during interim management. If the WSA is not designated as wilderness, the stipulation would no longer apply.

Status as of August, 1985; updated information may be obtained through BLM, Colorado State Office, Mineral Leasing Section (C0-943), 2020 Arapahoe, Denver, Colorado.

TABLE 3-25
MINING CLAIMS IN THE CHEW WINTER CAMP WSA

<u>Location</u>	<u>Serial Number</u>	<u>Location Date</u>
T. 7 N., R. 102 W., sec. 23	198375 LD	4/16/83
T. 7 N., R. 102 W., sec. 23	198376 LD	4/16/83
T. 7 N., R. 102 W., sec. 23	198377 LD	4/16/83
T. 7 N., R. 102 W., sec. 23	198378 LD	4/16/83
T. 7 N., R. 102 W., sec. 23	198379 LD	4/16/83
T. 7 N., R. 102 W., sec. 23	198380 LD	4/16/83
T. 7 N., R. 102 W., sec. 25	198379 LD	4/16/83
T. 7 N., R. 102 W., sec. 25	198380 LD	4/16/83
T. 7 N., R. 102 W., sec. 26	198377 LD	4/16/83
T. 7 N., R. 102 W., sec. 26	198379 LD	4/16/83

VEGETATION

Occasional ponderosa pine is scattered throughout the predominant pinyon-juniper cover. Ridgetops and slopes are covered more by high sage on the lower slopes. Grasses and cacti make up the scattered understory. Sagebrush and grass dominate the draws and valley floors.

LIVESTOCK GRAZING

The study area is located entirely within the Big Joe Draw Allotment #4319. The allotment is used by only one permittee. A cow-calf system operates from April 15 through November 15. This allotment contains 7,640 acres of public land and 556 AUMs (see Table 3-26). A total of 1,320 federal acres and 98 AUMs are located within the study area. Existing rangeland management facilities within the allotment include one reservoir and 5.5 miles of fence.

SOILS

Three major soil units are found within the boundary of Chew Winter Camp WSA. Approximately 81 percent of area is mapped as unit 194. The erosion hazard of this unit varies from moderate to high. Coupled with these high erosion hazards are moderate to rapid runoff rates.

WATER

All streams are intermittent. The U.S. Government owns a reserved water right on Chew Winter Camp Spring, located in the SW1/4NE1/4, Sec. 25, T. 7 N., R. 102 W., 6th P.M. The spring water is reserved for stock and human consumption, with a priority date of 4/17/26 (*USA vs. City and County of Denver*, 656 Psd 1 (1982)).

TABLE 3-26
ALLOTMENTS IN CHEW WINTER CAMP WSA

<u>Allotment Name</u>	<u>Acres in Allotment</u>	<u>WSA Acres</u>	<u>AUMs in Allotment</u>	<u>AUMs in WSA</u>	<u>% AUMs Affected</u>
Big Joe Draw	7,640	1,320	556	98	18

CHAPTER 3

FOREST RESOURCES

Pinyon and juniper is the only forest type within this unit, occurring on 363 acres. However, only 54 acres are considered capable of producing woodland products of commercial character. Given the remoteness of these sites, it is unlikely that they would be offered for sale in the foreseeable future.

RECREATION

The ROS inventory has classified the settings within the Chew Winter Camp Wilderness Study Areas as shown in Table 3-27.

TABLE 3-27
ROS CLASSES
IN CHEW WINTER CAMP WSA

Class	Acreage	Percent of Area
Semiprimitive Nonmotorized	1,182	90
Semiprimitive Motorized	138	10

A total of 90 percent of the study area provides nonmotorized settings for recreation opportunities. This class offers opportunities to experience isolation and to have a high degree of interaction with the natural environment. The nonmotorized class provides risk and challenge, among other opportunities. These experiences are present in the motorized class as well, but are of less importance.

VISUAL RESOURCES

The entire study area has an A scenic quality rating and is in Visual Resource Management Class II (see Appendix E). The ridges and intervening drainages provide some variety in the landscape. Views from the high points are predominantly to the south into the Monument; views in other directions are restricted.

LANDS AND REALTY

There are no realty-related land use authorizations in the Chew Winter Camp WSA. The surface and mineral estates

are in federal ownership, and mining claims represent the only known private/state inholdings. Given this unit's location, surrounding topography, and land use, as well as service area locations, the potential for realty-related authorizations within the study area is minimal.

There are approximately 25 acres of public water reserves in this study area. No related developments exist; the potential for such developments is unknown.

PETERSON DRAW

WILDERNESS VALUES

Mandatory Wilderness Characteristics

Size. This WSA contains 5,160 acres of public land administered by BLM.

Naturalness. The Peterson Draw WSA contains portions of several draws, with Peterson, Buck, and Five Springs being the most prominent. These and other intermittent side drainages trend generally southward, leading into Dinosaur National Monument and ultimately to the Yampa River. The study area also consists of ridges, peaks, and gently rolling areas. Elevations vary from 8,000 feet in the north to 6,600 feet at the southern boundary.

The area is natural in appearance, with only a few minor, scattered imprints of man. Approximately 1 mile of a way traverses south down Peterson Draw, allowing access to two small reservoirs and an abandoned stockwater tank and pipeline. The accessibility of Peterson Draw via roads outside the unit has opened the area to domestic livestock grazing uses. Another way traverses approximately 1-1/4 miles down a draw in the unit from the KT copper mine on Perusek Peak to the north. A third way traverses the southeast corner of the study area and ends inside the Monument. Portions of four old fencelines, less than 1/2 mile each, protrude into the unit in four different locations and all across the boundary. A way approximately 2,000 feet long leads to a small inactive exploration hole near the eastern boundary on Buck Ridge. These minor imprints are well screened and scattered mostly around the periphery of the study area. All are substantially unnoticeable within the study area as a whole.

The abandoned KT copper mine forms a portion of the northern boundary. This underground mine sits on a patented claim and was abandoned in 1983. Associated with this mine are two acid ponds, several buildings, abandoned equipment, junked cars, and piles of junk, including transformers scattered throughout the claim site. Most of

the development is screened from view within the WSA; however, it can be seen from a small portion of the draw to the west of the mine and a portion of the upper end of Buck Draw. There is also a spring development along the northern border in the upper end of Buck Draw consisting of a pump, collection area, small pond, transformer, transmission lines, and a buried pipeline proceeding west to the KT mine.

Outstanding Opportunities for Solitude or Primitive and Unconfined Recreation. The upper ends of the draws, which border on the east and west sides of the abandoned KT mine, do not offer opportunities for solitude because of the prominent views of the support facilities, developments, and junk at the mine site. There are no other outside sights or sounds which would diminish wilderness values. See this section under Ant Hills WSA for characteristics common to all five Section 202 WSAs.

Diversity in the National Wilderness Preservation System. See this section under Ant Hills WSA.

GEOLOGY AND MINERALS

Rock units known to outcrop at present within this study area include materials of Precambrian, Paleozoic, and Quaternary ages. The Precambrian rocks are designated as the Uinta Mountain Group.

The Paleozoic rocks within the study area, in order of decreasing age, include the following units. The Lodore Formation, of Cambrian age, unconformably overlain by

the Mississippian Madison/Leadville Formation, the Humbug Formation, and the Doughnut Shale, also of Mississippian age.

The youngest Paleozoic units include rocks of Pennsylvanian age. These are the Round Valley Formation, directly overlain by the Morgan Formation. Deposits of Quaternary age occur intermittently across the area, overlying exposed older rocks. Refer to the Regional Affected Environment for lithologic descriptions of these units and their relationships.

The study area is entirely under lease for oil and gas. A list of these leases and their dates of issuance is shown in Table 3-28. Map 3-12 indicates their locations.

The Regional Affected Environment discusses fault and joint systems in the region. One of these major east-northeast trending faults transects the study area, and is associated with known base and precious metal mineralization whose character, extent, and resource significance remain to be fully determined. There has been some past production from this mineralization.

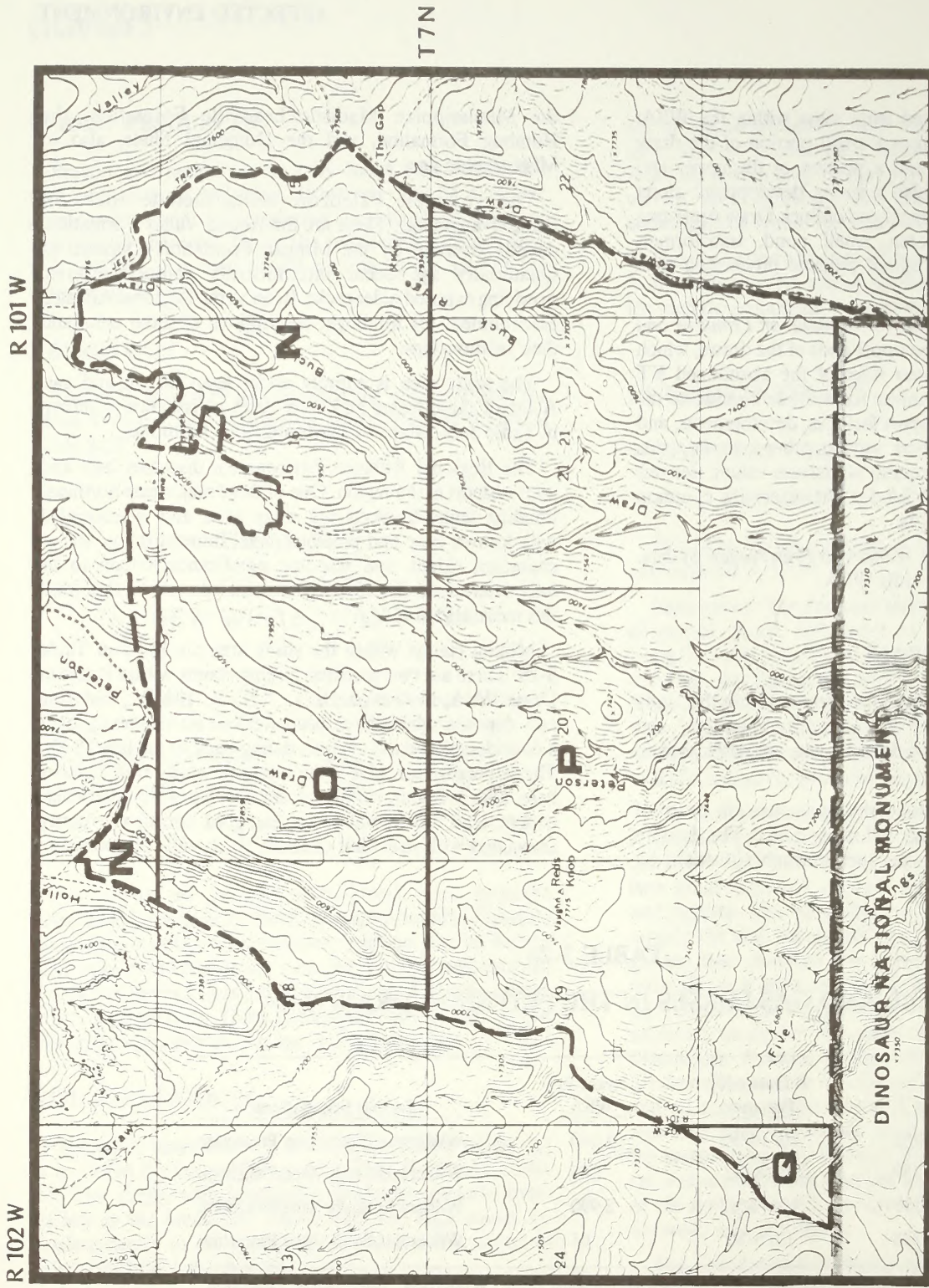
Mining claims within the study area are listed in Table 3-29. There are two patented mining claims within Peterson Draw WSA, in Section 16, T. 7 N., R. 101 W., featuring two deposits which have been worked intermittently over a considerable period of time, dating back to the late 1800s. The mineralization of interest within the study area includes base and precious metals of several types—in particular copper, lead, zinc, iron, manganese, gold, and silver—partly associated with structural controls. Rock units prospectively

TABLE 3-28
OIL AND GAS LEASES IN THE PETERSON DRAW WSA

<u>Leases</u>	<u>Date of Issuance</u>	<u>Acres in WSA</u>	<u>Special Stipulations¹</u>
N = C34355	10/14/82	1,160	Wilderness Study Area Protection
O = C34359	10/8/82	945	Wilderness Study Area Protection
P = C34236	10/13/82	2,990	Wilderness Study Area Protection
Q = C34238	12/6/82	65	Wilderness Study Area Protection

¹ Does not include seasonal or standard stipulations. The "Wilderness Study Area Protection" stipulation applies only during interim management. If the WSA is not designated as wilderness, the stipulation would no longer apply.

Status as of August, 1985; updated information may be obtained through BLM, Colorado State Office, Mineral Leasing Section (CO-943), 2020 Arapahoe, Denver, Colorado.



Map 3 - 12. PETERSON DRAW
Oil and Gas Lease Boundaries

LEGEND

- Oil and Gas Lease Boundary
- - - Wilderness Study Area

valuable for base and precious metals include the Pennsylvanian, Mississippian, Cambrian, and Precambrian sequences, with additional potential for uranium-vanadium in the Uinta Mountain Group, as well. The entire WSA is underlain by rocks prospectively valuable for base and/or precious metal occurrences. Refer to the Regional Affected Environment for the rock units considered to be prospectively valuable for mineralization and a discussion of the types of potential mineralization.

VEGETATION

The north-facing slopes in the entire northern section consist of frequent ponderosa pine stands, mixed with juniper and some pinyon. Mountain mahogany is found on some northeast slopes in the northern section. Ridgetops consist primarily of Rocky Mountain juniper and pinyon. Sagebrush is found primarily in the draws and the open, relatively flat to gently sloping areas. Grass is occasionally found scattered in these areas also.

TABLE 3-29

MINING CLAIMS IN THE PETERSON DRAW WSA

<u>Location</u>	<u>Serial Number</u>	<u>Location Date</u>
T. 7 N., R. 101 W., sec. 8	173021 LD	12/25/80
T. 7 N., R. 101 W., sec. 8	173026 LD	12/25/80
T. 7 N., R. 101 W., sec. 8	173028 LD	12/25/80
T. 7 N., R. 101 W., sec. 8	173037 LD	12/25/80
T. 7 N., R. 101 W., sec. 9	198830 LD	4/17/83
T. 7 N., R. 101 W., sec. 9	198832 LD	4/17/83
T. 7 N., R. 101 W., sec. 9	198838 LD	4/17/83
T. 7 N., R. 101 W., sec. 9	198839 LD	4/17/83
T. 7 N., R. 101 W., sec. 9	198840 LD	4/17/83
T. 7 N., R. 101 W., sec. 10	198839 LD	4/17/83
T. 7 N., R. 101 W., sec. 10	198841 LD	4/17/83
T. 7 N., R. 101 W., sec. 15	198831 LD	4/17/83
T. 7 N., R. 101 W., sec. 15	198833 LD	4/17/83
T. 7 N., R. 101 W., sec. 15	198834 LD	4/17/83
T. 7 N., R. 101 W., sec. 15	198835 LD	4/17/83
T. 7 N., R. 101 W., sec. 16	134884 LD	9/29/67
T. 7 N., R. 101 W., sec. 16	134885 LD	9/29/67
T. 7 N., R. 101 W., sec. 16	173025 LD	12/25/80
T. 7 N., R. 101 W., sec. 16	173034 LD	12/25/80
T. 7 N., R. 101 W., sec. 16	173035 LD	12/25/80
T. 7 N., R. 101 W., sec. 16	198834 LD	4/17/83
T. 7 N., R. 101 W., sec. 16	198835 LD	4/17/83
T. 7 N., R. 101 W., sec. 16	198836 LD	4/17/83
T. 7 N., R. 101 W., sec. 16	198837 LD	4/17/83
T. 7 N., R. 101 W., sec. 17	173027 LD	12/25/80
T. 7 N., R. 101 W., sec. 17	173029 LD	12/25/80
T. 7 N., R. 101 W., sec. 17	173038 LD	12/25/80
T. 7 N., R. 101 W., sec. 17	173039 LD	12/25/80
T. 7 N., R. 101 W., sec. 17	173041 LD	12/25/80
T. 7 N., R. 101 W., sec. 17	173042 LD	12/25/80
T. 7 N., R. 101 W., sec. 27	134892 LD	9/29/67

LIVESTOCK GRAZING

This study area is located in four different allotments: Big Joe Draw #4319, Holland Draw #4317, Peterson Draw #4316, and Browns Draw #4315. These four allotments are used by two livestock operators, who operate a cow-calf program from April 15 through November 15. The four allotments contain 24,934 acres of public land and 2,016 AUMs.

A total of 5,160 acres of public land and 496 AUMs are located within the WSA. The forage percentages affected in each of the allotments within the WSA are listed in Table 3-30. Existing rangeland management facilities within the four allotments include two reservoirs, one check dam, and one water pipeline from a spring located on private ground.

SOILS

There are six major soil units which are found within the confines of the Peterson Draw WSA. Approximately 76 percent of the area is unit 194. This unit is characterized by moderate to high erosion hazards and moderate to high runoff rates.

WATER

All streams are intermittent. Four water rights have been decreed on Peterson Draw study area water sources, three of which belong to private citizens and one to BLM. The three privately owned water rights are on BLM Spring 073-03, (also known as "Buck Draw Spring"), which is located in the NW1/4NW1/4, Sec. 15, T. 7 N., R. 101 W., 6th P.M. The spring development consists of a pipeline, pump,

collection area, small pond, transformer, and transmission lines. The water is decreed for stock watering purposes and for use in a mining operation located outside the study area.

BLM has been decreed a water right to Peterson Draw Pipeline, which begins outside the study area in the SE1/4SE1/4, Section 8, T. 7 N., R. 101 W. and continues southward through the study area, ending in Section 17, T. 7 N., R. 101 W., 6th P.M. Water from the pipeline is decreed for stock, human, and wildlife purposes. (*USA vs. City and County of Denver*, 656 Psd 1 (1982)).

FOREST RESOURCES

One 380-acre stand of old growth ponderosa pine occurs on the northeastern end of this unit. This stand was classified as commercial forest land under the Timber Production Capability Classification inventory in 1980. Several sawlog sales have been conducted in adjacent areas during the past 10 years, and additional sales are presently planned in adjacent areas to control a recent outbreak of mountain pine beetle activity on Douglas Mountain.

Beetle activity has recently been noted within the Peterson Draw WSA. Without immediate control action, these small outbreaks are expected to expand, killing 75 to 100 percent of all trees that are over 9 inches in diameter within the area. This particular stand, however, when considered alone, does not represent a significant portion of the total forest land base on Douglas Mountain.

RECREATION

The ROS inventory has classified the settings within the Peterson Draw WSA as shown in Table 3-31.

TABLE 3-30
ALLOTMENTS IN PETERSON DRAW WSA

Allotment Name	Acres in Allotment	WSA Acres	AUMs in Allotment	AUMs in WSA	% AUMs Affected
Big Joe Draw	7,640	95	556	11	2
Holland Draw	3,254	743	182	43	24
Peterson Draw	2,610	2,360	192	192	85
Browns Draw	11,430	1,962	1,052	250	24

TABLE 3-31
ROS CLASSES
IN PETERSON DRAW WSA

Class	Acreage	Percent of Area
Primitive	400	8
Semiprimitive Nonmotorized	2,179	42
Semiprimitive Motorized	2,581	50

A total of 50 percent of the area offers nonmotorized forms of recreation opportunities. These nonmotorized settings offer opportunities to experience isolation and to have a high degree of interaction with the natural environment. They provide challenge and risk, among other opportunities. These experiences are also present in 50 percent of the study area in the motorized setting, but are of less importance there.

VISUAL RESOURCES

The entire study area is in Visual Resource Management Class II, with an A scenic quality rating (see Appendix E). Views are generally panoramic to the east, south, and west and include small portions of the Yampa River Canyon. These views are from the high points within the area, such as Reds Knob and Buck Ridge. The ridges and numerous draws and ridges provide interesting landscape relief.

LANDS AND REALTY

There are no realty-related land use authorizations in the Peterson Draw unit. The surface and mineral estates are in federal ownership. Mining claims represent the only known private/state inholdings. Given this unit's location, surrounding topography, and land use, as well as service area locations, the potential for realty-related authorizations within the study area is minimal.

There are approximately 55 acres of public water reserves in this unit. No related developments exist; the potential for such developments is unknown.

There are several unauthorized water-related developments in the NW1/4NW1/4, Section 15, and the N1/2N1/2, Section 16, T. 7 N., R. 101 W., 6th P.M., that were developed to serve a mining operation on patented

claims in Section 16. These include a water diversion (pond, collection device, and pumphouse), a buried waterline, an electric powerline (ground line), and a road. No disturbance, resulting from development of these facilities, has been rehabilitated.

TEPEE DRAW

WILDERNESS VALUES

Mandatory Wilderness Characteristics

Size. The Tepee Draw WSA contains 5,490 acres of public land administered by BLM. Although the area is over 5,000 acres, it does not contain outstanding opportunities for solitude or primitive unconfined recreation unless considered with the adjoining Dinosaur National Monument lands.

Naturalness. The study area contains portions of draws (Browns, Tepee, and Corral Springs, among others) that trend generally southward, leading ultimately into the Yampa River in Dinosaur National Monument. Ridges, peaks, valleys, and steep to gently rolling areas occur within the study area. Tepee, the most prominent point in the extreme northern end of the area, has a long narrow ridge extending south into the main portion of the study area. Elevations vary from 7,800 feet in the north to 6,600 feet in the south in Tepee Draw.

The only imprints of man remaining in the area are a way and a fenceline. The way traverses approximately 1-1/4 miles of the unit in two segments near the southwestern boundary and passes through a corner of the Monument. A National Park Service drift fence is located along 1-1/2 miles of the southern boundary with Dinosaur National Monument. These imprints are minor, well screened, and substantially unnoticeable within the unit. Overall, the study area exhibits a very high quality natural state.

Outstanding Opportunities for Solitude or Primitive and Unconfined Recreation. This WSA technically has enough area for opportunities for solitude to be present. However, the opportunities to experience solitude do not become truly outstanding until the adjacent Monument lands are considered. (See this section under Ant Hills WSA for characteristics common to all five WSAs.)

Diversity in the National Wilderness System. See this section under Ant Hills WSA.

GEOLOGY AND MINERALS

Rock units known to outcrop at present within Tepee Draw WSA, in order of decreasing age, include the following units: the Precambrian Uinta Mountain Group and the Lodore Formation, of Cambrian age, which is unconformably overlain by the Mississippian Madison/Leadville Formation. Intermittent occurrences of the Humbug Formation and the Doughnut Shale are also of Mississippian age. The youngest Paleozoic units include rocks of Pennsylvanian age. These are the Round Valley Formation directly overlain by the Morgan Formation.

Unconformably overlying these units is the Bishop Conglomerate, of Tertiary age. Relationships are somewhat obscure, but most likely materials which should be assigned to the Browns Park Formation, of Tertiary age, overlie the Bishop Conglomerate within portions of the study area. Deposits of Quaternary age occur intermittently across the area, overlying exposed older rocks.

The Regional Affected Environment discusses fault and joint systems in the region. One of these major east-northeast trending faults transects the study area, associated with known base and precious metal mineralization whose character, extent, and resource significance remain to be fully determined.

The entire WSA is under lease for oil and gas. Table 3-32 shows these leases, including their dates of issuance. Map 3-13 shows where these leases are located.

As of June 1982, there were no mining claims located within Tepee Draw WSA. The mineralization of interest within the study area includes base and precious metals—in particular copper, lead, zinc, iron, manganese, gold, and silver—of several types, in part at least associated with structural controls. Rock units prospectively valuable for base and precious metals include the Pennsylvanian, Mississippian, Cambrian, and Precambrian sequences, with additional potential for uranium-vanadium in the Uinta Mountain Group and possibly the Browns Park Formation as well.

The entire WSA is underlain by rocks prospectively valuable for base and/or precious metal occurrences.

VEGETATION

The north, northwest, and northeast slopes and ridgetops in the central to northern areas of Tepee Draw WSA consist of ponderosa pine, juniper, and pinyon. Sagebrush and grass dominate the draws and open, flatter areas.

LIVESTOCK GRAZING

The study area is located within two allotments, Browns Draw #4315 and Tepee Draw #4309. These two allotments are managed for use as a cow-calf operation from May 1 through February 28. These two allotments contain 18,705 acres of public land and 1,374 AUMs.

TABLE 3-32
OIL AND GAS LEASES IN THE TEPEE DRAW WSA

Leases	Date of Issuance	Acres in WSA	Special Stipulations ¹
C = C34360	8/23/82	540	Wilderness Study Area Protection
D = C34237	8/10/82	3,970	Wilderness Study Area Protection; 160 acres No Surface Occupancy
E = C34361	10/8/82	800	Wilderness Study Area Protection
F = C34236	10/13/82	180	Wilderness Study Area Protection

¹ Does not include seasonal or standard stipulations. The "Wilderness Study Area Protection" stipulation applies only during interim management. If the WSA is not designated as wilderness, the stipulation would no longer apply.

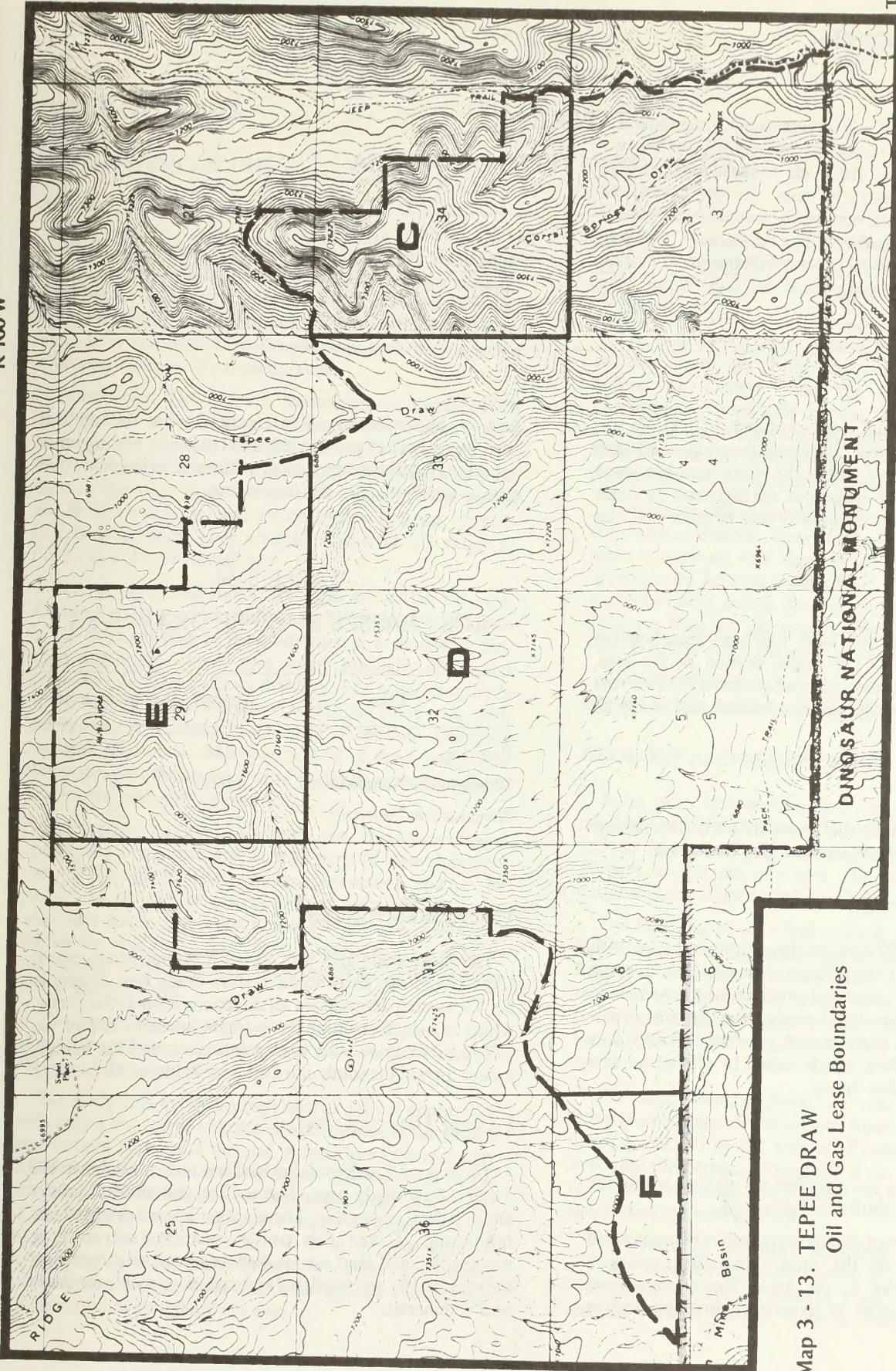
Status as of August, 1985; updated information may be obtained through BLM, Colorado State Office, Mineral Leasing Section (C0-943), 2020 Arapahoe, Denver, Colorado.

R 101 W

R 100 W

T 7 N

T 6 N



Map 3 - 13. TEPEE DRAW
Oil and Gas Lease Boundaries

LEGEND

- Oil and Gas Lease Boundary
- - - Wilderness Study Area

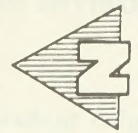


TABLE 3-33
ALLOTMENTS IN TEPEE DRAW WSA

Allotment Name	Acres in Allotment	WSA Acres	AUMs in Allotment	AUMs in WSA	% AUMs Affected
Browns Draw	11,430	2,965	1,052	236	22
Tepee Draw	7,275	2,525	322	131	41

A total of 5,490 public land acres and 367 AUMs are located within the study area. The forage percentages affected in each of the allotments within the study area are listed in Table 3-33. Existing rangeland management facilities within the two allotments include .5 mile of fence and one retention dam.

have a high degree of interaction with the natural environment. They provide risk and challenge, among other opportunities. These experiences are present in the motorized class as well but are of less importance.

SOILS

There are four major soil units which are found within the Tepee Draw WSA. The major portion of the area, approximately 84 percent, is mapped as unit 194. This unit is exhibits moderate to high erosion hazard and moderate to rapid runoff rates.

TABLE 3-34

ROS CLASSES IN TEPEE DRAW WSA

Class	Acres	Percent of Area
Primitive	106	2
Semiprimitive Nonmotorized	4,025	73
Semiprimitive Motorized	1,359	25

WATER

All streams are intermittent. There are no known springs and no decreed water rights in the Tepee Draw unit.

FOREST RESOURCES

Approximately 1,350 acres of this unit are covered with pinyon-juniper forest. Only 220 acres are classified as being capable of producing woodland products of a commercial nature. Demand for woodland products in this area is low because of its remote location and poor accessibility. It is unlikely that any of these stands would be offered for sale now or in the foreseeable future.

VISUAL RESOURCES

The entire study area is in Visual Resource Management Class II and has an A scenic quality rating (see Appendix E). Views are panoramic in all directions from Tepee Draw, which is a high point at the extreme northern end of the WSA. Views from other high points are somewhat limited, except toward the south into Dinosaur National Monument.

RECREATION

The ROS inventory has classified the settings within the Tepee Draw WSA as shown in Table 3-34.

A total of 75 percent of the study area offers nonmotorized settings, which provide the most outstanding primitive recreation opportunities in the area. The nonmotorized classes offer opportunities to experience isolation and to

LANDS AND REALTY

There are no realty-related land use authorizations in the Tepee Draw study area. The surface and mineral estates are in federal ownership. There are no known private/state inholdings. Given this unit's location, surrounding topography, and land use, as well as service area locations, the potential for realty-related authorizations within the study area is minimal.

VALE OF TEARS

WILDERNESS VALUES

Mandatory Wilderness Characteristics

Size. The WSA contains 7,420 acres of public land administered by BLM. Although the area is larger than the 5,000-acre minimum, it does not contain outstanding opportunities for solitude or primitive unconfined recreation until it is considered in conjunction with the adjacent Dinosaur National Monument lands.

Naturalness. The WSA is located on the slopes of the southeastern end of Douglas Mountain. The area comes closer to the Yampa River Canyon, 1/2 mile, than any of the other study areas. The northernmost portion comprises parts of the steep slopes of Sawmill Canyon. These slopes are broken and rocky and are covered with dense pinyon-juniper woodlands. They gradually taper off into ridges to the south at lower elevations.

Several draws and minor drainages are within the area. All trend southward to the Yampa River. Klauson Pasture in the southern part of the study area is a somewhat flat, open, sagebrush covered area which gradually slopes and drops into the Vale of Tears drainage. The upper two-thirds of the Vale of Tears drainage is within the study area, with the remainder opening wide as it slopes into Dinosaur National Monument. The open bottom of the drainage and side slopes have the appearance of badlands, with red, yellow, tan, brown, and gray colored soils.

The western portion of the study area is a narrow finger comprising gently rolling hills, with parts of three drainages passing through it. The extreme southeastern end of the study area consists of rolling to steep hills and drainages with very sparse sagebrush/saltbush vegetation. Elevations within the study area vary from 7,800 feet on a peak in the extreme northern part to 5,800 feet in the lower portions of the Vale of Tears.

The boundary is composed of roads and private land along the northern, western, and eastern sides and Dinosaur National Monument to the south.

The study area exhibits a high quality natural appearance with only a few minor imprints of man located in the eastern and western portions of the unit. A fenceline approximately 2,000 feet long traverses the extreme western finger of the study area and extends into the Monument. A small reservoir is located in the western portion, with a short way leading to it from the north boundary. It is in an open area of low sagebrush and is visible from the boundary road. These imprints are minor, scattered, and remain substantially unnoticeable within the study area.

Outstanding Opportunities for Solitude or Primitive and Unconfined Recreation. The fairly dense, uniform pinyon-juniper woodlands in the study area, as well as some of the draws, provide some opportunities for isolation. The Vale of Tears drainage opens into the eastern end of Dinosaur National Monument and the Yampa River. Across the Yampa River is the Deerlodge Park campground and access road, much of which is screened by cottonwood trees in the floodplain.

The bulk of the study area is adjacent to the relatively narrow eastern end of the Monument, which is more open before the Yampa enters the rugged canyon. While opportunities for solitude do exist, they are limited in extent and, therefore, not outstanding within the study area itself. However, when considered in conjunction with the Monument, the opportunities become outstanding.

In addition, the opportunities for primitive recreation are not considered to be outstanding within the area itself, but, when considered with the adjacent Monument lands, the opportunities become outstanding. Unconfined movement is possible both within the area and between the area and Dinosaur National Monument. (See this section under Ant Hills WSA for characteristics common to all WSAs.)

Diversity in the National Wilderness Preservation System. See this section under Ant Hills WSA.

GEOLOGY AND MINERALS

Rock units known to outcrop at present, or occur at relatively shallow depths within the Vale of Tears WSA include formations of Precambrian, Paleozoic, Mesozoic, Tertiary, and Quaternary ages. The Precambrian rocks are designated the Uinta Mountain Group.

The Paleozoic rocks which outcrop within Vale of Tears WSA, in order of decreasing age, include several units. The Lodore Formation, of Cambrian age, unconformably overlain by the Lodore is the Mississippian Madison/Leadville Formation. Sporadic occurrences of the Humbug Formation and the Doughnut Shale are also of Mississippian age.

The next youngest Paleozoic units include rocks of Pennsylvanian age. These are the Round Valley Formation directly overlain by the Morgan Formation. Conformably overlying the Morgan Formation is the Weber Sandstone, of Pennsylvanian age. The Park City Formation, of Permian age, is the next youngest unit.

Pre-Cretaceous Mesozoic units that occur within Vale of Tears WSA area are the Triassic Moenkopi and Chinle Formations, the Triassic-Jurassic Glen Canyon Formation, and the Jurassic Carmel, Entrada, Stump, and Morrison

formations. The overlying Cretaceous units include the Cedar Mountain, Dakota, Mowry, Frontier, and Mancos sequences.

Unconformably overlying portions of the older rocks within the study area is the Browns Park Formation, of Tertiary age. Quaternary age deposits occur sporadically across the area, overlying exposed older rocks. Refer to the Regional Affected Environment for lithologic descriptions of these rock units and a discussion of their relationships.

Oil and gas leases within the WSA are listed in Table 3-35, along with their dates of issuance. Map 3-14 indicates where these leases occur.

Paleozoic and Mesozoic rocks within the study area include numerous horizons of potential significance as petroleum source and/or reservoir rocks. The structural relationships are favorable for accumulations of hydrocarbons.

Mining claims in the study area are listed in Table 3-36. The entire WSA is underlain by rocks prospectively valuable for base and/or precious metal occurrences.

VEGETATION

Juniper and pinyon stands are characteristic of the northeast slopes of Sawmill Canyon, with sagebrush in the canyon floor. Ponderosa pine is scattered throughout the northern portion of Sawmill Canyon and the northern part of the unit. The ridges in the remainder of the unit are mainly juniper, with some pinyon. As these slopes level out and decrease in elevation, the vegetation becomes mainly sagebrush. Sagebrush and grass cover the open flatter areas, including Klauson Pasture and Vale of Tears.

LIVESTOCK GRAZING

The study area is located within three different allotments—Tepee Draw #4309, East Douglas Mountain #4306, and Sawmill Canyon #4308. These three allotments are used by four different operators. Three of these livestock operators have cattle operations; one operator has sheep. These four operators graze their livestock year-round. The three allotments contain 37,858 acres of public land and 1,916 AUMs.

TABLE 3-35
OIL AND GAS LEASES
IN THE VALE OF TEARS WSA

Leases	Date of Issuance	Acres in WSA	Special Stipulations ¹
G = C30869	6/30/82	1,760	Wilderness Study Area Protection
H = C23309	7/1/76	1,141	None
I = C22428	Expired	797	Pending
J = C35018	7/26/82	160	Wilderness Study Area Protection
K = C23308	7/1/76	1,722	None
L = C31184	8/10/82	1,075	Wilderness Study Area Protection
M = C34237	8/10/82	320	Wilderness Study Area Protection
N = C30871	7/12/82	445	None

¹ Does not include seasonal or standard stipulations. The "Wilderness Study Area Protection" stipulation applies only during interim management. If the WSA is not designated as wilderness, the stipulation would no longer apply.

Status as of August, 1985; updated information may be obtained through BLM, Colorado State Office, Mineral Leasing Section (C0-943), 2020 Arapahoe, Denver, Colorado.

R 100 W

R 99 W

T 7 N

T 6 N

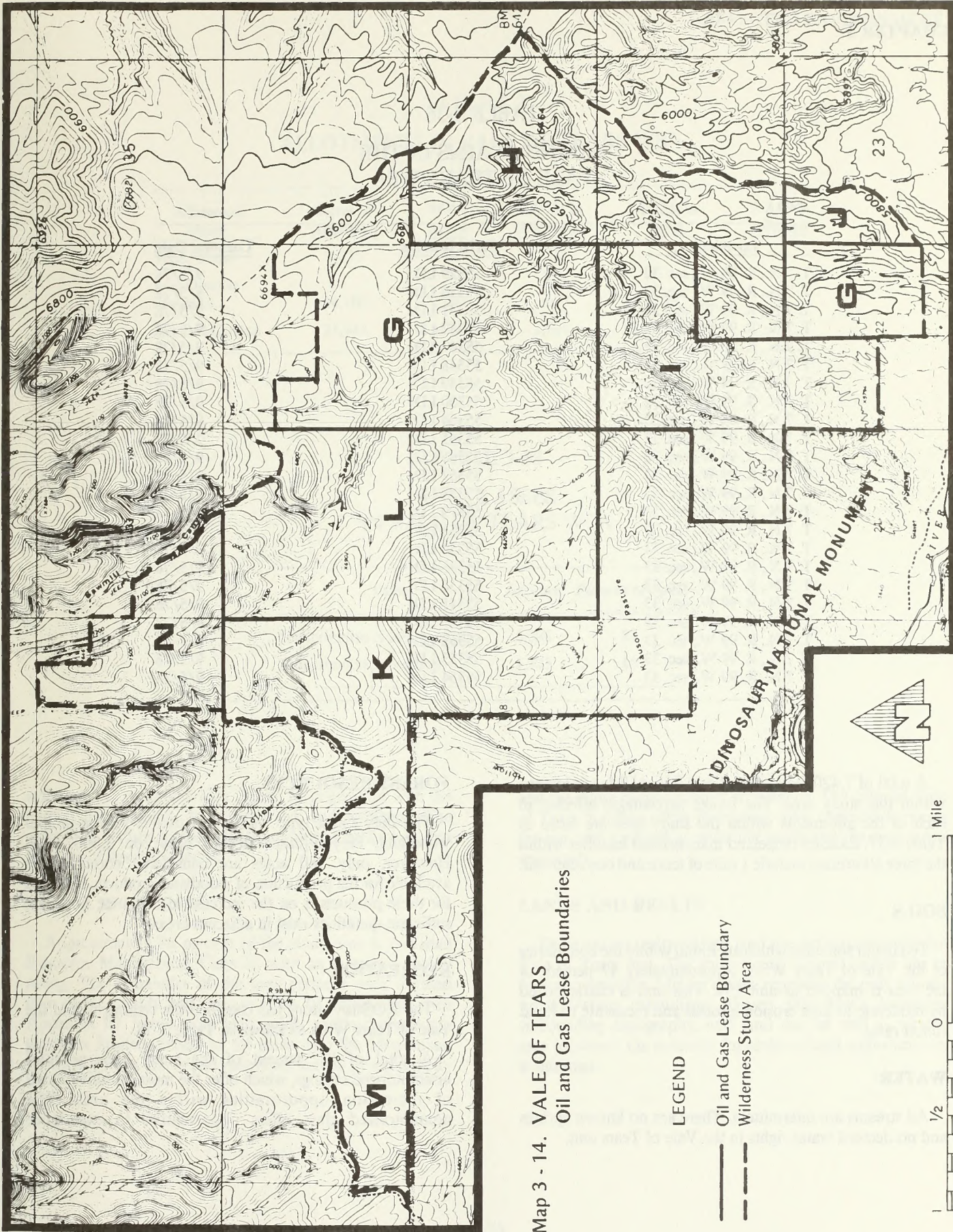


TABLE 3-36
MINING CLAIMS IN THE
VALE OF TEARS WSA

<u>Location</u>	<u>Serial Number</u>	<u>Location Date</u>
T. 7 N., R. 99 W., sec. 32	55329 LD	9/5/78
T. 7 N., R. 99 W., sec. 32	55330 LD	9/5/78
T. 7 N., R. 99 W., sec. 32	55331 LD	9/5/78
T. 7 N., R. 99 W., sec. 32	55332 LD	9/5/78
T. 7 N., R. 99 W., sec. 32	55347 LD	9/5/78
T. 7 N., R. 99 W., sec. 32	55348 LD	9/5/78
T. 7 N., R. 99 W., sec. 32	55349 LD	9/5/78
T. 7 N., R. 99 W., sec. 32	55350 LD	9/5/78
T. 7 N., R. 99 W., sec. 32	55364 LD	9/5/78
T. 7 N., R. 99 W., sec. 32	55365 LD	9/5/78
T. 7 N., R. 99 W., sec. 32	55366 LD	9/5/78
T. 7 N., R. 99 W., sec. 32	55367 LD	9/5/78
T. 7 N., R. 99 W., sec. 32	55378 LD	9/5/78
T. 7 N., R. 99 W., sec. 32	55379 LD	9/5/78
T. 7 N., R. 99 W., sec. 33	55333 LD	9/5/78
T. 7 N., R. 99 W., sec. 33	55334 LD	9/5/78
T. 7 N., R. 99 W., sec. 33	55335 LD	9/5/78
T. 7 N., R. 99 W., sec. 33	55336 LD	9/5/78
T. 7 N., R. 99 W., sec. 33	55341 LD	9/5/78
T. 7 N., R. 99 W., sec. 33	55351 LD	9/5/78
T. 7 N., R. 99 W., sec. 33	55352 LD	9/5/78
T. 7 N., R. 99 W., sec. 33	55353 LD	9/5/78
T. 7 N., R. 99 W., sec. 33	55354 LD	9/5/78

A total of 7,420 federal acres and 746 AUMs are located within this study area. The forage percentages affected in each of the allotments within the study area are listed in Table 3-37. Existing rangeland management facilities within the three allotments include 1 mile of fence and one reservoir.

SOILS

Ten major soil units which are found within the boundaries of the Vale of Tears WSA. Approximately 47 percent of the area is mapped as unit 194. This unit is characterized by moderate to high erosion hazards and moderate to rapid runoff rates.

WATER

All streams are intermittent. There are no known springs and no decreed water rights in the Vale of Tears unit.

FOREST RESOURCES

The only forest type within this unit is pinyon-juniper woodland. Pinyon-juniper forests occur on 3,500 acres. However, only 380 acres are considered commercially available for the production of woodland products. Demand for these products is on the increase in this area; however, sufficient quantities exist in adjacent areas.

RECREATION

The ROS inventory has classified the settings within the Vale of Tears WSA as shown in Table 3-38.

A total of 82 percent of the study area provides nonmotorized settings, which offer the most primitive forms of recreation opportunities within the area. The nonmotorized class offers opportunities to experience

TABLE 3-37
ALLOTMENTS IN VALE OF TEARS WSA

<u>Allotment Name</u>	<u>Acres in Allotment</u>	<u>WSA Acres</u>	<u>AUMs in Allotment</u>	<u>AUMs in WSA</u>	<u>% AUMs Affected</u>
Tepee Draw	7,275	86	322	4	1
East Douglas Mountain	14,100	1,592	637	29	12
Sawmill Canyon	31,948	5,742	2,501	713	29

TABLE 3-38
ROS CLASSES
IN VALE OF TEARS WSA

<u>Class</u>	<u>Acreage</u>	<u>Percent of Area</u>
Semiprimitive Nonmotorized	6,095	82
Semiprimitive Motorized	1,325	18

isolation and to have a high degree of interaction with the natural environment. It provides risk and challenge. The motorized setting provides these opportunities as well, but they are of less importance.

VISUAL RESOURCES

Approximately 80 percent of the study area is in Visual Resource Management Class II, with an A scenic quality rating. The remainder of the area (eastern end) is rated B in scenic quality and given a Class III designation. (See Appendix E). Views from high points within the area are generally limited, except to the south into the Monument. Views within the draws and valleys are limited by topography

and the dense pinyon-juniper woodlands. The colorful Vale of Tears drainage offers interesting color contrasts between the tan, red, and yellow soils and rocks and the gray-green sagebrush.

LANDS AND REALTY

There are no realty-related land use authorizations in the Vale of Tears unit. The surface and mineral estates are in federal ownership. Mining claims represent the only known private/state inholdings. Given this unit's location, surrounding topography, and land use, as well as service area locations, the potential for realty-related authorizations is minimal.

CHAPTER 4

ENVIRONMENTAL CONSEQUENCES

INTRODUCTION

This chapter identifies and evaluates those impacts to the human and natural environment that could be expected to result from implementation of the management alternatives under consideration for the eight wilderness study areas (WSAs) in the Little Snake Resource Area. Each impact is identified in a cause-and-effect relationship, including those secondary impacts having significance. The cause of an impact is related to a component of the six alternatives identified and discussed in detail in Chapter 2. The effect of that impact is related to a component of the environment described in Chapter 3.

The impacts discussed in this chapter were assessed on the basis of the description of the six alternatives presented in Chapter 2. Considered were the beneficial and detrimental primary, secondary, as well as the cumulative effect of implementing each alternative. In addition, this assessment took into account the design features of the alternatives and federally required measures to prevent or minimize environmental impact. The absence of discussion of impacts indicates that the analyses either determined that an impact would not occur or that it would be insignificant. Unavoidable adverse impacts, the relationship between short-term uses and maintenance of long-term productivity, and any irreversible/irretrievable commitments of resources were considered for each resource component. They are discussed only when an impact was identified.

This chapter is divided into the following three sections: Assumptions and Analysis Guidelines; Common Impacts; Unit by Unit Analysis.

ASSUMPTIONS AND ANALYSIS GUIDELINES

During document preparation, Bureau of Land Management (BLM) resource specialists developed the

following basic assumptions and analysis guidelines, specific to wilderness, to facilitate impact assessment on various environmental elements. Assumptions specific to minerals can be found in Appendix F.

1. Designation or nondesignation of the eight WSAs would take place by 1993.
2. Short-term impacts, for the purpose of this analysis, are those which would occur within five years after designation/nondesignation, i.e., until 1998. Long-term impacts are those which would occur more than five years after designation.
3. Until designation or nondesignation occurs, the WSAs would continue to be managed under BLM's Interim Management Policy and Guidelines for Lands Under Wilderness Reviews, 1979. Impacts associated with managing the WSAs under the Interim Management Policy are not discussed, because they are, by definition, temporary.
4. If designated as wilderness, each WSA would be managed according to the Wilderness Act of 1964 and BLM's Wilderness Management Policy, 1981, which provide guidance as to permissible activities within wilderness areas. This guidance affects the study of each WSA in determining how wilderness and various resource values, including nonconforming uses, are analyzed in the study. A wilderness management plan would be completed after designation. Certain activities which were occurring within the WSAs prior to the passage of the Federal Land Policy and Management Act (FLPMA) could continue. This also affected the study of each WSA in determining how these uses would be analyzed.
5. BLM would have sufficient funding and personnel to implement the management actions described.
6. Air quality in the eight WSAs would continue to be managed under the Prevention of Significant Deterioration Class II Air Quality Standards regardless of the selected management alternative.

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7. BLM's Wilderness Management Policy provides specific guidance for livestock grazing operations. Maintenance of existing facilities would be allowed as well as construction of new improvements which are consistent with approved allotment management plans and/or which are necessary for protection of the range. Construction of new improvements should be primarily for the purpose of resource protection and more effective management of those resources rather than to accommodate increased numbers of livestock.

For purposes of impact analysis, it was assumed that structural projects proposed to improve livestock distribution, such as spring developments, small reservoirs, etc., could be designed to meet Wilderness Management Policy guidelines and therefore would be allowed in a designated wilderness area. It was also assumed that vegetation manipulation (e.g., prescribed burning and reseeding, chemical spraying) would not be allowed in a designated wilderness area.

8. In designated wilderness, the "minimum tool rule" applies to all management. It simply states that management practices must represent the minimum departure from the naturalness of the wilderness. Tools or equipment must be selected and used that minimize degradation of wilderness values. Where feasible, nonmotorized equipment should be used. Where practical alternatives (such as horseback) do not exist, maintenance or other activities may be accomplished through the occasional use of motorized equipment. Such motorized uses would be specifically approved by the authorized official.
9. Soil loss and/or sediment yield figures were computed from sediment yield data compiled by the Colorado Land Use Commission (1974). The following formula was used to compute the number of tons of soil lost over a five-year period (n):

$$n = z + .75z + .50z + .25z + .12z$$

z = # acres disturbed (# acre/ft. sediment yield) (43,560 sq. ft.) (80 lbs.) (1 ton)
640 acres 1 acre 1 cu. ft. 2000lbs.

COMMON IMPACTS

The following is a general discussion of resources affected by each of the various wilderness alternatives under consideration. These resources have impacts common among

all three Section 603 WSAs (West Cold Spring, Diamond Breaks, and Cross Mountain) for each of the six alternatives under consideration and for all five Section 202 WSAs. Unless otherwise noted, an analysis of each of these resources will follow this generalized section in the unit-by-unit analysis section of this chapter.

AIR QUALITY

No adverse impacts to the existing air quality would result from wilderness designation or if the areas are primarily managed for wildlife and nonmotorized recreation. If the areas are managed for other uses (mineral development, livestock grazing, etc.), only minimal impacts would occur in the immediate vicinity of surface-disturbing activities. During such activities it would be expected that unavoidable increases in total suspended particulates and pollutants from engine exhaust would cause a slight deterioration in air quality. However, these impacts would be short-term and would not cause an irreversible or irretrievable trend in air quality. For these reasons, air quality will not be discussed further.

TOPOGRAPHY

There would be no beneficial or deleterious significant impacts to topographic features under any alternative for any WSA. Therefore, topography will not be discussed further.

MINERALS

In the No Wilderness Alternative analyzed for each WSA, no-surface-occupancy stipulations have been proposed for new oil and gas leases which would affect varying acreages within each WSA. Occasionally, directional drilling methods would allow exploration and subsequent production without infringing upon the integrity of other resources. However, it is not technically meaningful to discuss directional drilling in terms of generalities regarding degrees of permissible/feasible deviation, attainable depths as a function of lateral offset of drillsites, etc. Maximum feasible deviation angles, and hence, feasible lateral offsets of drillsites, will differ from case to case, as a function of the geologic situation in any given instance. Drilling through superjacent thrust plates, particularly those which contain considerable thicknesses

of resistant, or variably resistant rocks (e.g., Precambrian Uinta Mountain Group, especially as in the Cross Mountain, West Cold Spring, and Diamond Breaks WSAs) presents formidable problems in this respect. The experience of the Louisiana Land and Exploration Company's Middle Mountain well, just to the north of the West Cold Spring WSA in Daggett County, Utah, is a case in point. This well was abandoned in "fractured Precambrian rock" (Gries, 1983) and subsequently had to be offset by another well in order to achieve the sub-Uinta Mountain thrust objectives of the exploration program. Similar difficulties in controlling subsurface attitudes and directions during the course of directional drilling are not uncommon in areas of complex subsurface structural, stratigraphic, and lithologic relationships.

Thus, a no-surface-occupancy stipulation may have the same effect as a no-leasing stipulation, in some instances. Each situation must be considered as an individual case, and frequently sound prediction will not be possible, due to lack of sufficient substantive geologic and geophysical (surface and subsurface) information. Drilling near canyon rims runs the risk of losing mud circulation in the hole before reaching the depth of the canyon bottom. Directionally drilled holes are also unstable and may collapse before drilling is completed. Directional drilling does not appear to be a complete solution. In addition, production becomes a problem—equipment suffers excessive wear and thus increases maintenance costs. Also, because of these increased costs, life of the wells would be reduced and would not accomplish maximum recovery of the resource.

VEGETATION

Within each WSA there would be no beneficial or detrimental impacts to any known threatened, endangered, candidate, or sensitive plant species or any vegetative species under any of the alternatives under consideration. For this reason vegetation is not discussed further, with one exception. Regional endemic and rare plant species are discussed under vegetation for Cross Mountain WSA.

LIVESTOCK GRAZING

Areas which are designated as wilderness would still allow maintenance of existing projects as well as certain types of improvement projects; however, new projects should be primarily for resource protection rather than to accommodate increased livestock use. All project work must be determined

to be nonimpairing to wilderness values, and special restrictions would be placed on the type of project and the method of construction. Where feasible, nonmotorized equipment would be used (such as horseback). Where this is not practical or feasible, motorized equipment may be authorized where large loads of material or heavy equipment is needed to maintain or install approved projects. Any use of motorized vehicles must have prior specific authorization. In addition to project restrictions, the closure of roads or nonmotorized restriction would adversely affect livestock operators by restricting livestock management, increasing the length of time necessary for normal livestock inspections and minor project maintenance, and increasing the overall costs of managing that portion of the BLM grazing permit.

WILDLIFE

The protection of the natural environment from human influences by wilderness designation would benefit wildlife by creating a natural balance between wildlife and their habitat. Natural succession of plant communities and wildlife numbers (as well as species richness and diversity) would be allowed to progress concurrently with change in seral stage. In some plant communities, such as pinyon/juniper, that are not significantly affected by livestock grazing, a climax community would eventually evolve creating habitat for climax dependent wildlife species.

Wildlife species sensitive to human disturbance would also benefit from the protection of wilderness designation. The areas would serve as high value security habitat for game species by offering refuge from the stress of vehicle activity. Raptors, such as goshawks, and some threatened or endangered species would have areas virtually free of disturbance for breeding and nesting.

On the other hand, wilderness designation would prohibit vegetation manipulation designed to maintain some plant communities in nonclimax seral stages in order to provide habitat for maximum wildlife populations and species diversity. This would be considered an adverse impact from the viewpoint of wildlife production for hunting opportunity.

Without wilderness designation, certain activities, such as oil and gas and other mineral development, could potentially occur and result in adverse impacts to wildlife. The general impacts of oil and gas and other mineral development, as presented for Diamond Breaks, West Cold Spring, and Cross Mountain would apply to each Section 202 WSA, as well. Lack of specific data prevents a detailed or quantified impact analysis for each Section 202 WSA. Some impacts may be locally significant; however,

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considering the small amount of potential disturbance in relation to the total available wildlife habitat, none of the impacts would be regionally significant (see Map 1-1).

The impacts of wilderness designation, as discussed, would occur in all five Section 202 WSAs under the All Wilderness Alternative. The impacts of designation would also apply to Ant Hills and Peterson Draw under the Conflict Resolution Alternative and to Ant Hills, Chew Winter Camp, and Peterson Draw under the Combined WSAs Alternative. The impacts of no wilderness designation would occur under the Preferred, No Wilderness, and No Action alternatives.

FOREST/WOODLAND RESOURCES

Forest and woodland resources would not be significantly affected by any alternative for any WSA. The limited amount of commercially valuable species found within the WSAs coupled with a lack of nearby processing centers and a generally low demand make it unlikely that forest resources within any of the WSAs would be harvested. The majority of commercially valuable forest and woodland sites are found outside the boundaries of the WSAs and are sufficient to meet current and expected future demand for forest products.

Since no beneficial or detrimental significant impact to forest and woodland resources occur within any alternative for any WSA they are not discussed further.

RECREATION

Visitation figures for the WSAs are not displayed because no meaningful data of this kind exists for these areas. Impacts are based on what changes would occur in the Recreation Opportunity Spectrum (ROS) settings and opportunities within each area for the various alternatives. This provides a more realistic and meaningful analysis of the probable impacts of each alternative and the ultimate effects upon the experience a recreation user can achieve in a WSA.

It also appears that no direct relationship can be established between wilderness designation and increases in recreation use of an area. However, recreation use of Colorado wilderness has increased at an annual compound growth rate of 9.2 percent per year (Walsh, Gillman, and Loomis, 1981). Whether or not wilderness designation itself increases wilderness use is an unknown and will not be discussed further in this chapter.

CULTURAL RESOURCES

Cultural resources will continue to be protected and managed under existing laws, regulations, as appropriate integrated cultural resource management plans developed for each designated area. Nondesignated areas will also be covered by cultural resource management plans. Designation as wilderness has the potential to increase use and therefore vandalism and destruction to cultural sites. Nondesignation as wilderness (assuming development) would also potentially increase vandalism as destruction to cultural sites due to secondary impacts associated with increased access and availability. Through proper application of existing laws, regulations, and policies, such impacts are preventable and/or mitigatable. In any case, there would be no unavoidable adverse impacts as no irreversible or irretrievable commitment of cultural resources in any of the alternatives under consideration. For these reasons, cultural resources are not discussed further except on special features to each WSA.

PALEONTOLOGY

There would be no beneficial or detrimental significant impacts under any alternative. Paleontological resources would be protected by existing laws. Designation of an area as wilderness would, at least in principle, result in protection of such paleontological resources as might be present in the area; however, such designation would also essentially preclude the surface-disturbing activities which would make these paleontological resources known to science. The geologic relationships indicate low-unknown to moderate-unknown likelihood of the existence of significant fossils within the eight WSAs. Paleontology will not be discussed further in this chapter.

LANDS AND REALTY ACTIONS

Based on the lack of potential for siting future realty-related projects within all but the Cross Mountain WSA, designation under any alternative would have no significant impacts from a lands/realty standpoint. With the exception of analysis specific to the Cross Mountain WSA where designation is proposed, lands and realty actions will not be discussed further in this chapter.

SOCIAL VALUES

There would be no significant impact to social values under any alternative for any WSA. (See discussion in chapter 3, Regional Affected Environment, Social Values section).

ECONOMICS

Based upon estimates presented in the Geology and Minerals section (specifically oil and gas) of Chapter 3 and the assumptions specific to oil and gas presented in Appendix F, there may be recoverable oil beneath all the WSAs. As the assumptions specific to oil and gas point out, these estimates are extremely speculative attempts to present an appreciation of the possible magnitude of the hydrocarbon resource which could be present below any WSA. The confidence value of the amounts listed for each WSA is further questioned when compared to the highly developed, producing Rangely oil and gas field (approximately 50 miles south of all WSAs). This field has generated approximately \$1,046,000,000 (net present value) of oil production from 1900 to 1983.

Specific amounts of recoverable oil, based upon the above listed assumptions, and the value foregone, also based upon the preceding assumptions, are presented for each WSA by alternative under the unit by unit analysis.

Since livestock grazing would continue at current levels, and since there would be no direct effect on designation or nondesignation, there would be no significant economic impacts to livestock grazing to any WSA for any alternative.

UNIT BY UNIT ANALYSIS

WEST COLD SPRING

The impacts to air quality, topography, vegetation, forest/ woodland resources, paleontology, lands and realty, cultural resources and economic assumptions are discussed in the Common Impacts section of Chapter 4. No significant impacts are anticipated for these resources. The Combined WSAs Alternative does not apply to this WSA. Proposed management actions for the various alternatives are presented in Table 2-2 in chapter 2.

Wilderness Values

Preferred Alternative. Nondesignation of West Cold Spring WSA would allow development of oil and gas and woodland resources, range improvements, increased livestock grazing, and wildlife habitat improvements. There would be high potential for oil and gas development, with an estimated 22 wells disturbing 110 to 176 acres within the WSA. The wilderness study area protection stipulation would be dropped from existing leases. Currently unleased areas would also be leased and developed over the long term. There would be moderate potential for locatable mineral development within the WSA. Some 270 acres of productive-operable woodland would be available for development. A range improvement project (burning and reseeded) is proposed on 750 acres. Road networks and vehicle use would increase.

Surface-disturbing activities would result in the loss of wilderness values over the long term. Naturalness would be lost throughout the WSA. Disturbance of the natural settings and noises from mechanical activities would negate opportunities to experience solitude and greatly reduce opportunities for primitive and unconfined recreation. The quality of recreation activities within the WSA such as hunting and hiking would diminish. Adverse impacts on diversity, geographic distribution, and providing wilderness opportunities within a day's drive of major metropolitan areas would also occur due to the loss of wilderness values. These losses would be significant and irretrievable within the region because these ecosystems are not well represented in the National Wilderness Preservation System.

All Wilderness Alternative. Wilderness designation would protect West Cold Spring's naturalness, roadlessness, and other wilderness values, including opportunities to experience solitude and primitive unconfined recreation. Protecting the wilderness values would, in turn, benefit other related resource values such as visual resources, plant communities, wildlife, and watershed. The Beaver Creek drainage provides critical habitat for some 30 Rocky Mountain bighorn sheep. Other wildlife also occur in the WSA. Natural ecological processes would continue to act upon the land with little or no disturbance from human activities over the long term.

Designation of the WSA would provide additional wilderness opportunities within a day's drive of two major population centers in Utah (Salt Lake /Ogden and Provo/Orem) and would help balance the geographic distribution of wilderness. It would also expand the diversity of ecosystems within the National Wilderness Preservation System which are not well represented. The only designated wilderness area in Colorado with a similar type of ecoregion/ecosystem is 11,180 acres of juniper-pinyon woodland in

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the Black Canyon of the Gunnison National Monument. Approximately 14,000 acres of the Bridger wilderness area in Wyoming has the Wyoming Basin/sagebrush-steppe classification.

The area would be closed to mineral leasing and entry upon designation. There are no valid existing rights within the WSA (e.g., pre-FLPMA leases, existing mining claims) which would cause impairment of the wilderness values. Approximately 200 acres of a flat area adjacent to a boundary road within the Utah portion would be subject to ORV use. There would be no other activities occurring within the WSA which would cause adverse impacts to wilderness values.

Conflict Resolution Alternative. Wilderness designation of 13,790 acres would protect wilderness values. Impacts would be similar to those discussed under the All Wilderness Alternative. Boundary adjustments on the west and south sides of the WSA would reduce conflicts between potential mineral and range development vs. wilderness designation. (Refer to Map 2-2.)

Natural values would be lost on approximately 2,000 acres of the nonsuitable portion of the WSA due to potential oil and gas development in the Utah portion and potential development along the southern boundary. Opportunities for solitude and primitive unconfined recreation would be lost on the entire 3,892 acres recommended as nonsuitable if development occurs in these areas. In addition, much of the sagebrush-steppe ecosystem (Wyoming Basin Province) would be in the nonsuitable area. This ecosystem is not well represented within the National Wilderness Preservation System, and its exclusion from the suitable area would be an important loss to diversity.

No Wilderness Alternative. Under the No Wilderness Alternative, wilderness values would be lost in portions of the WSA due to oil and gas and range development, as well as some locatable mineral and woodland development. Oil and gas leases within the areas which have no special protective stipulations (the wilderness study area protection stipulation would be dropped) would be developed in the short term. This would affect 5,687 acres or 32 percent of the WSA in the Utah portion and along the southern and eastern boundaries in Colorado. Development would cause an irretrievable loss of naturalness and opportunities for solitude and primitive unconfined recreation within and adjacent to these areas, most significantly west of Beaver Creek Canyon.

Approximately 11,995 acres in Colorado (68 percent of the WSA) is currently not leased for oil and gas development. Any new leases issued in this area would carry no-surface-occupancy stipulations to protect wildlife, nonmotorized

settings, visual resources, and the natural integrity of the area. Although the area would not be protected from locatable mineral entry, the potential for development in this portion of the WSA is low to moderate. Other activities such as range improvements projects and woodland development would not be precluded but would be restricted. These restrictions would provide moderate protection for primitive unconfined recreation within the core of the WSA, although any development would tend to impair naturalness and opportunities for solitude over the long term. Statutory protection would be needed to ensure long-term preservation of wilderness values of the WSA.

Nondesignation would also have adverse impacts on diversity in the National Wilderness Preservation System since the WSA's ecosystems are currently not well represented in the system. Nondesignation would adversely impact providing wilderness opportunities within a day's drive of major metropolitan areas.

No Action Alternative. Impacts to wilderness values under the No Action Alternative would be the same as those described under the Preferred Alternative. Impacts may be significant, and losses would be irretrievable.

Minerals

Preferred Alternative. All 12 existing leases could be developed and 9 new leases issued. There would be no wilderness study area protection stipulations; no surface occupancy and seasonal restrictions for wildlife would occur.

This alternative is highly beneficial to oil and gas development as well as exploration and potential development of base and precious metal deposits.

All Wilderness Alternative. All or portions of twelve post-FLPMA leases within West Cold Spring WSA (5,047 acres, 29 percent of the WSA) would not be developed. Most of these leases are either in the Utah portion of the WSA or along the southern and eastern edges of the WSA in Colorado (see Table 3-8 and Map 3-8 in Chapter 3). All or most of two of the Utah leases are within the WSA and therefore would not be developed with wilderness designation. The remaining ten leases extend outside the WSA; it is possible that they could be at least partially developed, in which case, their oil and gas potential would not be foregone. On the other hand, there would be no new leases issued, hence no future development on the remaining 12,635 acres (71 percent of the WSA).

Thus, development of most of the recoverable oil reserves within the WSA (see Appendix F for potential reserves) would be foregone. In addition, all of the base and/or precious metals (moderate to high potential) and other

mineral resources, as may be present, would be foregone due to closure of the entire WSA to mineral entry, a major unavoidable adverse impact.

Wilderness designation of West Cold Spring would be an irreversible and irretrievable commitment of much of the mineral resource underlying the WSA.

Conflict Resolution Alternative. There is high potential that all or portions of seven post-FLPMA leases in the nonsuitable areas would be developed for oil and gas over the long term. Three of the leases are in Colorado (total 842 acres) and four are in Utah (2,410 acres, with 1,560 acres of no surface occupancy); they total 3,252 acres, or 21 percent of the WSA. These areas would most likely be developed because the topography is less rugged than in the rest of the WSA. Portions of five post-FLPMA leases (1,795 acres, 11 percent of the WSA) would remain within the suitable area along the southern and eastern boundaries. As under the All Wilderness Alternative, development would occur on the portions of these leases outside the WSA.

In addition, locatable mineral entry and development would be allowed on the 3,892 nonsuitable acres. Base and/or precious metal potential is moderate to high within the WSA, but site-specific prediction of localities, types, and amounts is not possible.

The above development would be very beneficial to mineral resources. At the same time, 11,995 acres would not be leased or developed for oil and gas, due to wilderness designation. In addition, the entire 13,790 acres considered suitable for designation under this alternative would be closed to mineral entry and development. Much of this area has fairly rugged topography and would be difficult and expensive to develop at least in the near future. Nevertheless, wilderness designation would represent an irreversible commitment of the resource, preventing exploration and development over the long term. Given the high potential for oil and gas as well as base and/or precious metals within the area, this would be at least a moderate to high loss of mineral resource development over the long term.

In summary, this alternative would be at least moderately beneficial to mineral resources development. However, significant mineral resources would still be foregone over the greater portion of the WSA.

No Wilderness Alternative. Mineral exploration and development would be permitted under the No Wilderness Alternative, but restrictions would be imposed on the Colorado portion of the WSA (14,482 acres) due to the primary management objective for that area. The major constraint would be on oil and gas development, which would not benefit significantly from this alternative. This alternative is favorable to locatable mineral development.

Overall, impacts to oil and gas development would be similar to those described under the Conflict Resolution Alternative, that is, there would be some moderate benefits. However, considerable restrictions on development in large portions of the WSA would occur within Colorado. In particular, widespread no-surface-occupancy stipulations (11,995 acres) to maintain the wildlife, visual, recreation, and natural integrity of the area would effectively preclude exploration and development on 68 percent of the WSA. Development would be allowed on all 12 existing post-FLPMA leases (5,047 acres, 29 percent of the WSA, with 1,560 acres of no-surface-occupancy on Utah leases). In Utah, an additional 640 acres could also be leased and developed. See Appendix F for estimated oil and gas reserves and hypothetical development scenarios.

Locatable mineral entry would be allowed under the No Wilderness Alternative. ORV restrictions would slightly constrain, but not preclude, exploration and development. The potential for occurrence of base and/or precious metals is moderate to high within the WSA, but specific localities, amounts, etc., cannot be predicted. Development potential is moderate over the long term. Development of locatable minerals would be a moderate beneficial impact to mineral resources under this alternative.

No Action Alternative. Impacts to minerals under the No Action Alternative would be the same as under the Preferred Alternative.

Livestock Grazing

Preferred Alternative. The proposed burning and reseeded of 750 acres of sagebrush would be permitted, resulting in an increase of 75 AUMS of livestock forage in Spitzie Draw Allotment 4335. No significant adverse impacts would result.

All Wilderness Alternative. In addition to those impacts discussed in the Common Impacts section of this Chapter, the following impacts would occur.

A proposed prescribed burn project (Table 4-1), which would increase overall carrying capacity of allotment #4335 by 75 AUMs, would not be allowed due to existing wilderness guidelines. This impact would be insignificant in relation to grazing in the area.

Conflict Resolution Alternative. In addition to those impacts discussed in the Common Impacts section of this Chapter, the following impacts would occur.

This alternative includes a boundary change west of Beaver Creek Canyon to exclude open sagebrush areas proposed for range improvements. This would allow the burning and reseeded of approximately 80 acres but would still preclude

TABLE 4-1
WEST COLD SPRING WSA
IMPACTS TO LIVESTOCK MANAGEMENT
UNDER THE ALL WILDERNESS ALTERNATIVE

<u>Allotment Number</u>	<u>Proposed Management Action</u>	<u>Affected Resource</u>	<u>Benefit/Loss*</u>
4335	Prescribed burning and seeding of 750 acres of sagebrush community.	Livestock	75 AUMs/yr

* AUM figures indicate a loss of potential increase due to wilderness management restrictions on planned range management projects. They do not indicate a direct loss of existing AUMs.

burning and reseeded on 670 acres of the proposed area (Table 4-2). The restriction would preclude an increase of 67 AUMs to the carrying capacity of allotment #4335.

No Wilderness Alternative. Adverse impacts under the No Wilderness Alternative would be those possible additional costs associated with the implementation of the prescribed burn project to meet the restrictive guidelines involved with a priority recreation area. These impacts would be addressed in an environmental assessment and benefit/cost analysis prior to implementation. The proposed project would increase overall carrying capacity of allotment #4335 by 75 AUMs if fully implemented.

No Action Alternative. Impacts would be the same as the Preferred Alternative.

Wildlife

Impacts to wildlife habitat would be most significant under the No Wilderness and No Action alternatives. Many of the same impacts would also occur under the Preferred Alternative, however, because of priority management for wildlife on 65 percent of the area, the significance of many impacts could be mitigated. The fewest impacts would occur under the Conflict Resolution and All Wilderness alternatives.

Preferred Alternative. Under this alternative, management emphasis for wildlife habitat on about 4,400 acres around Beaver Creek and for semiprimitive motorized recreation (primarily hunting use) on about 9,000 acres would result in significant beneficial impacts.

TABLE 4-2
WEST COLD SPRING WSA
IMPACTS TO LIVESTOCK MANAGEMENT
UNDER THE CONFLICT RESOLUTION ALTERNATIVE

<u>Allotment Number</u>	<u>Proposed Management Action</u>	<u>Affected Resource</u>	<u>Benefit/Loss*</u>
4335	Prescribed burning and seeding of 670 acres of sagebrush community.	Livestock	67 AUMs/yr

* AUM figures indicates a loss of potential increase due to wilderness management restrictions on planned range management projects. They do not indicate a direct loss of existing AUMs.

Water developments and habitat manipulation projects would be implemented to improve bighorn sheep distribution and allow for increased populations, as well as to maintain the elk herd for trophy hunting. Aquatic and riparian habitat improvement projects would be initiated on Beaver Creek to improve overall condition and increase fish populations.

Although oil and gas development would be allowed in this area, seasonal restrictions would be used to avoid significant adverse impacts to goshawk, big game, and aquatic habitat as well as raptors such as Cooper's hawk, ferruginous hawk, Swainson's hawk, red-tailed hawk, and golden eagle.

Emphasis on oil and gas development on an adjacent 3,040 acres would result in significant adverse impacts to wildlife. There would be a potential for displacement and possible loss of 50 mule deer and significant disturbance to habitat for the previously listed raptor species. The value of the area for trophy elk hunting would essentially be eliminated.

Impacts to wildlife habitat would be most significant under the No Wilderness and No Action Alternative. Many of the same impacts would also occur under the Preferred Alternative, however, because of priority management for wildlife on 65 percent of the area, the significance of many impacts could be mitigated. The least impacts would occur under the Conflict Resolution and All Wilderness alternatives.

All Wilderness Alternative. Wilderness designation of West Cold Spring WSA would be beneficial to approximately 30 bighorn sheep in the Beaver Creek drainage by providing protection from certain human activities, especially vehicular use and disturbance from mineral development. Designation would also aid in the preservation of a trophy elk hunting area proposed for the region by the Colorado Division of Wildlife. Sensitive raptor species, such as ferruginous hawk, Swainson's hawk, and golden eagle would benefit significantly, especially from minimal human activity during the breeding season.

The Beaver Creek riparian habitat may or may not benefit from wilderness designation. Certain activities, such as road construction or oil and gas development, would be prohibited, thus protecting the riparian vegetation from direct removal. Livestock grazing, however, would continue and would be detrimental to attaining a completely undisturbed and natural riparian ecosystem.

Conflict Resolution Alternative. Impacts would be similar to those described under the All Wilderness Alternative. However, under this alternative, oil and gas exploration and development would have significant adverse impacts to elk trophy hunting value. Loss of elk numbers would likely

be low, but the increased human activity associated with mineral development would significantly decrease the trophy hunting value of Game Management Unit (GMU) 201. It is estimated that habitat would also be lost for 42 mule deer, most of which would probably be supported by adjacent habitat; therefore, the loss would not be significant.

No Wilderness Alternative. The No Wilderness Alternative is only moderately favorable to wildlife. No surface occupancy restrictions on 11,995 acres in Colorado and 1,560 acres in Utah would provide benefits similar to those described under the All Wilderness Alternative, although there is some potential for locatable mineral development.

The primary significant adverse impact to wildlife under this alternative would result from oil and gas exploration and development on an estimated 4,127 acres. As many as 30 bighorn sheep and 80 mule deer would be displaced and ultimately lost. Actual removal of 35 to 56 acres of habitat would not be significant. However, with the amount of human activity associated with seven wells, roads, and facilities, possibly 50 percent of the 4,127 acres would effectively be lost as wilderness habitat.

The value of the quality trophy elk hunting area would also be significantly reduced, as would the security value of the area for sensitive species such as the golden eagle, ferruginous hawk, and Swainson's hawk. The aquatic habitat of Beaver Creek would be severely impacted in the short term from siltation and possible introduction of toxic substances resulting in significant reductions in fish populations. Once the oil or gas deposit is depleted and abandonment of the field occurs, productivity of the area would return in the long term.

No Action Alternative. Under this alternative the entire WSA would be open to oil and gas development, and the long-term potential for development is high. Although some seasonal restrictions would be placed on development, nevertheless as much as 50 percent of the 17,682 acres open to development would effectively be lost as wildlife habitat. This would result in the potential loss of 30 bighorn sheep and 170 mule deer, as well as a significant amount of presently undisturbed habitat for raptors such as goshawk, Cooper's hawk, golden eagle, ferruginous hawk, Swainson's hawk, and the red-tailed hawk.

The trophy elk hunting opportunity in GMU 201 would essentially be eliminated. There would be a potential for significant adverse impacts to the aquatic habitat of Beaver Creek, resulting in drastic reductions in fish populations.

Other mineral development would also have significant adverse impacts to wildlife. Depending on the extent and location of development, the relatively primitive and

secluded habitat conditions required for healthy populations of bighorn sheep and raptors would be lost, resulting in significant reductions in populations.

If mineral development is not as extensive as predicted, or if it occurs in small areas over long periods of time, then the adverse impacts described above would be considerably lessened. In addition, there would then be opportunities for wildlife habitat improvement projects which would result in significant beneficial impacts. Water developments and habitat manipulation projects would be implemented to improve bighorn sheep distribution and allow for increased populations, as well as to maintain the elk herd for trophy hunting. Aquatic and riparian habitat improvement projects would be initiated on Beaver Creek to improve overall condition and increase fish populations.

Soils

Under all the alternatives, the continuation of livestock grazing would adversely affect soil resources, mainly through compaction of the surface in livestock concentration areas. Dense surface layers would reduce infiltration rates and increase surface runoff, resulting in accelerated topsoil erosion.

Preferred Alternative. Under this alternative, maximum surface disturbance is expected. Increased sediment yields and erosion are anticipated from the development of oil and gas leases and mining claims, construction of roads, and continued grazing of livestock. Disturbance of between 110 and 176 acres for well pad construction alone would result in an irretrievable loss of 80 to 250 tons of soil over a five-year period from accelerated erosion. Additional small unquantifiable soil losses would occur from the erosion of road surfaces. Although reclamation practices would restore soil productivity of the disturbed areas over the long term, the losses in topsoil would lower soil productivity and cause off-site sedimentation of streams in the short term.

One beneficial impact from the Preferred Alternative would result from the allowance of special erosion control measures (such as use of nonnative species, fencing, or methods used for fire control) in order to rehabilitate potential problem areas.

Overall, the Preferred and the No Action alternatives would result in maximum adverse impacts to the West Cold Spring WSA, whereas the All Wilderness and Conflict Resolution alternatives would have primarily beneficial impacts. The No Wilderness alternative would have mixed impacts.

All Wilderness Alternative. Wilderness designation would benefit soil resources. Designation would reduce the extent

of surface-disturbing activities, such as off-road vehicle (ORV) use, energy and mineral activities and road building. As a result, erosion potentials within the area as well as off-site impacts from wind or water carried material would be reduced. Insignificant soil compaction would result from livestock grazing which would continue under wilderness designation.

Under wilderness designation, the long-term productivity of watersheds in fair or better condition would improve or stabilize due to the reduction of surface-disturbing activities other than livestock. Those watersheds or localized areas in fair or poor condition, caused mainly by livestock, would probably exhibit a decrease in productivity due to livestock operations continuing and limited treatment methods available.

Generally, wilderness designation would benefit soil resources more than any of the other alternatives.

Conflict Resolution Alternative. Impacts under the Conflict Resolution Alternative would be similar to those described under the All Wilderness Alternative, except for those associated with oil and gas development. Approximately 25 to 40 acres would be disturbed from oil and gas activities, mostly in the Utah portion of the WSA. This disturbance would result in soil losses of 18 to 54 tons over a five-year period. Although reclamation practices would restore the original soil productivity over the long term, the losses in topsoil would lower soil productivity and cause off-site sedimentation of streams in the short term. For the 13,790 acres proposed for wilderness designation, impacts would be the same as under the All Wilderness Alternative.

Generally, this alternative would adversely impact soil resources in areas not suitable for wilderness designation and benefit them in areas suitable for wilderness designation. Given the large area that remains suitable for wilderness designation (13,790 acres), this alternative would still be mostly beneficial to soil resources.

No Wilderness Alternative. The No Wilderness Alternative would allow some surface-disturbing activities to occur (e.g., development of 12 existing oil and gas leases, some locatable mineral development, and livestock grazing). These activities would adversely impact soil resources, mainly through the construction of road networks, drill pads, and from the concentration of livestock in erodible areas. Development of the 12 existing oil and gas leases would disturb approximately 35 to 56 acres from well pad construction alone. Erosion of these barren pads would result in an irretrievable soil loss of 27 to 80 tons over a five-year period. Additional unquantifiable soil loss would occur from the erosion of road surfaces. Although reclamation

practices would restore the original soil productivity of the disturbed areas over the long term, the losses in topsoil would lower soil productivity and cause off-site sedimentation of streams in the short term.

Beneficial impacts would result from closing the area to ORV use and from stipulating no surface occupancy on new oil and gas leases on 11,995 acres. In addition, a wider range of corrective methods for dealing with erosion problems (should they develop) would be allowed under this alternative. Planned range improvements (prescribed burning and seedings) would probably increase the stability of the area over the long term.

Overall, the No Wilderness Alternative would have more adverse effects on soil resources than the All Wilderness Alternative, but would have fewer adverse effects than the No Action and Preferred alternatives.

No Action Alternative. Impacts would be the same as those outlined under the Preferred Alternative.

Water Resources

Under all the alternatives, the continuation of livestock grazing within the WSAs could adversely impact surface water resources. Concentration of livestock in riparian areas destroys stabilizing streambank vegetation and results in increased sediment concentrations within stream waters. Water quality is also degraded by increases in fecal coliform bacteria.

Preferred Alternative. Management for wildlife habitat, fish propagation, and nonmotorized forms of recreation under the Preferred Alternative would have no significant negative impacts to water resources. Positive impacts would result from streambank and channel stabilization projects and riparian improvement efforts related to wildlife and fish management.

Increases in stream sedimentation and turbidity would still result, however, from prescribed burning, road construction, and activities related to oil and gas and mining claim development. For example, the disturbance of 110 to 176 acres due to well pad construction alone would contribute 80 to 250 tons of sediment to local streams over a five-year period. Additional sedimentation would occur from the erosion of road surfaces. Streams that would be affected include Willow Creek, George Draw, and Birch Creek in Utah, and Spitzie Draw, and Beaver Creek in Colorado. Reclamation of the disturbed sites is expected to mitigate these adverse impacts over the long term. Because surface water is generally considered to be a renewable resource, it is possible that given enough time and surface protection stipulations, the impacts from increases in

consumption, sedimentation, streambank sloughing, and contamination from organic and inorganic constituents would be minimized and the water resources would eventually recover from short-term adverse impacts. Whether or not impacts to surface water resources would be short-term or long-term is dependent upon the extent and longevity of resource development and use activities.

Accidental contamination and interruption of groundwater sources could also occur with oil and gas activities. Seismic exploration, deep percolation from drilling fluids or produced water stored on the surface, migration of drilling fluids through improper casing, and aquifer contamination from improperly cased and abandoned wells all have the potential of interfering with or contaminating groundwater over the long term. Because these types of impacts would be significant, additional stipulations would be required during the APD process. The severity and appropriateness of these stipulations would be determined on a case-by-case basis. Contamination or destruction of groundwater sources would be considered irreversible and irretrievable.

Temporary consumption of water from oil and gas activities may impact wildlife, livestock, and recreational use of the area's water supplies. Consumption of water from Willow Creek, Beaver Creek, and perennial springs would generally be temporary in nature; however, destruction or draining of groundwater sources would be permanent losses.

Impacts from proposed timber-harvesting activities would be minimal and temporary. The harvesting of approximately 270 acres of woodland products from the north-central portion of the WSA would cause temporary increases in sedimentation and turbidity of Beaver Creek and other tributaries of the Green River, depending upon the extent and life-span of roads and timber extraction. Small increases in water yield would result, depending on the type of harvesting technique.

Although there currently are no patented or unpatented claims for locatable minerals in the WSA, future extraction of base and precious metals, uranium, copper, molybdenum, and sand and gravel would affect the area's water resources. Consumption and accidental contamination of surface and groundwater supplies would interfere with present wildlife, livestock, and recreational uses of water.

Maximum negative impacts to water resources are expected to occur under the Preferred and No Action alternatives in relation to the other alternatives. The All Wilderness and Conflict Resolution alternatives would have primarily beneficial impacts on water resources, while the impacts associated with the No Wilderness Alternative would be mixed.

All Wilderness Alternative. Two significant positive impacts would result from wilderness designation. First, Beaver Creek, intermittent tributaries of the Green River, and perennial springs would be assured of remaining in their relatively pristine state. Second, short-term and long-term consumptive uses by oil and gas and mineral development would be avoided.

As a result of curtailing water contamination and consumption, water flowing from the WSA would continue to contribute high quality water to the Green River and help dilute dissolved solids and other organic and inorganic nonpoint source pollutants. Although the amount of water contributed by this area is small, the diluting character of this water is not negligible and should be considered a positive impact. As consumption and pollution of the Green River increase, the value of West Cold Spring WSA's high quality waters would also proportionally increase.

Generally, wilderness designation would have more beneficial impacts on water resources than any other alternative.

Conflict Resolution Alternative. The same significant positive impacts to water resources, as discussed under the All Wilderness Alternative West Cold Springs WSA, would be expected within the 13,790 acres proposed for wilderness. Short-term, adverse impacts associated with oil and gas development would occur in areas not designated as wilderness, mostly in the Utah portion of the WSA. Soil erosion on 25 to 40 acres of oil and gas drilling and production pads would result in the sedimentation of local surface waters, including Willow Creek, George Draw, and Birch Creek in Utah, and Spitzie Draw in the southern portion of the WSA in Colorado. It is estimated that up to 18 to 54 tons of sediment would be deposited into streams over a five-year period from oil and gas activities. Reclamation of disturbed sites is expected to mitigate these adverse impacts over the long term.

Groundwater impacts from oil and gas activities would also occur in areas not designated as wilderness. These are described under Groundwater Impacts, West Cold Spring WSA, Preferred Alternative.

Some adverse impacts could be expected from the continuation of livestock grazing. See general discussion, West Cold Spring WSA, Water Resources.

This alternative would adversely impact water resources in areas not suitable for wilderness designation and benefit them in areas suitable for wilderness designation. Given the large area that remains suitable for wilderness designation (13,790 acres), this alternative would still be mostly beneficial to water resources.

No Wilderness Alternative. Adverse impacts to water resources would result from the potential development of 12 oil and gas leases under the No Wilderness Alternative. Well pad construction, and the subsequent erosion of the disturbed surface, would result in the addition of up to 27 to 80 tons of sediment within Beaver Creek and Spitzie Draw in Colorado, and George Draw, Willow Creek, and Birch Creek in Utah, over a five-year period. Additional sedimentation would occur from the erosion of road surfaces. Reclamation of all disturbed sites is expected to mitigate these adverse impacts over the long term. Groundwater impacts associated with oil and gas activities would be the same as those described under the Preferred Alternative, West Cold Spring WSA.

Beneficial impacts, in the form of reduced sediment yields, would result from closing the area to ORV use, restricting woodland development, and stipulating no surface occupancy on new oil and gas leases on 11,995 acres.

The No Wilderness Alternative would have more adverse effects on water resources than the All Wilderness Alternative, but would have fewer adverse effects than the Preferred and No Action alternatives.

No Action Alternative. Impacts to water resources would be the same as those under the Preferred Alternative.

Recreation

Preferred Alternative. Under the Preferred Alternative, the existing ROS settings would be adopted as the ROS classes but no specific actions would be implemented to protect the settings, specifically the semiprimitive nonmotorized settings. Changes in settings (Table 4-3) would occur with oil and gas development, intensive woodland management, wildlife habitat improvements, range improvements, increased grazing, and ORV use. Because the location and extent of development is not known, the changes in ROS settings are assumed to be realistic.

Forty percent of the nonmotorized settings would be changed to more developed settings; therefore, opportunities for primitive recreation would be lost and resulting experiences would diminish. The loss of 40 percent of the nonmotorized settings would be a significant adverse impact to recreation because these types of areas and opportunities are diminishing in the region. In addition the nonmotorized setting could be lost altogether.

The outstanding hunting and wildlife viewing opportunities would be adversely affected by woodland development, oil and gas development, and associated roads and facilities especially when activities occur during hunting seasons or reduce the number of animals present in the area.

TABLE 4-3
WEST COLD SPRING WSA CHANGES
IN ROS CLASSES UNDER THE PREFERRED ALTERNATIVE

ROS Classes	Estimated Acreage		Percent of Area	
	Existing	Change	Existing	Change
Semiprimitive Nonmotorized	14,137	7,000	80	40
Semiprimitive Motorized	3,100	6,432	18	36
Roaded Natural	445	3,200	2	18
Rural	0	1,050	0	6

All Wilderness Alternative. Opportunities for primitive recreation would be enhanced through additional protection of nonmotorized settings within the West Cold Spring WSA. Off-road vehicle (ORV) use would not be permitted; however, motorized uses within the WSA are low to nonexistent due to the steep, rugged terrain and opportunities for ORV use are available elsewhere in the Resource Area. The semiprimitive nonmotorized Recreation Opportunity Spectrum (ROS) class would essentially remain intact covering 80 percent of the WSA. Wilderness designation would provide long-term beneficial impacts to recreation by protecting the existing ROS settings, as well as the recreation features and attractions identified within the WSA. Thus, current uses such as hunting, hiking, viewing, fishing, etc., would continue.

A portion of Beaver Creek Canyon is within the WSA. This portion forms a hiking corridor, providing access into the area from the top and bottom of Cold Spring Mountain. The portion within the WSA would be protected and the portion on undeveloped public land outside the WSA would not.

Conflict Resolution Alternative. Primitive types of recreation would continue to occur within the 13,790-acre suitable area of West Cold Spring WSA. Upon designation the area would be closed to ORV use which would have an insignificant impact on motorized use. The existing ROS settings would change as depicted in Table 4-4.

Twenty percent of the nonmotorized settings would be lost over the long term, mainly within the nonsuitable Utah portion of the WSA and along the southern boundary in Colorado. Range improvement projects and oil and gas developments in the nonsuitable portion would cause a 20 percent increase in motorized settings within the WSA. This would have both positive and negative impacts to recreation by decreasing opportunities for primitive types of recreation

and increasing opportunities for motorized types of recreation. The loss of recreation experiences as a result of the loss of nonmotorized settings in the nonsuitable areas would be an irretrievable loss to users who prefer experiences associated with nonmotorized settings. Nevertheless, this alternative would still significantly benefit nonmotorized recreation opportunities.

A portion of Beaver Creek Canyon is within the WSA. This portion forms a hiking corridor, providing access into the area from the top and bottom of Cold Spring Mountain. The portion within the WSA would be protected and the portion on undeveloped public land outside the WSA would not.

No Wilderness Alternative. Under the No Wilderness Alternative, management actions designed to help protect wildlife, visual, and recreation resources, and the natural integrity of the WSA, would be implemented in the Colorado portion (14,482 acres). The existing ROS settings would change slightly (Table 4-5) in peripheral areas along the north and south boundaries with oil and gas development, but the nonmotorized settings comprising the core of the WSA (11,995 acres) would essentially remain the same.

The area would be closed to ORV use which would have an insignificant impact because this use is low to nonexistent in the WSA. However, the Utah portion of the WSA (3,200 acres) would be open to oil and gas or other resource development which would cause a loss of nonmotorized settings and resulting primitive recreation opportunities west of Beaver Creek Canyon. Approximately 11 percent of nonmotorized setting would be lost in this portion of the WSA, with a resulting increase in motorized settings.

No Action Alternative. Under the No Action Alternative, impacts to recreation are the same as described under the Preferred Alternative.

TABLE 4-4
WEST COLD SPRING WSA
CHANGES IN ROS CLASSES
UNDER THE CONFLICT RESOLUTION ALTERNATIVE

ROS Classes	Estimated Acreage		Percent of Area	
	Existing	Change	Existing	Change
Semiprimitive Nonmotorized	14,137	10,600	80	59
Semiprimitive Motorized	3,100	6,202	18	35
Roaded Natural	445	800	2	5
Rural	0	80	0	1

TABLE 4-5
WEST COLD SPRING WSA
CHANGES IN ROS CLASSES
UNDER THE NO WILDERNESS ALTERNATIVE

ROS Classes	Estimated Acreage		Percent of Area	
	Existing	Change	Existing	Change
Semiprimitive Nonmotorized	14,137	12,137	80	69
Semiprimitive Motorized	3,100	4,545	18	26
Roaded Natural	445	1,000	2	5

Visual Resources

Preferred Alternative. The wildlife and recreation priority management areas would be managed under VRM Class II which would restrict but not preclude development. The Utah portion and the livestock priority management area would experience a degradation of the existing landscape with oil and gas development, range improvements, and other resource developments. Prescribed burning and new roads and facilities associated with oil and gas development would still cause adverse impacts to visual resources throughout the WSA. Most of the Colorado portion of the WSA has high sensitivity to any landscape changes because it is highly visible from Colorado State Highway 318.

All Wilderness Alternative. The entire WSA would be managed under VRM Class I objectives (Appendix E). This

objective primarily allows for natural ecological changes which would provide additional protection of the WSA's visual qualities. Wilderness designation would provide long-term protection of the scenic quality of the area from within and from outside the WSA.

Conflict Resolution Alternative. Generally, designation of 13,790 acres of West Cold Spring WSA would significantly benefit scenic values within the WSA. The suitable portion of the WSA would be managed as VRM Class I which would protect visual quality. Wilderness designation would provide long-term protection for the scenic quality of the area as viewed from within as well as from outside the WSA. VRM classes in the nonsuitable portions would remain the same (III and IV) and allow development commensurate with the class objectives. The landscape may be altered with new roads, up to five oil and gas pads affecting 25 to 40

acres, locatable mineral development, and range improvements.

No Wilderness Alternative. Existing visual resources within the WSA would be protected through restrictions on development or intrusions in Colorado. The entire Colorado portion (14,482 acres) would be managed under the VRM Class II management objectives (Appendix E). The Utah portion (3,200 acres) would be developed, causing adverse impacts upon the landscape in the VRM Class III and IV areas.

No Action Alternative. The No Action Alternative would allow oil and gas development, range improvements, wildlife habitat improvements, and increased grazing and woodland management to occur with resulting roads, facilities, and changing of vegetation types. VRM Class II areas in the Colorado portion of West Cold Spring WSA would receive some protection under the class objectives (Appendix E). However, prescribed burning and mechanical seeding, and new roads and facilities associated with oil and gas development would still cause adverse impacts to visual resources in the WSA. Most of the Colorado portion of the WSA has high sensitivity to any landscape changes because it is highly visible from Colorado State Highway 318. The Utah portion of the WSA would be managed under VRM Class III and IV objectives where intrusions or alteration of the landscape would occur from development activities associated with oil and gas or other resources.

Economics

Based upon the assumptions presented in the Economics Section of Common Impacts for all eight WSAs; and Appendix F assuming development within 20 years, with an extraction life of 20 years, a net revenue value of \$4.00 per barrel and a discount rate of 8 3/8 percent, the following impacts could result.

The magnitude of hydrocarbons present could be up to 134,000,000 barrels of recoverable oil. The net present value of this potential resource would be approximately \$21,386,400.

According to information presented in the Geology and Minerals section of Chapter 3, the West Cold Spring WSA has moderate to high potential for occurrence of base/precious metals and moderate potential for other locatables. No data is available on amounts actually present or their potential value.

Preferred Alternative. Under the Preferred Alternative, potential mineral resources in West Cold Spring WSA (discussed above) would be available for development, along with associated economic potential. The effect on any

changes in employment, income, public revenue, and infrastructure would vary relative to the potential development.

All Wilderness Alternative. Since the area would be closed to mineral entry under this alternative, wilderness designation would essentially preclude exploration and/or development. The impact is unknown, given the absence of data on amounts present.

Therefore, it is assumed that if the area is designated wilderness, the above potential energy or mineral resources present would be foregone, along with any associated economic potential. The effect on any changes in employment, income, public revenue, and infrastructure, would vary relative to the potential foregone.

Preferred Alternative. Impacts would be the same as No Action Alternative.

Conflict Resolution Alternative. Impacts would be similar to those described under the All Wilderness Alternative, except some mineral development would be allowed on about 20 percent of the WSA. Nevertheless, given the potential for mineral occurrence within the WSA, it is assumed that on the 13,790 acres designated, any potential energy and/or mineral resources present would be foregone, along with any associated economic potential. The effect on any changes in employment, income, public revenue, and infrastructure would vary relative to the potential foregone in the long term.

No Wilderness Alternative. Much of the oil and gas economic potential described under the All Wilderness Alternative would still be foregone under the No Wilderness Alternative since only about 32 percent of the WSA would be developed. Economic potential associated with locatable mineral development would not be foregone. The effect on any changes in employment, income, public revenue, and infrastructure would vary relative to the potential.

No Action Alternative. Impacts would be the same as the Preferred Alternative.

DIAMOND BREAKS

The impacts to air quality, topography, vegetation, forest and woodland resources, paleontology, land and realty, cultural resources and economic assumptions are discussed in the Common Impacts section of Chapter 4. No significant impacts are anticipated for these resources. Proposed management actions for the various alternatives are presented in Table 2-6 in chapter 2. The Combined WSAs Alternative would not apply to the Diamond Breaks WSA.

CHAPTER 4

Wilderness Values

Preferred Alternative. Wilderness designation would protect Diamond Breaks WSA's naturalness, outstanding opportunities for solitude, and outstanding opportunities for primitive unconfined recreation. Protecting the wilderness values would, in turn, benefit visual resources, wildlife, and watershed, and provide additional protection to the scenic quality along the Green River in Browns Park which has been recommended for scenic designation under the Wild and Scenic Rivers Act.

Designation would also provide additional wilderness opportunities within a day's drive of two major population centers in Utah (Salt Lake/Ogden and Provo/Orem) and would help balance the geographic distribution of wilderness. It would also help expand the diversity of ecosystems within the National Wilderness Preservation System. Diamond Breaks WSA is in the Rocky Mountain Forest Province (juniper-pinyon woodland/mountain mahogany-oak scrub/sagebrush-steppe); these three ecosystems are not well represented in the wilderness preservation system. The WSA would also provide semiarid, mountainous land forms which complement the river canyons of Dinosaur National Monument. Overall, Diamond Breaks would be an important addition to the National Wilderness Preservation System.

There is some potential that an existing oil and gas lease would be developed in the short term on the 1,200 acres proposed for addition to the WSA. Development would impair wilderness values within and adjacent to the area over the long term.

All Wilderness Alternative. In addition to the impacts described in the Preferred Alternative, approximately 130 acres of a Recreation and Public Purposes Act lease exist adjacent to the Browns Park State Waterfowl Management Area in Utah. The lease constitutes a prior existing right and the area could be altered or developed. Although there are no current plans for any development, the two parcels could not be managed as wilderness until the lease expires.

After designation, there would be no other valid existing rights within the WSA which would cause impairment of the wilderness values. However, potential oil and gas development on a lease in Warren Draw and the lower ends of Yellow Jacket and Chokeycherry draws, which are undeveloped and adjacent to the WSA, would diminish opportunities for solitude in small portions of the WSA in the short term due to outside sights and sounds. (This is the same 1,200-acre area that would be added into the WSA under the Preferred Alternative). In addition, opportunities for primitive unconfined recreation in Warren Draw would be visually impaired by any development in

this undisturbed area. The same impacts would occur adjacent to the 635 acres of split estate mineral ownership (federal surface and state of Colorado minerals) and the 190 acres of Utah State lands bordering Crouse Canyon. The probability of oil and gas occurrence is potentially moderate and other mineral potential is considered to be moderate to high (see Chapter 3).

ORV use on the cherrystem ways in Chokeycherry and Yellow Jacket Draws would also diminish opportunities for solitude and primitive unconfined recreation. Motorized use of the way from the Browns Park National Wildlife Refuge, along the WSA boundary to Yellow Jacket Draw, would also diminish outstanding opportunities for solitude and primitive unconfined recreation in small adjacent areas of the WSA. However, because ORV use is low this impact would be minor.

Conflict Resolution Alternative. Wilderness values would be lost on the 280 acres recommended as nonsuitable, which would be a minor adverse impact. The existing way in Yellow Jacket Draw could not effectively be closed and most of the Recreation and Public Purpose Act lease in Utah would be eliminated. Otherwise, impacts would be the same as described under the All Wilderness Alternative.

No Wilderness Alternative. Nondesignation of Diamond Breaks WSA would prevent comprehensive, long-term protection of the area's high quality wilderness values. It would also prevent a contribution to the diversity of the National Wilderness Preservation System and to the geographic distribution of wilderness areas. Long-term maintenance or loss of the WSA's wilderness values under this alternative would depend primarily on the extent and location of future mineral development.

There would be no woodland or forest resource development within the area, and no range, wildlife, or watershed projects are currently proposed. Closing the area to off-road vehicle use and constraining future resource development projects would provide some protection, which would have beneficial impacts to wilderness values.

A total of 13,690 acres in Colorado is currently not leased for oil or gas. No-surface-occupancy stipulations placed on future leases would protect the naturalness of portions of the WSA, primarily in the north toward Browns Park National Wildlife Refuge and along the southern and southwestern slopes of Diamond Mountain. However, depending on when the area was released from interim management, there would be moderate potential that five existing post-FLPMA leases would be developed on 17,544 acres (50 percent of the WSA with only 200 acres of no surface occupancy). Leasing and development of 3,900 acres in Utah and 635 acres of split-estate land in Colorado would

also be possible. Oil and gas development activities would therefore potentially occur within 22,079 acres, resulting in approximately 100 to 160 acres of surface disturbance for well pads, plus attendant roads, pipelines, and human activities. In addition, there is low to moderate potential that locatable minerals would be developed anywhere within the WSA over the long term. If such mineral development occurs, it would cause irretrievable long-term degradation of naturalness in and around the disturbed areas. In addition, the existing oil and gas leases are scattered throughout the WSA (see Table 3-12 and Map 3-9 in Chapter 3). Therefore, full development not only would nullify outstanding opportunities for solitude and primitive unconfined recreation within the development areas, but also would seriously impair these opportunities in the remaining 13,690 acres.

In addition oil and gas development and ORV use could occur adjacent to the WSA in Warren Draw and the lower ends of Yellow Jacket and Chokecherry draws which would impair wilderness values due to outside sights and sounds. It is possible that the existing leases would expire before Congress releases the WSA from interim management. If so, new oil and gas leases would carry a no-surface-occupancy stipulation which would help protect wilderness values in the long term, although the area would still be open to locatable mineral entry.

No Action Alternative. Impacts of the No Action Alternative would be similar to those described under the No Wilderness Alternative. In the short term, wilderness values in Diamond Breaks WSA would probably be protected unless mineral activity increased quickly. In the long term, naturalness, opportunities for solitude, and opportunities for primitive unconfined recreation would diminish and eventually be lost because of altered landscapes, new roads, facilities, and ORV use mostly related to mineral development.

The major difference from the No Wilderness Alternative would be that the entire WSA would be open to oil and gas development. There is moderate potential that the area would be developed over the long term. Impacts to wilderness values would depend on the location of developments within the area; they would be lost forever in the entire WSA if extensive development occurs. It is estimated that development of 33 wells would physically impact between 165 and 264 acres of surface area if the entire WSA is developed. Although this acreage is small, the disturbed areas would be scattered throughout the WSA. Increased road networking and human activity associated with development would eradicate wilderness values over the long term. As under the No Wilderness Alternative, this loss of wilderness values and the failure to expand the

ecological diversity of the National Wilderness Preservation System with this WSA would be considered a major negative impact over the long term.

Minerals

Preferred Alternative. Management of Diamond Breaks WSA as wilderness would preclude further exploration for and production of mineral resources within the WSA. Five post-FLPMA leases (17,544 acres, 50 percent of the WSA) are unlikely to be developed; no new leases would be issued once these have expired. There would also be no new leases issued, hence no future development, on the remaining 17,236 acres (50 percent of the WSA). An isolated 635 acre split estate tract (federal surface, state of Colorado minerals) which is not currently leased would also probably not be leased or developed. The results would be lost rental income and royalty revenues and an irreversible commitment of the resource.

The area would also be closed to locatable mineral entry after designation. Thus, development of base and/or precious metals (moderate to high potential), and other mineral resources as may be present would be irretrievably foregone. Given the moderate potential for development, this would be a moderate adverse impact to mineral resource development.

The 1,200 acres proposed for addition to Diamond Breaks WSA is currently covered by a post-FLPMA oil and gas lease. A small portion of this lease is also within the current boundaries of the WSA. Development could occur on the 1,200 acres outside the boundary prior to wilderness designation since the wilderness study area protection stipulation does not apply to this area. Development of this lease would be a small beneficial impact.

If the lease is not developed in the next couple of years, it would probably expire prior to designation. After designation, no new lease would be issued, and the entire oil and gas potential would be foregone. See Appendix F for an estimate of potentially recoverable reserves.

All Wilderness Alternative. Management impacts to minerals would be the same as those described under the Preferred Alternative, excluding the 1,200 acres added to the WSA in that alternative. These acreages do not apply to the All Wilderness Alternative.

Conflict Resolution Alternative. The impact of this alternative would be the same as those described in the All Wilderness Alternative; further exploration for and production of mineral resources within the Diamond Breaks WSA would essentially be precluded. Given the moderate geologic potential for oil, gas, and base and precious metal

deposits, this alternative would be a moderate adverse impact to mineral resource development.

No Wilderness Alternative. Mineral exploration and development would be permitted. Restrictions on ORV use would constrain, but not prevent, mineral development. However, no-surface-occupancy stipulations on new oil and gas leases to protect visual resources and nonmotorized recreation would impair and probably preclude oil and gas exploration and development. There is insufficient data to determine whether these areas could be developed by slant drilling, but it would be unlikely if no surface occupancy is extensive.

There is a moderate potential that all five existing post-FLPMA leases would be developed for oil and gas (17,544 acres, 50 percent of the WSA, with 200 acres of no surface occupancy). In Utah, 3,900 acres may be leased and developed; an isolated tract of 635 acres in Colorado could also be leased and developed.

On the other hand, if the existing leases expire without being developed, new leases on these 17,544 acres would be issued with no-surface-occupancy stipulations. This would effectively preclude development on a total of 30,845 acres (87 percent of the WSA), a moderate adverse impact to oil and gas development. See Appendix F for an estimate of potentially recoverable oil reserves.

The WSA would also be open to mineral entry. The potential for occurrence of base and/or precious metals is moderate to high within the WSA, but specific localities, amounts, etc., cannot be predicted.

Management under the No Wilderness Alternative would inhibit or preclude long-term productivity of at least part of the oil and gas resources that may exist within the area. This would be an irretrievable commitment of that part of the resource. On the other hand, development of existing leases and of locatable minerals would be beneficial.

No Action Alternative. Diamond Breaks WSA would be open to mineral exploration and development under existing laws, which would be moderately beneficial over the long term. There is moderate potential that all five post-FLPMA leases would be developed (17,544 acres, 50 percent of WSA, with 200 acres carrying no-surface-occupancy stipulations) and that the other 18,225 acres in the WSA would also be leased and developed. See Appendix F for an estimate of potentially recoverable oil reserves.

The moderate to high geologic potential for base and/or precious metals within the WSA would result in at least moderate levels of exploration, while subsequent development would depend upon exploration and economic factors. The long-term potential for development is low to moderate.

Livestock Grazing

Preferred Alternative. In addition to the impacts discussed in the Common Impacts section of this Chapter, the following impacts would occur.

The boundary would be modified to extend to the Browns Park Refuge. This modification would eliminate one road, thus further restricting access to the entire allotment.

There would be no significant impacts associated with range improvement projects as there are currently none in the allotment nor are there any planned at this time.

All Wilderness Alternative. In addition to the impacts discussed in the Common Impacts section of this Chapter, the following impacts would occur.

This alternative would include fewer impacts to the livestock operator than the Preferred Alternative. Here, the boundaries have been pulled back allowing full use of an existing way which is currently an important vehicle access into the allotment.

Conflict Resolution Alternative. Same impacts as the All Wilderness Alternative. The exclusion of 280 acres from the WSA does not affect any current proposed livestock plans.

No Wilderness Alternative. No significant impact would occur under this alternative.

No Action Alternative. No significant impact would occur under this alternative.

Wildlife

Preferred Alternative. Wilderness designation would provide maximum protection for mule deer and elk habitat, including critical winter range. Current populations are estimated at 400 mule deer and 40 elk. Protection would also be offered to several species of raptors including the Swainson's hawk and ferruginous hawk which are candidate species proposed for possible addition to the federal list of endangered and threatened wildlife. Nesting and feeding populations of golden eagles and the endangered peregrine falcon and bald eagle, which may occasionally inhabit the area, would also benefit from wilderness designation through protection from human disturbance.

The Preferred, All Wilderness, and Conflict Resolution alternatives would have essentially the same beneficial impacts to wildlife. There would be significant adverse impacts under the No Wilderness and No Action alternatives.

All Wilderness Alternative. Beneficial impacts would be the same as the Preferred Alternative.

Conflict Resolution Alternative. Beneficial impacts would be the same as the Preferred Alternative.

No Wilderness Alternative. Under the No Wilderness Alternative there would be a significant adverse impact to wildlife if oil and gas exploration and development occurs. The drilling of 20 wells over a 22,000-acre area would result in loss of up to 10,500 acres of wildlife habitat through both direct removal of habitat and the indirect effects of human activity. It is estimated that 120 mule deer, a minimum of 12 elk, and numerous raptors and other nongame wildlife populations would be lost from the WSA. Disturbance to 22,000 acres of elk critical winter range would likely reverse the present increasing elk population trend, affecting not only the Diamond Breaks WSA, but also adjacent elk herds that move into the area during winter. Once the oil or gas deposit is depleted and abandonment of the field occurs, productivity of the area would return over the long term. If no-surface-occupancy stipulations are imposed over most of the area, then these impacts would be significantly reduced, and wildlife in the area would benefit proportionally.

No Action Alternative. The significant impacts to wildlife under the No Action Alternative would result from oil and gas exploration, and other mineral development if it should occur. The types of impacts would be the same as those discussed in the No Wilderness Alternative but the extent of losses would be greater. There is a potential for the loss of up to 400 mule deer, a minimum of 12 elk, and numerous raptors and other nongame wildlife.

Soils

Preferred Alternative. Because of reduced surface disturbance and surface-using activities, erosion would be reduced, resulting in a beneficial impact. Long term productivity would improve or stabilize. (Additional supporting rationale is presented in the soils discussion for the All Wilderness Alternative, West Cold Spring WSA.)

All Wilderness Alternative. Impacts would be beneficial as discussed under the Preferred Alternative.

Conflict Resolution Alternative. Impacts to soil resources would be beneficial, and the same as the Preferred and All Wilderness alternatives.

No Wilderness Alternative. Management under the No Wilderness Alternative would allow some surface-disturbing activities, such as livestock grazing or oil and gas and locatable mineral entry, to continue within the Diamond Breaks WSA. These activities would adversely impact soil

resources, mainly through the construction of road networks, drill pads, and from the concentration of livestock in erodible areas.

Development of the five existing oil and gas leases as well as new leasing/development in the Utah portion, would disturb approximately 100 to 160 acres from well pad construction alone. Erosion of these barren pads would result in an irretrievable soil loss of 70 to 225 tons over a five-year period. Additional unquantifiable soil losses would occur from the erosion of road surfaces. Although reclamation practices would restore the soil productivity of the disturbed areas over the long term, the losses in topsoil would lower soil productivity and cause off-site sedimentation of streams in the short term. Widespread no-surface-occupancy stipulations, if imposed, would greatly reduce the above impacts.

Beneficial impacts would result from closing the area to ORV use and from stipulating no surface occupancy on new oil and gas leases within 13,690 acres. In addition, a wider range of corrective methods for dealing with erosion problems would be allowed under this alternative than under the All Wilderness or Conflict Resolution alternatives.

The No Wilderness Alternative would have more adverse effects on soil resources than the Preferred, All Wilderness or Conflict Resolution alternatives, but would have fewer adverse effects than the No Action Alternative.

No Action Alternative. Under the No Action Alternative, maximum surface disturbance would occur. Increased sediment yields and erosion would result from the development of oil and gas leases and mining claims, construction of roads, and continued grazing of livestock. Disturbance of 165 to 264 acres for well pad construction alone would result in the irretrievable loss of 120 to 390 tons of soil over a five-year period from accelerated erosion. Additional unquantifiable soil losses would occur from the erosion of road surfaces. Although reclamation practices would restore soil productivity of the disturbed areas over the long term, the losses in topsoil would lower soil productivity and cause off-site sedimentation of streams in the short term.

Other adverse impacts would result from the continuation of livestock grazing under this alternative.

One beneficial impact from the No Action Alternative would result from the allowance of special erosion control measures (such as use of nonnative species, fencing, or methods used for fire control) in order to rehabilitate potential problem areas.

The No Action Alternative would have more adverse impacts on soil resources than any of the other alternatives.

Water Resources

Preferred Alternative. Generally, wilderness designation of Diamond Breaks WSA under the Preferred Alternative would benefit water resources. Road construction and other surface disturbances related to development of oil and gas leases and mining claims would not occur under designation, preventing increases in soil erosion and stream sedimentation. Insignificant soil compaction and erosion would result from continued livestock grazing.

Surface water resources, which exhibit some degradation due to livestock use would probably continue to deteriorate, because wilderness designation would limit the use of structural or vegetative improvements. Surface water resources, which are being affected by current surface-disturbing activities other than livestock, would stabilize or improve with wilderness designation. Groundwater sources would remain in their current state of productivity.

The Preferred, All Wilderness, and Conflict Resolution alternatives would have more beneficial effects on water resources than the other alternatives. Both the No Wilderness and No Action alternatives would have primarily adverse impacts on water resources.

All Wilderness Alternative. Impacts to water resources would be the same as under the Preferred Alternative, Diamond Breaks WSA.

Conflict Resolution Alternative. Impacts to water resources would be the same as those under the Preferred Alternative, Diamond Breaks WSA.

No Wilderness Alternative. Adverse impacts to water resources would result from development of oil and gas leases under this alternative. Well pad construction, and the subsequent erosion of the disturbed surface, would result in the addition of up to 70 to 225 tons of sediment within Crouse Creek in Utah and Eckland Draw, Deerlick Draw, Davis Draw, Hoy Draw, Warren Draw, and Yellow Jacket Draw in Colorado over a five-year period. Additional unquantifiable amounts of sedimentation would occur from the erosion of road surfaces. Reclamation of all disturbed sites is expected to mitigate these adverse impacts over the long term.

Accidental contamination and interruption of groundwater associated with oil and gas activities could occur. Additional stipulations may be needed (as described under the Preferred Alternative, West Cold Spring WSA).

Other adverse impacts (some minor compaction and erosion) could occur from the continuation of livestock grazing.

Beneficial impacts in the form of reduced sediment yields would result from closing the area to ORV use and from stipulating no surface occupancy on new oil and gas leases on at least 13,690 acres. If existing leases expire, and no surface occupancy is imposed on up to 30,845 acres, then adverse impacts from mineral development would be substantially reduced.

Overall, the No Wilderness Alternative would have more adverse impacts on water resources than the Preferred, Conflict Resolution, and All Wilderness alternatives, but would have fewer adverse impacts than the No Action Alternative.

No Action Alternative. No significant adverse impacts are anticipated from recreation, wildlife, and range activities; however, adverse impacts to water resources would result from the development of oil and gas or locatable and saleable minerals under this alternative. Increases in sediment concentrations within local surface waters and alteration of alluvial aquifers are possible impacts from these mineral operations.

Disturbance of 165 to 264 acres due to well pad construction alone would contribute between up to 120 and 390 tons of sediment to local streams over a five-year period. Additional unquantifiable sedimentation would occur from the erosion of barren road surfaces. Streams that would be affected include Crouse Creek in Utah and Chokecherry Draw, Yellow Jacket Draw, Warren Draw, Davis Draw, Hoy Draw, Craig Draw, Deerlick Draw, and Eckland Draw in Colorado. Reclamation of the disturbed sites is expected to mitigate these adverse impacts over the long term.

Adverse impacts to groundwater from oil and gas activities would be the same as the No Wilderness Alternative. Other adverse impacts associated with the continued grazing of livestock would be the same as the Preferred Alternative. In relation to the other alternatives, the No Action Alternative would result in the greatest amount of water quality degradation.

Recreation

Preferred Alternative. Impacts to recreation would be virtually the same as those described under the All Wilderness Alternative. The only difference would be that approximately 1,000 acres outside the WSA boundaries would be added to the nonmotorized setting, further enhancing primitive recreation opportunities which are diminishing within the region. The resulting changes in ROS classes are shown in Table 4-6.

TABLE 4-6
DIAMOND BREAKS WSA
CHANGES IN ROS CLASSES
UNDER THE PREFERRED ALTERNATIVE

ROS Classes	Estimated Acreage		Percent of Area	
	Existing	Change	Existing	Change
Primitive	1,020	1,020	3	3
Semiprimitive Nonmotorized	26,460	31,740	76	88
Semiprimitive Motorized	6,080	2,000	18	6
Roaded Natural	1,180	1,180	3	3

All Wilderness Alternative. Primitive types of recreation, such as hiking, hunting, backpacking, and viewing, would continue in the Diamond Breaks WSA. The area would be closed to ORV use resulting in minor impacts to motorized uses, because ORV use is low to nonexistent in the WSA. Wilderness designation would protect the nonmotorized settings as well as recreation features and attractions in the area (see Table 4-7). The semiprimitive nonmotorized setting would increase by 12 percent. The area would continue to provide high quality primitive types of recreation opportunities over the long term.

Conflict Resolution Alternative. Impacts would be the same as the All Wilderness Alternative.

No Wilderness Alternative. In the No Wilderness Alternative, primitive types of recreation use, such as hunting, hiking, and viewing, would continue in Diamond Breaks WSA. The area in Colorado would be closed to ORV use

to eliminate conflicts between nonmotorized and motorized uses. This would have a minor impact on ORV use, because the use is low to nonexistent within the area.

Developments within the Colorado portion of the WSA would be restricted to maintain nonmotorized settings. However, under existing leases 17,544 acres of the area would be open to oil and gas development with a moderate potential for development. The wilderness study area protection stipulation would be dropped from existing oil and gas leases, but new leases, covering at least 13,690 acres, would be issued with a no-surface-occupancy stipulation. The area would remain open to mineral entry which would cause a loss of nonmotorized settings should development occur in the WSA.

The ROS settings within the WSA would change as depicted in Table 4-8. The semiprimitive nonmotorized class would increase by 12 percent which would benefit

TABLE 4-7
DIAMOND BREAKS WSA
CHANGES IN ROS CLASSES
UNDER THE ALL WILDERNESS ALTERNATIVE

ROS Classes	Estimated Acreage		Percent of Area	
	Existing	Change	Existing	Change
Primitive	1,020	1,020	3	3
Semiprimitive Nonmotorized	26,460	30,460	76	88
Semiprimitive Motorized	6,080	2,080	18	6
Roaded Natural	1,180	1,180	3	3

TABLE 4-8
DIAMOND BREAKS WSA
CHANGES IN ROS CLASSES
UNDER THE NO WILDERNESS ALTERNATIVE

ROS Classes	Estimated Acreage		Percent of Area	
	Existing	Change	Existing	Change
Primitive	1,020	1,020	3	3
Semiprimitive Nonmotorized	26,460	30,460	76	88
Semiprimitive Motorized	6,080	2,080	18	6
Roaded Natural	1,180	1,180	3	3

nonmotorized recreation. However, if oil and gas or mineral exploration or development occurs within the area, the semiprimitive nonmotorized class would decrease as much as 22 percent, causing a long-term adverse impact to primitive types of recreation. Impacts would be dependent upon the location and extent of any development. The Utah portion of the WSA would remain open to other resource uses, and settings would change from nonmotorized to motorized.

No Action Alternative. Under the No Action Alternative, the entire Diamond Breaks WSA would remain open to ORV use. Existing ORV users would benefit but motorized use would conflict with management of the area for the primitive and semiprimitive nonmotorized ROS classes. Conflicts would occur between motorized and nonmotorized uses in portions of the WSA.

The existing ROS settings would be adopted as the management classes. However, no specific actions would

be implemented to protect settings. ROS classes would change as illustrated in Table 4-9. There is high potential that the semiprimitive motorized settings would increase by 50 percent while the primitive setting would be eliminated and the semiprimitive nonmotorized settings would decrease by 53 percent, primarily as the result of mineral development with resulting roads and activity. This change would have a significant adverse impact on recreation based on the relative scarcity of primitive and semiprimitive nonmotorized settings within the resource area. If extensive oil and gas or other development occurs, the settings would change even more; the roaded natural settings may increase, and a rural setting may be added. The loss of the primitive and semiprimitive nonmotorized settings in the area would result in irreversible and irretrievable losses of primitive types of recreation opportunities which are diminishing in the region.

TABLE 4-9
DIAMOND BREAKS WSA
CHANGES IN ROS CLASSES
UNDER THE NO ACTION ALTERNATIVE

ROS Classes	Estimated Acreage		Percent of Area	
	Existing	Change	Existing	Change
Primitive	1,020	1,020	3	3
Semiprimitive Nonmotorized	26,460	22,960	76	66
Semiprimitive Motorized	6,080	9,580	18	28
Roaded Natural	1,180	1,180	3	3

Visual Resources

Preferred Alternative. The entire WSA would be managed under VRM Class I. The management objective for Class I allows primarily for natural ecological changes which would provide additional protection of the WSA's visual qualities (see Appendix E). Wilderness designation would have beneficial impacts by providing long-term protection to the scenic quality of the area, viewed from within and from outside the WSA.

All Wilderness Alternative. Impacts would be the same as the Preferred Alternative.

Conflict Resolution Alternative. Impacts would be the same as the Preferred Alternative.

No Wilderness Alternative. The 31,340 acres in Colorado would be managed under VRM Class II objectives (see Appendix E). Scenic quality in much of the WSA would be maintained, closing the area to ORV use and by placing constraints on other development in the WSA in Colorado and in the Green River Scenic Corridor ACEC in Utah. The scenic quality may be degraded in the Class III and Class IV areas in the Utah portion of the WSA.

No Action Alternative. The existing VRM classes would be adopted. Scenic quality in 13,240 acres of the Colorado portion of the WSA would be maintained by the VRM Class II management objectives (see Appendix E). Development would be restricted but not precluded in the Class II areas. The remaining area in Utah and Colorado outside of the Green River Corridor ACEC in Utah would be subject to development and resource improvement projects. The scenic quality in the VRM Class III and IV areas may be degraded where changes would occur to the original landscape character.

Economics

Based upon the assumptions presented in the economics section of Common Impacts for all eight WSAs; and Appendix F (assuming development within 20 years, with an extraction life of 20 years), a net revenue value of \$4.00 per barrel and a discount rate of 8 3/8 percent, the following impacts could result.

The magnitude of hydrocarbons present could be up to 32,000,000 barrels of recoverable oil. The net present value of this potential resource would be approximately \$5,107,200.

According to information presented in the Geology and Minerals section of Chapter 3, Diamond Breaks WSA has a high potential for occurrence of base/precious metals and

moderate potential for other locatables. No data is available on actual amounts present or their potential values.

Preferred Alternative. Since the area would be closed to mineral entry under this alternative, designation would essentially preclude long-term exploration or development of these minerals, along with any associated economic potential. This impact is unknown given the absence of data on amount present.

Therefore, it is assumed that if the area is designated wilderness, the above potential energy or mineral resources present would be foregone, along with any associated economic potential. The effect on any changes in employment, income, public revenue, and infrastructure, would vary relative to the potential foregone.

All Wilderness Alternative. Impacts would be the same as the Preferred Alternative.

Conflict Resolution Alternative. Impacts would be the same as the Preferred Alternative.

No Wilderness Alternative. Some of the oil and gas economic potential described under the All Wilderness Alternative would still be foregone under the No Wilderness Alternative since at least 39 percent (and up to 87 percent) of the WSA would not be developed. Economic potential associated with any locatable mineral development would not be foregone. The effect on any changes in employment, income, public revenue, and infrastructure would vary relative to the potential foregone.

No Action Alternative. Under the No Action Alternative, potential mineral resources in Diamond Breaks WSA would be available for development, along with any associated economic potential (see Economics under the All Wilderness Alternative). The effect on any changes in employment, income, public revenue, and infrastructure would vary relative to the potential development.

Cross Mountain

The impacts to air quality, topography, vegetation, forest/woodland resources, paleontology, cultural resources, and economic assumptions are discussed in the Common Impacts section of Chapter 4. No significant impacts would occur to these resources. The Combined WSAs Alternative does not apply to the Cross Mountain WSA. Proposed management actions for the various alternatives are presented in Table 2-8 in chapter 2.

CHAPTER 4

Wilderness Values

Preferred Alternative. Nondesignation of Cross Mountain as wilderness would prevent assured long-term protection of the area's wilderness values. It would also prevent a contribution to the diversity in the National Wilderness Preservation System and to the geographic distribution of wilderness areas. Designation of Cross Mountain Canyon as an ACEC would protect outstanding scenic quality, recreation, wildlife, and similar natural values on 3,000 acres in and along the canyon (as compared with 1,200 acres under the No Wilderness Alternative). A withdrawal from mineral entry would provide additional protection for naturalness within the canyon area.

Oil and gas development would be allowed in the draws around the periphery of Cross Mountain. Development in these areas (moderate to high long-term potential) would cause a loss of naturalness and/or opportunities for primitive unconfined recreation and solitude in the long term in and adjacent to the areas of development. Wilderness values would be lost irretrievably on approximately 9,000 acres of the WSA.

Closing the ACEC and northern portion of the SRMA to ORV use (except for exercise of valid existing rights) and constraining other resource development or improvement activities would help maintain some of the recreation, visual, and wildlife, values, as well as the natural integrity of much of the mountain. Planned wildlife improvement projects would cause slight negative impacts to wilderness values but would enhance wildlife, creating positive impacts to opportunities for primitive recreation. ORV use on the south end of the SRMA would be limited to designated roads and trails to eliminate conflicts between motorized and nonmotorized use.

The wilderness protection stipulation on existing post-FLPMA oil and gas leases would be dropped; there is low to moderate potential that these leases would be developed and low potential that the pre-FLPMA lease would be developed. If they are developed, some 90 percent of the WSA would be open to oil and gas exploration and development with associated roads, facilities, and surface-disturbing activities in the short term. Development of all these leases would result in the drilling of 12 wells which would impact between 60 and 96 acres, plus attendant roads, scattered throughout the WSA. Four of these leases are in the heart of the WSA, including around the canyon. Therefore, although actual surface disturbance would be relatively small, such development would cause an irretrievable loss of all wilderness values throughout much of the WSA.

Once Congress releases the area from interim management, new oil and gas leases would carry a no-surface-occupancy stipulation which would help protect wilderness values in the long term. The effectiveness of this protection would depend on the extent of short-term oil and gas development. This stipulation certainly would be applied to some 2,472 scattered acres which are currently unleased. In addition, the one pre-FLPMA lease (1,586 acres) is very likely to expire undeveloped in 1986. Any new leases issued after the WSA is released by Congress would also carry no-surface-occupancy stipulations on the majority of this acreage (that portion falling within the SRMA/ACEC). If the post-FLPMA leases also expire prior to Congressional decision, then any new leases in the remainder of the SRMA/ACEC area would also be covered by no-surface-occupancy stipulations. Under these circumstances, wilderness values would receive considerable long-term protection on 5,000 acres of the WSA.

The entire area would be open to locatable mineral entry and there is moderate long-term potential for development. Naturalness would be lost and solitude and primitive unconfined recreation seriously impaired in and around disturbed areas. The limestone mining claims would be inside the SRMA/ACEC and have moderate potential for development in the long term. Outstanding opportunities for solitude and primitive unconfined recreation in the area south of Cross Mountain Canyon would be lost due to outside sights and sounds if these four claims were developed. Naturalness would be lost on a portion of the WSA along the southern boundary.

In summary, long-term maintenance or loss of Cross Mountain WSA's wilderness values under the Preferred Alternative would depend primarily on the timing, extent, and location of future mineral development. Unless mineral activity increases appreciably in the short term, wilderness values on most of the WSA would be protected in the long term with designation of the ACEC and constraints on other developments within the WSA. At a minimum, administrative protection of the area would benefit opportunities for solitude and primitive unconfined recreation on approximately 5,000 acres, in the long term. However, not all resource uses (e.g., mineral entry) would be prohibited, which would cause adverse impacts to naturalness. Statutory protection would be needed to ensure long-term preservation of all wilderness values of the WSA.

All Wilderness Alternative. Wilderness designation would protect Cross Mountain Canyon WSA's naturalness, outstanding opportunities for solitude, and numerous opportunities for primitive unconfined recreation. Designation of the entire WSA as wilderness would also benefit the identified special features, including 40 bighorn

sheep, threatened and endangered wildlife species, rare endemic plant species, and high quality scenic values. Designation would provide additional protection for the proposed Cross Mountain Canyon Area of Critical Environmental Concern (ACEC) and values identified for the Yampa River in the Nationwide Rivers Inventory.

Designation of the WSA would provide wilderness opportunities within a day's drive of major population centers in both Colorado (Denver/Boulder and Ft. Collins) and Utah (Salt Lake/Ogden and Provo/Orem). Designation would balance the geographic distribution of wilderness. It would also contribute to expanding diversity of ecosystems in the National Wilderness Preservation System. Cross Mountain is within the Rocky Mountain Forest Province (juniper-pinyon woodland/sagebrush-steppe), an ecosystem not well represented in the wilderness system.

There is one pre-FLPMA oil and gas lease within Cross Mountain WSA covering 1,586 acres in the northern portion of the WSA (see Table 3-15 and Map 3-10 in Chapter 3). Approximately 840 acres of this lease has a no-surface-occupancy stipulation. While the potential exists for development, it is unlikely that exploration or development would occur before the lease expires in 1986. Any development that did occur would be limited to the base of the mountain. Nine post-FLPMA leases (covering 10,023 acres) would probably not be developed under this alternative since wilderness protection stipulations are attached to them. Overall, there is very low potential that the WSA would be adversely impacted by oil and gas development within the area under the All Wilderness Alternative.

Limestone mining claims exist along the southern boundary of the WSA. The validity of the claims is unknown at present. Although the resource is available on Juniper Mountain to the east, and potentially on Douglas Mountain to the west, there is low to moderate potential that the Cross Mountain claims would be developed if proven valid prior to wilderness designation. Surface mining would cause a severe, irretrievable loss of naturalness within the WSA on approximately 256 acres along the southern boundary. Outside sights and sounds from mining activity would also significantly diminish outstanding opportunities for solitude and primitive unconfined recreation within the entire area south of Cross Mountain Canyon in the long term. Intensive woodland development has been identified as a possibility south of the WSA boundary. If such developments were to occur, they would diminish outstanding opportunities for solitude and primitive recreation due to outside sights and sounds. However, the likelihood of woodland development is probably low.

ORV use would be very difficult to control on approximately 375 acres of a relatively flat open area on the east side of Cross Mountain. Extensive use would cause some loss of naturalness and outstanding opportunities for primitive unconfined recreation and solitude within this area.

Two dead end four-wheel drive roads on the west boundary of the WSA would be closed so that adjacent portions of the WSA could be managed as wilderness. The four-wheel drive trail on the south end of the mountain would also be closed. Any development within most of this WSA would be naturally limited due to the steep, rugged topography of Cross Mountain.

Conflict Resolution Alternative. Impacts under the Conflict Resolution Alternative would be similar to those described under the All Wilderness Alternative. One difference would be that all wilderness values would be lost in the unsuitable areas (631 acres total) due to long-term oil and gas or other resource development and continued ORV use. This would be a minor adverse impact given the small areas involved.

More significantly, since the limestone mining claims would be outside the wilderness boundaries, the potential for their development over the long term would be slightly higher than under the All Wilderness Alternative. Such development would cause a loss of opportunities for solitude and primitive unconfined recreation within the entire area south of Cross Mountain Canyon during the period of operation. Impacts to the 13,465 acres recommended as suitable would be the same as those described under the All Wilderness Alternative.

No Wilderness Alternative. Nondesignation of Cross Mountain WSA would prevent assured long-term protection of the area's wilderness values. It would also prevent a contribution to the diversity of the National Wilderness Preservation System and to the geographic distribution of wilderness areas. Wilderness values would be lost irretrievably on the 1,381 acres outside the SRMA/ACEC, i.e., around the edges of the WSA, particularly the area south of Cross Mountain Canyon ACEC.

Closing the 11,000-acre core area to ORV use (except for exercise of valid existing rights) and constraining other resource development or improvement activities would help maintain recreation, visual resources, wildlife, and the natural integrity of the area. Planned wildlife improvement projects would cause slight negative impacts to wilderness values north of Cross Mountain Canyon but would enhance wildlife, creating positive impacts to opportunities for primitive recreation. There would be no woodland or forest resource development within the area. Designation of Cross Mountain Canyon as an ACEC would provide protection

for the outstanding scenic quality, recreation, wildlife, and similar natural values present in the canyon.

The wilderness protection stipulation on existing post-FLPMA oil and gas leases would be dropped; there is low to moderate potential that these leases would be developed and low potential that the pre-FLPMA lease would be developed. If all leases are developed, some 90 percent of the WSA would be open to oil and gas exploration and development with associated roads, facilities, and surface-disturbing activities in the short term. Development of all these leases would result in the drilling of 12 wells which would impact between 60 and 96 acres, plus attendant roads, scattered throughout the WSA. Four of these leases are in the heart of the WSA, including around the canyon. Therefore, although actual surface disturbance would be relatively small, such development would cause an irretrievable loss of all wilderness values throughout much of the WSA.

Once Congress releases the area from interim management, new oil and gas leases would carry a no-surface-occupancy stipulation which would help protect wilderness values in the long term. The effectiveness of this protection would depend on the extent of short-term oil and gas development. This stipulation certainly would be applied to some 2,472 scattered acres which are currently unleased. In addition, the one pre-FLPMA lease (1,586 acres) is very likely to expire undeveloped in 1986. Any new leases issued after the WSA is released by Congress would also carry no-surface-occupancy stipulations on the majority of this acreage (that portion falling within the SRMA/ACEC). If the post-FLPMA leases also expire prior to Congressional decision, then any new leases in the remainder of the SRMA/ACEC area would also be covered by no-surface-occupancy stipulations. Under these circumstances, wilderness values would receive considerable long-term protection on 12,700 acres of the WSA.

The entire area would be open to locatable mineral entry, and there is moderate long-term potential for development. Naturalness would be lost and solitude and primitive unconfined recreation seriously impaired in and around disturbed areas. The limestone mining claims would be outside the SRMA/ACEC and have moderate potential for development in the long term. Outstanding opportunities for solitude and primitive unconfined recreation in the area south of Cross Mountain Canyon would be lost due to outside sights and sounds if these four claims were developed. Naturalness would be lost on a portion of the WSA along the southern boundary.

In summary, long-term maintenance or loss of Cross Mountain WSA's wilderness values under the No Wilderness Alternative would depend primarily on the timing, extent,

and location of future mineral development. Unless mineral activity increases appreciably in the short term, wilderness values on 12,700 acres would be protected in the long term with designation of the ACEC and constraints on other developments within the WSA. Administrative protection of the area would benefit opportunities for solitude and primitive unconfined recreation in the long term. However, not all resource uses (e.g., mineral entry) would be prohibited, which would cause adverse impacts to naturalness. Statutory protection would be needed to ensure long-term preservation of all wilderness values of the WSA.

No Action Alternative. The No Action Alternative would have significant adverse impacts on wilderness values in Cross Mountain WSA. The wilderness protection stipulation would be dropped on post-FLPMA leases and the entire WSA would be open to oil and gas exploration and development, as well as locatable mineral development. Although most existing leases may expire undeveloped before Congress releases the WSA, there is high potential that new leases would be issued and developed in the long term. There is also moderate potential for locatable mineral development in the long term. Development of these resources would irretrievably destroy naturalness and opportunities for solitude and primitive unconfined recreation throughout the WSA in the long term.

Some 750 acres of productive-operable woodland would be available for development. Harvesting woodland products on the south end of the mountain and on the west side of the WSA would also cause adverse impacts to naturalness, opportunities for solitude and primitive unconfined recreation on the south end, and would impair naturalness and opportunities for solitude on the west side of the WSA.

The area would be designated as open to ORV use, impairing naturalness, opportunities for solitude and primitive unconfined recreation on the south end of the WSA, on portions of the west side of the mountain, and on a relatively flat open area on the east side. ORV use would cause a loss of wilderness values on at least 1,000 acres of the WSA.

Opportunities to increase wilderness within a day's drive of five major population centers and provide geographic distribution of wilderness areas would be lost. The opportunity to add diversity to the National Wilderness Preservation System would also be lost.

In summary, nondesignation of the area would cause a loss of wilderness potential forever which would be an irreversible and irretrievable commitment of outstanding wilderness resource values to other uses. The area would no longer be suitable for wilderness consideration.

Minerals

Preferred Alternative. Mineral exploration and development would be permitted under the Preferred Alternative, but restrictions would be imposed on 13,000 acres due to the primary management objective for the area as SRMA/ACEC. The major constraint would be on oil and gas development. In particular, no-surface-occupancy stipulations would constrain, and in the long term potentially preclude, exploration and development on large portions of the WSA, plus additional areas along the southern boundary of the WSA, which have been added into the SRMA.

Once Congress releases the WSA, no-surface-occupancy stipulations would be placed on new leases. Thus, anywhere from 2,472 acres (currently unleased areas) to 4,058 acres (if the pre-FLPMA lease expires) to a maximum of 13,000 acres (if post-FLPMA leases expire) would be covered by no-surface-occupancy stipulations in the long term. The maximum restriction, which is quite possible, would effectively preclude development on most of the WSA. On the other hand, oil and gas development would be allowed within the draws on the west side of Cross Mountain and along relatively flat, open areas east of the mountain. In the foreseeable future, these areas are more likely to be developed than the cove of the mountain. (See Appendix F for estimated potentially recoverable reserves.)

If Cross Mountain Canyon is withdrawn from mineral entry, then development of locatable minerals would be precluded on 3,000 acres. The remainder of the area would be open to locatable mineral entry and there is moderate potential for development in the long term. The potential for occurrence of base and/or precious metals is moderate to high within the area, but specific localities, amounts, etc., cannot be predicted. Restrictions on ORV use would constrain, but not preclude, development. The Preferred Alternative is favorable to locatable mineral development, a moderate to high beneficial impact over the long term.

All Wilderness Alternative. Management of Cross Mountain WSA as wilderness would preclude further exploration for and production of mineral resources within the WSA in both the short and long term. The potential for occurrence is moderate to high for oil/gas, high-calcium limestone, and base/precious metals; and moderate for other locatable minerals. Valid prior existing rights would be respected, and there is potential for oil and gas development in the northern portion of the WSA and for limestone development in the southern portion of the WSA. Given the moderate to high geologic potential, wilderness designation would be a significant adverse impact to mineral development in the long term.

There is a possibility that the pre-FLPMA lease would not be developed, since it is due to expire by 1986. Development would be a moderate beneficial impact in the long term.

Three of the nine post-FLPMA leases are on the fringes of the WSA; therefore, it is possible that these would be at least partially developed on the portions extending outside the WSA, which would be a beneficial impact. The remaining leases, however, are predominantly or totally within the WSA; they would not be developed if development would impair wilderness values.

Expiring leases would not be offered for lease in the future, nor would leases be offered on the 10 percent of the WSA that is currently unleased. The results would be lost rental income and royalty revenues from a moderate to high potential area. Thus, development of such oil and gas resources as may be present would be foregone. See Appendix F for estimated recoverable reserves.

The area would be withdrawn from mineral location. The four existing claims at the southeastern tip of the WSA would be evaluated for their validity if development were proposed. The mineral examination and minerals report must confirm that as of the date of designation, minerals had been found that would constitute a valid claim. There is potentially some local or regional market for the high-calcium limestone to be found on the existing claims, although the resource can be found elsewhere in the area. The estimated potential for development with wilderness designation is low to moderate.

In summary, wilderness designation would preclude most mineral development on Cross Mountain WSA, an irretrievable and irreversible commitment of the resource. The minerals foregone in the WSA would be considered a major adverse impact in the long term because of the overall moderate to high mineral potential.

Conflict Resolution Alternative. On some 631 scattered acres, mineral exploration and development would be permitted. There is high potential that oil and gas development would occur over the long term and moderate potential for locatable mineral development, including development of the existing limestone mining claims. These would be small to moderate beneficial impacts, depending on the extent and type of development. Otherwise, impacts under the Conflict Resolution Alternative would be the same as those described under the All Wilderness Alternative.

No Wilderness Alternative. Impacts to oil and gas development would be similar to those described under the Preferred Alternative. However, a smaller area would potentially be affected by no-surface-occupancy stipulations in the long term (12,700 acres as compared with 13,000

acres). Development would be allowed on some 1,300 acres around the edges of the WSA, which would be outside the SRMA/ACEC. Although there would be some benefit from development of the latter areas, overall restrictions under the No Wilderness Alternative would cause adverse impacts to oil and gas development in the long term.

Cross Mountain Canyon would not be closed to mineral entry. Impacts on the remainder of the areas would be the same as described under the Preferred Alternative.

No Action Alternative. Cross Mountain WSA would be open to mineral exploration and development under existing laws. The area has a moderate to high potential for oil and/or gas development. Therefore, although existing leases could expire undeveloped, there is high potential that new leases would be issued and developed in the long term. See Appendix F for estimated potentially recoverable reserves.

The base and/or precious metal potential is moderate to high within the WSA, but specific localities, amounts, etc., cannot be predicted. Long-term development would be a major beneficial impact. The No Action Alternative is very favorable to mineral resource development.

Vegetation

Leptodactylon watsonii would not be affected under any alternative since it occurs on the canyon walls where disturbance is unlikely to occur.

Preferred Alternative. Under the Preferred Alternative, Cross Mountain Canyon would be designated as an ACEC (3,000 acres) within Cross Mountain SRMA. Development of the two post-FLPMA oil and gas leases along the north rim of the canyon would be possible under this alternative. Such development, while not highly likely in the canyon area, would potentially disturb or destroy a regional endemic and rare plant species (*Penstemon yampaensis*) in the long term. Loss of the plant species would be a long-term, probably irretrievable impact. Once the species has been seriously disturbed, its uses for education and scientific research would be lost for decades, and potentially forever. The long-term potential for no-surface-occupancy stipulation on new oil and gas leases would greatly reduce the adverse impacts described above, as would a withdrawal from mineral entry.

All Wilderness Alternative. Wilderness designation would provide long-term protection of *Penstemon yampaensis* within Cross Mountain Canyon.

Conflict Resolution Alternative. Impacts would be the same as described under the All Wilderness Alternative.

No Wilderness Alternative. Impacts would be similar to those described under the Preferred Alternative. However, under the No Wilderness Alternative, Cross Mountain Canyon would remain open to locatable mineral entry, increasing the long-term potential for disturbance or destruction of *Penstemon yampaensis* within the canyon.

No Action Alternative. Cross Mountain Canyon would be open to mineral exploration and development. Development would potentially disturb or destroy the *Penstemon yampaensis*, an irretrievable long-term impact.

Livestock Grazing

Preferred Alternative. This alternative would result in the managing of the major portion of Cross Mountain as an SRMA. Developments would have to meet recreation and ACEC management objectives, which may curtail the proposed spring development because of special costs associated with meeting specific guidelines. However, recreation management would not impact existing available forage.

All Wilderness Alternative. In addition to the impacts discussed in the Common Impacts section of this chapter, the following impacts would occur.

A spring development (Table 4-10) has been proposed within the Sawmill Canyon Allotment #4308 lying within the southwestern boundary of Cross Mountain WSA. This spring development would not be eliminated as a result of wilderness designation; however, mitigating the impact of the development to conform with wilderness guidelines would increase costs and thus may curtail the development. The purpose of the spring development is not to increase available AUMs, but to improve livestock distribution within the allotment.

Conflict Resolution Alternative. Impacts would be the same as the All Wilderness Alternative. Spring development in Sawmill Canyon may be curtailed because of costs necessary to meet specific guidelines.

No Wilderness Alternative. Impacts would be the same as the Preferred Alternative. Spring development may be curtailed due to costs of meeting specific guidelines.

No Action Alternative. This alternative would be the least restrictive of all alternatives. Under this alternative, the proposed spring development would be allowed resulting in improved livestock distribution on Allotment #4308. In addition any future improvement proposals could be considered without the wilderness restrictions applied.

TABLE 4-10
CROSS MOUNTAIN WSA
IMPACTS TO LIVESTOCK MANAGEMENT
UNDER THE ALL WILDERNESS ALTERNATIVE

<u>Allotment Number</u>	<u>Proposed Management Action</u>	<u>Affected Resource</u>	<u>Benefit/Loss</u>
4308	Spring development— T. 6 N., R. 98 W., Section 15, NE1/4NE1/4	Range	Uniform distribution

Wildlife

Preferred Alternative. Under the Preferred Alternative there would be a potential for development of existing oil and gas leases and other minerals on 90 percent of the WSA. Such development, if extensive, would effectively eliminate Cross Mountain as Rocky Mountain bighorn sheep habitat. The amount of disturbance associated with this level of activity would result in total and permanent displacement of all 40 bighorn sheep, as well as the loss of elk, mule deer, and nongame animal species. The loss of elk, mule deer, and nongame wildlife would be significant relative to the numbers currently occupying Cross Mountain.

However, there is some potential that oil and gas development would be restricted or precluded over the long term by no-surface-occupancy stipulations. In that case, there would be opportunity to significantly benefit bighorn sheep through habitat improvement projects, primarily water development. Currently, bighorn distribution is restricted to an area around Cross Mountain Canyon because of availability of water. This restriction may be limiting population growth. With water sources throughout the area, the bighorn sheep would be able to better utilize available habitat which could result in significant population growth.

The Preferred and No Wilderness alternatives would have the same adverse impacts to wildlife with the possibility of some mitigation from protective restrictions. The No Action Alternative would have slightly more severe and permanent adverse impacts than the Preferred. The All Wilderness and Conflict Resolution alternatives would have considerably more benefits to wildlife than any of the other alternatives.

All Wilderness Alternative. Wilderness designation of Cross Mountain WSA would provide maximum protection of the high value habitats for approximately 40 bighorn

sheep and unknown numbers of mule deer, elk, raptors, and nongame species of wildlife present in the Cross Mountain area. The threatened or endangered species (peregrine falcon, bald eagle, Colorado squawfish, and humpback chub) that inhabit or use the area for feeding or other activities would have a high degree of seclusion from human interference. There would be long-term protection of the valuable habitat diversity that supports an unusually large number of both aquatic and terrestrial wildlife.

On the other hand, wilderness designation would preclude any intensive water development for bighorn sheep. As herd numbers increase, it is very possible that water would be the limiting factor for these animals. If this does occur, dispersion of animals would take place. This would force the bighorns to move into areas that are not designated for management of these animals and where they might be subject to greater human disturbance. This would affect long-term productivity.

There is also a small possibility that one pre-FLPMA oil and gas lease would be developed under this alternative. The resulting impacts of this development would depend on the specific location of disturbance, but would involve some displacement or loss of elk, mule deer, and nongame animals. Since any development would be in the northern portion of the WSA, well away from Cross Mountain Canyon, the bighorn sheep would not be affected. Any development of mining claims in the southeastern portion of the WSA is unlikely to affect the bighorn sheep because they tend to stay on the north side of the canyon.

Overall, wilderness designation would be highly beneficial to wildlife habitat and species in Cross Mountain WSA.

Conflict Resolution Alternative. Same as All Wilderness.

No Wilderness Alternative. Same as Preferred Alternative.

No Action Alternative. The anticipated impacts of this alternative would be similar to those discussed in the No Wilderness and Preferred alternatives. The primary difference would be the potential for more extensive oil and gas or mineral development, resulting in permanent displacement of all 40 bighorn sheep. The endangered peregrine falcon, Colorado squawfish, and humpback chub would be protected through the use of protective stipulations.

Soils

Preferred Alternative. Nondesignation of wilderness under the Preferred Alternative would allow some surface-disturbing activities to continue, such as livestock grazing and saleable and locatable mineral activities, while restricting ORV use and the development of new oil and gas leases. There is some potential that existing oil and gas leases, as well as several mining claims, would be developed with few restrictions. Oil and gas development, if extensive, would result in approximately 60 to 96 acres being disturbed by well pad construction alone. Erosion of these disturbed areas would result in irretrievable soil losses of 215 to 680 tons over a five-year period. Additional soil would be lost from the erosion of road surfaces and from the disturbed areas within the mining claims. Although reclamation practices would restore soil productivity on the disturbed sites over the long term, the losses in topsoil would lower soil productivity and cause off-site sedimentation of streams in the short term.

Beneficial impacts would result from the implementation of range improvement projects and from stipulating no surface occupancy on new oil and gas leases. If widespread no surface occupancy is imposed, then significant benefits to the soil resources would result, although disturbance from locatable mineral development would still occur.

Generally, the Preferred Alternative would have more adverse effects on soil resources than the All Wilderness and Conflict Resolution alternatives, but would have fewer adverse effects than the No Action Alternative. The No Wilderness Alternative would be the same as the Preferred Alternative.

All Wilderness Alternative. Impacts to soil resources would be beneficial. Erosion would be reduced because there would be no surface-disturbing activities. This effort is described in more detail under the All Wilderness Alternative, West Cold Spring WSA.

In addition, adverse impacts could occur from the development of one pre-FLPMA oil and gas lease and four mining claims within Cross Mountain WSA, although the

potential for their development is fairly low. If oil and gas development occurred, approximately 10 to 16 acres would be disturbed by well pad construction alone. This disturbance would result in soil losses of 35 to 115 tons over a five-year period from the erosion of the disturbed areas. Additional soil would be lost from the erosion of road surfaces and from four mining claim sites in the southwest portion of the WSA. Although reclamation practices would restore soil productivity on the disturbed sites over the long term, the losses in topsoil would lower soil productivity and cause off-site sedimentation of streams in the short term.

Generally, the All Wilderness Alternative would have fewer adverse impacts on soil resources than all the other alternatives under consideration.

Conflict Resolution Alternative. Impacts to soil resources would be the same as under the All Wilderness Alternative, Cross Mountain WSA.

No Wilderness Alternative. Impacts to soil resources would be the same as those under the Preferred Alternative, Cross Mountain WSA.

No Action Alternative. Under this alternative, maximum surface disturbance is expected from activities such as oil and gas production and limestone mining. It is estimated that between 65 and 104 acres would be disturbed from oil/gas well pad construction alone. Erosion of these areas would result in soil losses of 230 to 750 tons over a five-year period. Additional unquantifiable soil losses would occur from the erosion of road surfaces and mining claim sites.

Although reclamation practices would restore soil productivity of the disturbed areas over the long term, the losses in topsoil would lower soil productivity and cause off-site sedimentation of streams in the short term. Adverse impacts would also occur from ORV use and forest and woodland harvesting practices.

At the same time, more intensive methods (use of nonnative species, fencing, prescribed burning, etc.) of rehabilitating existing or potential problem areas would be allowed. Proposed improved livestock distribution would reduce the impact of livestock on watershed values.

Overall, this alternative would have more adverse impacts on soil resources than any other alternative.

Water Resources

Preferred Alternative. Both adverse and beneficial impacts would occur to water resources under this alternative.

If the one pre-FLPMA and nine post-FLPMA oil and gas leases were all developed, between 70 to 112 acres

would be disturbed by well pad construction alone. Erosion of these disturbed areas would result in stream sediment additions of up to 250 to 795 tons over a five-year period. Additional unquantifiable amounts of sedimentation would occur from the erosion of road surfaces and from disturbed sites associated with the four mining claims. Streams that would be affected include Horse Gulch and several intermittent tributaries of the Yampa and Little Snake rivers. Reclamation of the disturbed sites is expected to mitigate the adverse impacts over the long term.

Accidental contamination and interruption of groundwater could occur from oil and gas activities. Special stipulations may be needed (see also West Cold Spring, WSA, Preferred Alternative, Groundwater Impacts). Some minor soil compaction could occur from continued livestock grazing within Cross Mountain WSA.

Beneficial impacts would result from the implementation of range improvement projects and from stipulating no surface occupancy on new oil and gas leases. If widespread no surface occupancy is imposed, then significant benefits to the soil resources would result, although disturbance from locatable mineral development would still occur.

Generally, the Preferred and No Wilderness alternatives would have more adverse effects on soil resources than the Conflict Resolution and All Wilderness alternatives, but would have fewer adverse effects than the No Action Alternative.

All Wilderness Alternative. Generally, wilderness designation of Cross Mountain WSA would have beneficial effects on water resources. Rights-of-way construction and other surface disturbances related to development of post-FLPMA oil and gas leases and new mining claims would not occur under designation, preventing increases in soil erosion and stream sedimentation.

Designation of the area as wilderness would prevent on-site use of water sources for oil and gas and mineral interests, unless the water is located on valid existing claims. The privately-owned water rights associated with the proposed Cross Mountain Dam project would not be irretrievably forfeited by wilderness designation. Construction of water-regulating structures, power installations, and related water improvement structures which are not exclusively used for range or wildlife purposes, may still occur, but such construction is subject to Presidential approval.

There is relatively low potential that the one pre-FLPMA oil and gas lease and four existing mining claims would be developed under a wilderness designation. Maximum oil and gas development would disturb approximately 10 to 16 acres which would result in stream sediment increases of 35 to 115 tons over a five-year period from the erosion

of the disturbed areas. Additional unquantifiable amounts of sedimentation would occur from the erosion of road surfaces and from disturbed sites associated with the four mining claims. Streams that would be affected include some intermittent tributaries of the Yampa and Little Snake rivers. Reclamation of the disturbed sites is expected to mitigate the adverse impacts over the long term.

Adverse impacts (such as compaction and erosion) could occur under this alternative, primarily from the continuation of livestock grazing.

Surface water resources which exhibit some degradation due to livestock use would probably continue to deteriorate since wilderness designation would limit the use of structural or vegetative improvements. Surface water resources which are being affected by current surface-disturbing activities other than livestock would stabilize or improve with wilderness designation. Groundwater sources would remain in their current state of productivity.

The All Wilderness Alternative would have fewer adverse impacts on water resources than any other alternative.

Conflict Resolution Alternative. Impacts to water resources would be the same as under the All Wilderness Alternative, Cross Mountain WSA.

No Wilderness Alternative. Impacts to water resources would be the same as those under the Preferred Alternative, Cross Mountain WSA.

No Action Alternative. No significant adverse impacts to water resources are anticipated from the planned wildlife, range, or recreation programs. However, adverse impacts would result from the development of oil and gas leases and mining claims.

Between 65 and 104 acres would be disturbed from oil/gas well pad construction alone under this alternative. Erosion of these areas would result in stream sediment additions of up to 230 to 750 tons over a five-year period. Streams that would be affected include Horse Gulch and several intermittent tributaries of the Yampa and Little Snake rivers. Reclamation of the disturbed sites is expected to mitigate the adverse impacts over the long term.

Groundwater impacts associated with oil and gas activities would be the same as those described for West Cold Spring WSA, Preferred Alternative. Impacts from continued livestock grazing could also occur. See General Discussion, West Cold Spring WSA, Water Resources.

Activities associated with forest and woodland harvesting, which could occur under this alternative, would adversely affect water resources, mainly through increased sediment loads resulting from the erosion of barren and compacted soil surfaces.

Overall, the No Action Alternative would have more adverse impacts on water resources than any of the other alternatives.

Recreation

Preferred Alternative. Managing Cross Mountain as an SRMA, emphasizing nonmotorized recreation use, and designating Cross Mountain Canyon as an ACEC would have positive impacts on recreation, although the amount of benefit would depend on the amount of mineral development. However, significant adverse impacts to recreation may still occur with a reduction in the size of the area.

With extensive development of oil and gas and other minerals in the WSA, the ROS settings would change as shown in Table 4-11. Without wilderness designation, the wilderness protection stipulation would be dropped from existing oil and gas leases, which would open 10,769 acres of the WSA to exploration and development in the short term. If development occurs in the short term, the nonmotorized settings and resulting types of recreation experiences would be lost depending on the location of development. As many as 12 wells distributed over 10,769 acres would be necessary to develop the potential oil and gas resource within the WSA.

If the limestone mining claims are developed south of Cross Mountain Canyon (moderate potential in the long term), it would preclude recreation use on approximately 256 acres of the WSA along the southern boundary. Opportunities to experience solitude would also be lost. All

recreation opportunities would be lost in and adjacent to any resource development activities where the setting is changed to modern urban. The original semiprimitive nonmotorized and motorized settings would be lost with extensive development such as surface mining.

There is potential that most of these leases inside the SRMA would not be developed. New leases would carry a no-surface-occupancy stipulation to maintain nonmotorized settings, visual resources, wildlife habitat, and the natural integrity of the mountain. However, even if this restriction is extensively applied within the SRMAs semiprimitive nonmotorized recreation opportunities would still only be maintained on approximately 5,000 acres in the long term, as shown in Table 4-11. The loss of the nonmotorized settings within the SRMA would be caused by development around the periphery of the mountain on benches and in draws well inside the WSA boundaries. The majority of the SRMA could not be managed for nonmotorized recreation uses.

If the Cross Mountain Canyon ACEC is withdrawn from mineral entry, approximately 3,000 acres of nonmotorized recreation setting would be protected. Failure to withdraw the ACEC from mineral entry would allow road building and facility development for mining activities. These activities would destroy the nonmotorized settings which are decreasing in the resource area and have an adverse effect upon resource-dependent recreation activities. The unique character and limited availability of the type of recreation opportunities offered in the canyon area make mineral withdrawal a necessity for the protection of visual and recreation resources.

TABLE 4-11
CROSS MOUNTAIN WSA
CHANGES IN ROS CLASSES
UNDER THE PREFERRED ALTERNATIVE

ROS Classes	Estimated Acreage		Percent of Area	
	Existing	Change	Existing	Change
Semiprimitive Nonmotorized	11,481	5,000	82	35
Semiprimitive Motorized	1,130	2,411	8	17
Roaded Natural	1,470	4,470	10	32
Rural	0	2,000	0	14
Modern Urban	0	200	0	1

All Wilderness Alternative. Designation of Cross Mountain WSA as wilderness would have both short- and long-term benefits to primitive types of recreation in the rest of the WSA by preserving the settings in which nonmotorized opportunities and resulting experiences occur. Primitive forms of recreation, such as hunting, hiking, backpacking, kayaking, and viewing, would continue in the WSA. Outstanding opportunities for primitive types of recreation would be enhanced through additional protection of the nonmotorized settings within the WSA. ORV use would not be permitted. Closure would cause an insignificant impact to motorized recreation opportunities. ORV use is currently low, occurring primarily in small peripheral areas south of Cross Mountain Canyon, on the west side of Cross Mountain, and within an open flat area on the east side adjacent to Moffat County Road 10. Use is restricted in the majority of the area because of the steep and rugged topography.

The existing ROS settings would change slightly in the WSA if the area were designated wilderness, as depicted in Table 4-12. The semiprimitive nonmotorized class would increase by 2 percent and the semiprimitive motorized class would decrease by 2 percent. This would be an insignificant impact to both motorized and nonmotorized opportunities.

However, if the limestone mining claims are developed along the southern boundary (low to moderate potential), the settings would change in this area. Approximately 800 acres of the semiprimitive nonmotorized setting would be changed to roaded natural. Approximately 200 acres of the semiprimitive nonmotorized and semiprimitive motorized settings in the WSA would be changed to rural or modern urban depending on the location and extent of development.

Thus, recreation use in and adjacent to the developments would not be allowed during the period of operation, and all primitive types of opportunities and resulting experiences would be irreversibly and irretrievably lost south of Cross Mountain Canyon. Similar changes from nonmotorized to motorized settings would occur if development of pre-FLPMA oil and gas lease takes place in the northern portion of the WSA (low potential).

Conflict Resolution Alternative. The ROS settings and resulting impacts would essentially be the same as described under the All Wilderness Alternative, except that approximately 375 acres on the east side of the WSA would be eliminated and not affected by the ORV closure. Effects on motorized use would be insignificant.

No Wilderness Alternative. Managing Cross Mountain as an SRMA, emphasizing nonmotorized recreation use, and designating Cross Mountain Canyon as an ACEC would have positive impacts on recreation, although the amount of benefit would depend on the amount of mineral development.

With extensive development of oil and gas and other minerals in the WSA, the ROS settings would change as shown in Table 4-13. Without wilderness designation, the wilderness protection stipulation would be dropped from existing oil and gas leases, which would open 10,769 acres of the WSA to exploration and development in the short term. If development occurs in the short term, the nonmotorized settings and resulting types of recreation experiences would be lost depending on the extent location of development. As many as 12 wells distributed over 10,769 acres would be necessary to develop the potential oil and gas resource within the WSA.

TABLE 4-12
 CROSS MOUNTAIN WSA
 CHANGES IN ROS CLASSES
 UNDER THE ALL WILDERNESS ALTERNATIVE

ROS Classes	Estimated Acreage		Percent of Area	
	Existing	Change	Existing	Change
Semiprimitive Nonmotorized	11,481	11,881	82	84
Semiprimitive Motorized	1,130	730	8	6
Roaded Natural	1,470	1,470	10	10

TABLE 4-13
 CROSS MOUNTAIN WSA
 CHANGES IN ROS CLASSES
 UNDER THE NO WILDERNESS ALTERNATIVE
 WITH EXTENSIVE MINERAL DEVELOPMENT

ROS Classes	Estimated Acreage		Percent of Area	
	Existing	Change	Existing	Change
Semiprimitive Nonmotorized	11,481	5,000	82	35
Semiprimitive Motorized	1,130	2,411	8	17
Roaded Natural	1,470	4,470	10	32
Rural	0	2,000	0	14
Modern Urban	0	200	0	1

If the limestone mining claims are developed south of Cross Mountain Canyon (moderate potential in the long term), it would preclude recreation use on approximately 256 acres of the WSA along the southern boundary. Opportunities to experience solitude would also be lost. All recreation opportunities would be lost in and adjacent to any resource development activities where the setting is changed to modern urban. The original semiprimitive nonmotorized and motorized settings would be lost with extensive development such as surface mining.

However, there is potential that most of these leases would not be developed. New leases would carry a no-surface-occupancy stipulation to maintain nonmotorized settings,

visual resources, wildlife habitat, and the natural integrity of the mountain. If this restriction is extensively applied, semiprimitive nonmotorized recreation opportunities would be maintained in the long term, as shown in Table 4-14. Semiprimitive nonmotorized settings would increase by 400 acres which would benefit primitive types of recreation opportunities.

No Action Alternative. Under the No Action Alternative, the existing ROS classes would be adopted and used as management objectives for recreation. The area would remain open to ORV use, mineral entry, oil and gas development, intensive woodland management, range improvements, and other resource management actions.

TABLE 4-14
 CROSS MOUNTAIN WSA
 CHANGES IN ROS CLASSES
 UNDER THE NO WILDERNESS ALTERNATIVE
 WITH NO MINERAL DEVELOPMENT

ROS Classes	Estimated Acreage		Percent of Area	
	Existing	Change	Existing	Change
Semiprimitive Nonmotorized	11,481	11,881	82	84
Semiprimitive Motorized	1,130	730	8	6
Roaded Natural	1,470	1,470	10	10

Table 4-15 shows the changes in ROS classes which are likely to occur with full development of potential resources within the WSA. Forty-six percent of the semiprimitive nonmotorized class would be lost and changed to one of the other motorized classes. This would result in significant adverse impacts to nonmotorized forms of recreation and in some instances may benefit motorized uses. However, it is more difficult to move an area toward the resource-dependent (primitive) end of the spectrum than it is to move it toward the facility-dependent (modern urban) end of the spectrum and nonmotorized settings and opportunities are diminishing within the region. This is a significant reduction of preferred settings in the WSA. All recreation opportunities would be lost in and adjacent to developments that change the setting to modern urban and in the limestone lease areas. The semiprimitive nonmotorized and motorized settings would be lost with extensive development such as surface mining or permanent roads. It is also possible that development associated with roads, facilities, and other surface-disturbing activities would eliminate the nonmotorized class altogether if it occurs in the center of the WSA.

Visual Resources

Preferred Alternative. The Cross Mountain Canyon ACEC would be managed under VRM Class I objectives which allows primarily for natural ecological changes. This would provide additional protection of the canyon's outstanding scenic qualities. The remainder of the mountain would be managed under VRM Class II. The Class II

management objectives would provide maintenance of the scenic quality of the WSA. (See Appendix E for description of VRM class objectives.)

Long-term adverse impacts may occur to the landscape from extensive oil and gas development allowed on leases where the wilderness protection stipulation is dropped. Additional protection and restrictions on development activities would have long-term beneficial impacts to visual resources in the SRMA/ACEC. Adverse impacts would occur to the landscape in the VRM Class II area on the south end of Cross Mountain from limestone mining in an area that is highly sensitive to change and visible from U.S. Highway 40 to the south. These impacts would cause irreversible and ir retrievable impacts if the area could not be restored to VRM Class II condition. Present technology does not exist to economically replace landforms (e.g., rock outcrops) to their original forms.

All Wilderness Alternative. The entire WSA would be managed under VRM Class I objectives (Appendix E). The objectives allow primarily for natural ecological changes which would provide additional protection of the WSA's outstanding visual qualities. Wilderness designation would provide protection for the scenic quality viewed from within and outside the WSA. The entire mountain has high sensitivity to change and is visible from U.S. Highway 40 State Highway 318, and Moffat County roads 10, 25, 123, 153, 14, and 85. Overall, both short- and long-term beneficial impacts would occur to visual resources in most of the WSA as a result of wilderness designation and the VRM Class I management objectives.

TABLE 4-15
 CROSS MOUNTAIN WSA
 CHANGES IN ROS CLASSES
 UNDER THE NO ACTION ALTERNATIVE

ROS Classes	Estimated Acreage		Percent of Area	
	Existing	Change	Existing	Change
Semiprimitive Nonmotorized	11,481	5,000	82	35
Semiprimitive Motorized	1,130	2,411	8	17
Roaded Natural	1,470	4,470	10	32
Rural	0	2,000	0	14
Modern Urban	0	200	0	1

CHAPTER 4

If the limestone mining claims are developed along the southern boundary, significant long-term adverse impacts would occur to visual resources. The extent of the impact would depend on the location and extent of the development, neither of which is known. Any unsuccessful reclamation would result in a permanent landscape change which would be an irreversible commitment of the visual resource.

Conflict Resolution Alternative. Impacts would be the same as the All Wilderness Alternative.

No Wilderness Alternative. Impacts are the same as described under the Preferred Alternative.

No Action Alternative. The WSA would be managed under existing VRM Classes (II, III, and IV). The landscape in the Class III and IV areas would experience a deterioration in visual quality from resource developments. The Class II objective, to retain the existing character of the landscape, may constrain developments on most of the mountain except where mineral development may occur. Development of the limestone claims on the south end of Cross Mountain would cause adverse impacts to visual resources. This area has high sensitivity to landscape change because it is visible from U.S. Highway 40. Any area where the original VRM class objectives (see Appendix E) would not be achieved after development would be an irreversible and irretrievable loss of visual resources by permanently altering the landscape. The technology does not exist to economically replace landforms (e.g., rock outcrops) to their original forms.

Lands and Realty

All Alternatives. Based on the low potential for siting future realty-related actions within the Cross Mountain WSA, designation under this alternative would have no significant impacts from a lands/realty standpoint. Although water power values exist within the unit, potential for development is currently low. Should existing conditions change, designation would not necessarily preclude such developments, since wilderness management policy allows their construction, subject to Presidential concurrence.

Economics

Based upon the assumptions presented in the economics section of Common Impacts for all eight WSAs and Appendix F; assuming development within 20 years, with an extraction life of 20 years, a net revenue value of \$4.00 per barrel and a discount rate of 8 3/8 percent, the following impacts would result.

The magnitude of hydrocarbons present could range from 15,700,000 to 41,600,000 barrels of recoverable oil in

scenarios I and II. The net present value of this potential resource would be approximately \$2,505,720 in scenario I and \$6,639,360 in scenario II.

According to information presented in the Geology and Minerals section of Chapter 3, Cross Mountain WSA has moderate to high potential for occurrence of base/precious metals and moderate potential for other locatables. No data are available on amounts actually present or their potential value.

Preferred Alternative. The national net present wilderness value foregone of \$90,000 represents projected recreation use valued at \$58/RVD at a discount rate of 8 3/8 percent (Water Resource Council rate for 1985).

Some (and potentially most) of the oil and gas potential described above would be foregone under the No Wilderness Alternative, along with any associated economic potential. Economic potential associated with locatable mineral development would not be foregone. The effect on any changes in employment, income, public revenue, and infrastructure would vary relative to the potential developed.

All Wilderness Alternative. Although there is some potential that four existing mining claims would be developed, wilderness designation would essentially preclude exploration and/or development of mineral resources on most of the area. Therefore, most of the potential mineral resource would be foregone, along with any associated economic potential. The effect on any changes in employment, income, public revenue, and infrastructure would vary relative to the potential foregone.

Cross Mountain could reach up to 5,200 visitors annually by the year 2000. (Jungst wilderness equation.) The national wilderness net present value of \$90,000 represents projected recreation use valued at \$58/RVD at a discount rate of 8 3/8 percent (Water Resource Council rate for 1985). However, it is assumed that local impact of wilderness designation is negligible since wilderness users generally depend very little upon the local area for most supplies and service.

Conflict Resolution Alternative. Impacts would be the same as under the All Wilderness Alternative.

No Wilderness Alternative. Impacts would be the same as under the Preferred Alternative.

No Action Alternative. If the area is not designated as wilderness, potential energy and mineral resources would be available for development, along with associated economic potential. The effect on any changes in employment, income, public revenue, and infrastructure would vary relative to the potential development. The wilderness recreation value would also be foregone, as under the Preferred Alternative.

ANT HILLS

The impacts to air quality, topography, vegetation, forest/woodland resources, paleontology, visual resources, cultural resources, lands and realty, wildlife, and economic assumptions are discussed in the Common Impacts section of Chapter 4. No significant impacts are anticipated for these resources. Proposed management actions for the various alternatives are presented in Table 2-10 in chapter 2.

Wilderness Values

Preferred Alternative. Nondesignation of the WSA under this alternative would essentially open the area to all resource uses. Although there would be low potential for both oil and gas development and woodland development, any development would irretrievably impair wilderness values in the long term and adjacent to the disturbance. Maximum disturbance would involve 5 to 8 acres from oil and gas development and 474 acres from woodland development. Although reclamation would be required, natural values would not be replaced. Significant impairment of wilderness values would result from (1) development of locatable minerals, which have at least a moderate potential to occur and be developed anywhere within the Ant Hills WSA, and (2) development of roads, as well as increased ORV use, associated with mineral and woodland development.

Overall, locatable mineral, oil and gas, and woodland development with surface-disturbing activities would irretrievably impair the naturalness as well as opportunities for solitude and primitive unconfined recreation in the WSA. Ant Hills WSA does not possess outstanding opportunities for solitude or primitive and unconfined recreation in and of itself and does not have sufficient acreage to contribute to diversity. Therefore, nondesignation would not represent a major loss to the National Wilderness Preservation System.

All Wilderness Alternative. The entire WSA is covered by two post-FLPMA oil and gas leases. These leases would not be developed if development would impair wilderness values.

There is a low potential that, prior to designation, valid discoveries would be made on at least some of the 26 existing mining claims located on the east third of the WSA. Although development of these claims would be subject to the nonimpairment requirements of the Wilderness Management Policy, development of valid claims would cause significant unavoidable adverse impacts to wilderness values within 1,450 acres. Surface-disturbing activities associated with development would disturb the primitive settings on this portion of the WSA, lessening or negating opportunities

for solitude, primitive unconfined recreation, and impairing naturalness over the long term.

Designation of the Ant Hills WSA as wilderness would maintain the WSA's wilderness values. Designation would maintain the WSA's relatively natural condition and would allow natural ecological processes to continue over most of the WSA. There would be little or no disturbance from human activities on at least 2,900 acres. Depending on the extent of locatable mineral development, human disturbance would also be minimized by designation on the other 1,450 acres; overall potential for development under this alternative is low. In turn, other resources or resource uses within the WSA would also benefit from designation, such as wildlife, water resources, soils, visual resources, and primitive unconfined recreation.

In conjunction with the Dinosaur National Monument, the Ant Hills WSA would provide outstanding opportunities for solitude and primitive unconfined recreation, if designated as wilderness. Designation would also benefit the wilderness values identified within the Monument by limiting or precluding development along the boundary. The area would contribute only slightly toward diversity of ecosystems within the National Wilderness Preservation System.

Conflict Resolution Alternative. The natural character of the 34 acres which would be recommended as nonsuitable would be lost. This small area does not have outstanding opportunities for solitude or primitive unconfined recreation. Impacts on wilderness values in the remaining 4,320 acres would be the same as under the All Wilderness Alternative.

Combined WSAs Alternative. This alternative would benefit wilderness values in the three WSAs.

The seven post-FLPMA oil and gas leases within the suitable acreage would not be developed (10,220 acres) if development would impair wilderness values. There is a low potential that, prior to designation, valid discoveries would be made on at least some of the 60 mining claims located on the east third of Ant Hills WSA, the east half of Chew Winter Camp WSA, and the north third of Peterson Draw WSA. Although development of these claims would be subject to the nonimpairment requirement of the Wilderness Management Policy, development of valid claims would cause significant unavoidable adverse impacts to wilderness values within 1,450 acres of Ant Hills WSA, 660 acres of Chew Winter Camp WSA, and 1,720 acres of Peterson Draw WSA (total of 3,830 acres). Surface-disturbing activities associated with development would disturb the primitive settings on these portions of the three WSAs, lessening or negating opportunities for solitude, primitive unconfined recreation, and impairing naturalness over the long term.

wilderness designation would be a major unavoidable adverse impact to locatable mineral development in the long term. Wilderness designation would be an irreversible and irretrievable commitment of the locatable mineral resource.

Some 614 acres of Ant Hills and Peterson Draw WSAs could be developed. Existing and future mining claims could be developed over the long term. Mineral development in this small area would be a minor beneficial impact to the mineral resource base.

No Wilderness Alternative. Development of the two existing post-FLPMA oil and gas leases on Ant Hills WSA would be allowed. Development of the leases would be a beneficial impact. See Appendix F for an estimate of potentially recoverable oil and gas reserves.

The low potential for actual occurrence of oil and gas resources under Ant Hills WSA suggests that the two existing leases could expire without development. Should this occur, any new leases would be subject to 100 percent no-surface-occupancy stipulations, which would effectively preclude development. Given the low resource potential, this would be a small adverse impact.

Impacts to locatable mineral development would be the same as under the Preferred Alternative.

No Action Alternative. Impacts to mineral development would be the same as under the Preferred Alternative.

Livestock Grazing

Preferred Alternative. In addition to the Common Impacts discussed earlier in this Chapter, livestock operations would continue as they have in the past. No significant impact to current operations is expected to result.

All Wilderness Alternative. In addition to the impacts discussed in the Common Impacts section of this chapter, no significant impacts would result. No projects would be proposed for this area.

Conflict Resolution Alternative. Impacts would be the same as the All Wilderness Alternative.

Combined WSAs Alternative. Impacts would be the same as the All Wilderness Alternative.

No Wilderness Alternative. Impacts would be the same as the Preferred Alternative.

No Action Alternative. Impacts would be the same as the Preferred Alternative.

Soils

Preferred Alternative. Under the Preferred Alternative, maximum surface disturbance is expected to occur. Increased sediment yields and erosion are anticipated from the potential increases in surface disturbance (from livestock grazing, oil and gas activities, locatable mineral development, and ORV use). This would be an irretrievable short-term impact. Soil material removed from the site by erosion also has the potential to impact off-site resource values (e.g., the silting-in of reservoirs). Reclamation would mitigate many of these impacts in the long term.

At the same time, more intensive methods of rehabilitating existing or potential problem areas (such as use of nonnative species, fencing, or vegetative manipulations) would be allowed.

There would be potential for adverse impacts to occur within the WSA under the Preferred Alternative.

All Wilderness Alternative. The All Wilderness Alternative would have the fewest adverse impacts to soil resources than any other alternative. Wilderness designation would reduce the extent of surface-disturbing activities such as ORV use, post-FLPMA oil and gas activities, and road building. As a result, erosion potentials within the WSA, as well as off-site impacts from wind or water carried material, would be reduced.

The only development that would take place would be associated with existing mining claims if they are proven valid prior to designation. There would be low potential for development of the existing claims. The surface disturbance resulting from these enterprises would cause small increases in soil erosion, which would be an irretrievable short-term impact.

In addition, livestock grazing would continue under a wilderness designation. Concentration of livestock near water sources or salting areas would result in soil compaction and erosion of these areas. Treatment of these problems would be difficult due to the limited methods available under this alternative.

Under the All Wilderness Alternative, the long-term productivity of watersheds in fair or better condition would improve or stabilize due to the reduction of surface-disturbing activities other than livestock. Those watersheds or localized areas in fair or poor condition, caused mainly by livestock, would probably exhibit a decrease in productivity due to livestock operations continuing and limited treatment methods available.

Conflict Resolution Alternative. Impacts would be the same as under the All Wilderness Alternative.

Combined WSAs Alternative. The impacts to soil resources would be similar to those described in the All Wilderness Alternative, except for some increases in soil loss and sedimentation from the erosion of disturbed areas associated with potential development of up to 60 mining claims within the 10,220-acre area. Because there is low potential that most of these claims would be proven valid prior to wilderness designation, it is estimated that this would not be a significant impact. Both beneficial and adverse impacts of designation would affect 10,220 acres. Nondesignation of 614 acres would have no significant impact on the soil resources.

No Wilderness Alternative. This alternative would allow some surface-disturbing activities (e.g., saleable and locatable mineral entry, development of post-FLPMA oil and gas leases, livestock grazing, and some ORV use) to continue. These activities would adversely impact soil resources, mainly by development of locatable minerals (moderate potential over the long term), construction of road networks and drilling pads, concentration of livestock in erodible areas, and destruction of stabilizing vegetation by the driving of vehicles off existing trails. On the disturbed areas, there would be some irretrievable loss of soil productivity in the short term. Reclamation would mitigate many of these impacts in the long term.

Benefits, such as reduced sediment yields, would result from stipulating no surface occupancy on new oil and gas leases, should existing leases expire without development. In addition, a wider range of corrective methods for dealing with erosion problems (should they develop) would be allowed under this alternative in relation to the All Wilderness Alternative. Overall, no severe adverse impacts to soils would be anticipated under this alternative.

No Action Alternative. Impacts would be the same as under the Preferred Alternative. Potential adverse impacts could occur.

Water Resources

Preferred Alternative. The Preferred Alternative would not generally benefit water resources in Ant Hills WSA. Increases in sediment yields to intermittent streams could be expected from the surface-disturbing actions of grazing livestock, oil and gas development, mineral development, and ORV use. The flushing of sediments into perennial streams outside of the WSA would be considered a significant impact.

Accidental contamination or interruption of groundwater sources could also occur under these alternatives (See West Cold Spring WSA, Preferred Alternative, Groundwater

Impacts for a discussion of possible impacts). However, given the lack of groundwater information for this area, the significance of this potential impact is not assessable; special stipulations may be needed.

The potential for adverse impacts would be greatest under the Preferred and No Action alternatives and least under the All Wilderness and Conflict Resolution alternatives. Impacts under the No Wilderness Alternative would be mixed.

All Wilderness Alternative. No significant adverse impacts to water resources are anticipated from wilderness designation of Ant Hills WSA. There would be some possible increases in sedimentation from the erosion of disturbed areas associated with the development of mining claims within the WSA. However, the development potential is low and no significant impacts are anticipated.

Significant beneficial impacts would result from the elimination of most surface- and subsurface-disturbing activities. Sediment yield to the intermittent water courses would be limited to that contributed by livestock, development of mining claims (low potential), and natural activities. Groundwater sources would remain undisturbed.

Generally, wilderness designation would have more beneficial impacts on water resources than any other alternative.

Conflict Resolution Alternative. Impacts would be the same as under the All Wilderness Alternative.

Combined WSAs Alternative. The impacts to water resources would be similar to those described in the All Wilderness Alternative, except for some increases in sedimentation from the erosion of disturbed areas associated with potential development of up to 60 mining claims within the 10,220-acre area. Because there is low potential that most of these claims would be proven valid prior to wilderness designation, it is estimated that this would not be a significant impact. Both beneficial and adverse impacts of designation would affect 10,220 acres. Nondesignation of 614 acres would have no significant impact on water resources.

No Wilderness Alternative. The No Wilderness Alternative would not benefit water resources within Ant Hills WSA. Adverse impacts would result from the potential development (moderate potential) of locatable and saleable minerals and post-FLPMA oil and gas leases under this alternative. Increases in sediment concentration within local surface waters and alteration of alluvial aquifers would occur from these mineral operations. Benefits such as reduced sediment yields would result from stipulating no surface occupancy on new oil and gas leases.

No Action Alternative. Impacts would be the same as under the Preferred Alternative.

Recreation

Preferred Alternative. The entire Ant Hills WSA would be open to mineral, oil and gas, range and woodland development which would cause a permanent change in the ROS settings away from primitive and semiprimitive nonmotorized settings and toward motorized settings. Surface-disturbing activities would cause the loss of primitive and semiprimitive nonmotorized settings, which would be an irretrievable loss of the settings and associated opportunities which are decreasing in the region. All recreation opportunities would be lost in or adjacent to any intensive resource development. Motorized recreation may benefit in the long term.

Table 4-16 shows the changes in ROS classes anticipated over the long term with development in the WSA.

All Wilderness Alternative. Designation of the Ant Hills WSA as wilderness would enhance primitive recreation opportunities, such as hiking, by closing the road in the northeast corner of the WSA, changing approximately 200 acres (5 percent) of the semiprimitive motorized setting to semiprimitive nonmotorized. The adverse effects to motorized use would be small because ORV use is low within the area and is available elsewhere. Table 4-17 summarizes the changes in ROS classes due to wilderness designation.

Conflict Resolution Alternative. Impacts would be the same as under the All Wilderness Alternative.

Combined Alternative. Designation of Ant Hills, Chew Winter Camp, and Peterson Draw WSAs combined would benefit nonmotorized recreation by providing additional protection for the primitive and semiprimitive nonmotorized recreation settings. This type of use would continue in the area.

Upon designation the area would be closed to ORV use, enhancing nonmotorized recreation by adding an additional 500 acres to the semiprimitive nonmotorized class. Insignificant impacts would occur to ORV use because it is low to nonexistent within the areas. Table 4-18 summarizes changes in ROS classes.

The nonsuitable portions of the WSAs would be open to other resource uses and the ROS settings may or may not change.

No Wilderness Alternative. Under the No Wilderness Alternative, the Ant Hills WSA would be open to locatable mineral development, as well as oil and gas exploration and development under existing leases. The constraints and stipulations placed on resource developments, improvements, projects, etc., would moderately benefit nonmotorized recreation opportunities and associated experiences. Without development the ROS classes would be as shown in Table 4-17 under the All Wilderness Alternative. However, mineral development (particularly locatable minerals) would in the long term cause a change in the ROS settings from nonmotorized to motorized, which would be an irreversible trend. Development would also in the long term cause an irretrievable loss of primitive forms of recreation and resulting experiences as shown in Table 4-16 under the Preferred Alternative.

TABLE 4-16
ANT HILLS WSA
CHANGES IN ROS CLASSES
UNDER THE PREFERRED ALTERNATIVE

ROS Classes	Estimated Acreage		Percent of Area	
	Existing	Change	Existing	Change
Primitive	564	0	13	0
Semiprimitive Nonmotorized	3,310	0	76	0
Semiprimitive Motorized	480	2,854	11	66
Roaded Natural	0	900	0	21
Rural	0	500	0	11
Modern Urban	0	100	0	2

TABLE 4-17
ANT HILLS WSA
CHANGES IN ROS CLASSES
UNDER THE ALL WILDERNESS ALTERNATIVE

ROS Classes	Estimated Acreage		Percent of Area	
	Existing	Change	Existing	Change
Primitive	564	564	13	13
Semiprimitive Nonmotorized	3,310	3,510	76	81
Semiprimitive Motorized	480	280	11	6

TABLE 4-18
ANT HILLS, CHEW WINTER CAMP, AND PETERSON DRAW WSAs
CHANGES IN ROS CLASSES
UNDER THE COMBINED WSAs ALTERNATIVE

ROS Classes	Estimated Acreage		Percent of Area	
	Existing	Change	Existing	Change
Primitive	964	964	9	9
Semiprimitive Nonmotorized	6,666	7,166	61	66
Semiprimitive Motorized	3,204	2,704	30	25

No Action Alternative. Impacts would be the same as described under the Preferred Alternative.

Economics

Based upon the assumptions presented in the economics section of Common Impacts for all eight WSAs and Appendix F (assuming development within 20 years with an extraction life of 20 years), a net revenue value of \$4.00 per barrel, and a discount rate of 8 3/8 percent, the following impacts could result.

The magnitude of hydrocarbons present could be up to 4,600,000 barrels of recoverable oil. The net present value of this potential resource would be approximately \$734,160.

According to information presented in the Geology and Minerals section of Chapter 3, Ant Hills WSA has high potential for occurrence of base/precious metals and low

to moderate potential for other locatables. No data are available on amounts actually present or potential economic value.

Preferred Alternative. If the area is not designated wilderness, potential energy and mineral resources would be available for development, along with associated economic potential (see above discussion). The effect on any changes in employment, income, public revenue, and infrastructure is unknown and would vary relative to the potential development.

All Wilderness Alternative. Since there is a low potential that the 26 existing mining claims or 2 existing oil and gas leases would be developed under this alternative, wilderness designation would essentially preclude long-term exploration and/or development on most of the area. Therefore, most of the potential mineral resource discussed above would be foregone, along with any associated

economic potential. The effect on any changes in employment, income, public revenue, and infrastructure is unknown, but would vary relative to the potential foregone.

Conflict Resolution Alternative. Impacts would be the same as under the All Wilderness Alternative.

Combined WSAs Alternative. Impacts would be the same as under the All Wilderness Alternative.

No Wilderness Alternative. The economic potential for oil and gas resources described under the All Wilderness Alternative may still be foregone under this alternative (see Minerals). Locatable mineral potential would not be foregone. The effect on changes in employment, income, public revenue, and infrastructure is unknown and would vary relative to the amount of actual development. At a minimum, development of locatable minerals would be expected to have at least a small beneficial impact on the local economy.

No Action Alternative. Impacts would be the same as under the Preferred Alternative.

CHEW WINTER CAMP

The impacts to air quality, topography, vegetation, forest/ woodland resources, paleontology, visual resources, cultural resources, lands and realty, wildlife, and economic assumptions are discussed in the Common Impacts section of Chapter 4. No significant impacts are anticipated for these resources. The Conflict Resolution Alternative does not apply to this WSA. Proposed management actions for the various alternatives are presented in Table 2-12 in chapter 2.

Wilderness Values

Preferred Alternative. Although there would be low potential for both oil and gas development and woodland development, any development would tend to irretrievably impair wilderness values in the long term in the vicinity of the disturbance. Maximum disturbance would involve 5 to 8 acres from oil and gas development and 54 acres from woodland development. Although reclamation would be required, natural values would not be replaced. Significant impairment of wilderness values would result from (1) development of locatable minerals, which have at least a moderate potential to occur and be developed anywhere within Chew Winter Camp WSA, and (2) development of roads, as well as increased ORV use associated with mineral and woodland development.

Overall, locatable mineral, oil and gas, and woodland developments with surface-disturbing activities would irretrievably impair the naturalness and opportunities for solitude and primitive unconfined recreation in the WSA. Chew Winter Camp WSA does not possess outstanding opportunities for primitive or unconfined recreation in and of itself nor would this small area contribute to diversity. Therefore, nondesignation would not represent a significant loss to the National Wilderness Preservation System.

All Wilderness Alternative. The entire WSA is covered by one post-FLPMA oil and gas lease, which would not be developed if development would impair wilderness values. There is a low potential that prior to designation, valid discoveries would be made on at least some of the ten existing mining claims located on the east half of the Chew Winter Camp WSA. Although development of these claims would be subject to the nonimpairment requirements of the Wilderness Management Policy, development of valid claims would cause significant unavoidable adverse impacts to wilderness values within 660 acres. Surface-disturbing activities associated with development would disturb the primitive settings on this portion of the WSA, lessening or negating opportunities for solitude and impairing naturalness over the long term.

Overall, designation of the Chew Winter Camp WSA as wilderness would maintain the WSA's wilderness values. Designation would maintain the WSA's relatively natural condition and would allow natural ecological processes to continue over most of the WSA. There would be little or no disturbance from human activities on at least 660 acres. Depending on the extent of locatable mineral development (low potential), human disturbance would also be minimized by designation on the other 660 acres. In turn, other resources or resource uses within the WSA would also benefit from designation, such as wildlife, water resources, soils, visual resources, and primitive unconfined recreation.

In conjunction with the Dinosaur National Monument, the Chew Winter Camp WSA would provide outstanding opportunities for solitude and primitive unconfined recreation if designated as wilderness. Designation would also benefit the wilderness values identified within the Monument by limiting or precluding development along the boundary. The area would not contribute toward diversity of ecosystems within the National Wilderness Preservation System.

Combined WSAs Alternative. Impacts would be described under Ant Hills WSA, Combined WSAs Alternative.

No Wilderness Alternative. Overall, this alternative would not benefit wilderness values. The wilderness protection stipulation would be dropped from the existing oil and gas

lease, which covers the entire WSA. Total surface disturbance would be minimal (5 to 8 acres out of 1,320), but associated roads would cut up the WSA, adversely affecting naturalness. However, given the low potential for oil and gas under this WSA, it is more likely that this lease would expire undeveloped. Any new leases would stipulate 100 percent no surface occupancy, which would help maintain the natural character of the WSA, as would constraints on most other resource uses (e.g., woodland development, range, wildlife or other project development, and restrictions on ORV use).

However, there is at least a moderate long-term potential that locatable minerals underlying the Chew Winter Camp WSA would be developed, including the ten existing claims. Associated surface-disturbing activities would result in an unavoidable loss of naturalness in the long term. Disturbance of the primitive settings and noises from mechanical activities would negate opportunities to experience solitude and primitive and unconfined recreation.

The net effect of potential development under the No Wilderness Alternative would be an irretrievable loss of all wilderness values in Chew Winter Camp WSA over the long term. This WSA does not possess outstanding opportunities for primitive or unconfined recreation in and of itself. Therefore, nondesignation would not represent a major loss to the National Wilderness Preservation System.

Minerals

Preferred Alternative. The entire Chew Winter Camp WSA (1,320 acres) would be open to mineral exploration and development under existing laws. Existing oil and gas leases may be developed in the long-term. Development of all 10 existing mining claims would be possible. There would be at least a moderate potential for location and development of additional claims throughout the entire 1,320 acres of the WSA. These would all be major long-term beneficial impacts.

All Wilderness Alternative. Wilderness designation of Chew Winter Camp WSA would effectively preclude development of the post-FLPMA oil and gas lease which covers the WSA. Designation would also prevent an expiring lease from being offered for lease in the future. This would result in lost rental income and royalty revenues and would be an irreversible commitment of the resource. Future productivity of this oil and/or gas resource would be precluded. (See Appendix F for an estimate of potentially recoverable oil reserves.) Given the low to moderate potential for actual occurrence of oil and gas under Chew Winter Camp WSA, nondevelopment would not be considered a major adverse impact in the long term.

The ten existing mining claims on the east half of the Chew Winter Camp WSA would be developed if valid claims were proven before wilderness designation, which would be a beneficial impact to locatable minerals. After designation the area would be withdrawn from mineral location, and no additional development of the resource would be allowed. Overall, given the high potential for occurrence of base/precious metals and low to moderate potential for other locatables, wilderness designation would be a moderate to major unavoidable adverse impact to locatable mineral development in the long term. Wilderness designation would be an irreversible and irretrievable commitment of the locatable mineral resource.

Combined WSAs Alternative. Impacts to minerals would be the same as the Ant Hills WSA, Combined WSAs Alternative.

No Wilderness Alternative. Development of the existing post-FLPMA oil and gas lease covering Chew Winter Camp WSA would be allowed. See Appendix F for an estimate of potentially recoverable reserves.

The low potential for actual occurrence of oil and gas resources under Chew Winter Camp WSA suggests that the existing lease could expire without development. Should this occur, any new leases would be subject to 100 percent no-surface-occupancy stipulations, which would effectively preclude development. Given the low resource potential, this would be a small adverse impact.

Development of all ten existing mining claims would be possible. There would be at least a moderate potential for location and development of additional claims throughout the entire 1,320 acres of the WSA. These would be major long-term beneficial impacts.

No Action Alternative. Impacts to mineral resources would be the same as those under the Preferred Alternative. This alternative is beneficial to mineral resource development.

Water Resources

Preferred Alternative. Impacts would be the same as Preferred Alternative, Ant Hills WSA. The flushing of sediments into perennial streams outside of the WSA would be considered a significant impact.

All Wilderness Alternative. Impacts would be the same as the All Wilderness Alternative, Ant Hills WSA. No significant impacts are expected.

Combined WSAs Alternative. Impacts would be the same as described under Ant Hills, Combined WSAs Alternative.

No Wilderness Alternative. Impacts would be the same as the No Wilderness Alternative, Ant Hills WSA. Increases in sediment concentration within local surface waters and alteration of alluvial aquifers would occur from these mineral operations.

No Action Alternative. Impacts would be the same as the Preferred Alternative.

Livestock Grazing

All Alternatives. Because there are no range improvements or projects proposed, there would be no significant impacts. For additional discussion of this rationale see the Livestock and Grazing discussion for Ant Hills WSA.

Soils

Preferred Alternative. Impacts would be the same as the Preferred Alternative, Ant Hills. Increased sediment yields and erosion are anticipated from the potential increases in surface disturbances. See Preferred Alternative, Ant Hills.

All Wilderness Alternative. Impacts would be the same as the All Wilderness Alternative, Ant Hills WSA. Erosion potentials within the WSA as well as off-site from wind or water carried material would be reduced.

Combined WSAs Alternative. Impacts would be the same as described under Ant Hills WSA, Combined WSAs Alternative.

No Wilderness Alternative. Impacts would be the same as the No Wilderness Alternative, Ant Hills WSA. There would be some irretrievable loss of soil productivity in the short term.

No Action Alternative. Impacts would be the same as the Preferred Alternative.

Recreation

Preferred Alternative. The entire Chew Winter Camp WSA would be open to locatable mineral, oil and gas, range, and woodland development. This would cause a permanent change in the ROS settings away from semiprimitive nonmotorized settings and toward the more developed settings as shown in Table 4-19. Surface-disturbing activities would cause the loss of semiprimitive nonmotorized settings, which would be an irretrievable loss of the settings and associated opportunities which are diminishing in the region. All recreation opportunities would be lost in or adjacent to any intensive resource development. Motorized recreation may benefit in the long term.

All Wilderness Alternative. Primitive types of recreation use such as hiking and hunting would continue within the Chew Winter Camp WSA. Designation of the WSA would provide additional protection for the existing ROS settings (1,182 acres of semiprimitive nonmotorized, 90 percent of the WSA). The WSA would be closed to ORV use; this would have little effect on vehicle use because use is low to nonexistent within the area.

Combined WSAs Alternative. The impacts would be the same as described under Ant Hills WSA, Combined WSAs Alternative.

No Wilderness Alternative. Under the No Wilderness Alternative, the Chew Winter Camp WSA would be open to locatable mineral development, as well as oil and gas exploration and development under existing leases. The constraints and stipulations placed on resource developments, improvements, projects, etc., would moderately benefit nonmotorized recreation opportunities and associated experiences. However, mineral development (particularly locatable minerals) would in the long term cause a change in the ROS settings from nonmotorized to motorized, which

TABLE 4-19
CHEW WINTER CAMP
CHANGES IN ROS CLASSES
UNDER THE PREFERRED ALTERNATIVE

ROS Classes	Estimated Acreage		Percent of Area	
	Existing	Change	Existing	Change
Semiprimitive Nonmotorized	1,182	0	90	0
Semiprimitive Motorized	138	1,220	10	92
Rural	0	100	0	8

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would be an irreversible trend. Development would also in the long term cause an irretrievable loss of primitive forms of recreation and resulting experiences.

No Action Alternative. Impacts would be the same as the Preferred Alternative.

Economics

Based upon the assumptions presented in the economics section of Common Impacts for all eight WSAs and Appendix F; assuming development within 20 years, with an extraction life of 20 years, a net revenue value of \$4.00 per barrel and a discount rate of 8 3/8 percent, the following impacts could result.

The magnitude of hydrocarbons present could be up to 1,400,000 barrels of recoverable oil. The net present value of this potential resource would be approximately \$223,460.

According to information presented in the Geology and Minerals section of Chapter 3, Chew Winter Camp WSA has high potential for occurrence of base/precious metals and moderate potential for other locatables. No data are available on the amount actually occurring or potential economic value.

Preferred Alternative. If the area is not designated wilderness, potential energy and mineral resources would be available for development, along with associated economic potential (see above discussion). The effect on any changes in employment, income, public revenue, and infrastructure is unknown and would vary relative to the potential development.

All Wilderness Alternative. Since there is a low potential that the 26 existing mining claims and the existing oil and gas lease would be developed under this alternative, wilderness designation would essentially preclude long-term exploration and/or development on most of the area. Therefore, most of the potential mineral resource would be foregone, along with any associated economic potential (described above). The effect on any changes in employment, income, public revenue, and infrastructure is unknown, but would vary relative to the potential foregone.

Combined Alternative. Impacts would be the same as the Ant Hills Combined WSAs Alternative.

No Wilderness Alternative. The economic potential for oil and gas resources described under the All Wilderness Alternative may still be foregone under this alternative (see Minerals). Locatable mineral potential would not be foregone. The effect on changes in employment, income, public revenue, and infrastructure is unknown and would vary relative to the amount of actual development. At a

minimum, development of locatable minerals would be expected to have a small beneficial impact on the local economy.

No Action Alternative. Impacts would be the same as under the Preferred Alternative.

PETERSON DRAW

The impacts to air quality, topography, vegetation, forest/ woodland resources, paleontology, visual resources, cultural resources, land and realty, wildlife, and economic assumptions are discussed in the Common Impacts section of Chapter 4. No significant impacts are anticipated to these resources. Proposed management actions for the various alternatives are presented in Table 2-14 in chapter 2.

Wilderness Values

Preferred Alternative. Although there would be low potential for both oil and gas development and woodland development, any development would tend to irretrievably impair wilderness values in the long term in the vicinity of the disturbance. Maximum disturbance would involve 25 to 40 acres from oil and gas development and 380 acres from forest resource development. Although reclamation would be required, natural values would not be replaced. Significant impairment of wilderness values would result from (1) development of locatable minerals, which have at least a moderate potential to occur and be developed anywhere within the Peterson Draw WSA, and (2) development of roads, as well as increased ORV use, associated with mineral and woodland development.

Overall, locatable mineral, oil and gas, and forest resource developments with attendant surface-disturbing activities would irretrievably impair the naturalness as well as opportunities for solitude and primitive unconfined recreation in the WSA. Peterson Draw WSA does not possess outstanding opportunities for primitive or unconfined recreation in and of itself and the relatively small size would not contribute to diversity. Therefore, nondesignation would not represent a major loss to the National Wilderness Preservation System.

All Wilderness Alternative. The entire WSA is covered by four post-FLPMA oil and gas leases which would not be developed if development would impair wilderness values. There is a low potential that, prior to designation, valid discoveries would be made on at least some of the 31 existing mining claims located on the north third of the WSA. Although development of these claims would be subject

to the nonimpairment requirements of the Wilderness Management Policy, development of valid claims would cause significant unavoidable adverse impacts to wilderness values within 1,720 acres. Surface-disturbing activities associated with development would disturb the primitive settings on this portion of the WSA, lessening or negating opportunities for solitude and impairing naturalness over the long term.

However, designation of the Peterson Draw WSA as wilderness would maintain the WSA's wilderness values, natural condition, and would allow natural ecological processes to continue over most of the WSA. There would be little or no disturbance from human activities on at least 3,440 acres; depending on the extent of locatable mineral development (low potential), human disturbance would also be minimized by designation on the other 1,720 acres. In turn, other resources or resource uses within the WSA would also benefit from designation, such as wildlife, water resources, soils, visual resources, and primitive unconfined recreation.

In conjunction with the Dinosaur National Monument, the Peterson Draw WSA would provide outstanding opportunities for solitude and primitive unconfined recreation, if designated as wilderness. Designation would also benefit the wilderness values identified within the Monument by limiting or precluding development along the boundary. The area would contribute only slightly toward diversity of ecosystems within the National Wilderness Preservation System.

Conflict Resolution Alternative. The natural character of the 580 acres excluded would be lost. This small area does not have outstanding opportunities for solitude or primitive unconfined recreation. Impacts on wilderness values in the remaining 4,580 acres would be the same as under the All Wilderness Alternative.

Combined WSAs Alternative. Impacts would be the same as described under Ant Hills WSA, Combined WSAs Alternative.

No Wilderness Alternative. This alternative would not benefit wilderness values. The wilderness protection stipulation would be dropped from the four existing oil and gas leases, which cover the entire WSA. Total surface disturbance would be minimal (25 to 40 acres out of 5,160), but associated roads would dissect the WSA, adversely affecting naturalness. However, given the low potential for oil and gas under this WSA, it is more likely that these three leases would expire undeveloped. Any new leases would stipulate 100 percent no surface occupancy, which would help maintain the natural character of the WSA, as would constraints on most other resource uses (e.g.,

woodland development, range, wildlife or other project development, and restrictions on ORV use).

There is at least a moderate long-term potential that locatable minerals underlying the WSA would be developed, including the 31 existing claims. Associated surface-disturbing activities would result in an unavoidable loss of naturalness in the long term. Disturbance of the primitive settings and noises from mechanical activities would negate opportunities to experience solitude and primitive unconfined recreation.

The net effect of potential development under the No Wilderness Alternative would be an irretrievable loss of all wilderness values in Peterson Draw WSA over the long term. This WSA does not possess outstanding opportunities for primitive or unconfined recreation in and of itself and the small size would not contribute significantly to diversity. Therefore, nondesignation would not represent a major loss to the National Wilderness Preservation System.

No Action Alternative. The impacts would be the same as under the Preferred Alternative.

Minerals

Preferred Alternative. The entire Peterson Draw WSA (5,160 acres) would be open to mineral exploration and development under existing laws. The four existing oil and gas leases may be developed in the long-term. Development of all 31 existing mining claims would be possible. There would be at least a moderate potential for location and development of additional claims throughout the entire 5,160 acres of the WSA. These would all be major long-term beneficial impacts.

All Wilderness Alternative. Wilderness designation of Peterson Draw WSA would effectively preclude development of the four post-FLPMA oil and gas leases which cover the WSA. Designation would also prevent expiring leases from being offered for lease in the future. This would result in lost rental income and royalty revenues on these leases and would be an irreversible commitment of the resource. Future productivity of this resource would be precluded. (See Appendix F for an estimate of potentially recoverable oil reserves). Given the low to moderate potential for actual occurrence of oil and gas under Peterson Draw WSA, nondevelopment would not be considered a major adverse impact in the long term.

The 31 existing mining claims on the north third of the Peterson Draw WSA could be developed if valid claims were proven before wilderness designation, which would be a beneficial impact on locatable minerals. After designation the area would be withdrawn from mineral entry,

and no additional development of the resource would be allowed. Overall, given the high potential for base/precious metals and low to moderate potential for other locatables, wilderness designation would be a moderate to major unavoidable adverse impact to locatable mineral development in the long term. Wilderness designation would be an irreversible and irretrievable commitment of the locatable mineral resource.

Conflict Resolution Alternative. Impacts of the Conflict Resolution Alternative would be similar to those under the All Wilderness Alternative. The only difference is that on the 580-acre nonsuitable area, locatable minerals could be developed (moderate potential in the long term) and a portion of one existing oil and gas lease could be developed (one well disturbing 5 to 8 acres). Such development would be a minor beneficial impact.

Combined WSAs Alternative. Impacts to mineral resources would be the same as those under the Ant Hills WSA, Combined WSAs Alternative.

No Wilderness Alternative. Development of the four existing post-FLPMA oil and gas leases on Peterson Draw WSA would be allowed. See Appendix F for an estimate of potentially recoverable oil and gas reserves. Development of the leases would be a beneficial impact.

The low potential for actual occurrence of oil and gas resources under Peterson Draw WSA suggests that the four existing leases could expire without development. Should this occur, any new leases would be subject to no-surface-occupancy stipulations, which would effectively preclude development. Given the low resource potential, this would be a small adverse impact.

Development of all 31 existing mining claims would be possible. There would be at least moderate potential for location and development of additional claims throughout the entire 5,160 acres of the WSA. These would all be long-term beneficial impacts.

No Action Alternative. Impacts would be the same as described under the Preferred Alternative.

Livestock Grazing

All Alternatives. No significant impacts would result because no projects are proposed. See the Livestock Grazing section of the Ant Hills WSA for further discussion of this rationale.

Soils

Preferred Alternative. Impacts would be the same as Preferred Alternative, Ant Hills WSA (i.e., increased

sediment yields and erosion are anticipated from the potential increases in surface disturbances).

All Wilderness Alternative. Impacts would be the same as the All Wilderness Alternative, Ant Hills WSA. Erosion potentials within the WSA, as well as off-site impacts from wind or water carried material, would be reduced.

Conflict Resolution Alternative. Impacts would be the same as the All Wilderness Alternative.

Combined WSAs Alternative. Impacts would be the same as Ant Hills, Combined WSAs Alternative.

No Wilderness Alternative. Impacts would be the same as the No Wilderness Alternative, Ant Hills WSA. There would be some irretrievable loss of soil productivity in the short term.

No Action Alternative. Impacts would be the same as the Preferred Alternative.

Water Resources

Preferred Alternative. Impacts would be the same as the Preferred Alternative, Ant Hills WSA. The flushing of sediments into perennial streams outside the WSA would be considered a significant impact.

All Wilderness Alternative. Impacts would be the same as the All Wilderness Alternative, Ant Hills WSA. No significant impacts are expected.

Conflict Resolution Alternative. Impacts would be the same as the All Wilderness Alternative. No significant impacts are expected.

No Wilderness Alternative. Impacts would be the same as the No Wilderness Alternative, Ant Hills WSA. Increases in sediment concentration within local surface waters and alteration of alluvial aquifers would occur from these mineral operations.

No Action Alternative. Impacts would be the same as the Preferred Alternative.

Recreation

Preferred Alternative. The entire Peterson Draw WSA would be open to mineral, oil and gas, range, and woodland development which could cause a permanent change in the ROS settings away from primitive and semiprimitive nonmotorized settings and toward motorized settings in the long term as shown in Table 4-20. Surface-disturbing activities would cause the loss of primitive and semiprimitive nonmotorized settings, which would be an irretrievable loss of the settings and associated opportunities which are

diminishing in the region. All recreation opportunities would be lost in or adjacent to any intensive resource development. Motorized recreation may benefit in the long term.

All Wilderness Alternative. Designation of the Peterson Draw WSA as wilderness would provide additional protection for the nonmotorized settings within the WSA. Primitive types of recreation use would continue in the WSA.

The area would be closed to ORV use, expanding the nonmotorized setting by about 500 acres (see Table 4-21). Closure would have an insignificant impact on motorized use because use is low to nonexistent.

Conflict Resolution Alternative. The 580 acres recommended nonsuitable may trend toward the more

developed settings in the long term as shown in Table 4-22. This would result from oil and gas development and associated roads and other activities. These changes would be minor.

Combined WSAs Alternative. The impacts would be the same as described under Ant Hills WSA for the Combined WSAs Alternative.

No Wilderness Alternative. Under the No Wilderness Alternative, the Peterson Draw WSA would be open to locatable mineral development, as well as oil and gas exploration and development under existing leases. The constraints and stipulations placed on resource developments, improvements, projects, etc., would moderately benefit

TABLE 4-20
PETERSON DRAW WSA
CHANGES IN ROS CLASSES
UNDER THE PREFERRED ALTERNATIVE

ROS Classes	Estimated Acreage		Percent of Area	
	Existing	Change	Existing	Change
Primitive	400	0	8	0
Semiprimitive Nonmotorized	2,179	0	42	0
Semiprimitive Motorized	2,581	4,710	50	91
Roaded Natural	0	100	0	2
Rural	0	250	0	5
Modern Urban	0	100	0	2

TABLE 4-21
PETERSON DRAW WSA
CHANGES IN ROS CLASSES
UNDER THE ALL WILDERNESS ALTERNATIVE

ROS Classes	Estimated Acreage		Percent of Area	
	Existing	Change	Existing	Change
Primitive	400	400	8	8
Semiprimitive Nonmotorized	2,179	2,679	42	52
Semiprimitive Motorized	2,581	2,081	50	40

TABLE 4-22
 PETERSON DRAW WSA
 CHANGES IN ROS CLASSES
 UNDER THE CONFLICT RESOLUTION ALTERNATIVE

ROS Classes	Estimated Acreage		Percent of Area	
	Existing	Change	Existing	Change
Primitive	400	400	8	8
Semiprimitive Nonmotorized	2,179	2,279	42	44
Semiprimitive Motorized	2,581	2,381	50	46
Roaded Natural	0	100	0	2

nonmotorized recreation opportunities and associated experiences. Without development the settings may be as shown in Table 4-21. However, mineral development would in the long term cause a change in the ROS settings from nonmotorized to motorized, as shown in Table 4-20 under the Preferred Alternative which would be an irreversible trend. In the long term development would also cause an irretrievable loss of primitive forms of recreation opportunities and resulting experiences.

No Action Alternative. Impacts would be the same as under the Preferred Alternative.

Economics

Based upon the assumptions presented in the economics section of Common Impacts for all eight WSAs and Appendix F (assuming development within 20 years with an extraction life of 20 years), a net revenue value of \$4.00 per barrel and a discount rate of 8 3/8 percent, the following impacts could result.

The magnitude of hydrocarbons present could be up to 5,300,000 barrels of recoverable oil. The net present value of this potential resource would be approximately \$845,880.

According to information presented in the Geology and Minerals section of Chapter 3, Peterson Draw WSA has high potential for occurrence of base/precious metals and low to moderate potential for other locatables. No data are available the amounts actually occurring or their potential economic value.

Preferred Alternative. If the area is not designated wilderness, potential energy and mineral resources would be available for development, along with associated

economic potential (see above discussion). The effect on any changes in employment, income, public revenue, and infrastructure is unknown and would vary relative to the potential development.

All Wilderness Alternative. Since there is a low potential that the 31 existing mining claims and 4 oil and gas leases would be developed under this alternative, wilderness designation would essentially preclude long-term exploration and/or development on most of the area. Therefore, most of the potential mineral resource would be foregone, along with any associated economic potential (described above). The effect on any changes in employment, income, public revenue, and infrastructure is unknown, but would vary relative to the potential foregone.

Conflict Resolution Alternative. Impacts would be the same as the All Wilderness Alternative.

Combined WSAs Alternative. Impacts would be the same as those described under Ant Hills WSAs, Combined WSAs Alternative.

No Wilderness Alternative. Overall, the economic potential for oil and gas discussed under the All Wilderness Alternative may still be foregone (see Minerals). The locatable mineral potential would not be foregone. The effect on changes in employment, income, public revenue, and infrastructure is unknown and would vary relative to the amount of actual development. At a minimum, development of locatable minerals would be expected to have at least a small to moderate beneficial impact on the local economy.

No Action Alternative. Impacts would be the same as under the Preferred Alternative.

TEPEE DRAW

The impacts to air quality, topography, vegetation, forest/woodland resources, paleontology, visual resources, cultural resources, lands and realty, wildlife, and economic assumptions are discussed in the Common Impacts section of Chapter 4. No significant impacts are anticipated for these resources. The Conflict Resolution and Combined WSAs alternatives do not apply to this WSA. Proposed management actions for the various alternatives are presented in Table 2-16 in chapter 2.

Wilderness Values

Preferred Alternative. Although there would be low potential for both oil and gas development and woodland development, any development would tend to irretrievably impair wilderness values in the long term in the vicinity of the disturbance. Maximum disturbance would involve 25 to 40 acres from oil and gas development and 220 acres from forest resource development. Although reclamation would be required, natural values would not be replaced. The long-term potential for locatable mineral development is low to moderate. Significant disturbance is not projected for the foreseeable future.

Overall, wilderness values would probably be retained in the short term because development potential is relatively low for the near future. Over the long term, however, surface-disturbing activities would irretrievably impair the naturalness and the opportunities for solitude and primitive unconfined recreation in Tepee Draw WSA. The WSA does not possess outstanding opportunities for primitive or unconfined recreation in and of itself. Therefore, nondesignation would not represent a major loss to the National Wilderness Preservation System.

All Wilderness Alternative. The entire WSA is covered by four post-FLPMA oil and gas leases. These leases would not be developed if development would impair wilderness values. There are no existing mining claims on Tepee Draw WSA and no locatable mineral development would occur under this alternative.

Designation of Tepee Draw WSA as wilderness would maintain the WSA's relatively natural condition and would allow natural ecological processes to continue over the entire WSA. In turn, other resources or resource uses within the WSA would also benefit from designation, such as wildlife, water resources, soils, visual resources, and primitive unconfined recreation.

In conjunction with the Dinosaur National Monument, the Tepee Draw WSA would provide outstanding

opportunities for solitude and primitive unconfined recreation, if designated as wilderness. Designation would also benefit the wilderness values identified within the Monument by limiting or precluding development along the boundary. The area would contribute only slightly toward diversity of ecosystems within the National Wilderness Preservation System.

No Wilderness Alternative. This alternative would provide some protection of wilderness values in the WSA. The wilderness protection stipulation would be dropped from the four existing oil and gas leases which cover the entire WSA. Total surface disturbance would be minimal (25 to 40 acres out of 5,490), but associated roads would dissect the WSA, adversely affecting naturalness. However, given the low potential for oil and gas under this WSA, it is more likely that these four leases would expire undeveloped. Any new leases would stipulate no surface occupancy, which would help maintain the natural character of the WSA, as would constraints on most other resource uses (e.g., woodland development, range, wildlife or other project development, and restrictions on ORV use).

There is a low to moderate long-term potential that locatable minerals underlying the WSA would be developed. Associated surface-disturbing activities would result in an unavoidable loss of naturalness in the long term. Disturbance of the primitive settings and noises from mechanical activities would negate opportunities to experience solitude and primitive and unconfined recreation.

Given the relatively low potential for mineral development in the short term, some long-term protection would be provided to wilderness values under this alternative. However, the net effect of development under the No Wilderness Alternative would be an irretrievable loss of all wilderness values over the long term. Tepee Draw WSA does not possess outstanding opportunities for primitive or unconfined recreation in and of itself. Therefore, nondesignation would not represent a major loss to the National Wilderness Preservation System.

No Action Alternative. Impacts would be the same as the Preferred Alternative.

Minerals

Preferred Alternative. The entire Tepee Draw WSA (5,490 acres) would be open to mineral exploration and development under existing laws. Existing oil and gas leases may be developed in the long-term. There would be at least a moderate potential for location and development of mining claims throughout the entire 5,490 acres of the WSA in the long-term. These would all be major long-term beneficial impacts.

All Wilderness Alternative. Wilderness designation of Tepee Draw WSA would effectively preclude development of the four post-FLPMA oil and gas leases which cover the WSA. Designation would also prevent expiring leases from being offered for lease in the future. This would result in lost rental income and royalty revenues on these leases and would be an irreversible commitment of the resource. Future productivity of this resource would be precluded. (See Appendix F for an estimate of potentially recoverable oil reserves.) Given the low to moderate potential for actual occurrence of oil and gas under Tepee Draw WSA, nondevelopment would not be considered a major adverse impact in the long term.

There are no existing mining claims on Tepee Draw WSA, and none are likely to be staked and proven valid prior to designation. After designation the area would be withdrawn for mineral location, and no additional development of the resource would be allowed. Given the high potential for base/precious metals and low to moderate potential for other locatables, wilderness designation would be a major unavoidable adverse impact to locatable mineral development in the long term. Wilderness designation would be an irreversible and irretrievable commitment of the locatable mineral resource.

No Wilderness Alternative. Development of the four existing post-FLPMA oil and gas leases on Tepee Draw WSA would be allowed. See Appendix F for an estimate of potentially recoverable reserves. Development of the leases would be a beneficial impact.

The low potential for actual occurrence of oil and gas resources under Tepee Draw WSA suggests that the four leases could expire without development. Should this occur, any new leases would be subject to no-surface-occupancy stipulations, which would effectively preclude development. Given the low resource potential, this would be a small adverse impact.

There would be a long-term low to moderate potential for location and development of mining claims within Tepee Draw WSA, which would be a long-term beneficial impact.

No Action Alternative. Impacts to mineral resources under the No Action Alternative would be the same as those described under the Preferred Alternative.

Livestock Grazing

All Alternatives. There are no projects proposed for this area; therefore, no significant impacts would result to livestock grazing under any alternative. See Ant Hills WSA for a further discussion of this rationale.

Soils

Preferred Alternative. Impacts would be the same as the Preferred Alternative, Ant Hills WSA. Increased sediment yields and erosion are anticipated from the potential increases in surface disturbance.

All Wilderness Alternative. Impacts would be the same as the All Wilderness Alternative, Ant Hills WSA. Erosion potentials within the WSA, as well as off-site impacts from wind or water carried material, would be reduced.

No Wilderness Alternative. Impacts would be the same as the No Wilderness Alternative, Ant Hills WSA. There would be some irretrievable loss of soil productivity in the short term.

No Action Alternative. Impacts would be the same as the Preferred Alternative.

Water Resources

Preferred Alternative. Impacts would be the same as the Preferred Alternative, Ant Hills, WSA.

All Wilderness Alternative. Impacts would be the same as the All Wilderness Alternative, Ant Hills WSA.

No Wilderness Alternative. Impacts would be the same as the No Wilderness Alternative, Ant Hills WSA. Increases in sediment concentrations within local surface waters and alteration of alluvial aquifers result from these mineral operations.

No Action Alternative. Impacts would be the same as the Preferred Alternative.

Recreation

Preferred Alternative. The entire Tepee Draw WSA would be open to forest and mineral resource development. Because potential for development is relatively low in the short term, existing ROS settings would remain relatively unchanged for the time being. If surface-disturbing activities increase over the long term, ROS settings would trend toward the more developed settings, which would be an irreversible change as shown in Table 4-23.

All Wilderness Alternative. Primitive types of recreation such as hiking and hunting would continue within the Tepee Draw WSA. Designation of the WSA would provide additional protection for the nonmotorized ROS settings. The semiprimitive nonmotorized class would increase by 9 percent, thus enhancing opportunities for primitive recreation which is decreasing in the region (see Table 4-24).

TABLE 4-23
TEPEE DRAW WSA
CHANGES IN ROS CLASSES
UNDER THE PREFERRED ALTERNATIVE

ROS Classes	Estimated Acreage		Percent of Area	
	Existing	Change	Existing	Change
Primitive	106	0	2	0
Semiprimitive Nonmotorized	4,025	1,000	73	18
Semiprimitive Motorized	1,359	4,040	25	74
Roaded Natural	0	200	0	4
Rural	0	250	0	4

TABLE 4-24
TEPEE DRAW WSA
CHANGES IN ROS CLASSES
UNDER THE ALL WILDERNESS ALTERNATIVE

ROS Classes	Estimated Acreage		Percent of Area	
	Existing	Change	Existing	Change
Primitive	106	106	2	2
Semiprimitive Nonmotorized	4,025	4,525	73	82
Semiprimitive Motorized	1,359	859	25	16

No Wilderness Alternative. The Tepee Draw WSA would be open to oil and gas exploration and development under existing leases; the area would also be open to locatable mineral entry. Given the low potential for mineral development, plus the constraints and stipulations placed on resource developments, improvements, projects, etc., under this alternative, it is anticipated that nonmotorized types of recreation opportunities and associated experiences would remain available in the WSA. The ROS classes would remain the same.

No Action Alternative. Impacts would be the same as the Preferred Alternative.

Economics

Based upon the assumptions presented in the economics section of Common Impacts for all eight WSAs and

Appendix F (assuming development within 20 years with an extraction life of 20 years), a net revenue value of \$4.00 per barrel and a discount rate of 8 3/8 percent, the following impacts could result.

The magnitude of hydrocarbons present could be up to 5,600,000 barrels of recoverable oil. The net present value of this potential resource would be approximately \$893,760.

According to information presented in the Geology and Minerals section of Chapter 3, Tepee Draw WSA has high potential for occurrence of base/precious metals and low to moderate potential for other locatables. Data are not available on amounts actually occurring or their potential economic value.

Preferred Alternative. If the area is not designated wilderness, potential energy and mineral development would be available for development, along with associated

economic potential (see above discussion). The effect on any changes in employment, income, public revenue, and infrastructure is unknown and would vary relative to the potential development.

All Wilderness Alternative. Wilderness designation would essentially preclude long-term mineral exploration and/or development. Therefore, the potential mineral resource would be foregone, along with any associated economic potential. The effect on any changes in employment, income, public revenue, and infrastructure is unknown, but would vary relative to the potential foregone.

No Wilderness Alternative. The economic potential for oil and gas described under the All Wilderness Alternative may still be foregone (see Minerals). Locatable mineral potential would not be foregone. The effect on changes in employment, income, public revenue, and infrastructure is unknown and would vary relative to the amount of actual development. Since the potential for mineral development is low, no significant economic benefits are expected.

No Action Alternative. Impacts would be the same as described under the Preferred Alternative.

VALE OF TEARS

The impacts to air quality, topography, vegetation, forest/woodland resources, paleontology, visual resources, cultural resources, lands and realty, wildlife, and economic assumptions are discussed in the Common Impacts section of Chapter 4. No significant impacts are anticipated for these resources. The Conflict Resolution Alternative and the Combined WSAs Alternative do not apply to the Vale of Tears WSA. Proposed management actions for the various alternatives are presented in Table 2-18 chapter 2.

Wilderness Values

Preferred Alternative. There would be moderate to high potential for oil and gas development, with an estimated seven wells disturbing a total of 35 to 56 acres. There would also be moderate potential for locatable mineral development within the WSA. Some 380 acres of productive-operable woodland would be available for development. A number of range improvement projects are proposed, including 1,300 acres of prescribed burning and reseeding and 500 acres of chemical spraying. Road networks and ORV use would increase.

Surface-disturbing activities would result in the loss of wilderness values over the long term. Naturalness would be lost throughout the WSA. Disturbance of the primitive

settings and noises from mechanical activities would negate opportunities to experience solitude and primitive and unconfined recreation. These losses would be irretrievable.

Vale of Tears WSA does not possess outstanding opportunities for primitive or unconfined recreation in and of itself. Therefore, nondesignation would not represent a major loss to the National Wilderness Preservation System.

All Wilderness Alternative. Two existing pre-FLPMA oil and gas leases occupy 39 percent (2,863 acres) of the WSA. The two leases could be developed without nonimpairment or no-surface-occupancy stipulations. Development would significantly impair wilderness values. Since these leases are scheduled to expire in 1986, it appears unlikely that impairing activities would occur prior to their expiration.

Five post-FLPMA leases cover the remaining 51 percent of the WSA (3,760 acres). These leases would not be developed if development would impair wilderness values.

There is a low potential that prior to designation, valid discoveries would be made on at least some of the 23 existing mining claims located on the extreme northwest corner of the Vale of Tears WSA. Although development of these claims would be subject to the nonimpairment requirements of the Wilderness Management Policy, development of valid claims would cause significant unavoidable adverse impacts to wilderness values. Surface-disturbing activities associated with development would disturb the primitive settings on this small portion of the WSA, and would be visible from other, lower portions of the WSA. Opportunities for solitude would be lessened; naturalness would be impaired over the long term.

Given the low potential for mineral development in the short term, designation of the Vale of Tears WSA would help to maintain the WSA's wilderness values. Designation would maintain the WSA's natural condition and would allow natural ecological processes to continue over most of the WSA. There would be little or no disturbance from human activities. In turn, other resources or resource uses within the WSA would also benefit from designation, including wildlife, water resources, soils, visual resources, and primitive, unconfined recreation.

In conjunction with the Dinosaur National Monument, the Vale of Tears WSA would provide outstanding opportunities for solitude and primitive unconfined recreation, if designated as wilderness. Designation would also benefit the wilderness values identified within the Monument by limiting or precluding development along the boundary. The area would contribute toward diversity of ecosystems within the National Wilderness Preservation System.

No Wilderness Alternative. Constraints on some development activities (e.g., woodland and range development) would help maintain the existing natural character of the WSA. However, surface-disturbing activities related to projected mineral development would have significant adverse impacts on wilderness values in the WSA.

It is not likely that the two pre-FLPMA leases would be developed; they would expire in 1986. Any new leases issued to replace them would carry a no-surface-occupancy stipulation, providing long-term protection from oil/gas-related surface disturbance on 3,660 acres (49 percent of the WSA).

The wilderness protection stipulation would be dropped from the five post-FLPMA oil and gas leases which occupy 3,760 acres (51 percent of the WSA). There is a moderate to high potential that these leases would be developed over the long term. Total surface disturbance would be minimal (15 to 24 acres to develop three wells), but associated roads would dissect the WSA.

There is moderate potential that locatable mineral development would occur within the Vale of Tears WSA in the long term. Such development would cause further loss of naturalness due to surface disturbance and additional road networks.

The net effect of potential development under the No Wilderness Alternative would be an irretrievable loss of all wilderness values in Vale of Tears WSA over the long term. Although reclamation would be required, natural values would not be replaced. Disturbance of the primitive settings and noises from mechanical activities would negate opportunities to experience solitude and primitive, unconfined recreation.

Vale of Tears WSA does not possess outstanding opportunities for primitive or unconfined recreation in and of itself. Therefore, nondesignation would not represent a major loss to the National Wilderness Preservation System.

No Action Alternative. Impacts would be the same as the Preferred Alternative.

Minerals

Preferred Alternative. The entire Vale of Tears WSA (7,420 acres) would be open to mineral exploration and development under existing laws. Because of the high potential for occurrence of base or precious metals in the WSA, there would be at least moderate potential for locatable mineral development in the long term. In addition, there is moderate to high potential for oil and gas development in the long term. Refer to Appendix F for

an estimate of potentially recoverable oil reserves. This alternative is beneficial to mineral resource development.

All Wilderness Alternative. Wilderness designation of Vale of Tears WSA would effectively preclude development of the five post-FLPMA oil and gas leases. Designation would also prevent expiring leases from being offered for lease in the future. This would result in lost rental income and royalty revenues on these leases and would be an irreversible commitment of the resource. Future productivity of this resource would be precluded. (See Appendix F for an estimate of potentially recoverable oil reserves). Given the moderate potential for actual occurrence of oil and gas under Vale of Tears WSA, nondevelopment would be considered a moderate adverse impact in the long term.

The 23 existing mining claims on the northern tip of the Vale of Tears WSA would be developed if valid claims were proven before wilderness designation, which would benefit locatable minerals. After designation the area would be withdrawn from mineral location, and no additional development of the resource would be allowed. Overall, given the high potential for base/precious metals and low to moderate potential for other locatables, wilderness designation would be a moderate to major unavoidable adverse impact to locatable mineral development in the long term. Wilderness designation would be an irreversible and irretrievable commitment of the locatable mineral resource.

No Wilderness Alternative. Development of the five existing post-FLPMA oil and gas leases on Vale of Tears WSA would be allowed. See Appendix F for an estimate of potentially recoverable oil reserves. Development of the leases would be a beneficial impact.

The two pre-FLPMA leases could expire undeveloped. New leases would carry no-surface-occupancy stipulations. Insufficient information is available to determine whether such leases could be developed by directional drilling, but there is some potential that they could not. Given the moderate potential for occurrence of oil and gas under the Vale of Tears WSA, nondevelopment of these leases would be a moderate adverse impact.

Development of all 23 existing mining claims would be possible. There would be at least moderate potential for location and development of additional claims throughout the entire 7,420 acres of the Vale of Tears WSA. These would all be long-term beneficial impacts.

Overall, the No Wilderness Alternative would be moderately beneficial to development of mineral resources within the Vale of Tears WSA.

No Action Alternative. Impacts to mineral development under the No Action Alternative would be the same as those under the Preferred Alternative.

Livestock Grazing

Preferred Alternative. In addition to the Common Impacts discussed earlier in this chapter, livestock operations and proposed projects could continue as planned. This would be a significant benefit to livestock grazing. These projects are detailed in Table 4-25.

All Wilderness Alternative. In addition to the impacts discussed in the Common Impacts section of this Chapter, the following impacts would occur.

Proposed range improvement projects, having the potential of increasing forage production by 225 AUMs, would be prevented under this alternative (see Table 4-26). The projects would involve two of the three allotments affected by the wilderness area. Other projects, which would not directly result in forage increases, would provide a more uniform distribution of livestock within each subject allotment. These proposed projects, consisting of water developments and a division fence, would not necessarily be eliminated as a result of wilderness designation, but development costs of these projects would increase to stay within the specific guidelines associated with a wilderness area. Impacts on existing forage production, as a result of wilderness designation, would be insignificant.

No Wilderness Alternative. All proposed range improvement projects could be developed, as long as they were designed to be compatible with the primary objective of maintaining nonmotorized recreation settings protecting visual resources. The additional costs imposed as a result of these guidelines could curtail or relocate some developments.

As summarized in Table 4-25, these projects would increase the overall carrying capacity of allotment #4306 by 30 AUMs and allotment #4308 by 195 AUMs and they would increase availability of water and improve livestock distribution on both allotments.

No Action Alternative. Significant impacts under the No Action Alternative would be the same as impacts under the Preferred Alternative.

Soils

Preferred Alternative. Under this alternative, maximum surface disturbance would be expected. Increased sediment yields and erosion are anticipated from the increases in surface disturbance.

There is a moderate to high potential that the WSA would be developed for oil and gas. Seven wells would be needed, occupying a total of 35 to 56 acres. This disturbance would cause soil losses of 125 to 400 tons over a five-year period

from the erosion of well pad sites. Additional soil would be lost from the erosion of barren road surfaces. There is also moderate potential for locatable mineral development within the WSA, causing additional soil loss, mainly from construction of road networks. Although reclamation practices would restore soil productivity on the disturbed sites over the long term, the losses in topsoil would lower soil productivity and cause off-site sedimentation of streams in the short term.

One beneficial impact of the Preferred Alternative would be the allowance of more intensive methods of erosion control (such as use of nonnative species, fencing, or fire control methods) in potential problem areas. The proposed range improvements, such as prescribed burns, spraying, reservoir and spring development, and fencing have the potential to improve watershed condition with proper management because these projects would distribute water sources and livestock. The reservoirs would assist in keeping sediment on-site and not impacting off-site resource values.

Overall, more adverse impacts to soil resources would occur under the Preferred and No Action alternatives than under and of the other alternatives. Primarily beneficial impacts would occur under the All Wilderness Alternative.

All Wilderness Alternative. Impacts to soil resources would be the same as under the All Wilderness Alternative, Ant Hills WSA, i.e., increased sediment yields and erosion are anticipated from the potential increases in surface disturbances.

In addition to these, impacts could occur from the development of 23 mining claims at the northern edge of Vale of Tears WSA, although the potential for development would be low. Surface disturbance associated with such development would cause very small, short-term increases in soil erosion; the impact is unlikely to be significant.

There would also be a very low potential for development of the two pre-FLPMA leases covering 39 percent (2,863 acres) of the WSA. Development would disturb 20 to 32 acres (4 wells), causing additional soil losses of 30 to 115 tons over a 5-year period from the erosion of well pad sites. Additional soil would be lost from the erosion of barren road surfaces. Although reclamation practices would restore soil productivity on the disturbed sites over the long term, the losses in topsoil would lower soil productivity and cause off-site sedimentation of streams in the short term. As noted, however, it is more likely that these leases would expire undeveloped; if so, no new leases would be issued on these 2,863 acres which would benefit soil resources.

No Wilderness Alternative. Management of Vale of Tears WSA primarily for nonmotorized recreation would benefit the soil resource. However, nondesignation of wilderness

TABLE 4-25
 VALE OF TEARS WSA
 IMPACTS TO LIVESTOCK MANAGEMENT
 UNDER THE PREFERRED, NO WILDERNESS
 AND NO ACTION ALTERNATIVES

<u>Allotment Number</u>	<u>Proposed Management Action</u>	<u>Affected Resource</u>	<u>Benefit</u>
4306	300 acres of prescribed burning and reseedling	Livestock	30 AUMs
4306	Reservoir development— T. 6 N., R. 99 W., Section 6, NW1/4SE1/4	Livestock	Water availability
4306	Reservoir development— T. 6 N., R. 99 W., Section 5, NE1/4NE1/4	Livestock	distribution
4308	1,000 acres of prescribed burning and reseedling	Livestock	125 AUMs
4308	500 acres of chemical spraying	Livestock	70 AUMs
4308	Spring development, T. 6 N., R. 99 W., section 17, NE1/4	Livestock	Water availability
4308	Spring development, T. 6 N., R. 99 W., section 16, NE1/4NE1/4	Livestock	distribution
4308	Spring development, T. 6 N., R. 99 W., section 14	Livestock	distribution
4308	Reservoir development, T. 6 N., R. 99 W., section 3, NW1/4SW1/4	Livestock	Water availability
4308	Reservoir development, T. 6 N., R. 99 W., section 2, SW1/4SW1/4	Livestock	distribution
4308	Reservoir development, T. 6 N., R. 99 W., section 22, NW1/4	Livestock	distribution
4308	Reservoir development, T. 6 N., R. 99 W., section 9, NE1/4	Livestock	distribution
4308	Division fenceline, located along the eastern boundary of sections 4, 9, and 16	Livestock	distribution

TABLE 4-26
VALE OF TEARS WSA
IMPACT TO LIVESTOCK MANAGEMENT
UNDER THE ALL WILDERNESS ALTERNATIVE

PROJECTS WHICH MAY BE ALLOWED

<u>Allotment Number</u>	<u>Proposed Management Action</u>	<u>Affected Resource</u>	<u>Benefit</u>
4306	Reservoir development T. 6 N., R. 99 W., Section 6, NW1/4SE1/4	Livestock	Water availability
4306	Reservoir development T. 6 N., R. 99 W., Section 5, NE1/4NE1/4	Livestock	distribution
4308	Reservoir development T. 6 N., R. 99 W., Section 3, NW1/4SW1/4	Livestock	Water availability
4308	Reservoir development T. 6 N., R. 99 W., Section 2, SW1/4SW1/4	Livestock	distribution
4308	Reservoir development T. 6 N., R. 99 W., Section 22, NW1/4	Livestock	distribution
4308	Reservoir development, T. 6 N., R. 99 W., Section 9, NE1/4	Livestock	distribution
4308	Spring development, T. 6 N., R. 99 W., Section 17 NE1/4	Livestock	Water availability
4308	Spring development, T. 6 N., R. 99 W., Section 16, NE1/4NE1/4	Livestock	distribution
4308	Spring development, T. 6 N., R. 99 W., Section 14	Livestock	distribution
4308	Division fenceline, located along the eastern boundary of Section 4, 9, and 16	Livestock	distribution

PROJECTS WHICH WOULD NOT BE ALLOWED

<u>Allotment Number</u>	<u>Proposed Management Action</u>	<u>Affected Resource</u>	<u>Loss*</u>
4306	300 acres of prescribed burning and reseeding	Livestock	30 AUMs
4308	1,000 acres of prescribed burning and reseeding	Livestock	125 AUMs
4308	500 acres of chemical spraying	Livestock	70 AUMs

* AUM figures indicate a loss of potential increase due to wilderness management restrictions on planned range management projects. They do not indicate a direct loss of existing AUMs.

would allow some surface disturbing activities (e.g., mineral development) to continue. These activities could adversely impact soil resources, mainly through the construction of road networks.

There is a moderate to high potential that the five post-FLPMA oil and gas leases would be developed. Seven wells would be needed, occupying a total of 35 to 56 acres. This disturbance would cause soil losses of 50 to 170 tons over a five-year period from the erosion of well pad sites. Additional soil would be lost from the erosion of barren road surfaces. There is also moderate potential for locatable mineral development within the WSA, which would cause additional soil loss, mainly from construction of road networks. Although reclamation practices would restore soil productivity on the disturbed sites over the long term, the losses in topsoil would lower soil productivity and cause off-site sedimentation of streams in the short term.

Beneficial impacts would result from closing the area to ORV use and from stipulating no surface occupancy on new oil and gas leases (likely to affect some 797 acres or 10 percent of the WSA). In addition, a wider range of corrective methods for dealing with erosion problems would be allowed under this alternative in comparison to the All Wilderness Alternative. The proposed range improvements, such as prescribed burns, spraying, reservoir and spring development, and fencing, might improve the overall watershed condition because projects would distribute the water sources and livestock more evenly while the reservoirs would keep sediments on-site. Restrictions on woodland development activities would also reduce surface-disturbing activities.

No Action Alternative. Impacts to soil resources would be significant and the same as under the Preferred Alternative, Vale of Tears WSA.

Water Resources

Preferred Alternative. Overall, the Preferred Alternative would not benefit water resources. Development of oil and gas resources would disturb 35 to 56 acres. This would cause stream sediment additions of 125 to 400 tons to Vale of Tears and other intermittent streams over a five-year period. Locatable mineral development would cause some additional increases, mainly from the erosion of road surfaces. The flushing of sediments into perennial streams outside of the WSA would be considered a significant impact. Reclamation of the disturbed sites would mitigate these adverse impacts over the long term.

As with the other WSAs, accidental contamination and interruption of groundwater sources could also occur with

oil and gas activities. Special stipulations may be necessary. However, given the lack of groundwater information for this area, the significance of this potential impact is difficult to assess.

More adverse impacts to water resources would occur under the Preferred and No Action alternatives than under all the other alternatives. Primarily beneficial impacts would occur under the All Wilderness Alternative. Impacts under the No Wilderness Alternative would be mixed.

All Wilderness Alternative. Wilderness designation of Vale of Tears WSA would be beneficial to water resources in and around the WSA. No significant adverse impacts are anticipated, unless the two post-FLPMA leases are developed. Development would cause stream sediment additions of 30 to 115 tons over a five-year period from the erosion of well pad sites. Reclamation of the disturbed sites would mitigate these adverse impacts over the long-term. However, it is very unlikely that these leases would be developed. If they expire in 1986, no new leases would be issued to replace them.

Significant beneficial impacts would result from the elimination of most surface- and subsurface-disturbing activities through wilderness designation. Sediment yield to the intermittent water course would be limited to that contributed by livestock and natural activities. Groundwater sources would remain undisturbed.

No Wilderness Alternative. Management of Vale of Tears WSA for nonmotorized recreation would provide moderate benefits to water resources in and around the WSA. Reduced sediment yields would result from no-surface-occupancy requirements on new oil and gas leases (affecting up to 797 acres), restrictions on woodland development, reduced ORV use, and range improvement projects.

Development of the five post-FLPMA oil and gas leases would cause stream sediment additions of 50 to 170 tons over a five-year period. Locatable mineral development would cause some additional increases. Reclamation of the disturbed sites would mitigate these adverse impacts over the long term.

No Action Alternative. Overall, water resources would not benefit from the No Action Alternative. Impacts to water resources would be the same as under the Preferred Alternative.

Recreation

Preferred Alternative. The entire WSA would be open to mineral, oil and gas, range, and woodland development which would cause a change in the ROS settings from nonmotorized to motorized, as shown in Table 4-27.

TABLE 4-27
**VALE OF TEARS WSA
 CHANGES IN ROS CLASSES
 UNDER THE PREFERRED ALTERNATIVE**

ROS Classes	Estimated Acreage		Percent of Area	
	Existing	Change	Existing	Change
Semiprimitive Nonmotorized	6,095	1,000	82	13
Semiprimitive Motorized	1,325	1,420	18	19
Roaded Natural	0	2,000	0	27
Rural	0	3,000	0	41

The nonmotorized settings would decrease due to extensive vegetation manipulation projects (burning and reseeding, chemical spraying, and development of reservoirs and springs) which would alter the landscape. The most primitive forms of recreation opportunities (i.e., the semiprimitive nonmotorized settings) would be lost in 69 percent of the WSA. This would cause a significant adverse impact to primitive recreation opportunities and associated experiences which are diminishing in the region.

All Wilderness Alternative. Primitive types of recreation, such as hunting and hiking, would benefit and continue within the area. Designation of the WSA would provide additional protection for the existing ROS settings (82 percent semiprimitive nonmotorized; 18 percent semiprimitive motorized). The WSA would be closed to ORV use; closure would have little effect on vehicle use because use is low to nonexistent within the WSA.

No Wilderness Alternative. Under the No Wilderness Alternative, the Vale of Tears WSA would be open to locatable mineral development and oil and gas exploration and development under existing leases. The constraints and stipulations placed on resource development, improvements, projects, etc., would moderately benefit nonmotorized recreation opportunities and associated experiences, at least in the short term. However, mineral development would in the long term cause a change in ROS settings from nonmotorized to motorized, which would be an irreversible trend. In the long term, development would also cause an irretrievable loss of primitive forms of recreation and resulting experiences, mostly in the northern portion of the WSA.

No Action Alternative. Impacts would be the same as the Preferred Alternative.

Economics

Based upon the assumptions presented in the economics section of Common Impacts for all eight WSAs and Appendix F (assuming development within 20 years with an extraction life of 20 years), a net revenue value of \$4.00 per barrel and a discount rate of 8 3/8 percent, the following impacts could result.

The magnitude of hydrocarbons present could be up to 8,600,000 barrels of recoverable oil. The net present value of this potential resource would be approximately \$1,372,560.

According to information presented in the Geology and Minerals section of Chapter 3, Vale of Tears WSA has high potential for occurrence of base/precious metals and low to moderate potential for other locatables. Data are not available on actual amounts occurring or their potential economic value.

Preferred Alternative. If the area is not designated wilderness, potential energy and mineral resources would be available for development, along with associated economic potential (see above discussion). The effect on changes in employment, income, public revenue, and infrastructure is unknown and would vary relative to the amount of actual development.

All Wilderness Alternative. Since there is a low potential that the 23 existing mining claims and existing oil and gas leases would be developed under this alternative, wilderness designation would essentially preclude exploration and/or development on most of the area. Therefore, most of the potential mineral resource would be foregone, along with

CHAPTER 5

CONSULTATION AND COORDINATION

Throughout the course of preparing this Wilderness Technical Supplement, in conjunction with the Little Snake Resource Management Plan, considerable formal and informal efforts have been made to involve the public, other federal agencies, state and local governments, and numerous individuals. Public input, which is required by law, has been sought at various stages of the RMP/Wilderness Technical Supplement process.

PUBLIC PARTICIPATION

The planning process began in July, 1983 with identification of issues and public concerns in conjunction with the Little Snake Resource Management Plan. Public meetings were held for issue identification (scoping) in Denver, Steamboat Springs, and Craig, Colorado, on July 18, 19, and 21, 1983, respectively. Following these, a public comment period extended until early September to allow all interested parties to submit written comments.

A mailing list of individuals, organizations, and government entities was developed so that all interested parties could be kept up to date as the Resource Management Plan and wilderness studies evolved. The primary means of keeping the public informed was through the "Little Snake RMP Report." This newsletter encouraged public participation in the planning process and kept interested parties informed of actions or progress on the plan and wilderness study.

In April, 1984 the planning issues and planning criteria were made available to the public for review. In September, 1984, the preliminary alternatives were developed and again the public was asked to comment. By March, 1985 the Preferred Alternative was developed.

Publication of the Draft Little Snake Resource Management Plan/Environmental Impact Statement and Wilderness Technical Supplement begins another phase of critical public involvement. Hearings will be conducted, and

comments on the draft plan and wilderness study will be considered and incorporated into the Preliminary Final Environmental Impact Statement for Wilderness and Wilderness Study Report.

COORDINATION WITH OTHER BLM OFFICES

The Craig and Vernal BLM Districts have a Memorandum of Understanding to complete wilderness studies for the West Cold Spring and Diamond Breaks WSAs. Colorado and Utah personnel have met throughout the planning process to coordinate the studies. Although Colorado has the lead for completing the studies, the Vernal District has provided analysis of areas under their jurisdiction and conducted reviews as necessary throughout the study process. Formulation of final alternatives and selection of the preferred alternative were handled jointly by the Districts. If a suitable recommendation is made on either WSA, the wilderness study reports and documentation will be used to amend Vernal's Management Framework Plan for the Three Corners Planning Unit. A public hearing for the Draft Resource Management Plan/Environmental Impact Statement will also be held in Vernal, Utah.

CONSISTENCY WITH OTHER PLANS

None of the proposed alternatives would directly conflict with the objectives of other federal, regional, state or local land use plans, policies or controls for the areas involved.

REVIEW OF THE DRAFT

The Draft Resource Management Plan/Environmental Impact Statement for the Little Snake Resource Area, including this Wilderness Technical Supplement, has been mailed to those agencies, organizations, companies, and individuals that have expressed an interest in this planning effort. Table 5-1 contains a partial listing of government agencies that have received this document. Other members of the federal and state congressional delegations, state, county, and local officials, Craig BLM District Advisory Council, Craig BLM District Grazing Advisory Board, media, schools, and libraries, and numerous organizations and individuals have received this document, as well.

RELATIONSHIP TO OTHER DOCUMENTS

This document was prepared within the context of the BLM wilderness inventory, completed in 1980, and various management framework plans. The associated documents are described below and are referenced in the text.

Wilderness Inventory Handbook - September 27, 1978. U.S. Department of the Interior, Bureau of Land Management. This handbook contains the policy, direction, procedures, and guidance for conducting wilderness inventory on the public lands.

Interim Management Policy and Guidelines for Lands Under Wilderness Review - December 12, 1979. U.S. Department of the Interior, Bureau of Land Management. The Interim Management Policy describes the temporary management of wilderness study areas and applies only during the time an area is under wilderness review and until Congress acts on wilderness study areas.

BLM: Initial Wilderness Inventory - Final - August 1979. In this report, public lands administered by BLM which clearly and obviously do not have wilderness characteristics are identified. Existing information, such as maps and aerial photos, and input received from the public were utilized to determine whether areas possessed wilderness characteristics. Three criteria had to be met during this stage for an area to be recommended for intensive inventory. Each area had to be (1) at least 5,000 acres in size or contiguous to a proposed or existing wilderness area, (2) roadless, and (3) substantially free of human imprints.

BLM: Intensive Wilderness Inventory - Proposed Wilderness Study Areas - February 1980. This report documents the intensive inventory. In this stage, field surveys were conducted, and areas were examined for wilderness qualities listed in the Wilderness Act: opportunities for solitude or primitive and unconfined recreation, naturalness, and the presence of supplemental values. Areas having these characteristics were identified as proposed wilderness study areas (WSAs).

BLM: Intensive Wilderness Inventory - Final Wilderness Study Areas - November 1980. This document contains the same information as the Proposed Wilderness Study Areas report and also includes a thorough analysis and evaluation of public comments, along with any changes to the WSA recommendations made as a result of these comments. This document represents the completion of the wilderness inventory.

Wilderness Study Policy - February 3, 1982. Policies, criteria, and guidelines for conducting wilderness studies on public lands are presented.

Wilderness Management Policy - September 1981. This document describes how BLM will manage lands which are designated by Congress as part of the National Wilderness Preservation System.

Vermillion (1973) and Great Divide - Maybell (1976) Management Framework Plans. The management framework plan (MFP) is the land use master plan that identifies the management priorities for public lands. These MFPs will be replaced by the Little Snake RMP.

Little Snake Oil and Gas Umbrella Environmental Assessment (1982). This environmental assessment evaluates probable environmental impacts and provides preventive and mitigative measures to facilitate an orderly and timely system of leasing oil and gas within the Little Snake Resource Area. This environmental assessment will be updated after the Little Snake RMP is completed.

All of the wilderness-related documents listed above are available for review at any BLM office. The MFPs and Oil and Gas Environmental Assessment can be reviewed at the BLM offices in Craig, Colorado.

TABLE 5-1
 GOVERNMENT AGENCIES RECEIVING
 THE WILDERNESS TECHNICAL SUPPLEMENT

Federal Agencies

Advisory Council on Historic Preservation	U.S. Department of Defense
Environmental Protection Agency	U.S. Department of Energy
Federal Highway Administration	U.S. Department of Housing and Urban Development
Small Business Administration	U.S. Department of the Interior
U.S. Air Force	Bureau of Indian Affairs
U.S. Department of Agriculture	Bureau of Mines
Agriculture Stabilization & Conservation Service	Bureau of Reclamation
U.S. Forest Service	Minerals Management Service (Offshore)
Soil Conservation Service	National Park Service
U.S. Department of Commerce	Office of Environmental Project Review -- Regional Environmental Officer
U.S. Department of Defense	
U.S. Department of Energy	
Office of Surface Mining	
U.S. Fish & Wildlife Service	
U.S. Geological Survey	

State Agencies

Colorado Department of Health	Utah Division of Wildlife
Colorado Department of Highways	Utah Office of Planning & Budget (State Clearinghouse)
Colorado Department of Labor & Employment	Utah State Historic Preservation Officer
Colorado Department of Natural Resources	Wyoming State Planning Coordinator's Office
Colorado Division of Wildlife	Wyoming Department of Environmental Quality
Colorado Forest Service	
Colorado Mined Land Reclamation Division	
Colorado State Historic Preservation Office	
Colorado Water Conservation Board	

Local Agencies and Governments

Dagget County Commissioners	Rifle Chamber of Commerce
Lincoln/Uintah Association of Governments	Rio Blanco County Commissioners
Associated Govts. of Northwest CO.	Rio Blanco County Development Department
Moffat County Commissioners	Routt County Commissioners
Moffat County Planning Department	Routt County Regional Planning Department
Northwest Colorado Council of Governments	Uintah Basin Association of Governments
Northern Colorado Water Conservancy District	Uintah County Commissioners

LITTLE SNAKE RESOURCE MANAGEMENT PLAN/ ENVIRONMENTAL IMPACT STATEMENT (RMP/EIS)

BLM's Wilderness Study Policy requires that the wilderness analysis must be WSA specific and that All Wilderness, No Wilderness, and No Action alternatives must be considered. Partial wilderness alternatives may be developed when appropriate to resolve resource conflicts or manageability considerations. The study policy (Quality Standards No. 2 and No. 3) also requires the analysis of impacts on other resources from wilderness designation and the impact of nondesignation on wilderness values.

The Draft RMP/EIS analyzes the cumulative impacts of designating or not designating all, none, or a combination

of WSAs in the resource area through the alternatives. The No Action and Preferred alternatives in this Wilderness Technical Supplement fit into the Current Management and Preferred alternatives respectively, in the Draft RMP/EIS. The other alternatives in this supplement are considered under different alternatives in the draft statement as appropriate (Table 5-2).

From the analysis in this Wilderness Technical Supplement a recommendation for suitability or nonsuitability for wilderness designation was made for each WSA in each alternative. These recommendations are also presented in the Draft RMP/EIS. This supplement should be used in conjunction with the Draft RMP/EIS, which contains more information on the alternatives and the management of the various resource programs. The maps in the Draft RMP/EIS Map Addendum also show the locations of and management priorities for the various resources in each alternative.

TABLE 5-2
COMPARISON OF HOW WILDERNESS ALTERNATIVES RELATE TO RMP ALTERNATIVES

Wilderness Alternatives by HSA	Little Snake RMP Alternatives																			
	Current Management				Energy and Minerals				Commodity Production				Renewable Resources				Natural Environment			
	S ¹	NS ²	S	NS	S	NS	S	NS	S	NS	S	NS	S	NS	S	NS	S	NS		
West Cold Spring																				
All Wilderness	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-		
Conflict Resolution ³	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-		
No Wilderness	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-		
No Action (Preferred)	0	17,682	0	17,682	0	17,682	-	-	-	-	-	-	-	-	-	-	0	17,682		
Diamond Breaks																				
All Wilderness	-	-	0	35,380	-	35,380	0	35,380	0	35,380	0	-	-	-	-	-	-	-		
Conflict Resolution ³	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-		
No Wilderness	-	-	-	-	0	35,380	-	-	-	-	-	-	-	-	-	-	-	-		
No Action	0	35,380	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-		
Preferred	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	36,240	340		
Cross Mountain																				
All Wilderness	-	-	-	-	-	-	14,081	0	14,081	0	14,081	0	-	-	-	-	-	-		
Conflict Resolution ³	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-		
No Wilderness	-	-	0	14,081	-	-	-	-	-	-	-	-	-	-	-	-	-	-		
No Action	0	14,081	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-		
Preferred	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	0	14,081		
Ant Hills																				
All Wilderness	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-		
Conflict Resolution ³	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-		
Combined HSA ³	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-		
No Wilderness	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-		
No Action (preferred)	0	4,354	0	4,354	0	4,354	-	-	-	-	-	-	-	-	-	-	0	4,354		

¹ S = Suitable
² NS = Unsuitable
³ Variations of All Wilderness alternatives analyzed in the Wilderness Technical Supplement but not specifically incorporated into RMP alternatives.

TABLE 5-2 (cont.)
COMPARISON OF HOW WILDERNESS ALTERNATIVES RELATE TO RMP ALTERNATIVES

Wilderness Alternatives by MSA	Little Snake RMP Alternatives														
	Current Management			Energy and Minerals			Commodity Production			Renewable Resources			Natural Environment		
	S ¹	MS ²	NS	S	MS	NS	S	MS	NS	S	MS	NS	S	MS	NS
Chew Winter Camp															
All Wilderness	-	-	-	-	-	-	-	-	-	-	-	1,320	0	-	-
Combined MSAs ³	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
No Wilderness	-	-	-	-	-	-	-	-	-	0	1,320	-	-	-	-
No Action (Preferred)	0	1,320	0	1,320	0	1,320	-	-	-	-	-	-	0	1,320	-
Peterson Draw															
All Wilderness	-	-	-	-	-	-	-	-	-	-	-	5,160	0	-	-
Conflict Resolution ³	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Combined MSAs	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
No Wilderness	-	-	-	-	-	-	-	-	0	5,160	-	-	-	-	-
No Action (Preferred)	0	5,160	0	5,160	0	5,160	-	-	-	-	-	-	0	5,160	-
Tepee Draw															
All Wilderness	-	-	-	-	-	-	-	-	-	-	-	5,490	0	-	-
Conflict Resolution ³	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
No Wilderness	-	-	-	-	-	-	-	-	0	5,490	-	-	-	-	-
No Action (Preferred)	0	5,490	0	5,490	0	5,490	-	-	-	-	-	-	0	5,490	-
Vale of Tears															
All Wilderness	-	-	-	-	-	-	-	-	-	7,420	0	7,420	0	-	-
Conflict Resolution ³	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
No Wilderness	-	-	0	7,420	-	-	-	-	-	-	-	-	-	-	-
No Action (Preferred)	0	7,420	-	-	0	7,240	-	-	-	-	-	-	0	7,420	-
Totals⁴	0	90,887	35,380	55,507	14,081	76,806	56,881	34,006	90,887	0	36,240	55,847	0	36,240	55,847

⁴ Includes acreage for all MSAs including public land in Vernal District (Utah)

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CHAPTER 5

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CHAPTER 5

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APPENDIXES

EXISTING AND POTENTIAL WILDERNESSES WITH THE SAME POTENTIAL NATURAL VEGETATION CLASSIFICATIONS WITHIN 200 MILES OF THE WILDERNESS STUDY AREAS

The existing Wilderness of 200 miles and potential wilderness of 200 miles are shown on maps of the same area. The maps are available from the National Wilderness System, Department of the Interior, Bureau of Land Management, Washington, D.C. 20250. The maps are available for purchase from the National Wilderness System, Department of the Interior, Bureau of Land Management, Washington, D.C. 20250. The maps are available for purchase from the National Wilderness System, Department of the Interior, Bureau of Land Management, Washington, D.C. 20250.

TABLE 1
PAGE 1

EXISTING AND POTENTIAL WILDERNESSES WITH
THE SAME POTENTIAL NATURAL VEGETATION
CLASSIFICATIONS WITHIN 200 MILES
OF THE WILDERNESS STUDY AREAS

EXISTING WILDERNESS	POTENTIAL WILDERNESS	STATE	ACRES	PERCENT
WILDERNESS STUDY AREAS				
14-001	14-001	California	1,000	100
POTENTIAL WILDERNESS				
14-002	14-002	California	1,000	100
14-003	14-003	California	1,000	100
WILDERNESS STUDY AREAS				
14-004	14-004	California	1,000	100
14-005	14-005	California	1,000	100
14-006	14-006	California	1,000	100
14-007	14-007	California	1,000	100
14-008	14-008	California	1,000	100
14-009	14-009	California	1,000	100
14-010	14-010	California	1,000	100
14-011	14-011	California	1,000	100
14-012	14-012	California	1,000	100
14-013	14-013	California	1,000	100
14-014	14-014	California	1,000	100
14-015	14-015	California	1,000	100
14-016	14-016	California	1,000	100
14-017	14-017	California	1,000	100
14-018	14-018	California	1,000	100
14-019	14-019	California	1,000	100
14-020	14-020	California	1,000	100
14-021	14-021	California	1,000	100
14-022	14-022	California	1,000	100
14-023	14-023	California	1,000	100
14-024	14-024	California	1,000	100
14-025	14-025	California	1,000	100
14-026	14-026	California	1,000	100
14-027	14-027	California	1,000	100
14-028	14-028	California	1,000	100
14-029	14-029	California	1,000	100
14-030	14-030	California	1,000	100
14-031	14-031	California	1,000	100
14-032	14-032	California	1,000	100
14-033	14-033	California	1,000	100
14-034	14-034	California	1,000	100
14-035	14-035	California	1,000	100
14-036	14-036	California	1,000	100
14-037	14-037	California	1,000	100
14-038	14-038	California	1,000	100
14-039	14-039	California	1,000	100
14-040	14-040	California	1,000	100
14-041	14-041	California	1,000	100
14-042	14-042	California	1,000	100
14-043	14-043	California	1,000	100
14-044	14-044	California	1,000	100
14-045	14-045	California	1,000	100
14-046	14-046	California	1,000	100
14-047	14-047	California	1,000	100
14-048	14-048	California	1,000	100
14-049	14-049	California	1,000	100
14-050	14-050	California	1,000	100
14-051	14-051	California	1,000	100
14-052	14-052	California	1,000	100
14-053	14-053	California	1,000	100
14-054	14-054	California	1,000	100
14-055	14-055	California	1,000	100
14-056	14-056	California	1,000	100
14-057	14-057	California	1,000	100
14-058	14-058	California	1,000	100
14-059	14-059	California	1,000	100
14-060	14-060	California	1,000	100
14-061	14-061	California	1,000	100
14-062	14-062	California	1,000	100
14-063	14-063	California	1,000	100
14-064	14-064	California	1,000	100
14-065	14-065	California	1,000	100
14-066	14-066	California	1,000	100
14-067	14-067	California	1,000	100
14-068	14-068	California	1,000	100
14-069	14-069	California	1,000	100
14-070	14-070	California	1,000	100
14-071	14-071	California	1,000	100
14-072	14-072	California	1,000	100
14-073	14-073	California	1,000	100
14-074	14-074	California	1,000	100
14-075	14-075	California	1,000	100
14-076	14-076	California	1,000	100
14-077	14-077	California	1,000	100
14-078	14-078	California	1,000	100
14-079	14-079	California	1,000	100
14-080	14-080	California	1,000	100
14-081	14-081	California	1,000	100
14-082	14-082	California	1,000	100
14-083	14-083	California	1,000	100
14-084	14-084	California	1,000	100
14-085	14-085	California	1,000	100
14-086	14-086	California	1,000	100
14-087	14-087	California	1,000	100
14-088	14-088	California	1,000	100
14-089	14-089	California	1,000	100
14-090	14-090	California	1,000	100
14-091	14-091	California	1,000	100
14-092	14-092	California	1,000	100
14-093	14-093	California	1,000	100
14-094	14-094	California	1,000	100
14-095	14-095	California	1,000	100
14-096	14-096	California	1,000	100
14-097	14-097	California	1,000	100
14-098	14-098	California	1,000	100
14-099	14-099	California	1,000	100
14-100	14-100	California	1,000	100

APPENDIX A

EXISTING AND POTENTIAL WILDERNESS WITH THE SAME POTENTIAL NATURAL VEGETATION CLASSIFICATIONS WITHIN 200 MILES OF THE WILDERNESS STUDY AREAS

The regional boundary of 200 air miles approximates a day's drive (5 hours) and encompasses existing or potential wilderness areas which contain similar ecoregion and vegetation types. Tables A-1 through A-4 list designated, endorsed, and other study areas within 200 air miles which are within the same ecoregion and have the same potential natural vegetation types.

APPENDIX A
TABLE A-1

AREAS WITHIN 200 AIR MILES
WITH ECOSYSTEM M3110-21
(ROCKY MOUNTAIN FOREST, JUNIPER-PINYON WOODLAND)

Unit Number	Unit Name	Acres*	State	Agency
STATUTORY WILDERNESS				
NP-003	Blk. Cny. of the Gunnison N.M.	11,180	Colorado	NPS
ADMINISTRATIVELY ENDORSED				
NP-909	Colorado National Monument	13,842	Colorado	NPS
NP-913	Dinosaur National Monument	102,835	Colorado	NPS
OTHER WILDERNESS STUDY AREAS				
CO-010-001	Bull Canyon	5,000	Colorado	BLM
CO-010-002	Willow Creek	6,000	Colorado	BLM
CO-010-003	Skull Creek	8,000	Colorado	BLM
CO-010-007A	Black Mountain	9,932	Colorado	BLM
CO-010-007C	Windy Gulch	12,274	Colorado	BLM
CO-030-286	McKenna Peak	4,380	Colorado	BLM
UT-060-068A	Desolation-Gray Canyon	77,393	Utah	BLM

*Acreage shows Potential Natural Vegetation type only.

APPENDIXES

APPENDIX A
TABLE A-2

AREAS WITHIN 200 AIR MILES
WITH ECOSYSTEM M3110-31
(ROCKY MOUNTAIN FOREST, MOUNTAIN MAHOGANY-OAK SCRUB)

Unit Number	Unit Name	Acres*	State	Agency
STATUTORY WILDERNESS				
NF932	Lone Peak	30,088	Utah	USFS
I4753	Mt. Olympus	16,450	Utah	USFS
04760	Wellsville Mountain	23,850	Utah	USFS
OTHER WILDERNESS STUDY AREAS				
CO-010-046	Oil Spring Mountain	17,740	Colorado	BLM
CO-030-286	McKenna Peak	821	Colorado	BLM
UT-060-100B	Flume Canyon	9,688	Utah	BLM
C2087	Huston Park	1,000	Wyoming	USFS

*Acreage shows Potential Natural Vegetation type only.

APPENDIX A
TABLE A-3

AREAS WITHIN 200 AIR MILES
WITH ECOSYSTEM M3110-49
(ROCKY MOUNTAIN FOREST, SAGEBRUSH STEPPE)

Unit Number	Unit Name	Acres*	State	Agency
STATUTORY WILDERNESS				
-	-	0	-	-
ADMINISTRATIVELY ENDORSED				
NP-913	Dinosaur National Monument	102,836	Colorado	NPS
NP-913	Dinosaur National Monument	13,179	Utah	NPS
OTHER WILDERNESS STUDY AREAS				
CO-010-001	Bull Canyon	6,777	Colorado	BLM
CO-010-002	Willow Creek	7,368	Colorado	BLM
CO-010-003	Skull Creek	5,740	Colorado	BLM

*Acreage shows Potential Natural Vegetation type only.

APPENDIX A

TABLE A-4

AREAS WITHIN 200 AIR MILES
WITH ECOSYSTEM A3140-49
(WYOMING BASIN, SAGEBRUSH STEPPE)

Unit Number	Unit Name	Acres*	State	Agency
STATUTORY WILDERNESS				
-	-	0	-	-
A4901	Bridger Addition	15,948	Wyoming	USFS
OTHER WILDERNESS STUDY AREAS				
WY-030-120	Sweetwater Rocks	5,956	Wyoming	BLM
WY-030-304	Bennett Mountains	5,722	Wyoming	BLM
WY-040-306	Buffalo Hump	10,300	Wyoming	BLM
WY-040-307	Sand Dunes	26,509	Wyoming	BLM
WY-040-311	Alkali Draw	16,990	Wyoming	BLM
WY-040-313	S. Pinnacles	10,800	Wyoming	BLM
WY-040-316/ WY-040-317	Alkali Basin E. Sand Dunes	12,800	Wyoming	BLM
WY-040-324	Oregon Buttes	5,700	Wyoming	BLM
WY-040-401/ WY-040-402	Devils Playground/ Twin Buttes	22,561	Wyoming	BLM
WY-040-406	Red Creek Badlands	8,020	Wyoming	BLM
WY-040-408	Adobe Town	52,710	Wyoming	BLM

*Acreage shows Potential Natural Vegetation type only.

APPENDIX B

EXISTING AND POTENTIAL WILDERNESS WITHIN A DAY'S DRIVE OF THE STANDARD METROPOLITAN STATISTICAL AREAS

The 200-mile regional boundary also approximates the day's drive (5 hours) element of Criterion Number 1. Tables B-1 through B-6 list the areas within 200 air miles of the Standard Metropolitan Statistical Areas in Colorado (Denver-Boulder and Fort Collins) and Utah (Provo-Orem and Salt Lake City-Ogden). The areas listed are within a day's drive of at least one of the population centers above.

APPENDIX B
TABLE B-1

STATUTORY WILDERNESS WITHIN 200 MILES OF COLORADO STANDARD METROPOLITAN STATISTICAL AREAS

Unit Number	Unit Name	Acres	State	Agency
NF021	Eagles Nest	133,915	Colorado	USFS
NF025	Flat Tops	235,230	Colorado	USFS
NF043	La Garita	101,286	Colorado	USFS
NF047	Maroon Bells-Snowmass	174,429	Colorado	USFS
NF057	Mount Zirkel	139,898	Colorado	USFS
NF066	Rawah	73,899	Colorado	USFS
NF088	Weminuche	465,690	Colorado	USFS
NF089	West Elk	176,412	Colorado	USFS
NF096	Hunter-Frying Pan	74,450	Colorado	USFS
NFXXX	Indian Peaks	70,894	Colorado	USFS
A2111	Never Summer	14,100	Colorado	USFS
02118	Cache La Poudre	9,400	Colorado	USFS
A2119	Comanche Peaks	67,500	Colorado	USFS
02120	Neota	10,220	Colorado	USFS
A2145/C2145	Mt. Evans	73,000	Colorado	USFS
A2170	Holy Cross	126,060	Colorado	USFS
H C&G 2180	Collegiate Peaks	159,900	Colorado	USFS
A2181	Raggeds	59,200	Colorado	USFS
02223/ 02228/02359	Big Blue	97,700	Colorado	USFS
02231	Mt. Sneffels	16,200	Colorado	USFS
A2252/B2252	Lost Creek	106,000	Colorado	USFS
02259	Mt. Massive	26,000	Colorado	USFS
A2284	South San Juan	127,721	Colorado	USFS
NF102	Savage Run	15,260	Wyoming	USFS
C2080	Platte River	23,000	Wyoming	USFS
02086	Encampment	10,400	Wyoming	USFS
A2087	Huston Park	31,300	Wyoming	USFS
NP-003	Blk. Cyn. of the Gunnison N.M.	11,180	Colorado	NPS
NP-XXX	Great Sand Dunes N.M.	33,490	Colorado	NPS
Total	29 Areas	2,663,734		

APPENDIX B

APPENDIX B
TABLE B-2

ADMINISTRATIVELY ENDORSED
WILDERNESS STUDY AREAS
WITHIN 200 MILES OF COLORADO
STANDARD METROPOLITAN STATISTICAL AREAS

Unit Number	Unit Name	Acres	State	Agency
NP-925	Rocky Mountain National Park	263,792	Colorado	NPS
NP-913	Dinosaur National Monument	205,671	Colorado	NPS
CO-030-089	Powderhorn	50,140	Colorado	BLM
B2100	Davis Peak	8,100	Colorado	USFS
A2104	Service Creek	39,860	Colorado	USFS
A2177	Service Creek	8,000	Colorado	USFS
02218	Cannibal Plateau	31,990	Colorado	USFS
A2250	Buffalo Peaks	56,900	Colorado	USFS
A2266	Sangre De Cristo	221,000	Colorado	USFS
A2270	Greenhorn Mountain	22,300	Colorado	USFS
A2361	Vasquez Peak/St. Louis Peak	12,800	Colorado	USFS
Total	16 Areas	920,553		

APPENDIX B
TABLE B-3OTHER WILDERNESS STUDY AREAS
WITHIN 200 MILES OF COLORADO
STANDARD METROPOLITAN STATISTICAL AREAS

Unit Number	Unit Name	Acres	State	Agency
CO-010-007A	Black Mountain	9,932	Colorado	BLM
CO-010-007C	Windy Gulch	12,274	Colorado	BLM
CO-010-155	Troublesome	8,250	Colorado	BLM
CO-030-208	Red Cloud Peak	38,400	Colorado	BLM
CO-030-217	American Flats	4,710	Colorado	BLM
CO-030-229B	Needle Creek	4,540	Colorado	BLM
CO-030-230B	Whitehead Gulch	5,560	Colorado	BLM
CO-030-238B	Weminuche Contiguous	1,980	Colorado	BLM
CO-030-241	Handies Peak	18,260	Colorado	BLM
CO-030-353	Camel Back	10,900	Colorado	BLM
CO-030-370B	Adobe Badlands	10,560	Colorado	BLM
CO-030-388	Gunnison Gorge	20,240	Colorado	BLM
CO-050-002	Browns Canyon	6,614	Colorado	BLM
CO-050-013	McIntyre Hills	16,060	Colorado	BLM
CO-050-014	Lower Grape Creek	10,630	Colorado	BLM
CO-050-016	Beaver Creek	26,150	Colorado	BLM
CO-050-017	Upper Grape Creek	9,840	Colorado	BLM
CO-050-141	San Luis Hills	10,240	Colorado	BLM
CO-070-066	Little Bookcliffs Wildhorse Area	26,525	Colorado	BLM
CO-070-150	Dominguez Canyons	75,800	Colorado	BLM
CO-070-392	Eagle Mountain	330	Colorado	BLM
CO-070-425	Hack Lake	3,360	Colorado	BLM
CO-070-430	Bull Gulch	14,364	Colorado	BLM
CO-070-433	Castle Peak	11,940	Colorado	BLM
204	Fossil Ridge	47,400	Colorado	USFS
2-114	Williams Fork	74,770	Colorado	USFS
02181	Oh-Be-Joyful	5,500	Colorado	USFS
02271	Spanish Peaks	19,600	Colorado	USFS
B2284	South San Juan (V-Rock)	32,800	Colorado	USFS

APPENDIXES

APPENDIX B
TABLE B-3

OTHER WILDERNESS STUDY AREAS
WITHIN 200 MILES OF COLORADO
STANDARD METROPOLITAN STATISTICAL AREAS
(continued)

Unit Number	Unit Name	Acres	State	Agency
WY-030-120	Sweetwater Rocks	6,316	Wyoming	BLM
WY-030-122	Sweetwater Rocks	12,749	Wyoming	BLM
WY-030-123A	Sweetwater Rocks	7,041	Wyoming	BLM
WY-030-123B	Sweetwater Rocks	6,429	Wyoming	BLM
WY-030-304	Bennett Mountains	5,722	Wyoming	BLM
WY-030-401/ WY-040-408	Adobe Town	81,871	Wyoming	BLM
WY-030-407	Ferris Mountains	20,495	Wyoming	BLM
WY-040-318	Red Lake	9,515	Wyoming	BLM
Total	37 Areas	687,667		

APPENDIX B
TABLE B-4

STATUTORY WILDERNESS
WITHIN 200 MILES OF UTAH
STANDARD METROPOLITAN STATISTICAL AREAS

Unit Number	Unit Name	Acres	State	Agency
NF038	Jarbidge	64,830	Nevada	USFS
NF008	Bridger	428,000	Wyoming	USFS
NF024	Fitzpatrick	191,103	Wyoming	USFS
NF934/ A2901	Popo Agie	101,991	Wyoming	USFS
C4102/ E4102	Gros Ventre	287,080	Wyoming	USFS
E4610	Jedediah Smith	116,535	Wyoming	USFS
NP-005	Craters of the Moon N.M.	43,243	Idaho	NPS
NF932	Lone Peak	30,088	Utah	USFS
04253	Ashdown Gorge	7,000	Utah	USFS
I4753	Mt. Olympus	16,450	Utah	USFS
04760	Wellsville Mountain	23,850	Utah	USFS
04758	Mt. Naomi	44,350	Utah	USFS
04259	Box-Death Hollow	26,000	Utah	USFS
	High Uintas	460,000	Utah	USFS
Total	14 Areas	1,840,520		

APPENDIX B
TABLE B-5ADMINISTRATIVELY ENDORSED
WILDERNESS STUDY AREAS
WITHIN 200 MILES OF UTAH
STANDARD METROPOLITAN STATISTICAL AREAS

Unit Number	Unit Name	Acres	State	Agency
ID-33-1	Great Rift	355,850	Idaho	BLM
I4179	Worm Creek	15,770	Idaho	USFS
NP-909	Colorado National Monument	13,842	Colorado	NPS
NP-913	Dinosaur National Monument	205,671	Colorado	NPS
NP-900	Arches National Mounument	70,008	Utah	NPS
NP-903	Bryce Canyon National Park	20,810	Utah	NPS
NP-905	Canyonlands National Park	278,420	Utah	NPS
NP-906	Capitol Reef National Monument	183,865	Utah	NPS
NP-908	Cedar Breaks National Monument	4,830	Utah	NPS
NP-913	Dinosaur National Monument	39,537	Utah	NPS
NP-916	Grand Teton National Park	91,105	Wyoming	NPS
Total	11 Areas	1,279,708		

APPENDIXES

APPENDIX B
TABLE B-6

OTHER WILDERNESS STUDY AREAS
WITHIN 200 MILES OF UTAH
STANDARD METROPOLITAN STATISTICAL AREAS

Unit Number	Unit Name	Acres	State	Agency
CO-010-001/ UT-080-419	Bull Canyon	12,297	Colorado/ Utah	BLM
CO-010-002	Willow Creek	13,368	Colorado	BLM
CO-010-003	Skull Creek	13,740	Colorado	BLM
CO-010-007A	Black Mountain	9,932	Colorado	BLM
CO-010-007C	Windy Gulch	12,274	Colorado	BLM
CO-010-046	Oil Spring Mountain	17,740	Colorado	BLM
CO-010-208/ CO-070-009	Demaree Canyon	21,050	Colorado	BLM
CO-070-066	Little Bookcliffs Wildhorse Area	26,525	Colorado	BLM
CO-070-113				
CO-070-113A	Black Ridge Canyons	18,150	Colorado	BLM
UT-060-116/ UT-060-117	Black Ridge Canyons West	54,290	Colorado/ Utah	BLM
CO-070-132	The Palisade	26,050	Colorado	BLM
CO-070-176	Sewem Up Mesa	19,140	Colorado	BLM
NV-010-027	Bluebell	55,665	Nevada	BLM
NV-010-033	Goshute Peak	69,770	Nevada	BLM
NV-010-035	South Pequop	41,090	Nevada	BLM
NV-010-151	Rough Hills	6,685	Nevada	BLM
NV-010-184	Bad Lands	9,426	Nevada	BLM
NV-040-015	Goshute Canyon	30,585	Nevada	BLM
NV-040-169	Mt. Grafton	73,216	Nevada	BLM
NV-040-177	Fortification Range	41,615	Nevada	BLM
NV-040-197	Table Mountain	35,958	Nevada	BLM
NV-040-202/ NV-040-216	White Rock Range	23,625	Nevada	BLM
UT-020-089	North Stansbury Mountains	10,480	Utah	BLM
UT-020-094	Cedar Mountains	50,500	Utah	BLM
UT-040-061	Steep Creek	21,896	Utah	BLM
UT-040-076	Carcass Canyon	46,711	Utah	BLM
UT-040-077	Mud Springs Canyon	38,075	Utah	BLM

APPENDIX B
TABLE B-6OTHER WILDERNESS STUDY AREAS
WITHIN 200 MILES OF UTAH
STANDARD METROPOLITAN STATISTICAL AREAS
(continued)

Unit Number	Unit Name	Acres	State	Agency
UT-040-082	Scorpion	35,884	Utah	BLM
UT-040-268	The Blues	19,030	Utah	BLM
UT-ISA-1	Phipps-Death Hollow	42,731	Utah	BLM
UT-ISA-2	North Escalante/The Gulch	119,300	Utah	BLM
UT-050-020	Deep Creek Mountains	68,910	Utah	BLM
UT-050-035	Conger Mountain	20,400	Utah	BLM
UT-050-061	Swasey Mountains	49,500	Utah	BLM
UT-050-070	King Top	84,770	Utah	BLM
UT-050-073/ UT-040-205	Wah Wah Mountains	42,140	Utah	BLM
UT-050-077	Howell Peak	24,800	Utah	BLM
UT-050-078	Notch Peak	51,130	Utah	BLM
UT-050-127	Fish Springs	52,500	Utah	BLM
UT-050-186	Rockwell	9,150	Utah	BLM
UT-050-236A	Dirty Devil	61,000	Utah	BLM
UT-050-236B	French Spring-Happy Canyon	25,000	Utah	BLM
UT-050-237	Horseshoe Canyon (South)	38,800	Utah	BLM
UT-050-238	Blue Hills-Mt. Ellen	58,480	Utah	BLM
UT-050-241	Fiddler Butte	65,000	Utah	BLM
UT-050-242	Bull Mountain	11,800	Utah	BLM
UT-050-247	Little Rockies	38,700	Utah	BLM
UT-050-248	Mt. Pennell	27,300	Utah	BLM
UT-050-249	Mt. Hiller	20,000	Utah	BLM
UT-060-007	Muddy Creek	31,400	Utah	BLM
UT-060-023	Sids Mountain	80,530	Utah	BLM
UT-060-025	Devils Canyon	9,610	Utah	BLM
UT-060-028A	Crack Canyon	25,315	Utah	BLM
UT-060-029A	San Rafael Reef	55,540	Utah	BLM
UT-060-045/ UT-050-237A	Horseshoe Canyon (North)	20,500	Utah	BLM
UT-060-054	Mexican Mountain	59,600	Utah	BLM
UT-060-067	Turtle Canyon	33,690	Utah	BLM
UT-060-068A	Desolation-Gray Canyon	289,650	Utah	BLM
UT-060-100B	Flume Canyon	50,800	Utah	BLM
UT-060-100C	Spruce Canyon	20,350	Utah	BLM
UT-060-118	Westwater Canyon	31,160	Utah	BLM
UT-060-140A	Behind the Rocks	12,635	Utah	BLM
UT-060-164	Indian Creek	6,870	Utah	BLM

APPENDIXES

APPENDIX B
TABLE B-6

OTHER WILDERNESS STUDY AREAS
WITHIN 200 MILES OF UTAH
STANDARD METROPOLITAN STATISTICAL AREAS
(continued)

Unit Number	Unit Name	Acres	State	Agency
UT-060-167	Bridger Jack Mesa	5,290	Utah	BLM
UT-060-169	Butler Wash	22,030	Utah	BLM
UT-ISA-6	Dark Canyon Complex	68,030	Utah	BLM
WY-030-101	Sweetwater Canyon	9,056	Wyoming	BLM
WY-030-401/				
WY-040-408	Adobe Town	81,871	Wyoming	BLM
WY-040-101	Scab Creek	7,636	Wyoming	BLM
WY-040-110	Lake Mountain	13,865	Wyoming	BLM
WY-040-221	Raymond Mountains	32,936	Wyoming	BLM
WY-040-306	Buffalo Hump	10,300	Wyoming	BLM
WY-040-307	Sand Dunes	26,509	Wyoming	BLM
WY-040-311	Alkali Draw	16,990	Wyoming	BLM
WY-040-313	S. Pinnacles	10,800	Wyoming	BLM
WY-040-316/				
WY-040-317	Alkali Basin E. Sand Dunes	12,800	Wyoming	BLM
WY-040-318	Red Lake	9,515	Wyoming	BLM
WY-040-323	Honeycomb Buttes	40,750	Wyoming	BLM
WY-040-324	Oregon Buttes	5,700	Wyoming	BLM
WY-040-401/	Devils Playground/			
WY-040-402	Twin Buttes	22,561	Wyoming	BLM
WY-040-406	Red Creek Badlands	8,020	Wyoming	BLM
04758	Mount Naomi	28,800	Idaho	USFS
04352	Mt. Moriah	97,205	Nevada	USFS
04359	Wheeler Peak	61,919	Nevada	USFS
04367	Ruby Mountains	55,180	Nevada	USFS
04391	Highland Ridge	76,017	Nevada	USFS
A4372	Jarbidge Addition	31,070	Nevada	USFS
ID-17-11	Jarbridge River	75,340	Idaho	BLM
ID-28-1	Petticoat Peak	11,298	Idaho	BLM
ID-31-14	Appendicitus Hill	21,900	Idaho	BLM
ID-31-17	White Knob Mountains	9,950	Idaho	BLM
ID-32-9	Black Canyon	5,400	Idaho	BLM
ID-33-4	Cedar Butte	35,700	Idaho	BLM
ID-33-15	Hell's Half Acre	66,200	Idaho	BLM
ID-34-2	Table Rock Islands	380	Idaho	BLM
ID-34-3	Pine Creek Islands	155	Idaho	BLM
ID-34-4	Conant Valley Islands	235	Idaho	BLM

APPENDIX B
TABLE B-6OTHER WILDERNESS STUDY AREAS
WITHIN 200 MILES OF UTAH
STANDARD METROPOLITAN STATISTICAL AREAS
(continued)

Unit Number	Unit Name	Acres	State	Agency
ID-35-3	Sand Mountain	21,100	Idaho	BLM
ID-53-5	Friedman Creek	9,773	Idaho	BLM
ID-54-5	Little City of Rocks	5,875	Idaho	BLM
ID-54-6	Black Canyon	10,371	Idaho	BLM
ID-54-8A	Gooding City of Rocks	14,743	Idaho	BLM
ID-54-8B	Gooding City of Rocks	6,287	Idaho	BLM
ID-56-2	Lava	23,680	Idaho	BLM
ID-57-2	Shale Butte	15,968	Idaho	BLM
ID-57-8	Sand Butte	20,792	Idaho	BLM
ID-57-10	Raven's Eye	67,110	Idaho	BLM
ID-57-11	Little Deer	33,531	Idaho	BLM
ID-57-14	Bear Den Butte	9,700	Idaho	BLM
ID-59-7	Shoshone	6,914	Idaho	BLM
W4613	Palisades (West)	111,250	Idaho	USFS
W4613/ E4613	Palisades	135,840	Wyoming	USFS
NP-916	Grand Teton National Park	45,552	Wyoming	USFS NPS
Total	87 Areas	4,013,722		

APPENDIX C

LAND CLASSIFICATION FOR GEM RESOURCES POTENTIAL

After thoroughly reviewing the existing literature and data base sources, MSME/Wallaby personnel plotted all known and documented mineral occurrences, mines, prospects, oil and gas fields, sand and gravel operations, processing facilities, mining claims, mineral leases, and the locations of anomalous geochemical samples from the National Uranium Resource Evaluation-Hydrological and Stream Sediment Reconnaissance-Airborne Radiometric and Magnetic (NURE-HSSR-ARMS) programs. This plotted information and the data bases on each WSA were made available to a multifaceted team of experts which made three successive evaluations of the GEM resource potential of each of the WSAs.

The team or panel of geological experts was comprised of:

Dr. Paul Gilmour: Base and precious metal deposits in western U.S. and Canada, expert on Precambrian mineral resources.

Mr. Ted Eyde: Base and precious metal deposits in western U.S., expert on industrial mineral resources.

Mr. Annan Cook: Base and precious metal deposits in western U.S., expert on porphyry deposits and mine evaluation.

Mr. Edward Heylmun: Oil, gas, and oil shale deposits of western U.S.

Dr. Robert Carpenter: Mineral deposits of Colorado and western U.S., expert on geology of Colorado.

Dr. Donald Gentry: Expert in coal and oil shale deposits of Colorado and western U.S.

Dr. Larry Lepley: Expert in remote sensing and geothermal resources.

Mr. Walter E. Heinrichs: Geophysics and base and precious metal deposits of western U.S., expert on porphyry copper deposits.

As indicated earlier, Dr. Gentry and Dr. Carpenter made certain field investigations as a result of the base data analysis phase. The purpose of the field investigations was to either

verify the existing data or assess relatively unknown areas. Dr. Lepley reviewed all aerial photographs for observable anomalies, which were then investigated by the field team or verified against the existing base data.

The evaluations were then made on the basis of examination of the data bases, field investigations, and the individual experiences of the members of the panel in areas such as base and precious metals, industrial and energy mineral deposits, oil and gas deposits, and geothermal resources. In the course of these evaluations, every attempt was made to objectively rate the potential for a particular commodity within the respective study area. In this effort, the evaluation criteria proposed by the Bureau was rigorously used. In many cases the lack of information did not allow for a full determination of the GEM resource potential and the panel was forced to leave some areas unranked or classified for some commodities. The situation thus arises where there is an area that has been unclassified for a commodity, despite a reported occurrence, because it is next to an area where there is insufficient data to make a meaningful attempt at classification. Nonetheless, each resource has been additionally rated as to what level of confidence the panel of experts attached to the selected classification. This is denoted by the letter associated with each rate classification. Resource rating criteria are defined below.

CLASSIFICATION SCHEME

1. The geologic environment and the inferred geologic processes do not indicate favorability for accumulation of mineral resources.
2. The geologic environment and the inferred geologic processes indicate low favorability for accumulation of mineral resources.
3. The geologic environment, the inferred geologic processes, and the reported mineral occurrences indicate moderate favorability for accumulation of mineral resources.
4. The geologic environment, the inferred geologic processes, the reported mineral occurrences, and the known mines or deposits indicate high favorability for accumulation of mineral resources.

APPENDIXES

LEVEL OF CONFIDENCE SCHEME

- A. The available data are either insufficient and/or cannot be considered as direct evidence to support or refute the possible existence of mineral resources within the respective area.
- B. The available data provide indirect evidence to support or refute the possible existence of mineral resources.
- C. The available data provide direct evidence, but are quantitatively minimal to support or refute the possible existence of mineral resources.

D. The available data provide abundant direct and indirect evidence in support or refute the possible existence of mineral resource.

A further restraint on this classification and delineation effort comes in the area of the lack of subsurface information. Some areas are very well known from past exploration efforts and have an abundance of subsurface information. Other areas are practically unknown due to an absence of any past exploration or development efforts.

For the most part, the WSAs are not well known geologically. For this reason, our expert team had to extrapolate geologic information from adjacent areas to make any sort of reasonable classification with some level of confidence.



United States Department of the Interior

IN REPLY REFER TO
1601/3030
(120)

BUREAU OF LAND MANAGEMENT

CRAIG DISTRICT OFFICE
455 LINCOLN STREET

CRAIG, COLORADO 81625

July 26, 1983

Gentlemen:

The Bureau of Land Management has been criticized in the past for developing land use plans based on inventory information that is either incomplete or inconsistent with information held by other organizations or industry. Although we have several mechanisms available to the public to provide input to our inventory and planning process, the public has often failed to respond because it is unclear what information would be of most value to the BLM. This criticism has come strongly from the energy and minerals industry who generally do not provide specific inventory information, and subsequently question decisions that may exclude mineral exploration or development.

In an effort to better structure industry input into our inventory process, the Rocky Mountain Oil and Gas Association and the Minerals Exploration Coalition have developed an energy and mineral resource rating system. This system is intended to encourage industry to rate a particular tract of land according to the favorability of the geologic environment to contain quantities of mineral and energy resources. The information obtained from industry will then be added to BLM's base inventory for inclusion in the land use planning process. This will assist us in making multiple-use trade-offs to optimize all resource uses in each planning area.

The Little Snake Resource Area of BLM is located in northwest Colorado, primarily in Moffat and Routt counties, with a small portion in Rio Blanco County. Attached is a map showing the land areas involved. The inventory data supplied by industry will be incorporated in the analysis of resource potentials in the Resource Management Plan. This initial input will hopefully act as only a starting point for further industry involvement in the planning process.

The Little Snake Resource Area has been divided into 5 inventory units which have been further subdivided into 3 to 16 tracts to be evaluated for mineral resource potential. A map of the Resource Area has been included in the attached package, showing the location of each of the inventory units. Also included are instructions on completing the mineral resource inventory forms for each tract. The inventory units are numbered 1 through 5, and the tracts within each unit are lettered A, B, C, etc. A rating form is included for each tract, with a map showing the specific location of the tract on the back of the form.

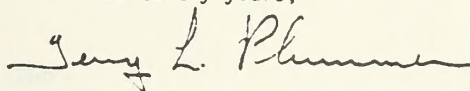
We are asking only that you rate each tract as shown in the instructions. Any more specific information (such as location of a particular deposit within the tract) that you are willing to include would be very helpful. However, please do not submit proprietary information; all information submitted for this mineral resource inventory will be part of the public record. Please return the rating forms by September 15, 1983, to the following address:

Bureau of Land Management
Little Snake Resource Area
P.O. Box 1136
Craig, CO 81626

ATTN: Carol MacDonald

Any questions regarding the mineral rating system or the planning process may be directed to Carol MacDonald or Kermit Witherbee at the address above or at (303) 824-4441. Thank you for your assistance in helping us manage the public lands and resources for everyone.

Sincerely yours,


for Lee Carie
District Manager

A-16a

INSTRUCTIONS

A. One of the attached assessment forms should be completed for each tract for which you have geologic information. There is one form for each tract, with a map showing the location of the tract on the back of the form. The forms for tracts where you have no interest should be left blank.

B. A rating should be assigned to each of the mineral or energy resources listed on the form, based on the tract's favorability to contain that resource. "Favorability" is defined as follows:

Favorability is the potential of a particular geologic environment to contain quantities of mineral and energy resources. Favorability does not consider the feasibility of extraction, the accessibility to the tract, or other factors that might preclude economic development of the resource. Favorability is a rating of the resource based on the (1) adverse, to (2) permissive, to (3) suggestive, to (4) highly suggestive nature of the geologic framework present within and adjacent to an area.

RATINGS

- 1 = lowest measure of favorability: very few geologic characteristics favorable for the accumulation of a given resource are known to be present.
- 2 = low intermediate favorability: some geologic characteristics are present that are favorable for the accumulation of a given resource.
- 3 = high intermediate favorability: a number of geologic characteristics are present that suggest the occurrence of a given resource.
- 4 = highest favorability: many geologic features are present that indicate the occurrence of a given resource.
- U = unknown favorability: this rating will be applied when there are few facts on which to make the evaluation, and the true rating may be 1, 2, 3, or 4.

C. If more specific location information is available, and you are willing to provide us with such information, feel free to identify such information on the tract map.

D. Remarks--indicate any clarifying information about the rating assigned (type of bed, stratification, depth, etc.)

E. Commentary and Summary--any narrative description in support of your ratings should be included here. The more back-up information that is provided to support your rating, the more helpful these ratings will be to us in allocating resources and land uses when the inventory is complete.

F. Geology--include any geologic support data here (age, structures, belts, etc.)

G. Reference/Citation--if any public documents are available for reference in support of the information given, list them here.

H. Rated by--give the name and telephone number of the rater or the person to contact for clarification or follow-up on the data provided. Include a mailing address to insure that you receive information on the progress of the planning process and opportunities for additional public involvement.

APPENDIX D

RECREATION OPPORTUNITY SPECTRUM (ROS) CLASSES

Within each Wilderness Study Area (WSA), different opportunities for primitive and unconfined types of recreation exist. These different opportunities can be recognized and classified according to the types of experiences that can be achieved in a particular setting.

Six broad classes of recreation can be identified on a spectrum or continuum. They are classified according to such factors as remoteness, size, amount of resource alteration, user density and managerial constraints. A WSA may include up to five of these classes, indicated as follows:

- Primitive
- Semi-Primitive (Non-Motorized)
- Semi-Primitive (Motorized)
- Roaded Natural
- Rural

The names of these classes do not imply the presence nor the absence of such things as ways, motorized use, or other resource alterations.

Types of activities available from area to area within each WSA are relatively similar. However, the environmental settings for these activities may vary widely. Recreation opportunity classes describe these differences in setting.

By comparing the relative percentages of each recreation opportunity class that would be included in the various alternatives, effects on potential wilderness users, and on the types of management that could be applied, can be described.

The following table describes each of the six Recreation Opportunity Spectrum classes in terms of (1) experience opportunities, (2) setting opportunities, and (3) activity opportunities. These provide a general overview of the opportunities included in each class. The overview statements do not describe each class in detail but do provide a point of departure from which the planner or manager can develop more precise prescriptions for each class based on specific situations encountered in field operations. The listing of activity opportunities is provided for illustrative purposes. It is not an all-inclusive list of activity opportunities on the public lands.

APPENDIX D
TABLE D-1
RECREATION OPPORTUNITY SPECTRUM CLASS DESCRIPTIONS

Opportunity Class	Experience Opportunity	Setting Opportunity	Activity Opportunity
Primitive	Opportunity for isolation from the sights and sounds of man, to feel a part of the natural environment, to have a high degree of challenge and risk, and to use outdoor skills.	Area is characterized by essentially unmodified natural environment of fairly large size. Concentration of users is very low and evidence of other users is minimal. The area is managed to be essentially free from evidence of man-induced restrictions and controls. Only facilities essential for resource protection are used. No facilities for comfort or convenience of the user are provided. Spacing of groups is informal and dispersed to minimize contacts between groups. Motorized use within the area is not permitted.	Camping, hiking, climbing, enjoying scenery or natural features, nature study, photography, spelunking, hunting (big game, small game, upland birds, waterfowl) ski touring and snowshoeing, swimming, diving (skin and scuba), fishing, canoeing, sailing, and river running (nonmotorized craft).
Semi-Primitive Nonmotorized	Some opportunity for isolation from the sights and sounds of man, but not as important as for primitive opportunities. Opportunity to have high degree of interaction with the natural environment, to have moderate challenge and risk, and to use outdoor skills.	Area is characterized by a predominantly unmodified natural environment of moderate to large size. Concentration of users is low but there is often evidence of other area users present. On-site controls and restrictions may be present but are subtle. Facilities are provided only for the protection of resource values and the safety of users. Formal spacing of groups may be made to disperse use and limit contacts between groups. Motorized use is not permitted.	Camping, hiking, climbing, enjoying scenery or natural features, nature study, photography, spelunking, hunting (big game, small game, upland birds, waterfowl), ski touring and snowshoeing, swimming, diving (skin and scuba), fishing, canoeing, sailing, and river running (nonmotorized craft).
Semi-Primitive Motorized	Some opportunity for isolation from the sights and sounds of man, but not as important as for primitive opportunities. Opportunity to have high	Area is characterized by a predominantly unmodified natural environment of moderate to large size. Concentration of users is low, but	Same as the above, plus the following: off-road vehicle use, four-wheel drive, dune buggy, dirt bike, snowmobile, power boating.

TABLE D-1 (cont'd)
RECREATION OPPORTUNITY SPECTRUM CLASS DESCRIPTIONS

Opportunity Class	Experience Opportunity	Setting Opportunity	Activity Opportunity
	<p>degree of interaction with the natural environment, to have moderate challenge and risk, and to use motorized equipment while in the area.</p>	<p>often there is evidence of other area users present. On-site controls and restrictions may be present but are subtle. Facilities are provided for the protection of resource values and safety of users only. Formal spacing of groups may be made to disperse use and limit contacts between groups. Motorized use is permitted.</p>	
Roaded Natural	<p>About equal opportunities for affiliation with other user groups and for isolation from sights and sounds of man. Opportunity to have a high degree of interaction with the natural environment. Challenge and risk opportunities are not very important except in specific challenging activities. Practice of outdoor skills may be important. Opportunities for both motorized and nonmotorized recreation are present.</p>	<p>Area is characterized by a generally natural environment with moderate evidence of the sights and sounds of man. Resource modification and use practices are evident but harmonize with the natural environment. Concentration of users is low to moderate, with facilities sometimes provided for group activity. On-site controls and restrictions offer a sense of security. Rustic facilities are provided for user convenience as well as for safety and resource protection. Conventional motorized use is provided for in construction standards and design of facilities.</p>	<p>All activities listed previously plus the following: picnicking, rock collecting, wood gathering, auto touring, downhill skiing, snowplay, ice skating, water skiing and other water sports, hang gliding, interpretive use, rustic resorts, and organized camps.</p>
Rural	<p>Opportunities to experience affiliation with individuals and groups are prevalent, as is the convenience of sites and opportunities. These factors are generally more important than the natural setting.</p>	<p>Area is characterized by substantially modified natural environment. Resource modification and use practices are obvious. Signs and sounds of man are readily evident and the concentration of users is often moderate to high.</p>	<p>All activities used previously plus the following: competitive games, spectator sports, bicycling, jogging, outdoor concerts, and modern resorts.</p>

TABLE D-1 (cont'd)
RECREATION OPPORTUNITY SPECTRUM CLASS DESCRIPTIONS

Opportunity Class	Experience Opportunity	Setting Opportunity	Activity Opportunity
	<p>Opportunities exist for wildland challenges. Risk taking and testing of outdoor skills are unimportant, except in those activities involving challenge and risk.</p>	<p>A considerable number of facilities are often provided for specific activities. Developed sites, roads, and trails are designed for moderate to high use. Moderate densities are provided far away from developed sites. Facilities for intensive motorized use are available.</p>	
Modern Urban	<p>Opportunities to experience affiliation with individuals and groups are prevalent, as is the convenience of sites and opportunities. Experiencing the natural environment and the use of outdoor skills are largely unimportant.</p>	<p>Area is characterized by a highly modified natural environment, although the background may have natural elements. Vegetation is often exotic and manicured. Soil may be protected by surfacing. Sights and sounds of man-on-site predominate. Large numbers of users can be expected. Modern facilities are provided for the use and convenience of a large number of people. Controls and restrictions are obvious and numerous. Facilities for high intensity motor use and parking are present, with forms of mass transit often available.</p>	<p>All activities listed previously.</p>

APPENDIX E

VISUAL RESOURCE MANAGEMENT (VRM) CLASSES

VRM CLASSIFICATION PROCESS

Four steps are required in the visual resource management classification process. These are (1) evaluation of scenic quality, (2) analysis of visual sensitivity levels, (3) determination of distance zones, and (4) assigning visual resource management classes based upon the first three steps.

Scenic Quality

Scenic quality is a measure of the visual appeal of the land. Areas are delineated and rated either A, B, or C, based on seven factors: land form, vegetation, water, color, adjacent scenery, scarcity, and human modifications. Areas with the most variety have the greatest scenic value.

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, using two sensitivity criteria: (1) use volume (both vehicular and pedestrian) and (2) expressed user attitudes toward change. These criteria are evaluated using a matrix, and a final sensitivity rating of high, medium, or low is given.

Distance Zones

Distance zones specify the distance between the observer and the observed area. They are outlined on topographic maps and show three areas: (1) foreground/midground, (2) background, and (3) seldom seen. The foreground/midground zone is a distance of 0 to 5 miles away, where activities can be viewed in detail. The background comprises the remaining area up to 15 miles in distance, and seldom seen includes those areas beyond 15 miles or not seen at all from any travel corridor.

Visual Resource Management Classes

After classification as to scenic quality, visual sensitivity, and distance zones, areas are assigned to one of four management classes, which are designed to maintain or enhance visual quality and describe the different degrees of modification allowed for the basic elements of the landscape. Class I is assigned to special areas where a decision has been made to retain a naturalistic landscape. Classes II, III, and IV are initially assigned based on scenic quality, sensitivity level, and distance zone classifications. Each class has an objective which prescribes a level of acceptable change to the characteristic landscape from a visual resources standpoint.

OBJECTIVES FOR VRM CLASSES

Class I Objective

The objective of VRM Class I is to preserve the existing character of the landscape. Only Congressionally authorized areas or areas approved through the land use planning process where the goal is to provide a landscape setting that appears unaltered by human activities should be placed in this class. The level of change to the characteristic landscape should be extremely low because only very limited development such as hiking trails should occur in these areas.

Class II Objective

The objective of VRM Class II is to retain the existing character of the landscape. The level of change to the characteristic landscape should be low. Management activities may be seen but should not attract the attention of the casual observer. Any changes must repeat the basic elements of form, line, color, and texture found in the predominant features of the characteristic landscape.

Class III Objective

The objective of VRM Class III is to partially retain the existing character of the landscape. The level of change to the characteristic landscape should be moderate. Management activities may attract attention but should not dominate the view of the casual observer. Changes should repeat the basic elements found in the predominant features of the characteristic landscape.

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Class IV Objective

The objective of VRM Class IV is to allow for management activities which require major modification of the existing character of the landscape. Contrasts may attract attention and be a dominant feature in the landscape in terms of scale. However, the changes should repeat the basic elements of the landscape.

APPENDIX F

MINERALS - ASSUMPTIONS AND ANALYSIS GUIDELINES

General

1. Estimated potential for occurrence and development of minerals within each WSA is based on best available data. Mineral potential of all areas recommended for wilderness designation will be further inventoried and analyzed by the U.S. Geological Survey/Bureau of Mines. The inventory results will accompany the recommendations when they are forwarded to the President and the Congress.
2. Nonimpairing mineral exploration may be conducted in a designated wilderness area.
3. Minerals may not be leased after designation.
4. No permits for common variety minerals (sand and gravel) will be issued after designation.
5. None of the public lands within any WSA would be acceptable for further consideration for coal leasing under any alternative.

Locatable Minerals

1. Locatable mineral exploration and development in WSAs which are not designated wilderness would be in accordance with 43 CFR 3809, Surface Management of Public Lands under U.S. Mining Laws. Exploration and development in areas designated as wilderness would be in accordance with 43 CFR 3809 and BLM's Wilderness Management Policy. Before surface disturbance may begin on a valid mining claim, a mining plan of operation must be submitted to and approved by BLM.
2. Valid existing claims can be mined within a designated wilderness area as long as there is no unnecessary or undue degradation. All existing claims on the date of wilderness designation must be proven valid; enough ore must be present that a prudent person would be willing to invest time and money to develop a paying mine.

3. If a WSA is designated as wilderness, no new mining claims could be filed or developed.
4. For purposes of impact analysis it was assumed that:
 - a. Mining claims currently within WSAs would be developed under any alternative (potential for development is discussed under each WSA).
 - b. No new mining claims would be filed within a WSA before designation/nondesignation.
 - c. If a WSA is not designated as wilderness, mining claims could be staked and developed anywhere in the WSA over the long term (potential for development is discussed under each WSA).

Oil And Gas Resources

1. No new leases would be issued on WSAs prior to designation/nondesignation (i.e., portions of WSAs not currently leased or where leases have expired, would not be leased before a decision is made on designation/nondesignation).
2. Similarly, "pending leases" would not be issued or reissued prior to designation/nondesignation (i.e., those acreages would also remain unleased).
3. No new leases would be issued in a designated wilderness area.
4. WSAs not designated wilderness could be fully leased and developed.
5. There is a low potential that pre-FLPMA leases would be developed under any alternative (only Cross Mountain and Vale of Tears WSAs have pre-FLPMA leases).
6. Post-FLPMA leases would not be developed (1) under the All Wilderness Alternative, (2) where applicable under the Conflict Resolution or Combined WSAs alternatives, or (3) for Diamond Breaks WSA under the Preferred Alternative.
7. Post-FLPMA leases would be developed under the No Wilderness, No Action, and (except for Diamond Breaks WSA) Preferred alternatives.
8. Currently unleased areas would not be leased or developed (1) under the All Wilderness Alternative, (2) where applicable under the Conflict Resolution or Combined WSAs alternatives, or (3) for Diamond Breaks WSA under the Preferred Alternative.

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9. Currently unleased areas would be leased and developed under the No Action and (except for Cross Mountain and Diamond Breaks WSAs) Preferred alternatives.
10. Unleased areas would be leased with no-surface-occupancy stipulations under the No Wilderness Alternative and (for Cross Mountain WSA) Preferred Alternative.
11. Reclamation would recover about 50 percent of all of the disturbance area within five years of the disturbance. The average surface disturbance for one well pad is 5 to 8 acres. Abandoned well pads would be totally reclaimed within five years of the disturbance. It should be noted that reclamation refers to a general reshaping of the surface, soil erosion stabilization, and reestablishment of vegetation. Reclamation would probably not be able to return the disturbed area to a natural appearance (as a wilderness value), at least within the short term.
12. The Little Snake Resource Area, while not a new petroleum producing area, is an area where comparatively few wells have been drilled. Outside of existing producing fields, the well density is extremely low. As a result, data are sparse. Predictions of new field occurrence, field size, and development intensity are, of necessity, based on geologic inference and a knowledge of oil field operating practices.

Each WSA has been classified as having high, moderate, or low potential on the Geology, Energy, Minerals/Rocky Mountain Oil and Gas Association (GEMs/RMOGA) mineral resource potential scheme (Chapter 3). Certain geologic and engineering parameters have been assumed in preparing resource estimates for each WSA. For purposes of this document, it is assumed that 20 percent of the areal extent of WSAs classified as high potential may be productive. For WSAs classified as having moderate to low potential, it is assumed that 15 percent of the areal extent of the WSA may be productive.

In determining impacts from oil and gas development, it is important that the mechanism of oil and gas exploration be understood. It is highly unlikely that leases existing in the WSAs would be developed individually. It is much more common that leases be grouped into blocks by either brokering or the formation of exploratory units. This practice allows prospects of economic size to be drilled. While the exact configuration (location) of each prospect is impossible to predict, by assuming an average size of approximately 5,000 acres per prospect, it is possible to predict the number of exploratory wells necessary to evaluate theoretical oil and/or gas resources within each WSA. If it is further assumed that each of the WSAs contains one oil and/or

gas field, then certain assumptions and attendant conclusions can be made regarding impacts to surface resources.

The estimates are the result of quite simplistic attempts to develop a model for each WSA which is consistent with available geological and geophysical information, synthesized in the context of analogies worldwide, based on the technical experience and knowledge of the estimators, two geologists and one petroleum engineer. These following estimates (assumptions) certainly represent no more than extremely generalized efforts to derive some appreciation of the possible magnitude of resources which could be present at depth below each WSA.

The estimators are well aware of the limitations of the available data base, the shortcomings of the numerous assumptions involved, and the pitfalls attendant to any sort of "resource appraisal" such as this. Any of these assumptions may well be grossly incorrect, in a given instance, because the level of confidence attainable in these scenarios is not great. The estimates may be grossly in error, but represent syntheses of available data, together with technical judgements which are subjective as well. The sole intent was to furnish some guidelines, however crude, for planning and impact analysis purposes.

Below are three additional oil and gas assumptions common to all of the WSAs. Following these are listings of assumptions specific to each WSA, as well as implications that facilitate impact analysis.

1. It is assumed that there are no subsurface structural or stratigraphic complexities below the Precambrian Uinta Mountain Group overthrust material.
2. The sedimentary rock sequence, to total depth within the WSA in question, is assumed to be essentially similar to known or inferred stratigraphic sequences elsewhere near the WSAs.
3. Geologic history, source rocks, reservoir rocks, thermal regimen, sealing, and trapping are assumed to all be appropriate for hydrocarbon migration, accumulation, and preservation in the sedimentary rocks at depth below the WSAs.

West Cold Spring WSA

1. The WSA (17,682 acres) is underlain by a low angle thrust-faulted sheet of Precambrian Uinta Mountain Group rocks, presently exposed at the surface, which in turn are underlain by younger sedimentary rock, which are prospectively valuable for hydrocarbon accumulations.

2. The thrust sheet is uniformly 5,000 feet thick across the WSA.
3. The estimated percentage of the area within the WSA below which oil and/or gas are likely to exist is 20 percent.
4. Based on the total depths of nearby wells, additional new wells would target depths to 20,000 feet within the WSA.
5. A sequence of prospectively valuable sedimentary rocks underlies the thrust plate, and is 15,000 feet thick in total.
6. Ten percent of this sedimentary rock section consists of potential hydrocarbon reservoir horizons.
7. The "average" porosity of these reservoir rocks is 10 percent.
8. The water saturation of the pores is 50 percent.
9. The net result yields an estimate of the volume of pore space potentially occupied by hydrocarbons (oil and/or gas) to a depth of 20,000 feet, below the area of the WSA = 11.6×10^9 cubic feet = 2.1×10^9 bbls.

This represents an estimated possible amount of hydrocarbons in place, subject to the general and specific assumptions.

The pore-space volumes estimated above in assumption #9 represent subsurface space in rock which might be occupied by oil and/or gas. Continuing with this volume of pore-space theory, it might be assumed, as a method of applying a probability of oil or gas occurring within the WSA, that 20 percent of this space might be associated with such hydrocarbon resources. This would be equivalent to 420×10^6 barrels in place. Conventional primary, secondary, and tertiary recovery methods generally result in recovery rates of no more than 32 percent for oil. Thus, recoverable oil reserves might be on the order of 134×10^6 barrels, given that all of the above assumptions for West Cold Spring WSA are correct. Recovery of gas is a function of reservoir pressures and a sufficient number of wells to actually contact the gas.

The estimated geologic potential for oil and gas resources to exist within the WSA is high. On this basis, together with the above estimate, it could be anticipated that development interest would be high, within the next twenty years, in the area, should such activities be permitted. This level of activity would require approximately 3 exploratory wells, with total field development requiring an estimated 22 wells.

Diamond Breaks WSA

1. The WSA (35,380 acres) is underlain by a low angle thrust-faulted sheet of Precambrian Uinta Mountain Group rocks, presently exposed at the surface, which in turn are underlain by younger sedimentary rocks which are prospectively valuable for hydrocarbon accumulations.
2. The thrust sheet is uniformly 6,000 feet thick over the WSA.
3. The estimated percentage of the area within the WSA below which oil and/or gas are likely to exist is 15 percent.
4. Based on sparse available data, the subthrust sedimentary rock sequence of prospective value for hydrocarbons totals 10,000 feet in thickness.
5. Total depths of 16,000 feet are feasible objectives for drilling in the area.
6. Ten percent of the sedimentary rock sequence consists of potential reservoir horizons.
7. The "average" porosity of these reservoir rocks is 10 percent.
8. The water saturation of the pores is 50 percent.
9. The net result yields an estimate of the volume of pore space potentially occupied by hydrocarbons, at a depth of 16,000 feet, below the area of the WSA = 11.4×10^9 cubic feet = 2.0×10^9 bbls.

This represents an estimated possible amount of hydrocarbons in place, subject to the general and specific assumptions.

The pore-space volumes estimated above in assumption #9 represent subsurface space in rock which might be occupied by oil and/or gas. Continuing with this volume of pore-space theory, it might be assumed, as a method of applying a probability of oil or gas occurring within this WSA, that 5 percent of this space might be associated with such hydrocarbon resources. This would be equivalent to 100×10^6 barrels in place. Conventional primary, secondary, and tertiary recovery methods generally result in recovery rates of no more than 32 percent for oil. Thus, recoverable oil reserves might be on the order of 32×10^6 barrels, given that all of the above assumptions for Diamond Breaks WSA are correct. Recovery of gas is a function of reservoir pressures and a sufficient number of wells to actually contact the gas.

The estimated geologic potential for oil and gas resources to exist within the WSA is moderate. On this basis, together with the above estimate, it could be anticipated that

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development interest would be moderate within the next twenty years in the area, should such activities be permitted. This level of activity would require approximately 7 exploratory wells, with total field development requiring an estimated 33 wells.

Cross Mountain WSA

Two scenarios are proposed.

Scenario I:

1. The WSA (14,081 acres) is underlain by a low angle thrust sheet of Precambrian Uinta Mountain Group rocks, presently exposed at the surface, which in turn are underlain by younger sedimentary rocks which are prospectively valuable for hydrocarbon accumulations.
2. This thrust sheet, with associated superjacent Paleozoic rocks, averages a total thickness of 2,000 feet across the WSA.
3. The estimated percentage of the area within the WSA below which oil and/or gas are likely to exist is 15 percent.
4. The sedimentary rock sequence below the overthrust sheet, prospectively valuable for hydrocarbon accumulation (Mesa Verde through Madison to Lodore Formations), total 15,000 feet in thickness.
5. Total depths of 17,000 feet are reasonable drilling objectives in the area.
6. Ten percent of this sedimentary rock sequence consists of potential hydrocarbon reservoir horizons.
7. The "average" porosity of these reservoir rocks is 10 percent.
8. The water saturation of the pores is 50 percent.
9. The net result yields an estimate of the volume of pore space potentially occupied by hydrocarbons, to a depth of 17,000 feet, below the area of the WSA = 6.9×10^9 cubic feet = 1.3×10^9 bbls.

This represents an estimated possible amount of hydrocarbons in place, subject to the general and specific assumptions.

The pore-space volumes estimated above in assumption #9 represent subsurface space in rock which might be occupied by oil and/or gas. Continuing with this volume of pore-space theory, it might be assumed, as a method of applying a probability of oil or gas occurring within this WSA, that 10 percent of this space might be associated with such hydrocarbon resources. This would be equivalent to 130×10^6 barrels in place. Conventional primary,

secondary, and tertiary recovery methods generally result in recovery rates of no more than 32 percent for oil. Thus, recoverable oil reserves might be on the order of 41.6×10^6 barrels, given that all of the above assumptions for Cross Mountain WSA are correct. Recovery of gas is a function of reservoir pressures and a sufficient number of wells to actually contact the gas.

Scenario II:

1. A portion of the area below the WSA, persisting below feasible drilling depths, is underlain by Precambrian rocks not favorable for the accumulation of hydrocarbons.
2. Those portions of the WSA beneath which hydrocarbon accumulations are more likely to occur are along the periphery of the WSA, and include portions totaling 40 percent of the total area of the WSA, i.e., some 5,632 acres. The estimated percent of this area below which oil and/or gas are likely to exist is 15.
3. These 5,632 acres represent "structural overhang" of foreland thrust faulting, beneath which sedimentary rocks prospectively valuable for hydrocarbon accumulations could exist.
4. Overthrust plate areas average 1,000 feet thick, within this peripheral 5,632 acres of the WSA.
5. Prospectively valuable sedimentary rocks beneath total 15,000 feet in thickness.
6. Total depths of 16,000 feet are feasible drilling objectives in the area.
7. Ten percent of this sedimentary rock sequence consists of potential reservoir rocks.
8. The "average" porosity of these reservoir rocks is 10 percent.
9. The water saturation of the pores is 50 percent.
10. The net result yields an estimate of the volume of pore space potentially occupied by hydrocarbons, to a depth of 16,000 feet below the area of the WSA = 2.8×10^9 cubic feet = 491.5×10^6 bbls.

This represents an estimated total amount of hydrocarbons in place, subject to the general and specific assumptions.

The pore-space volumes estimated above in assumption #10 represent subsurface space in rock which might be occupied by oil and/or gas. Continuing with this volume of pore-space theory, it might be assumed, as a method of applying a probability of oil or gas occurring within the WSA, that 10 percent of this space might be associated with such hydrocarbon resources. This would be equivalent to 49.2×10^6 barrels in place. Conventional primary,

secondary, and tertiary recovery methods generally result in recovery rates of no more than 32 percent for oil. Thus, recoverable oil reserves might be on the order of 15.7×10^6 barrels, given that all of the above assumptions for Cross Mountain WSA are correct. Recovery of gas is a function of reservoir pressures and a sufficient number of wells to actually contact the gas.

The estimated geologic potential for oil and gas resources to exist within this WSA is moderate to high. On this basis, together with the larger of the above estimates, it could be anticipated the development interest would be moderate to high within the next twenty years in the area, should such activities be permitted. This level of activity would require approximately 3 exploratory wells, with full field development requiring an estimated 13 wells.

Ant Hills WSA

1. This WSA (4,354 acres) is underlain by a low angle thrust sheet of Precambrian Uinta Mountain Group rocks presently exposed at the surface or covered by a relatively thin veneer (about 1,000 feet) of Paleozoic sedimentary rocks. This thrust-faulted sheet is underlain by younger (Mesozoic and Paleozoic) sedimentary rocks which are prospectively valuable for hydrocarbon accumulations.
2. The thrust sheet is uniformly 7,000 feet thick across the WSA, and contains 1,000 feet of prospectively valuable sedimentary rocks.
3. Based on sparse available data, the subthrust sedimentary rock sequence of prospective value for hydrocarbons totals 10,000 feet in thickness.
4. Total depths of 17,000 feet are feasible objectives for drilling in the area.
5. The estimated percentage of the area within the WSA below which oil and/or gas are likely to exist is 15 percent.
6. Ten percent of the sedimentary rock sequence consists of potential reservoir horizons.
7. The average porosity of these reservoir rocks is 10 percent.
8. The water saturation of the pores is 50 percent.
9. The net result yields an estimate of the volume of pore space potentially occupied by hydrocarbons, to a depth of 17,000 feet below the area of the WSA = 1.6×10^9 cubic feet = 278.7×10^6 bbls.

This represents an estimated possible amount of hydrocarbons in place, subject to the general and specific assumptions.

The pore-space volumes estimated above in assumption #9 represent subsurface space in rock which might be occupied by oil and/or gas. Continuing with this volume of pore-space theory, it might be assumed, as a method of applying a probability of oil or gas occurring within the WSA, that 5 percent of this space might be associated with such hydrocarbon resources. This would be equivalent to 14.4×10^6 barrels in place. Conventional primary, secondary, and tertiary recovery methods generally result in recovery rates of no more than 32 percent for oil. Thus, recoverable oil reserves might be on the order of 4.6×10^6 barrels, given that all of the above assumptions for Ant Hills WSA are correct. Recovery of gas is a function of reservoir pressures and a sufficient number of wells to actually contact the gas.

The estimated geologic potential for oil and gas resources to exist within this WSA is low to moderate. On this basis, together with the above estimate, it would be anticipated that development interest would be low to moderate, within the next twenty years in the area should such activities be permitted. This level of activity would require one exploring well, with full field development requiring an estimated four wells.

Chew Winter Camp WSA

1. The WSA (1,320 acres) is underlain by a low angle thrust sheet of Precambrian Uinta Mountain Group rocks presently exposed at the surface or covered by a relatively thin veneer (about 1,000 feet) of Paleozoic sedimentary rocks. This thrust-faulted sheet is underlain by younger (Mesozoic and Paleozoic) sedimentary rocks which are prospectively valuable for hydrocarbon accumulations.
2. The thrust sheet is uniformly 7,000 feet thick across the WSA, and contains 1,000 feet of prospectively valuable sedimentary rock.
3. Based on sparse available data, the subthrust sedimentary rock sequence of prospective value for hydrocarbons totals 10,000 feet in thickness.
4. Total depths of 17,000 feet are feasible objectives for drilling in the area.
5. The estimated percentage of the area within the WSA below which oil and/or gas are likely to exist is 15 percent.
6. Ten percent of the sedimentary rock sequence consists of potential reservoir horizons.
7. The "average" porosity of these reservoir rocks is 10 percent.
8. The water saturation of the pores is 50 percent.

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9. The net result yields an estimate of the volume of pore space potentially occupied by hydrocarbons, to a depth of 17,000 feet below the area of the WSA = 474.4×10^6 cubic feet = 84.5×10^6 bbls.

This represents an estimated possible amount of hydrocarbons in place, subject to the general and specific assumptions.

The pore-space volumes estimated above in assumption #9 represent subsurface space in rock which might be occupied by oil and/or gas. Continuing with this volume of pore-space theory, it might be assumed, as a method of applying a probability of oil or gas occurring within the WSA, that 5 percent of this space might be associated with such hydrocarbon resources. This would be equivalent to 4.2×10^6 barrels in place. Conventional primary, secondary, and tertiary recovery methods generally result in recovery rates of no more than 32 percent for oil. Thus, recoverable oil reserves might be on the order of 1.4×10^6 barrels, given that all of the above assumptions for Chew Winter Camp WSA are correct. Recovery of gas is a function of reservoir pressures and a sufficient number of wells to actually contact the gas.

The estimated geologic potential for oil and gas resources to exist within this WSA is low to moderate. On this basis, together with the above estimate, it could be anticipated that development interest would be low to moderate, within the next twenty years in the area, should such activities be permitted. This level of activity would require one exploratory and development well.

Peterson Draw WSA

1. The WSA (5,160 acres) is underlain by a low angle thrust sheet of Precambrian Uinta Mountain Group rocks presently exposed at the surface or covered by a relatively thin veneer (about 1,000 feet) of Paleozoic sedimentary rocks. This thrust-faulted sheet is underlain by younger (Mesozoic and Paleozoic) sedimentary rocks which are prospectively valuable for hydrocarbon accumulations.
2. The thrust sheet is uniformly 7,000 feet thick across the WSA, and contains 1,000 feet of prospectively valuable sedimentary rocks.
3. Based on sparse available data, the subthrust sedimentary rock sequence of prospective value for hydrocarbons totals 10,000 feet in thickness.
4. Total depths of 17,000 feet are feasible objectives for drilling in the area.
5. The estimated percentage of the area within the WSA

below which oil and/or gas are likely to exist is 15 percent.

6. Ten percent of the sedimentary rock sequence consists of potential reservoir horizons.
7. The "average" porosity of these reservoir rocks is 10 percent.
8. The water saturation of the pores is 50 percent.
9. The net result yields an estimate of the volume of pore space potentially occupied by hydrocarbons, to a depth of 17,000 feet below the area of the WSA = 1.9×10^9 cubic feet = 330.2×10^6 bbls.

This represents an estimated possible amount of hydrocarbons in place, subject to the general and specific assumptions.

The pore-space volumes estimated above in assumption #9 represent subsurface space in rock which might be occupied by oil and/or gas. Continuing with this volume of pore-space theory, it might be assumed, as a method of applying a probability of oil or gas occurring within this WSA, that 5 percent of this space might be associated with such hydrocarbon resources. This would be equivalent to 16.5×10^6 barrels in place. Conventional primary, secondary, and tertiary recovery methods generally result in recovery rates of no more than 32 percent for oil. Thus, recoverable oil reserves might be on the order of 5.3×10^6 barrels, given that all of the above assumptions for Peterson Draw WSA are correct. Recovery of gas is a function of reservoir pressures and a sufficient number of wells to actually contact the gas.

The estimated geologic potential for oil and gas resources to exist within this WSA is low to moderate. On this basis, together with the above estimate, it could be anticipated that development interest would be low to moderate, within the next twenty years in the area, should such activities be permitted. This level of activity would require one exploratory well with full field development requiring an estimated five wells.

Tepee Draw WSA

1. The WSA (5,490 acres) is underlain by a low angle thrust sheet of Precambrian Uinta Mountain Group rocks presently exposed at the surface or covered by a relatively thin veneer (about 1,000 feet) of Paleozoic sedimentary rocks. This thrust-faulted sheet is underlain by younger (Mesozoic and Paleozoic) sedimentary rocks which are prospectively valuable for hydrocarbon accumulations.

2. The thrust sheet is uniformly 7,000 feet thick across the WSA, and contains 1,000 feet of prospectively valuable sedimentary rocks.
3. Based on sparse available data, the subthrust sedimentary rock sequence of prospective value for hydrocarbons totals 10,000 feet in thickness.
4. Total depths of 17,000 feet are feasible objectives for drilling in the area.
5. The estimated percentage of the area within the WSA below which oil and/or gas are likely to exist is 15 percent.
6. Ten percent of the sedimentary rock sequence consists of potential reservoir horizons.
7. The "average" porosity of these reservoir rocks is 10 percent.
8. The water saturation of the pores is 50 percent.
9. The net result yields an estimate of the volume of pore space potentially occupied by hydrocarbons, to a depth of 17,000 feet below the area of the WSA = 2.0×10^9 cubic feet = 351.4×10^6 bbls.

This represents an estimated possible amount of hydrocarbons in place, subject to the general and specific assumptions.

The pore-space volumes estimated above in assumption #9 represent subsurface space in rock which might be occupied by oil and/or gas. Continuing with this volume of pore-space theory, it might be assumed, as a method of applying a probability of oil or gas occurring within this WSA, that 5 percent of this space might be associated with such hydrocarbon resources. This would be equivalent to 17.6×10^6 barrels in place. Conventional primary, secondary, and tertiary recovery methods generally result in recovery rates of no more than 32 percent for oil. Thus, recoverable oil reserves might be on the order of 5.6×10^6 barrels, given that all of the above assumptions for Tepee Draw WSA are correct. Recovery of gas is a function of reservoir pressures and a sufficient number of wells to actually contact the gas.

The estimated geologic potential for oil and gas resources to exist within this WSA is moderate. On this basis, together with the above estimate, it would be anticipated that development interest would be moderate, within the next twenty years in this area, should such activities be permitted. This level of activity would require one exploratory well with full field development requiring an estimated five wells.

Vale Of Tears WSA

1. The WSA (7,420 acres) is underlain by a low angle thrust sheet of Precambrian Uinta Mountain Group rocks presently exposed at the surface or covered by a relatively thin veneer (about 1,500 feet) of Paleozoic sedimentary rocks. This thrust-faulted sheet is underlain by younger (Mesozoic and Paleozoic) sedimentary rocks which are prospectively valuable for hydrocarbon accumulations.
2. The thrust sheet is uniformly 7,000 feet thick across the WSA, and contains 2,500 feet of prospectively valuable sedimentary rocks.
3. Based on sparse available data, the subthrust sedimentary rock sequence of prospective value for hydrocarbons totals 10,000 feet in thickness.
4. Total depths of 19,500 feet are feasible objectives for drilling in the area.
5. The estimated percentage of the area within the WSA below which oil and/or gas are likely to exist is 15 percent.
6. Ten percent of the sedimentary rock sequence consists of potential reservoir horizons.
7. The "average" porosity of these reservoir rocks is 10 percent.
8. The water saturation of the pores is 50 percent.
9. The net result yields an estimate of the volume of pore space potentially occupied by hydrocarbons, to a depth of 19,500 feet below the area of the WSA = 3.0×10^9 cubic feet = 539.7×10^6 bbls.

This represents an estimated possible amount of hydrocarbons in place, subject to the general and specific assumptions.

The pore-space volumes estimated above in assumption #9 represent subsurface space in rock which might be occupied by oil and/or gas. Continuing with this volume of pore-space theory, it might be assumed, as a method of applying a probability of oil or gas occurring within this WSA, that 5 percent of this space might be associated with such hydrocarbon resources. This would be equivalent to 27×10^6 barrels in place. Conventional primary, secondary, and tertiary recovery methods generally result in recovery rates of no more than 32 percent for oil. Thus, recoverable oil reserves might be on the order of 8.6×10^6 barrels, given that all of the above assumptions for Vale of Tears WSA are correct. Recovery of gas is a function of reservoir pressures and a sufficient number of wells to actually contact the gas.

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The estimated geologic potential for oil and gas resources to exist within the WSA is moderate. On this basis, together with the above estimate, it could be anticipated that development interest would be moderate, within the next twenty years in the area, should such activities be permitted. This level of activity would require one exploratory well, with full field development requiring an estimated seven wells.

Principles of the Mineral Resource Classification System of the U.S. Bureau of Mines and U.S. Geological Survey

MINERAL RESOURCE CLASSIFICATION SYSTEMS OF THE
U.S. BUREAU OF MINES AND U.S. GEOLOGICAL SURVEY

GEOLOGICAL SURVEY BULLETIN 1450-A

*A report published jointly by the
U.S. Bureau of Mines and
U.S. Geological Survey*

*Definitions of mineral resource classification
terms used by the U.S. Bureau of Mines and
U.S. Geological Survey*



UNITED STATES GOVERNMENT PRINTING OFFICE, WASHINGTON : 1976

FOREWORD

In order to use mineral resource terms with precision and common understanding and to compare resource data effectively, a joint U.S. Bureau of Mines and U.S. Geological Survey work group developed a standardized, definitive, broadly applicable classification system to derive uniform, coordinated resource estimates. This report presents the results of the work group that developed the basic terms of mineral resource classification. Other chapters in this series will present classification terms for specific commodities.

UNITED STATES DEPARTMENT OF THE INTERIOR

THOMAS S. KLEPPE, Secretary

GEOLOGICAL SURVEY

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MINERAL RESOURCE CLASSIFICATION SYSTEMS OF THE
U.S. BUREAU OF MINES AND U.S. GEOLOGICAL SURVEY

PRINCIPLES OF THE MINERAL
RESOURCES CLASSIFICATION SYSTEM
OF THE U.S. BUREAU OF MINES
AND U.S. GEOLOGICAL SURVEY

GENERAL DEFINITION OF MINERAL AND ENERGY
RESOURCES

The dictionary definition of resource "something in reserve or ready if needed" has been extended for mineral and energy resources to comprise all materials surmised to exist having present or future values. In geologic terms a mineral or energy resource is a concentration of naturally occurring solid, liquid, or gaseous materials in or on the Earth's crust in such form that economic extraction of a commodity is currently or potentially feasible. Material classified as a reserve is that portion of an identified resource producible at a profit at the time of classification.

Total Resources are materials that have present or future value and comprise identified or known materials plus those not yet identified, but which on the basis of geologic evidence are presumed to exist.

PHILOSOPHIC BASIS FOR A RESOURCE CLASSIFICATION

Public attention usually is focused on current economic availability of mineral or energy materials (reserves). Long-term public and commercial planning, however, must be based on the probability of geologic identification of resources in as yet undiscovered deposits and of technologic development of economic extraction processes for presently unworkable deposits. Thus, all the components of Total Resources must be continuously reassessed in the light of new geologic knowledge, of progress in science, and of shifts in economic and political conditions.

Another requirement of long-term planning is the weighing of total or multi-commodity resource availability against a particular need. To achieve this the general classification system must be uniformly applicable to all commodities so that data for alternate or substitute commodities can be compared.

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that economic extraction of a commodity is currently or potentially feasible.

Identified resources.—Specific bodies of mineral-bearing material whose location, quality, and quantity are known from geologic evidence supported by engineering measurements with respect to the demonstrated category.

Undiscovered resources.—Unspecified bodies of mineral-bearing material surmised to exist on the basis of broad geologic knowledge and theory.

Reserve.—That portion of the identified resource from which a usable mineral and energy commodity can be economically and legally extracted at the time of determination. The term *ore* is used for reserves of some minerals.

The following definitions for measured, indicated, and inferred are applicable to both the Reserve and Identified-Subeconomic resource components.¹

Measured.—Reserves or resources for which tonnage is computed from dimensions revealed in outcrops, trenches, workings, and drill holes and for which the grade is computed from the results of detailed sampling. The sites for inspection, sampling, and measurement are spaced so closely and the geologic character is so well defined that size, shape, and mineral content are well established. The computed tonnage and grade are judged to be accurate within limits which are stated, and no such limit is judged to be different from the computed tonnage or grade by more than 20 percent.

Indicated.—Reserves or resources for which tonnage and grade are computed partly from specific measurements, samples, or production data and partly from projection for a reasonable distance on geologic evidence. The sites available for inspection, measurement, and sampling are too widely or otherwise inappropriately spaced to permit the mineral bodies to be outlined completely or the grade established throughout.

Demonstrated.—A collective term for the sum of measured and indicated reserves or resources.

Inferred.—Reserves or resources for which quantitative estimates are based largely on broad knowledge of the geologic charac-

¹ The terms proved, probable, and possible (used by the industry and economic evaluation circles) are not used in this classification system. The terms proved and probable are synonymous with the terms measured, indicated, or inferred (used by the Department of the Interior mainly for regional or national estimates). The terms "proved," "measured," "inferred," "indicated," "possible," and "probable," however, are not synonymous with indicated, inferred, and possible. The term "possible" is used to describe mineral bodies which, under existing conditions, are not economically recoverable. The term "probable" is used to describe deposits sampled on two or three sides, and "possible" for deposits sampled only on one side; in the Bureau-Survey definitions, both would be described by the term "indicated."

To serve these planning purposes Total Resources are classified both in terms of economic feasibility and of the degree of geologic assurance. The factors involved are incorporated in figure 1 to provide a graphic classification of Total Resources.

General guides for the use of this classification system are as follows:

1. Resource categories and definitions in the classification, as specified in the glossary, should be applicable to all naturally occurring concentrations of metals, nonmetals, and fossil fuels. The categories may be subdivided for special purposes.
2. Definitions may be amplified, where necessary, to make them more precise and conformable with accepted usage for particular commodities or types of resource evaluations.
3. Quantities and qualities may be expressed in a variety of terms and units to suit different purposes, but must be clearly stated and defined.

GLOSSARY OF RESOURCE TERMS

Resource.—A concentration of naturally occurring solid, liquid, or gaseous materials in or on the Earth's crust in such form

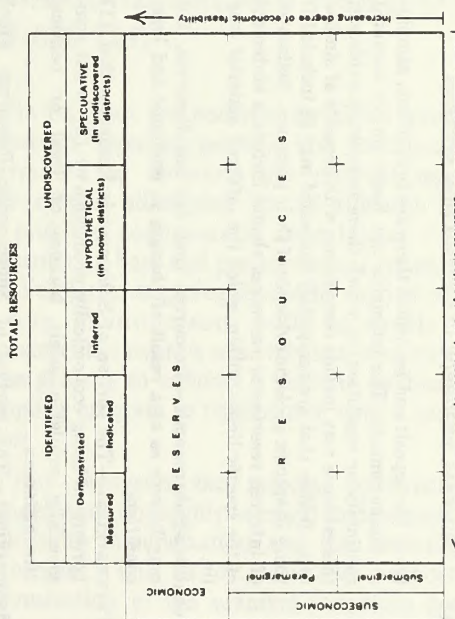


FIGURE 1.—Classification of mineral resources.

ter of the deposit and for which there are few, if any, samples or measurements. The estimates are based on an assumed continuity or repetition, of which there is geologic evidence; this evidence may include comparison with deposits of similar type. Bodies that are completely concealed may be included if there is specific geologic evidence of their presence. Estimates of inferred reserves or resources should include a statement of the specific limits within which the inferred material may lie.

Identified-Subeconomic.—Resources that are not Reserves, but may become so as a result of changes in economic and legal conditions.

Paramarginal.—The portion of Subeconomic Resources that (1) borders on being economically producible or (2) is not commercially available solely because of legal or political circumstances.

Submarginal.—The portion of Subeconomic Resources which would require a substantially higher price (more than 1.5 times the price at the time of determination) or a major cost-reducing advance in technology.

Hypothetical resources.—Undiscovered resources that may reasonably be expected to exist in a known mining district under known geologic conditions. Exploration that confirms their existence and reveals quantity and quality will permit their reclassification as a Reserve or Identified-Subeconomic resource.

Speculative resources.—Undiscovered resources that may occur either in known types of deposits in a favorable geologic setting where no discoveries have been made, or in as yet unknown types of deposits that remain to be recognized. Exploration that confirms their existence and reveals quantity and quality will permit their reclassification as Reserves or Identified-Subeconomic resources.

AREAS OF RESPONSIBILITY AND OPERATIONAL PROCEDURES

U.S. Bureau of Mines.—The Bureau appraises, analyzes, and publishes reserve estimates from base data supplied by the mineral and energy materials industry, the U.S. Geological Survey, and other governmental agencies. The Bureau judges commodity recoverability on existing economic and legal factors.

U.S. Geological Survey.—The Survey appraises, analyzes, and publishes estimates of Total Resources. It reports such measurable parameters of significance to resource evaluation as location, quality, quantity, and situation of Identified resources.

Annual Resource Summation.—The U.S. Bureau of Mines and U.S. Geological Survey will confer and agree annually on estimates in all of the resource categories defined above. These data will be in Bureau or Survey publications and will be available for inclusion in the Secretary's Annual Report required by the Mining and Minerals Policy Act of 1970.

Ad Hoc Joint Conferences.—The Directors will convene ad hoc joint work groups to resolve problems in the resource area.

APPENDIX G

RECOMMENDATIONS FOR FURTHER WORK IN WEST COLD SPRING, DIAMOND BREAKS, AND CROSS MOUNTAIN WSAs.

The GEMS report (MSME/Wallaby, 1983, Section V, Recommendations for Further Study) covering the three Section 603 WSAs offers the following recommendations:

"In the course of analyzing, assessing and evaluating each of the WSAs . . . both in the field and in available data—certain unknowns were uncovered that should be investigated in order that each WSA's GEM resources be more fully documented. This section recommends the type of studies and data gathering that should be made to inventory more completely each WSA.

"WEST COLD SPRING WSA (CO-010-208/UT-080-103)

"Since this area is known to have some potential for oil and gas resources, it is recommended that every effort be made to ascertain the full extent of this potential. Cooperative agreements should be made with various oil and gas producers to obtain proprietary information not available to this study. Such information as the projected reserves of the area, the importance of structural zones in localizing oil and gas pools, and the exact identification of pay zones within the generally favorable lithologies is of vital importance in the exact areal delineation of subsurface potential.

"In addition, a detailed program of geologic mapping and sampling should be carried out to fully delineate the extent of the Precambrian units. Any sampling carried out under such a program must include analysis of the copper, silver and uranium content of these units. The outcrops of the Tertiary Browns Park Formation should be sampled for the uranium content and correlated to other units in northwestern Colorado and eastern Utah. In addition, examination of the Browns Park units should be made by paleontologists for environments favorable for the preservation of mammal remains.

"Any prospects and mineral occurrences should be

mapped and thoroughly sampled to delineate the full extent of existing mineralization and the potential of the host lithologies. This is of particular importance in the determination of the uranium-vanadium potential of the Precambrian Uinta Group units. With regards to these specific units, a detailed study should be made of facies changes within these units, and the correlations with other units in northwestern Colorado and eastern Utah. In other areas these units have significant potential GEM resources [sic] should be studied in this area where there is little available information. Though the airborne and ground NURE-HSSR-ARMS information does not delineate any areas with anomalous values, ground radiometrics in conjunction with the geological-geochemical work would be helpful in identifying any areas of mineral potential.

"Stream sediment samples should be analyzed for their copper, molybdenum, lead, arsenic, uranium, vanadium and gold content. This data will supplement the existing NURE-HSSR-ARMS information.

"Since some of the Precambrian units have been used in the past as a source of local road building material and dimension stone, it would be wise to do further work on the demand for this material.

"In conclusion, from the work to date and the material compiled in the course of this project, it appears that the potential for GEM resources in this area is largely unknown."

"DIAMOND BREAKS WSA (CO-010-224/UT-080-113)

"In this area the potential for GEM resources is largely unknown. Detailed geologic and geochemical studies are warranted to ascertain the mineral potential of the Precambrian lithologies. Special attention should be paid to possible sedimentary assemblages associated with Precambrian base and precious metal systems. Stratigraphic and lithofacies mapping should be carried out to determine if any environments with favorable depositional characteristics exist. A relatively low-cost way to accomplish these goals is to conduct a streams sediment and outcrop sampling program in conjunction with a geologic mapping effort.

"Any prospects and mineral occurrences should be mapped and thoroughly sampled to delineate the full extent of existing mineralization and the potential of the host lithologies. This is of particular importance in the determination of the uranium-vanadium potential of the Precambrian Uinta Group units. With regards to these

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specific units, a detailed study should be made of facies changes within these units, and the correlations with other units in northwestern Colorado and eastern Utah. In other areas these units have significant potential GEM resources [sic] should be studied in this area where there is little available information. Though the airborne and ground NURE-HSSR-ARMS information does not delineate any areas with anomalous values, ground radiometrics in conjunction with the geological-geochemical work would be helpful in identifying any areas of mineral potential.

“Stream sediment samples should be analyzed for their copper, molybdenum, lead, arsenic, uranium, vanadium and gold content. This data will supplement the existing NURE-HSSR-ARMS information.

“Since some of the Precambrian units have been used in the past as a source of local road building material and dimension stone, it would be wise to do further work on the demand for this material.

“In conclusion, from the work to date and the material compiled in the course of this project, it appears that the potential for GEM resources in this area is largely unknown.”

“CROSS MOUNTAIN WSA (CO-010-230)

“A detailed geologic mapping and sampling program of drainage basins containing geochemical anomalies is necessary to ascertain the significance of the anomalies. Detailed litho-stratigraphic, geochemical, and petrologic studies coupled with conceptual modeling of red-bed sandstone copper-silver type deposits and Mississippi Valley lead-zinc type deposits with the Uinta Mountain Group/Lodore Formation and Madison Limestone/Morgan Formation, respectively is recommended.”

GLOSSARY

- ACEC (Area of Critical Environmental Concern).** An area within the public lands where special management attention is required (when such areas are developed or used, or where no development is required) to protect and prevent irreparable damage to important historic, cultural, or scenic values, fish and wildlife resources, or other natural systems or processes, or to protect life and safety from natural hazards (FLPMA Sec. 103(a)). The area must meet the Importance and Relevance Criteria and be more than locally significant.
- ACTIVE USE.** That portion of a permittee/lessee's grazing preference which has been authorized for livestock grazing in a given year or portion of a year.
- ALLOTMENT.** An area of land designated and managed for grazing of livestock.
- ALLOTMENT MANAGEMENT PLAN (AMP).** A document program which applies to livestock operations on the public lands, prepared in consultation, cooperation, and coordination with the permittee(s), lessee(s), or other involved affected interests. Includes supportive measures, if required, designed to attain specific management goals in a grazing allotment.
- ALLUVIUM.** 1. A general term for all detrital deposits resulting from the operations of modern rivers, thus including the sediments laid down in river beds, flood plains, lakes, fans at the foot of mountain slopes, and estuaries. 2. The rather consistent usage of the term throughout its history makes it quite clear that alluvium is intended to apply to stream deposits of comparatively recent time, that the subaqueous deposits of seas and lakes are not intended to be included, and that permanent submergence is not a criterion. Alluvium may become lithified, as has happened frequently in the past, and then may be termed ancient alluvium.
- AMBIENT AIR QUALITY.** The state of the atmosphere at ground level as defined by the range of measured and/or predicted ambient concentrations of all significant pollutants for all averaging periods of interest.
- ANIMAL UNIT MONTH (AUM).** The amount of forage necessary for the sustenance of one cow or its equivalent for a period of one month.
- ANTICLINE.** A fold that is convex upward or had such an attitude at some stage of development. In simple anticlines the beds are oppositely inclined, whereas in more complex types the limbs may dip in the same direction. Some anticlines are of such complicated form that no simple definition can be given. Anticlines may also be defined as folds with older rocks toward the center of curvature, providing the structural history has not been unusually complex.
- AQUIFER.** A water-bearing bed or stratum of permeable rock, sand, gravel, or porous stone.
- ARCHAIC.** The Archaic stage is currently viewed as an adaptive response to the warming trend that occurred at the end of the Pleistocene period, and to the loss of Pleistocene megafauna and its replacement by modern faunal forms. As a continent-wide phenomenon, hunting and gathering societies intensively exploited their local environments, heavily exploiting plant resources, seeds, and a wide variety of faunal species. Virtually all ecological niches were systematically exploited for their resources; consequently there is, through time, an increase in the diversity of tool types and specialization. Dates for the Archaic stage range from as early as 5000 B.C. to as late as A.D. 500.
- AUM.** See Animal Unit Month.
- BASELINE.** Level of activity existing today and projected for the future assuming no change in present BLM management. Baseline is used to compare the effects of all management alternatives to a uniform standard.
- BEDROCK.** The more or less solid rock in place either on or beneath the surface of the earth.
- BENTONITE.** Bentonite is a clay formed from the decomposition of volcanic ash and is largely composed of the clay minerals montmorillonite and beidellite. The rock must be produced by decomposition of volcanic ash and not from the decomposition of other substances. The color ranges from white to light green and light blue when fresh. On exposure the color frequently becomes a light cream and gradually changes to yellow and in some cases to red or brown. The rock commonly has great ability to adsorb or absorb water and to swell accordingly.
- CHERRY STEM.** Fingerlike intrusion into a wilderness study area (WSA) that is not part of the WSA; an example is a dead end road where WSA boundaries follow edge of road.
- CHERT.** 1. Insoluble residue. Cryptocrystalline varieties of silica regardless of color, composed mainly of petrographically microscopic chalcedony and/or quartz particles whose outlines range from easily resolvable to nonresolvable with binocular microscope at magnifications ordinarily used. Particles rarely exceed 0.5 mm. in diameter. 2. Mineral: A compact, siliceous rock formed of chalcedonic or opaline silica, one or both, and of organic or precipitated origin. Chert occurs distributed through limestone, affording cherty limestones. Flint is a variety of chert.
- CLASTIC.** Consisting of fragments of rocks or of organic structures that have been moved individually from their places of origin.
- CLIMATE.** The statistical collective of an area's weather conditions during a relatively long interval of time (usually several decades).
- CLIMAX VEGETATION.** The final stage of a seral stage progression in which a vegetation community has reached a balance with its ecosystem and reflects the maximum diversity and stability of that natural community.
- COLLUVIUM.** A general term applied to loose and incoherent deposits, usually at the foot of a slope or cliff and brought there chiefly by gravity. Talus and cliff debris are included in such deposits.
- CONGLOMERATE.** Puddingstone. 1. Rounded waterworn fragments of rock or pebbles, cemented together by another mineral substance. 2. A cemented clastic rock containing rounded fragments corresponding in their grade sizes to gravel or pebbles. Monogenetic and polygenetic types are recognized, according to the uniformity or variability of the composition and source of the pebbles.
- CONTRAST.** The relative difference in luminance between an object and its background. Inherent contrast is contrast as perceived at the position of the observed object. Apparent contrast is contrast as perceived at the observer's position.
- CULTURAL RESOURCES.** Those fragile and nonrenewable remains of human activity, occupation, or endeavor, reflected in districts, sites, structures, buildings, objects, artifacts, ruins, works of art, architecture, and natural features, that were of importance in human events. These resources consist of (1) physical remains, (2) areas where significant human events occurred—even though evidence of the event no longer

GLOSSARY

remains, and (3) the environment immediately surrounding the actual resource. Cultural resources, including both prehistoric and historic remains, represent a part of the continuum of events from the earliest evidences of man to the present day. (BLM Manual 8100)

The term "archaeological resource" means any material remains of past human life or activities which are of archaeological interest, as determined under uniform regulations promulgated pursuant to this Act. Such regulations containing such determination shall include, but not be limited to: pottery, basketry, bottles, weapons, weapon projectiles, tools, structures or portions of structures, pit houses, rock paintings, rock carvings, intaglios, graves, human skeletal materials, or any portion or piece of any of the foregoing items. Nonfossilized and fossilized paleontological specimens, or any portion or piece thereof, shall not be considered archaeological resources, under the regulations under this paragraph, unless found in an archaeological context. No item shall be treated as an archaeological resource under regulation under this paragraph unless such item is at least 100 year of age. (Archaeological Resource Protection Act of 1979 and 43 CFR 7)

CUSTODIAL MANAGEMENT (FORESTRY). A moderate level of management applied to certain areas. Areas that are nonproductive growing sites, withdrawn from planned harvest for other resource needs, or economically inaccessible or inoperable would not be intensively managed. Custodial management of these areas would be emphasized for the maintenance and protection of the forest environment. Harvesting would be permissible but would not be a goal of management under sustained yield principles. Any harvesting would be primarily salvage. Fires, insects, and diseases would be controlled but would have a lower priority than for the intensively managed areas. No intensive management practices, e.g., thinnings or artificial regeneration, would be planned.

DEVITRIFICATION. The process by which glassy rocks break up into definite minerals. The latter are usually excessively minute crystals of quartz and feldspar. The change from a glassy to a crystalline state after solidification.

DIP. The angle that a structural surface, e.g., a bedding or fault plane, makes with the horizontal, measured perpendicular to the strike of the structure.

DISPERSION POTENTIAL. The ability of the atmosphere to dilute or disperse air pollutants, as determined by normal ventilation values. A high dispersion potential results from high ventilation values, which can be caused by high transport wind speeds, high mixing heights, or high values of both.

DISSOLVED SOLIDS. The total amount of dissolved material, organic and inorganic, contained in water or wastes.

DOLOMITE. 1. A mineral, $\text{CaMg}(\text{CO}_3)_2$, commonly with some Fe replacing Mg (ankerite). Hexagonal rhombohedral. A common rock-forming mineral. 2. A term applied to those rocks that approximate the mineral dolomite in composition. Syn: MAGNESIAN LIMESTONE. It occurs in a great many crystalline and noncrystalline forms the same as pure limestone and among rocks of all geological ages. When the carbonate of magnesia is not present in the above proportion the rock may still be called a magnesian limestone, but not a dolomite, strictly speaking.

DOWN DIP. A direction that is downwards and parallel to the dip of a structure or surface.

ECOSYSTEM. Collectively, all populations in a community, plus the associated environmental factors.

ECOTONE. An ecological community of mixed vegetation formed by the overlapping of adjoining communities.

ENDEMIC. Peculiar to a specific locality or people.

EOLIAN. 1. Applied to deposits arranged by the wind, as the sands and other loose materials along shores, etc. (From Eolus, the god of winds.) Subaerial is often used in much the same sense. 2. Applied to the erosive action of the wind and to deposits which are due to the transporting action of the wind.

EROSION. The wearing away of the land surface by running water, wind, ice, or other geological agents.

EVAPORATION. The physical process by which a liquid is transformed to the gaseous state.

EVAPOTRANSPIRATION. The combined loss of water from a given area during a specific period of time by evaporation from the soil or water surface and by transpiration from plants.

FAULT. A fracture or fracture zone along which there has been displacement of the sides relative to one another parallel to the fracture. The displacement may be a few inches or many miles.

FLUVIAL. Of, or pertaining to, rivers; growing or living in streams or ponds; produced by river action, as, a fluvial plain.

FORMATION. The primary unit of formal mapping or description. Most formations possess certain distinctive, or combinations of distinctive, lithic features.

FREMONT CULTURE. The Fremont culture is characterized by the cultivation of maize, a sedentary or semi-sedentary life style, pit-houses and masonry dwellings, a distinctive rock art style, and a variety of ceramic gray wares. Despite the homogeneity implied by the term Fremont culture, it has been recognized that the Fremont culture is really a theme with many variations. Of the five variants only two, the Uinta and the San Rafael Fremont, seem to occur in northwestern Colorado. However, their boundaries or distributions have yet to be defined. The two are differentiated primarily by ceramics and variation in architectural styles.

FUGITIVE DUST. A type of particulate emission made airborne by forces of wind, man's activity, or both, resulting from unpaved roads, construction sites, tilled land, or windstorms.

GEOLOGICAL TIME SCALE. A chart that gives the era, period and epoch divisions of earth history. Comprised of, in part, ERA - Cenozoic 65 million years (my)-present; Mesozoic 230-65my; and Paleozoic 600-230my. PERIODS - Tertiary 65-1my; Quaternary 1my-present; and Cretaceous 135-65my. See chart following this glossary.

GEOMORPHOLOGY. That branch of both physiography and geology which deals with the form of the earth, the general configuration of its surface, and the changes that take place in the evolution of land forms.

GEOHERMAL. Of, or pertaining to, the heat of the earth's interior.

HABITAT. A specific set of physical conditions that surround the single species, a group of species, or a large community. In wildlife management, the major components of habitat are considered to be food, water, cover, and living space.

HABITAT MANAGEMENT PLAN (HMP). A written and approved activity plan for a geographical area of public lands identifying wildlife habitat management actions to be implemented in achieving specific objectives related to planning document decisions.

HISTORICAL. For this region, pertaining to human activity from 1776 until 50 years ago.

HYDROCARBON. A chemical compound composed principally of carbon and hydrogen but also containing varying amounts of other elements (i.e., sulfur, nitrogen, chlorine).

- IGNEOUS.** Formed by solidification from a molten or partially molten state. Said of the rocks of one of the two great classes into which all rocks are divided, and contrasted with sedimentary. Rocks formed in this manner have also been called plutonic rocks and are often divided for convenience into plutonic and volcanic rocks. There is no clear line between the two.
- IMPACT.** The effect, influence, alteration or imprint of an activity.
- IMPAIR.** To diminish in value or excellence.
- IMPERMEABLE.** Applies to strata such as clays, shales, etc., that do not permit water to move through them under the head differences ordinarily found in groundwater.
- IMPRINT.** A mark or evidence left by man.
- INFILTRATION.** The penetration of water into the soil surface through pores of the soil. The rate and amount of infiltration is limited by the size and abundance of pores, organic matter content, and the water absorption capacity of the soil.
- K FACTOR.** A soil erodibility factor used in the universal soil loss equation that is a measure of the susceptibility of soil particles to detachment and transport by rainfall and runoff. Estimation of the factor takes several soil parameters into account, including: soil texture, percent of sand greater than 0.10 mm, soil organic matter content, soil structure, soil permeability, clay mineralogy, and coarse fragments. K factor values range from .02 to .64, the greater values indicating the highest susceptibilities to erosion.
- LACUSTRINE.** 1. Produced by or belonging to lakes. 2. Of, or pertaining to, or formed or growing in, or inhabiting, lakes.
- LEASE.** An instrument through which interests are transferred from one party to another, subject to certain obligations and considerations.
- LIMESTONE.** 1. A bedded sedimentary deposit consisting chiefly of calcium carbonate (CaCO_3) which yields lime when burned. Limestone is the most important and widely distributed of the carbonate rocks and is the consolidated equivalent of limy mud, calcareous sand, or shell fragments. 2. A general term for that class of rocks which contain at least 80 percent of the carbonates of calcium or magnesium. The suitability of the rock for the manufacture of lime is not an essential characteristic.
- LITHIC SCATTER.** A type of surface cultural resource site manifestation. Cultural material and artifacts present consist of chipped stone.
- LITHIFICATION.** 1. That complex of processes that converts a newly deposited sediment into an indurated rock. It may occur shortly after deposition—may even be concurrent with it—or it may occur long after deposition. 2. A type of coal-bed termination wherein the disappearance takes place because of a lateral increase in impurities resulting in a gradual change into bituminous shale or other rock.
- LITHOLOGY.** The physical character of a rock, generally as determined megascopically or with the aid of a low-power magnifier.
- MAINTENANCE LEASE.** A lease required to maintain an existing mining operation at its current average annual level of production, or to supply coal for contracts signed prior to July 19, 1979, or both.
- MANAGEMENT FRAMEWORK PLAN (MFP).** The Bureau's basic land use plan prior to 1979.
- MANAGEMENT FRAMEWORK PLAN AMENDMENT.** An amendment to a management framework plan initiated by the need to consider monitoring and evaluation of findings, new data, new or revised policy, a change in circumstances, or an applicant's proposed action which may result in a significant change in a portion of the approved plan.
- MAPPING UNIT.** Represents an area on the landscape and consists of one or more soils for which the unit is named. Each description includes general facts about the soils and gives the principal hazards and limitations to be considered in planning for specific uses.
- METAMORPHISM.** Process by which consolidated rocks are altered in composition, texture, or internal structure by conditions and forces not resulting simply from burial and the weight of subsequently accumulated overburden. Pressure, heat, and the introduction of new chemical substances are the principal causes. The resulting changes, which generally include the development of new minerals, are a thermodynamic response to a greatly altered environment. Diagenesis has been considered to be incipient metamorphism.
- mg/l.** Abbreviation for milligrams per liter, the unit of expression for the concentration of dissolved minerals in water.
- MINERALIZATION.** 1. The process of replacing the organic constituents of a body by inorganic fossilization. 2. The addition of inorganic substances to a body. 3. The act or process of mineralizing. 4. The process of converting or being converted into a mineral, as, a metal into an oxide, sulfide, etc.
- MODELING.** A mathematical or physical representation of an observable situation. In air pollution control, models afford the ability to predict pollutant distribution or dispersion from identified sources for specified weather conditions.
- MULTIPLE RESOURCE VALUES AND USES.** The present and potential uses of the various resources administered through multiple use management on the public lands and any public values associated with such uses.
- MULTIPLE-USE.** The management of public lands and their various resource values so that they are utilized in the combination that will best meet the present and future needs of the American people.
- NATURALNESS.** Refers to an area which "generally appears to have been affected primarily by the forces of nature, with the imprint of man's work substantially unnoticeable" (From Section 2(c), Wilderness Act).
- NONGAME SPECIES.** Those species not commonly harvested either for sport or profit.
- NURE - National Uranium Resource Evaluation/HSSR - Hydrologic Stream Sediment Reconnaissance/ARMS - Airborne Radiometric Survey.** (U.S. Department of Energy Terminology).
- ONA (Outstanding Natural Area).** An area of unusual natural characteristics where management of recreation activities is necessary to preserve those characteristics. The objective is to manage for the maximum amount of recreation use possible without damage to the natural features that make the area outstanding.
- OROGENY.** The process of forming mountains, particularly by folding and thrusting.
- OVERBURDEN.** All the earth and other materials which lie above a natural deposit of minerals.
- PALEO-INDIAN.** The term "Paleo-Indian" stage is synonymous with Willey and Phillip's (1958) lithic stage. This stage deals with the antiquity of human settlement in the New World and with the nature of the adaptations made by these early immigrants into a pristine post-Glacial environment. In general, the big-game hunting peoples of the Paleo-Indian stage seem to be the earliest inhabitants of northwest Colorado. Their presence in the area is marked for the most part by distinctive lanceolate projectile points. This stage may be dated from approximately 10,000 B.C. to 5,500 B.C.
- PALEONTOLOGY.** 1. The science which treats fossil remains, both animal and vegetable. 2. The science that deals with the life of

- past geological ages. It is based on the study of the fossil remains of organisms. In restricted sense, study of fossil animals.
- PERENNIAL PERMANENT STREAM.** A stream that ordinarily has running water on a year-round basis.
- PERENNIAL WATER.** Water sources which contain water year-long.
- pH.** A measure of the acidity or alkalinity of a solution. Water is considered to be neutral at a pH of 7, acidic if the pH is less than 7, and basic if greater than 7.
- PHYSIOGRAPHIC PROVINCE.** A region of similar structure and climate that has had a unified geomorphic history.
- PHYSIOGRAPHY.** The study of the genesis and evolution of land forms.
- PISCATORIAL.** Of or pertaining to fishermen or fishing.
- POPULATION CENTER.** A Standard Metropolitan Statistical Area (SMSA) which has a population of 100,000 or greater. An SMSA is a county which contains at least one city of 50,000 inhabitants or more plus as many adjacent counties as are metropolitan in character and are socially integrated with that central city or cities.
- POST-FLPMA.** After October 21, 1976, the date of approval of the Federal Land Policy and Management Act.
- PRE-FLPMA.** Before October 21, 1976, the date of approval of the Federal Land Policy and Management Act.
- PRIMITIVE AND UNCONFINED RECREATION.** Nonmotorized and undeveloped types of outdoor recreational activities.
- PRODUCTIVE OPERABLE WOODLAND (P.O.W.)** Forest land bearing or capable of bearing vegetative products of commercial character and economically available now or prospectively for commercial use and not otherwise withdrawn from such use. Fuelwood and posts are the most common products harvested from this category.
- RADIOACTIVITY.** The property shown by some elements of changing into other elements by the emission of charged particles from their nuclei.
- RECREATION OPPORTUNITY SPECTRUM (ROS).** A continuum used to characterize recreation opportunities in terms of physical setting, recreation activity, and experience opportunities (See ROS Appendix D for more detail).
- 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 streams, around springs, etc.
- RHYOLITE.** The aphanitic equivalent of a granite.
- RNA (Research Natural Area).** An area that is established and maintained for the primary purpose of research and education because that land has one or more of the following characteristics: (1) atypical representation of a common plant or animal association, (2) an unusual plant or animal association, (3) a threatened or endangered plant or animal species, (4) atypical representation of common geologic, soil, or water feature, or (5) outstanding or unusual geologic, soil, or water feature.
- ROAD.** Vehicle routes which have been improved and maintained by mechanical means to insure relatively regular and continuous use.
- SCENIC QUALITY.** The inherent scenic values of the landscape. It can be best described as the overall impression retained after driving or walking through an area.
- SEDIMENT.** Soil, rock particles, and organic or other debris carried from one place to another by wind, water, or gravity.
- SEDIMENTATION.** The act or process of depositing a material, such as water depositing suspended soil particles in an area such as a stream bottom.
- SEDIMENT YIELD.** The amount of sediment given up by a watershed over a specific time period, usually a year.
- SEISMIC.** Pertaining to, characteristic of, or produced by earthquakes or earth vibration, as, seismic disturbances.
- SPECIES, CANDIDATE.** Any species not yet officially listed but which is undergoing a status Review, or is proposed for listing as Endangered according to *Federal Register* notices published by the Secretary of the Interior or the Secretary of Commerce. Candidate species are divided into 2 categories. Category 1 consists of those taxa for which the USFWS presently has sufficient information on hand to support the biological appropriateness of their being listed as Endangered or Threatened species. Category 2 consists of those taxa for which information now in the possession of the USFWS indicates the probable appropriateness of listing as Endangered or Threatened, but for which sufficient information is not presently available to biologically support a proposed rule.
- SPECIES, ENDANGERED.** An animal or plant whose prospects of survival and reproduction are in immediate jeopardy, and as is further defined by the Endangered Species Act of 1973, as amended.
- SPECIES, SENSITIVE.** A designation which is (1) applied to species not yet officially listed but which are undergoing a status review or are proposed for listing according to *Federal Register* notices published by the Secretary of the Interior, or the Secretary of Commerce, or in accordance with comparable state documents published by state officials; (2) applied to species whose populations are consistently small and widely dispersed or whose ranges are restricted to a few localities, such that any appreciable reduction in numbers, habitat availability, or habitat condition might lead toward extinction; or (3) applied to species whose numbers are declining so rapidly that official listing may become necessary as a conservation measure.
- SPECIES, THREATENED.** Any species which is likely to become an endangered species within the foreseeable future throughout all of a significant portion of its range, and as is further defined by the Endangered Species Act of 1973, as amended.
- SOLITUDE.** 1. The state of being alone or remote from habitations; isolation. 2. A lonely, unfrequented or secluded place.
- STANDARD METROPOLITAN STATISTICAL AREA (SMSA).** See POPULATION CENTER.
- STEPPE-TYPE VEGETATION.** Vegetation found on arid lands that usually have extreme temperature ranges and loess (wind deposited) soils.
- STOCKING RATE.** (Also known as Carrying Capacity). An estimate of the maximum number of animals (expressed in AUMs) a given area can support each year without inducing damage to the vegetation or related resources.
- STRATIGRAPHY.** That branch of geology which treats formation, composition, sequence, and correlation of stratified rocks as parts of the earth's crust.
- STRIKE.** The horizontal direction which is at right angles to the dip of a rock.
- STRUCTURE.** Any visible signs of displacement or deformation of the rock such as faulting or folding.
- SUBSTANTIALLY UNNOTICEABLE.** Refers to something that either is so insignificant as to be only a very minor feature of the overall area or is not distinctly recognizable by the average visitor as being manmade or man-caused because of age, weathering, or biological change. An example of the first would be a few minor dams or abandoned mine buildings that are widely scattered over a large area, so that they are an inconspicuous part of the scene. Serious

- intrusions of this kind, or many of them, may preclude inclusions of the land in a wilderness study area. An example of the second would be an old juniper control project that has grown up to a natural appearance, the old fallen trees being largely decomposed.
- SUITABILITY.** As used in the Wilderness Act and in the Federal Land Policy and Management Act, refers to a recommendation by the Secretary of the Interior or the Secretary of Agriculture that certain Federal lands satisfy the definition of wilderness in the Wilderness Act and have been found appropriate for designation as wilderness on the basis of an analysis of the existing and potential uses of the land.
- SYNCLINE.** A fold in rocks in which the strata dip inward from both sides toward the axis.
- THREATENED SPECIES.** Any species which is likely to become an endangered species within the foreseeable future throughout all or a significant portion of its range.
- TOPOGRAPHY.** The physical features of a district or region, such as are represented on maps, taken collectively; especially, the relief and contour of the land.
- TUFF.** A rock formed of compacted volcanic fragments, generally smaller than 4 mm in diameter.
- UNCONFORMITY.** A surface of erosion or nondeposition, usually the former, that separates younger strata from older rocks.
- VEGETATIVE SUCCESSIONAL STAGE.** A plant community which is part of a progressive series leading to a community which perpetuates itself indefinitely under the environmental conditions.
- VISIBILITY.** A measurement of the maximum distance to which large objects may be viewed. Fixed reference objects such as mountains, hills, towers, or buildings may be used to estimate visibility.
- VISUAL RANGE.** A standardized form of visibility that approximates actual observed visibility. It is the maximum distance at which a threshold contrast of .02 at a wavelength of 5,500 Angstroms can be detected between an ideal black object against the horizon sky in daylight.
- VISUAL RESOURCE.** Land, water, vegetation, animals and other visible features.
- VISUAL SENSITIVITY.** Degree of concern expressed by the user toward scenic quality and existing or proposed visual change in a particular characteristic landscape.
- WATER QUALITY.** The chemical, physical, and biological characteristics of water with respect to its suitability for a particular use.
- WATER RIGHT.** In Colorado, a separate property right which entitles the owner to use a specific amount of water from a specific point of diversion for a specific purpose.
- WATER RIGHT, ADJUDICATION.** The date of the judicial decree on a water right.
- WATER RIGHT, APPROPRIATION.** The establishment of a water right by diversion, due diligence, and beneficial use under Colorado State Law.
- WATER RIGHT, RESERVED.** A water right asserted by the BLM as being reserved in the name of the United States and limited to the uses and quantities necessary to accomplish the purposes for which the land has been reserved.
- WATERSHED.** All lands which are enclosed by a continuous hydrologic drainage divide and lie upslope from a specified point on stream.
- WATERSHED, SENSITIVE.** An area with adverse geologic, soil, and/or vegetative conditions which cause a fragile situation.
- WAY.** A two-wheel track created only by the passage of vehicles. A "way" is not a road.
- WILDERNESS AREA.** An area formally designated by Act of Congress as part of the National Wilderness Preservation System.
- WILDERNESS CHARACTERISTICS.** Identified by Congress in the 1964 Wilderness Act: namely size, naturalness, outstanding opportunities for solitude or a primitive and unconfined type of recreation, and supplemental values such as geological, archaeological, historical, ecological, scenic, or other features. It is required that the area possess at least 5,000 acres or more of contiguous public land or be of a size to make practical its preservation and use in an unimpaired condition; be substantially natural or generally appear to have been affected primarily by the forces of nature, with the imprint of man being substantially unnoticeable; and have either outstanding opportunities for solitude or a primitive and unconfined type of recreation. Congress stated that a wilderness area may also have supplemental values, which include ecological, geological, or other features of scientific, educational, scenic, or historical value.
- WILDERNESS INVENTORY.** An evaluation of public lands in the form of a written description and map showing those lands that meet the wilderness criteria as established under Section 603(a) of FLPMA and Section 2(c) of the Wilderness Act.
- WILDERNESS MANAGEMENT.** The management of human use and influence on lands which have been designated by Act of Congress as wilderness areas.
- WILDERNESS MANAGEMENT POLICY.** A policy document prescribing the general objectives, policies and specific activity guidance applicable to all designated BLM wilderness areas. Specific management objectives, requirements and decisions implementing administrative practices and visitor activities in individual wilderness areas are developed and described in the wilderness management plan for each unit.
- WILDERNESS REPORTING.** The process of preparing the reports containing wilderness recommendations on wilderness study areas and transmitting those reports to the Secretary of the Interior, the President and Congress.
- WILDERNESS REVIEW.** The term used to cover the entire wilderness inventory, study and reporting phases of the wilderness program of the Bureau of Land Management.
- WILDERNESS STUDY AREA (WSA).** A roadless area or island that has been inventoried and found to have wilderness characteristics as described in Section 603 of FLPMA and Section 2(c) of the Wilderness Act of 1964 (78 Stat. 891).
- WILDERNESS STUDY.** The process outlined in these guidelines which specifies how each wilderness study area must be studied through the BLM resource management planning system, analyzing all resources, values, and uses within the WSA to determine whether the area will be recommended as suitable or unsuitable for wilderness designation.
- WILDERNESS SUITABILITY RECOMMENDATIONS.** A recommendation by the Bureau of Land Management, the Secretary of the Interior or the President, with respect to an area's suitability or nonsuitability for preservation as wilderness.
- WILDERNESS VALUES.** The wilderness characteristics and multiple resource benefits of an area.
- WIND ERODIBILITY GROUP.** A group of soils having the same potential for soil blowing. Soils in groups 1 and 2 have the highest potential for being eroded by wind, while soils in groups 7 and 8 have the lowest potential. Soil textures included in groups 1 and 2 are very

GLOSSARY

fine sand, fine sand, medium sand, loamy sand, and loamy fine sand.

ZEOLITES. A generic term for a group of hydrous aluminosilicates of Na, Ca, Ba, Sr, and K, characterized by their easy and reversible loss of water of hydration and their intumescence when heated strongly. Many are also characterized by a significant capacity for ion-exchange.

Time Term	Epoch	Period	Era	
Rock Term	Series	System		
	Recent (Holocene)	Quaternary	Cenozoic	
	Pleistocene			
2	Pliocene	Tertiary		
12	Miocene			
26	Oligocene			
37	Eocene			
53	Paleocene			
				Cretaceous
		Jurassic		Mesozoic
136		Triassic		
190		Permian	225	
		Carboniferous	Paleozoic	
280				Pennsylvanian
320		Mississippian		
345		Devonian		
396		Silurian		
430		Ordovician		
500		Cambrian		570
		Precambrian		

The Geologic Time Scale. Numbers at sides of column are ages in millions of years before the present. (Press and Siever, 1978)

LITERATURE CITED

- BAILEY, R.G. 1978. Description of the ecoregions of the United States USDA, Forest Service, Ogden, Utah.
- BROWN, W.G. 1984. Basement involved tectonics foreland areas. American Association of Petroleum Geologists Continuing Education Course, Note Series No. 26, Tulsa.
- COLORADO LAND USE COMMISSION. 1974. Colorado land use map folio: sediment yield. Office of Colorado Land Use Commission, Denver, Colorado.
- FENNEMAN, N.M., and Gale, H.S. 1906. The Yampa coal field, Routt County, Colorado. U.S. Geol. Survey Bull. 297.
- GRIES, R. 1983. Oil and gas prospecting beneath precambrian of foreland thrust plates in Rocky Mountains. American Association of Petroleum Geologists Bulletin, v. 67, pp.1-38.
- KUHLER, A.W., Ed. 1975. Potential natural vegetation of the conterminous United States. Scale 1:3, 168,000. 2nd Ed. Am. Geographical Society, New York, NY.
- PENLAND, D.B. 1958. Madrono, 14: 156-160.
- PRESS, F., and SIEVER, R. 1978. Earth. 2nd Ed. W.H. Freeman and Co., San Francisco, CA.
- STATE OF COLORADO, DIVISION OF PARKS AND OUTDOOR RECREATION. 1981. State comprehensive outdoor recreation plan, Denver, CO.
- STATE OF COLORADO, DIVISION OF WILDLIFE. 1983. Computerized printout of population objectives, information summarized, in: today's strategytomorrow's wildlife, a comprehensive management plan for Colorado's wildlife. 3rd Ed., Denver, Co.
- UNITED STATES DEPARTMENT OF THE INTERIOR, BUREAU OF LAND MANAGEMENT. 1978. Wilderness inventory handbook, policy, direction, procedures, and guidance for conducting wilderness inventory on public lands. Sept.
- UNITED STATES DEPARTMENT OF THE INTERIOR, BUREAU OF LAND MANAGEMENT. 1979. Interim Management Policy and guidelines for wilderness study areas. (Amended July 12, 1983.)
- UNITED STATES DEPARTMENT OF THE INTERIOR, BUREAU OF LAND MANAGEMENT. Colorado State Office. 1980. Intensive wilderness inventory - analysis of public comment and final wilderness study areas.
- UNITED STATES DEPARTMENT OF THE INTERIOR, BUREAU OF LAND MANAGEMENT. 1980. Recreation economics, in: Glenwood Springs resource management plan. Grand Junction, CO. BLM District, Glenwood Springs Resource Area.
- UNITED STATES DEPARTMENT OF THE INTERIOR, BUREAU OF LAND MANAGEMENT. 1981. Wilderness Management Policy.
- UNITED STATES DEPARTMENT OF THE INTERIOR, BUREAU OF LAND MANAGEMENT. 1982. Browns Park management framework plan. Vernal, UT. BLM District, Diamond Mountain Resource Area.
- UNITED STATES DEPARTMENT OF THE INTERIOR, NATIONAL PARK SERVICE. 1984. Preliminary resource assessment for wilderness study areas contained in H.R. 1214. Rocky Mountain Regional Office.
- WALSH, R.G.; GILLMAN, R.B.; and LOOMIS, J.B. 1981. Wilderness resource economics; recreation use and preservation values. Department of Economics, Colorado State University, Fort Collins, CO.
- WITHERBEE, K.G. and LOW, D.J. nd. Elemental concentrations for stream sediment samples from the West Cold Spring, Diamond Breaks, Dinosaur National Monument adjacent northern boundary, and Cross Mountain wilderness study areas, northwest Colorado and northeast Utah (Basic Data Rpt.). Unpub Ms. USDI, BLM, Colorado State Office, 2020 Arapahoe, Denver, CO.
- WITHERBEE, K.G. 1983. Geology and mineral resource potential of the Cross Mountain wilderness study area, Moffat County, Colorado, GEM, Phase 1 and 2. Bureau of Land Management, U.S. Department of Interior.

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