UNITED STATES

DEPARTMENT OF THE INTERIOR

BUREAU OF LAND MANAGEMENT

BLACK MOUNTAIN

FOREST MANAGEMENT PLAN

Grand Junction District

Glenwood Springs Resource Area

Prepared by: L. Gifford Knapp
District Forester
Date 2-18-81

Jim Byers
Area Forester
Date 1/27/81

Concurrenc & Review: Lee Lauritzen
Chief, Division of Resources
Date Feb 20, 1981

Alfred Wright
Area Manager
Date JAN 27, 1981

Approved: David P. Jones
District Manager
Date February 24, 1981

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BLACK MOUNTAIN FOREST MANAGEMENT PLAN

I. Introduction

A. Purpose

This plan has been prepared in order to carry out multiple use land management objectives for the Black Mountain Management Area. Generally, this plan will define the resource, identify management objectives, outline general silvicultural and harvest practices which will maintain the health and vigor and perpetuate the timber resource while considering other multiple uses.

B. Background

This Forest Management Plan is written for 4,132 acres of public land in Routt County, Glenwood Springs Resource Area, Grand Junction, Bureau of Land Management, Colorado (see map I-1 & I-2). Timber stand data for this plan is taken from the BLM 1973 Extensive Forest Inventory, District Allowable Cut Plan (see appendix A), BLM Manual Series 5000, 1979 Operational Inventory, and individual cruise plot data.

Black Mountain is a contributing part of the Grand Junction allowable cut forest resource base as identified by the 1973 extensive inventory and Allowable Cut Plan (see appendix A). In developing the Allowable Cut Plan and this document, certain management assumptions (see page 34, Chapter II) were made without benefit of a unit resource analysis (URA) or management

frame work plan (MFP) decision, now called resource management plans (RMP's). This was necessary because planning for this area is not scheduled for completion until 1983. A forest Management Plan has been developed for the adjoining National Forest. The assumptions made in their plan are consistent with those identified in this plan. Also, decisions and assumptions made during the plot classification done in connection with the extensive forest inventory and Allowable Cut Plan are carried through in this plan.

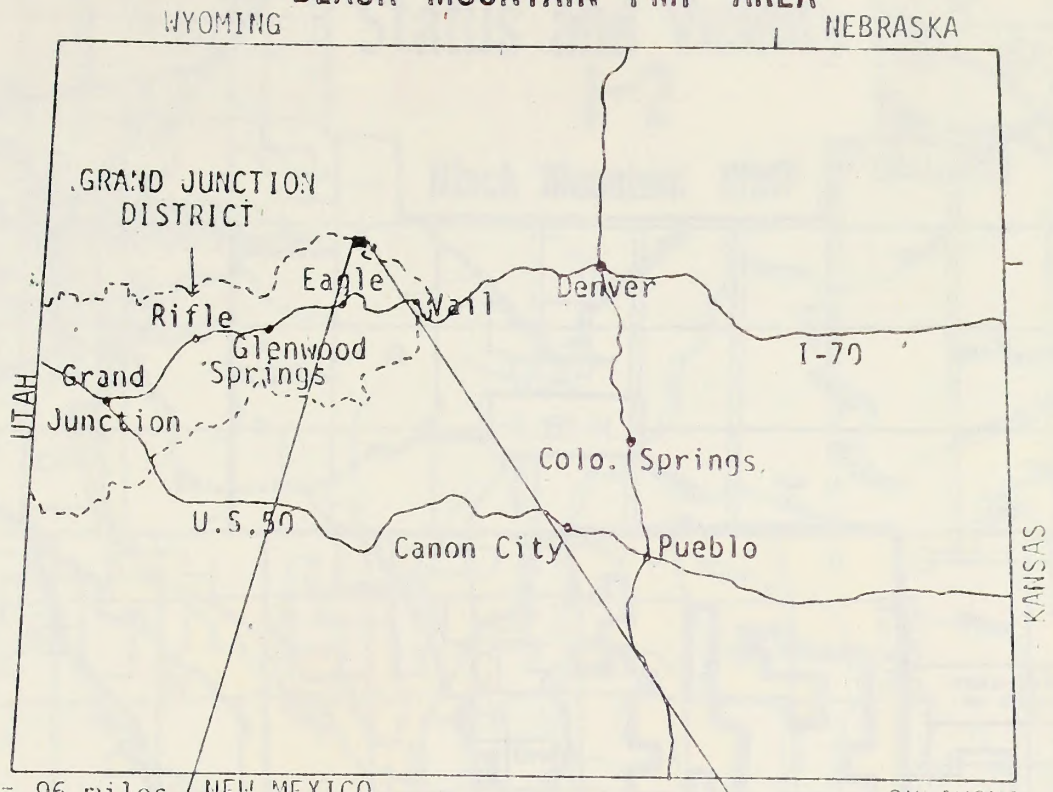
The FMP area is bounded on the north by the Routt National Forest. The Forest Service has developed the "Blacktail Land Use Plan" that identifies approximately 14,000 acres of timber that are available for harvesting on a sustained yield basis. Under a cooperative agreement, BLM plans a joint timber sale with the Forest Service in 1981. The sale should benefit both agencies in the partial implementation of our respective management plans. See appendix B for details of the agreement, and Chapter VII, environmental analysis for Little Whiskey Creek - Black Mountain Integrated Timber Sale.

The Little Whiskey Creek - Black Mountain integrated sale will provide an opportunity to develop a single road system and offer timber for sale in the most economically efficient

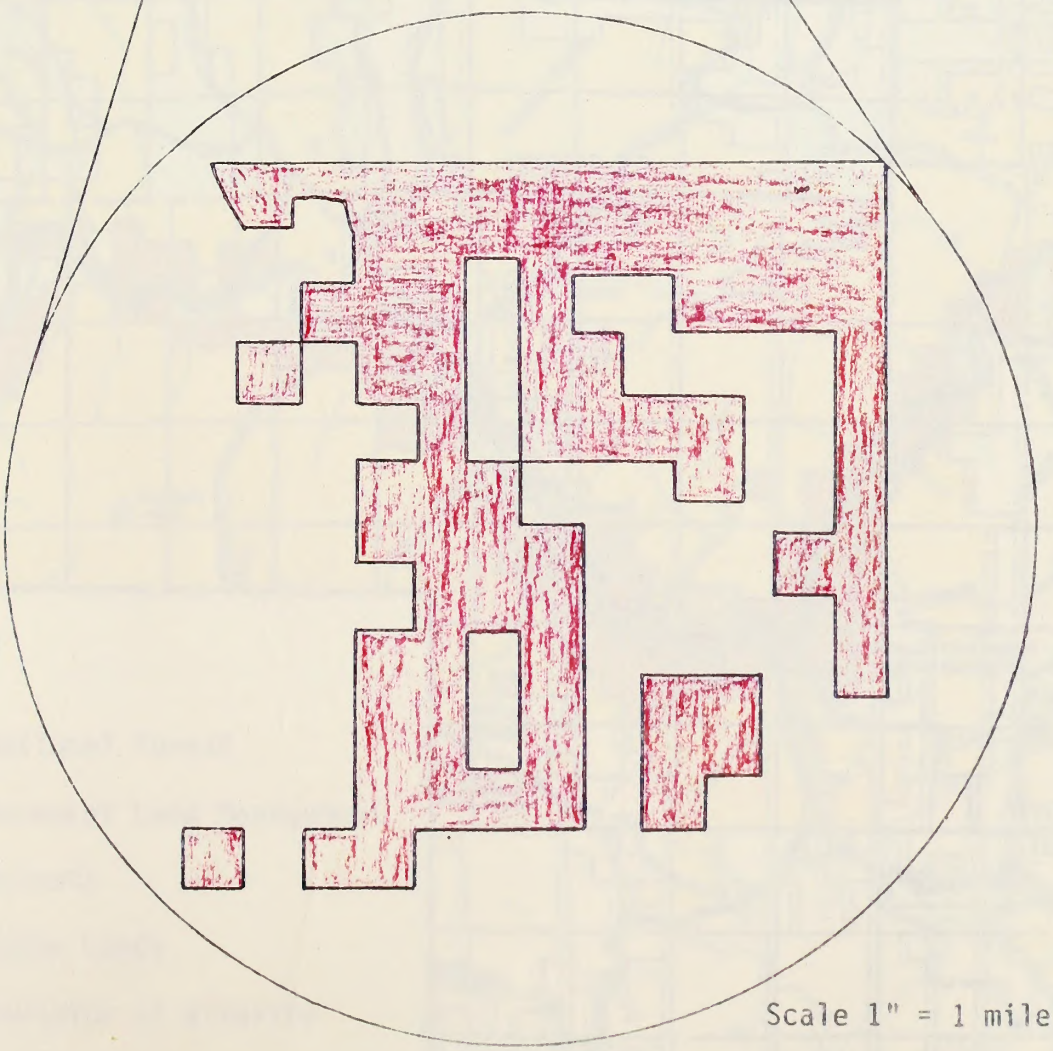
manner by eliminating duplication of effort between agencies. The estimated volume to offer is seven million board feet. Approximately 3 million from BLM and 4 million from the Forest Service.

In addition, there are two private land owners, (Mr. Horn and Mr. Leonard Roades), adjacent to BLM land who have also expressed a desire to cooperate through the Colorado State Forest Service. We will also coordinate with them in developing and implementing sound forest management in the Black Mountain area.

LOCATION MAP
BLACK MOUNTAIN FMP AREA



Scale 1" = 96 miles



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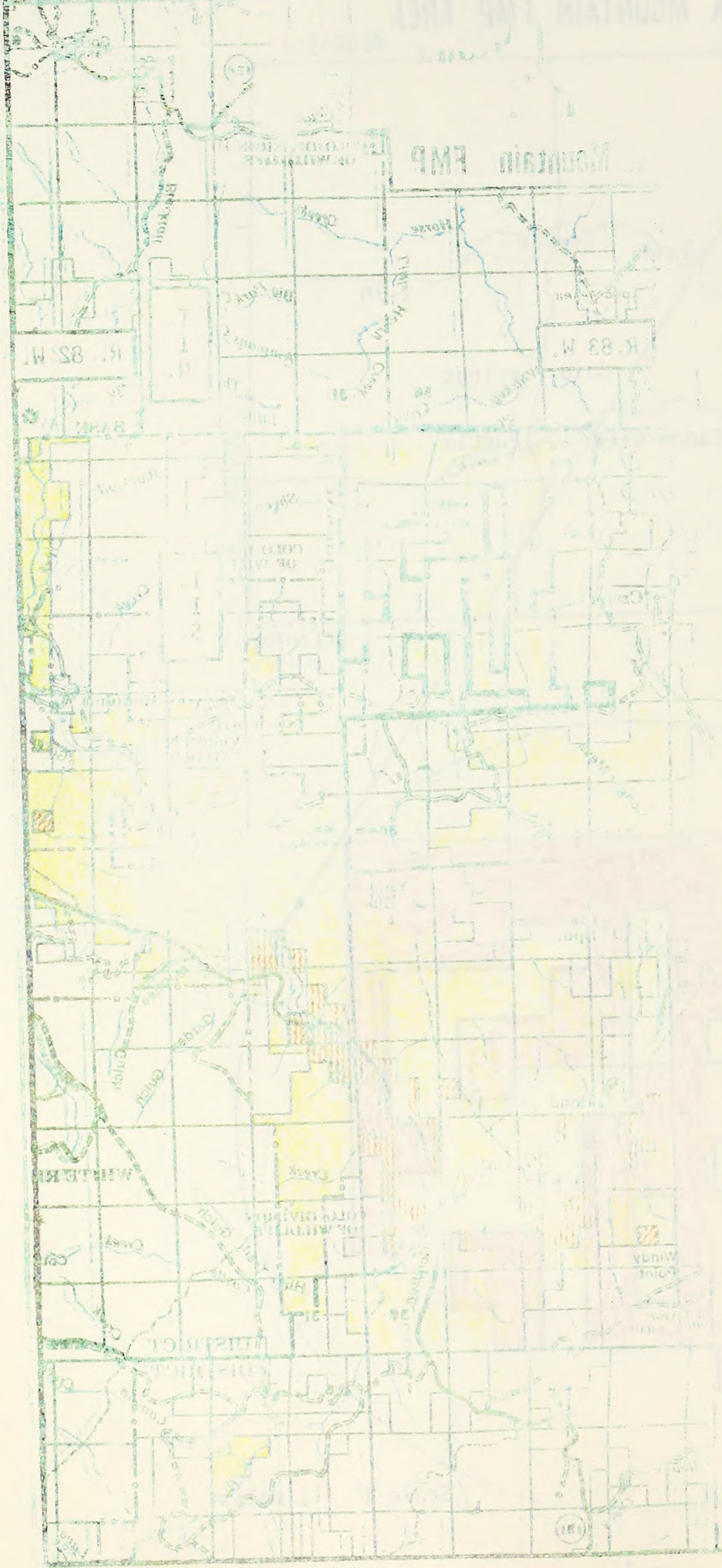
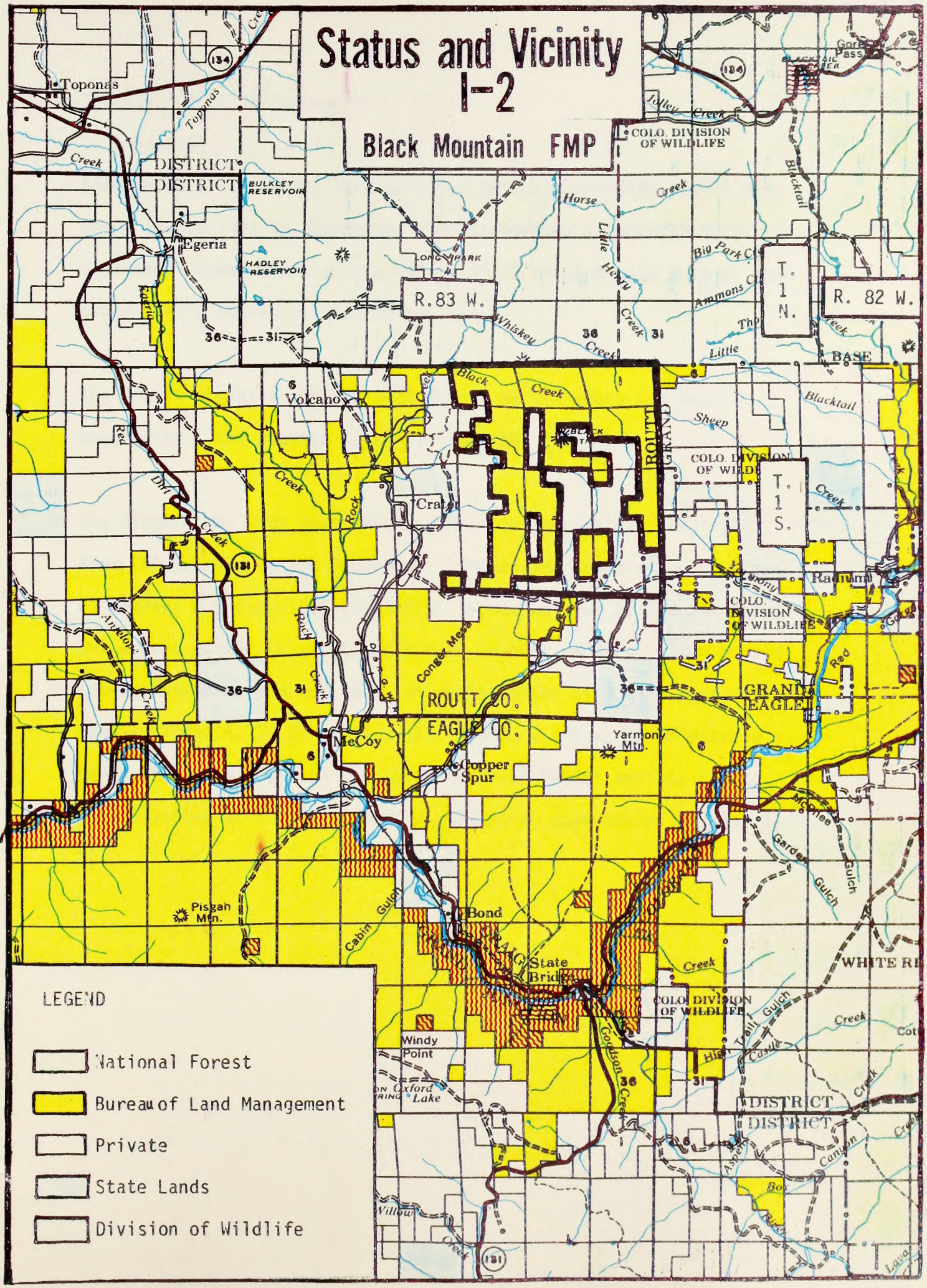



Status and Vicinity
I-2
Black Mountain FMP
Toponas
Egeria
DISTRICT
DISTRICT
BULKLEY RESERVOIR
HADLEY RESERVOIR
R. 83 W.
R. 82 W.
T. 1 N.
T. 1 S.
COLO. DIVISION OF WILDLIFE
Volcano
Crater
Radium
GRANDY
EAGLE
ROUTT CO.
EAGLE CO.
McCoy
Copper Spur
Yarmony Mtn.
Pisgah Mtn.
Bond
State Bridge
Windy Point
Oxford Lake
WHITE RI
DISTRICT
DISTRICT
LEGEND
National Forest
Bureau of Land Management
Private
State Lands
Division of Wildlife

C. Description of the Resources

1. General

Black Mountain, a local landmark, has two prominent knobs that are about 10,400 feet in elevation. The topography is moderately steep to steep. Some slopes are in excess of 40 percent with much of the ground being between 15 and 40 percent.

The lowest elevation, 8,400 feet occurs on the south and west boundaries. The average elevation is 9,600 feet.

The climate has wide seasonal variation in temperature ranging from -40 degrees to +80 degrees F. Summertime temperatures average 60 degrees F. Annual precipitation varies between 20 and 30 inches and occurs mostly as snow, and summer thunder showers. Snow occurs between November and May, and can reach depths of 3 to 4 feet. The area includes 4,132 acres of public lands, 3,160 acres of private lands and is adjacent to the Routt National Forest and its Black Tail planning unit which covers 23,475 acres (see tables I-1 and I-2).

TABLE I-1

FMP ACREAGE TABLE

Classification	Acres
Total FMP area	7,292
Total private land in FMP area	3,160
Total BLM land in FMP area	4,132
Nonforested BLM land	890
Productive forest land (PFL) in FMP area	3,242
PFL with no planned harvest (due to multiple use constraints)	694*
PFL with a planned harvest (allowable cut base)	2,548

*See table III-1

ACREAGE BY TIMBER TYPE

TYPE	STOCKING LEVEL**	ACRES	PERCENT OF TOTAL STOCKING LEVEL	PERCENT OF TOTAL BY SPECIES
Lodgepole Pine, Sawtimber (LP9)	W	1,657	51%	
	M	517	16	69%
	P	90	2	
Lodgepole Pine, Poles (LP8)	W	682	21	
	M	41	1	23
	P	16	1	
Aspen Poles (A8)	W	129	4	
	M	108	3	7
Douglas-Fir, Sawtimber (DF9)	W	2	1	1
TOTALS		3,242 AC.	100%	100%

**Stocking Levels

W - Well stocked, 70%+ Crown Density

M - Medium stocked, 40 - 69% Crown Density

P - Poorly stocked, 16 - 39% Crown Density

Table I-2

ACREAGE BY SECTION AND OWNERSHIP

	Total Acres	BLM	Private
Sec. 1	502.3	502.3	.0
Sec. 2	457.4	457.4	.0
Sec. 3	456.2	416.2	40.0
Sec. 10	640.0	360.0	280.0
Sec. 11	640.0	360.0	280.0
Sec. 12	667.7	467.6	200.0
Sec. 13	656.8	256.8	400.0
Sec. 14	654.2	254.2	400.0
Sec. 15	658.0	298.0	360.0
Sec. 22	640.0	320.0	320.0
Sec. 23	640.0	280.0	360.0
Sec. 24	640.0	120.0	520.0
Sec. 21	40.0	40.0	.0
	7,292.5	4,132.5	3,160.0

Black Mountain FMP

TOPOGRAPHY MAP

MC COY QUADRANGLE
COLORADO
7.5 MINUTE SERIES (TOPOGRAPHIC)

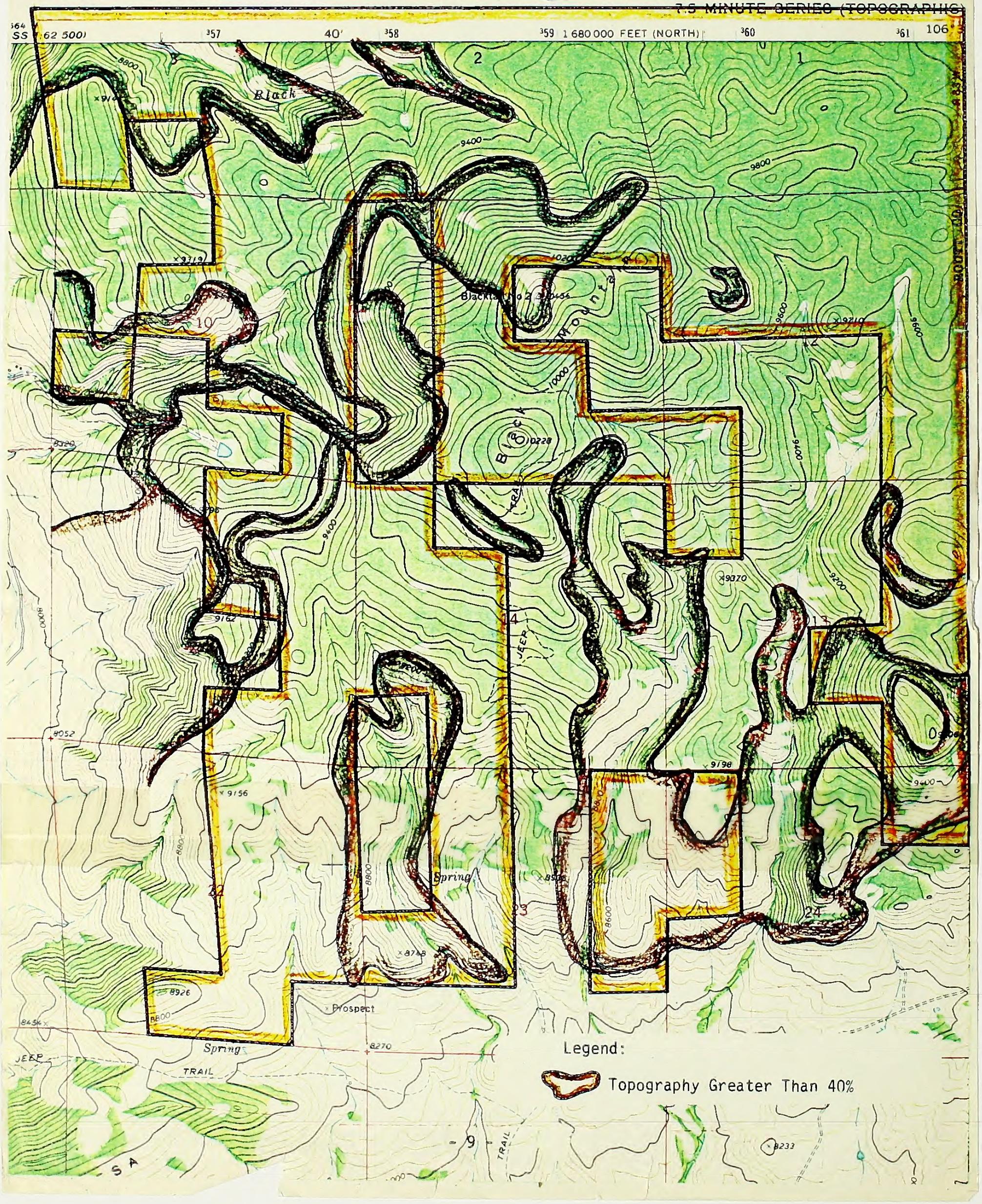


Photo I-1
South Side of Black Mountain
from Copper Spur Ranch

Photo I-2
This draw currently provides the only road access to
Black Mountain and crosses private land.

The area has been used since the 1880s for livestock grazing and ranching. BLM records indicate grazing use by cattle since inception of the Taylor Grazing Act of 1934. This cabin in Section 14 is a reminder of the historic years of grazing.

Photo I-3

"The line shack." Note the invasion of Aspen trees into the old cleared area around the cabin.

Four broad vegetative types occur: they are the Lodgepole pine-sedge type; the Aspen-subalpine fir type; Aspen-forb-grass type; and the Willow-wet meadow type. Lodgepole pine is the largest vegetative type occurring.

Photo I-4

Lodgepole Pine-Sedge type vegetation and existing access road.

Photo I-5
Aspen-subalpine fir vegetative type.

Photo I-6
Aspen-forbs-grass vegetation type, typical noncommercial aspen stands in the unit.

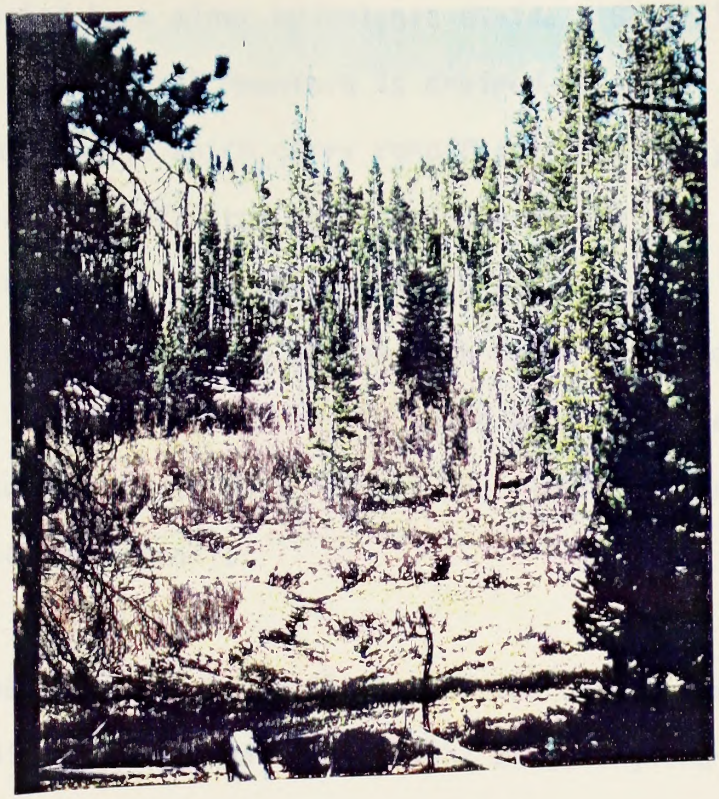


Photo I-7

Willow-wet meadow vegetative type

2. Water & Soil

The unit is bisected by a minor hydrologic divide. Generally, the area south and east of Black Mountain is drained by small, unnamed, ephemeral stream channels which carry runoff south directly into the Colorado River. Runoff from the remainder of the unit flows north-westerly into Rock Creek via Whiskey Creek and Black Creek. Approximately 7,300 acres (5.8%) of the Rock Creek Watershed lies within the unit. Typically, streams in the area exhibit seasonal variation in discharge, with 60 to 70% of the flow occurring in May and June from snowmelt runoff.

Limited water quality data are available for the unit. Field observations indicate water quality is high, exceeding the Colorado State Water Quality Standards for Class B-1 cold water fisheries (USDA Forest Service, 1976).

Flow requirements for fish, recreation, and other uses have not been established.

The soils are stable, they do not exhibit mass movement, and they are moderately erosive. (See table 1-4) The soils were mapped by the Soil Conservation Service in 1979.

3. Wildlife

Elk, deer and a limited number of beaver and bear are the major game species of wildlife in the unit. Smaller wildlife species found in the area are red squirrels, snowshoe hare, numerous song birds, coyotes, and other small rodents. Blue grouse and morning

doves are the only game birds found on the unit. East of the Black Mountain unit are 22,000 acres of land managed by the Colorado Division of Wildlife (DOW) and the Craig BLM District. These areas are managed for deer and elk winter range. The Black Mountain unit is used as spring, summer, and fall range but actual numbers are not known. Elk calve in all drainages and do not congregate in any large numbers. Primary calving grounds have not been identified. Conflicts between cattle and elk use does not seem to be a problem. Threatened or endangered species are not known to inhabit the unit. Spring use by bear has been observed and there are old beaver dams in Whiskey Creek but there is no sign of recent activity.

4. Minerals

To date no patented or unpatented mining claims have been noted in the unit and there is no sign of past prospecting or exploration. Geological reports and the lack of mining and exploration activity indicates an apparent low potential for locatable minerals, oil, or gas. There are no oil and gas leases in the unit.

5. Recreation

The unit has no public vehicle access or developed recreation sites. At least three perennial hunter camps are used seasonally. One camp has two corrals for pack animals. Hunting by local residents appears to be the primary use. Other uses may include snowmobiling and hiking, although there are no hiking trails, just some primitive roads. Roads developed for timber harvest will be single use roads that cross the National Forest and will be closed to the public for motor vehicle use on the National Forest portion. Timber management access and snowmobile use are the only exceptions at present.

6. Wilderness

The unit has been inventoried for wilderness potential and found not to have wilderness characteristics.

7. Air Quality

There are no industrial pollution sources and no nearby population centers that would contribute to poor air quality. This is a high elevation, high quality airshed at present.

8. Visual Resource

The unit has been inventoried as to scenic quality and has a Visual Resource Management classification of IV. (See BLM Manual 8411.6 for definitions). . The "C" level of scenic quality describes this landscape, which is background or seldom seen. This class allows visual contrasts to attract attention but requires that form, line, color and texture be repeated.

9. Fire Management

There is no recent history of fire occurrence but large fires have occurred maintaining even aged Lodgepole and Aspen plant communities. Forest fuels are accumulating in most old lodgepole stands and will continue to increase the fire hazard as the stands deteriorate. Access is very limited and there are few natural fuel breaks to aid in the control of large forest fires.

10. Transportation and Access

The only access is across private land from the south via a poorly maintained 4-wheel drive road. Access for timber harvest will be developed to the north across the Routt National Forest in cooperation with the Forest Service (see map I-4). Spur roads and skid trails will be of a temporary nature.

11. Range

This unit contains three grazing allotments. Three grazing licenses authorize 569 animal unit months of use under Section 15 of the Taylor Grazing Act. This results in 48 cattle grazing the area from April 12 through the end of October.

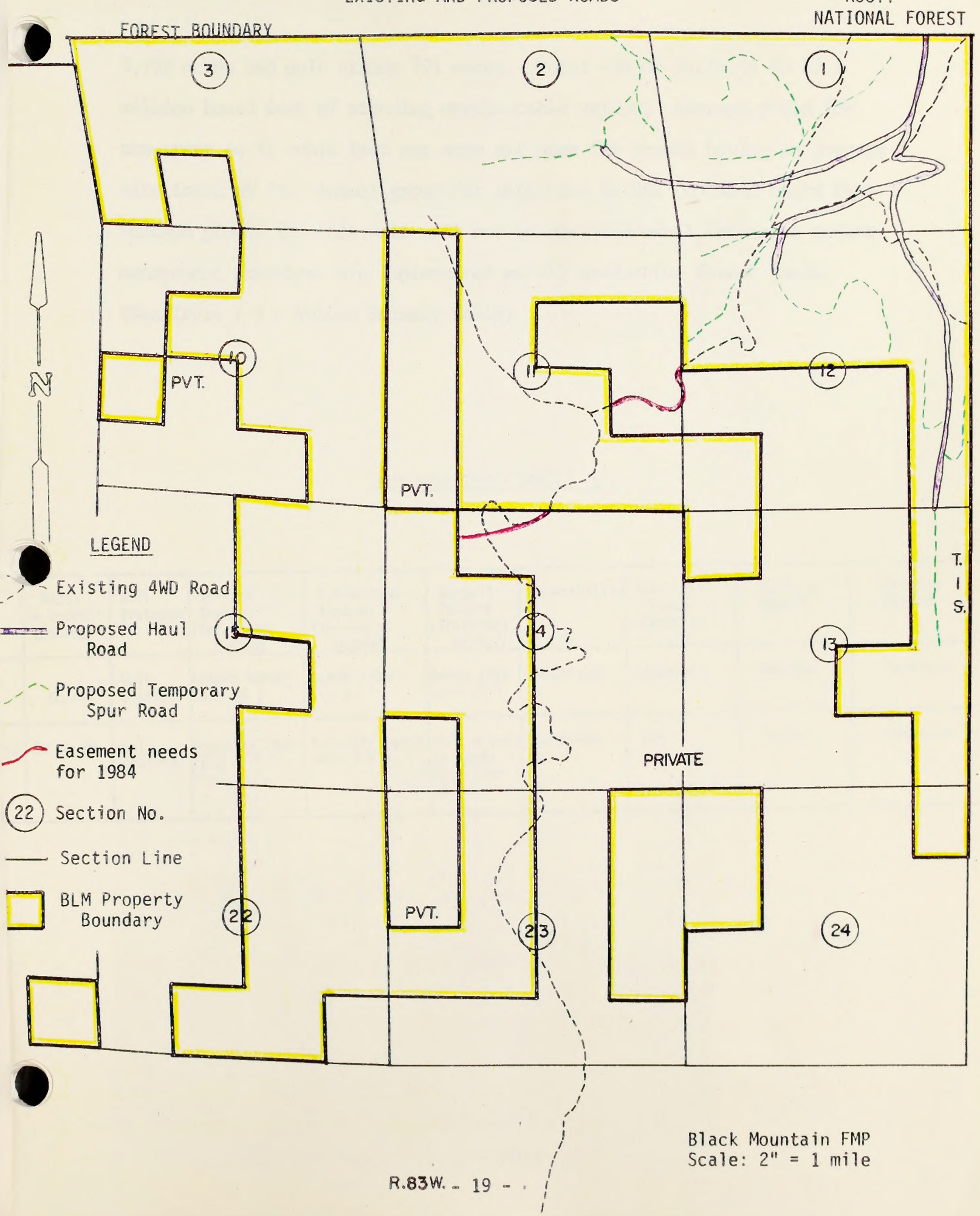
Table I-3
ALLOTMENT SUMMARY

Licensee	Allotment	Number Cattle	Months of Use	AUM's
Horn, Raymond	Horn	21	05/01-10/31	249
Copper Spur Corp	Copper Spur	18	04/01-10/31	211
Cronin	Black Mtn.	9	06/01-10/31	109

12. Timber

Lodgepole pine is the predominant forest type (92 percent). Timber inventories show 3,242 acres of productive forest land, of which 2,548 acres are suitable and available for intensive management and sustained yield harvest, see forest type map (back leaf) and table I-6 page 26, for appropriate data. Saw timber stands with a planned harvest occupy

MAP I-4
EXISTING AND PROPOSED ROADS



Black Mountain FMP
Scale: 2" = 1 mile

R.83W.

1,757 acres and pole stands 791 acres. Total volume estimate is 13.4 million board feet of standing merchantable volume. Average yield for the stand is 31 cubic feet per acre per year for stands having an average site index of 37. Annual growth at this time is 252 thousand board feet. Maximum growth for this unit will not be realized until intensive forest management practices are implemented on all productive forest lands. (See Table 1-5 - Volume Summary Table)

SOIL PROPERTIES - TABLE 1- 4

	Depth to Bedrock (inches)	Soil Drainage	Surface Texture (Thickness inches)	Subsurface Texture (Thickness inches)	Subsoil Texture (Thickness inches)	Permeability	Available Water Capacity	Surface Runoff	Erosion Hazard
	60 +	Well drained	Cobbly sandy loam (8)	Sandy loam (24)	Sandy clay loam (7)	Moderate	Moderate	Medium	Moderate
ed	10 to 20	Well drained	Gravelly loam (2)	Gravelly sandy loam (13)	Very gravelly sandy clay loam (3)	Moderate	Low	Medium	Moderate

Table I-5

VOLUME SUMMARY TABLE

	Sawtimber Stands	Pole Stands	Combined
Average Site Index	37	37	
Average DBH	10.7"	8.5"	
Average BA/acre			108.67
Average Yield	31/cu.ft/ac/yr.	29/cu.ft/ac/yr	
Average growth in BF	116 BF/ac.	61 BF/ac.	
Acres	1,757	791	2,548
Average annual BF Vol/ac. sustained yield	*203.8 MBF	*42.2 MBF	252 MBF

Average vol/ac 3,256 BF x 2548 ac = 13.4 MMBF standing volume.

* present production

Lodgepole pine (Pinus contorta). All sawtimber stands are 100 years of age or older and show signs of deterioration. The oldest stands are about 140 years have mistletoe infections, snags, snag top trees and subalpine-fir reproduction.

Photo I-8

Decadent Lodgepole pine stand. Note evidence of "brooming" caused by dwarf mistletoe.

In wet draws only reminant lodgepole stands remain and have been succeeded by subalpine fir and some spruce. There is very little commercial material in these stands.

Photo I-9

Overstock spruce fir stand, established under an over mature and dying out lodgepole stand.

Pole stands are also overstocked, slow growing, with almost no understory vegetation. Wood fuels are increasing on the forest floor from normal mortality.

Photo I-10

Overstocked pole stand inefficiently thins itself. Note absence of vegetation on the forest floor.

These stands provide a good opportunity for management since they grow on good sites and offer commercial material in the 5- to 9-inch diameter size. Increased growth is expected once the stands are thinned.

Sawtimber stands in the 9- to 15-inch diameter breast height class offer the largest volumes, up to 8,000 board feet per acre. These stands are more open, have vegetation in the understory and in places have some lodgepole reproduction. These stands are at or just beyond maturity. Some mortality occurs but generally the stands are still healthy with no disease problems.

Photo I-11

Mature, well-stocked lodgepole pine stand 9- to 15-inch diameter breast height. Good height and diameter growth indicates that this is a good site.

Aspen (Populus tremuloides). Most aspen stands have fallen out of the allowable cut base as unmerchantable; however, an aspen market is developing and 68 acres have been included in the base on Black Mountain. These stands occur as small pockets of pure aspen and as mixed stands having aspen in the overstory with an understory of subalpine fir.

Photo I-12

Aspen sawtimber in scattered pockets will be selected for harvest where practical. Note subalpine fir understory and natural small opening typical of this type.

See the timber type on the back cover leaf for details for individual stands and table I-6 , page 26.

Table I-6

INDIVIDUAL STAND ACREAGE

LODGEPOLE PINE SAWTIMBER, WELL-STOCKED (LP9W)

Stand No.	Stand Acres	Nonrestricted Acres	Restricted Acres
#103	219	129 Ac.	90 Ac.
110	42	42	0
112	681	581	100
123	10	10	0
130	56	23	33
136	26	26	0
142	66	16	50
144	237	190	47
151	8	0	8
154	138	138	0
158	34	34	0
159	140	140	0
TOTAL ACRES	1,657	1,329	328

Nonrestricted - Productive forest land without multiple use restrictions regarding the planned harvest of wood products.

Restricted - Productive forest land with no planned harvest due to multiple use constraints.

Table I-6, continued

LODGEPOLE PINE SAWTIMBER, MEDIUM STOCKED (LP9M)

Stand No.	Stand Acres	Nonrestricted Acres	Restricted Acres
#102	5	0	5
105	14	10	4
109	22	22	0
113	10	10	0
114	22	22	0
127	6	6	0
128	7	7	0
129	38	23	15
132	31	0	31
135	14	14	0
137	18	0	18
139	8	8	0
141	40	32	8
150	3	3	0
152	38	38	0
155	43	43	0
156	43	43	0
157	44	44	0
162	7	7	0
163	66	66	0
164	8	8	0
169	8	8	0
172	22	18	4
TOTAL ACRES	517	431	86

Table I-6, continued

LODGEPOLE PINE SAWTIMBER, POORLY STOCKED (LP9P)

Stand No.	Stand Acres	Nonrestricted Acres	Restricted Acres
#171	69	0	69
104	9	7	2
140	12	12	0
TOTAL ACRES	90	19	71

Table 1-6 continued

LODGEPOLE PINE POLES, WELL-STOCKED (LP8W)

Stand No.	Stand Acres	Nonrestricted Acres	Restricted Acres
#111	44	44	0
118	192	192	0
119	10	10	0
120	34	34	0
121	19	19	0
122	35	35	0
124	20	20	0
125	19	19	0
126	5	5	0
131	54	54	0
133	7	0	7
134	12	12	0
143	117	117	0
145	32	29	3
153	14	14	0
161	10	10	0
165	7	7	0
166	7	7	0
167	14	14	0
168	12	12	0
170	8	8	0
173	10	10	0
TOTAL ACRES	682	672	10

Table I-6 continued

LODGEPOLE PINE POLES, MEDIUM-STOCKED (LP8M)

Stand No.	Stand Acres	Nonrestricted Acres	Restricted Acres
108	4	4	0
160	7	7	0
	30	30	0
TOTAL ACRES	41	41	0

Table I-6 continued

LODGEPOLE PINE POLES POORLY STOCKED, (LP8P)

Stand No.	Stand Acres	Nonrestricted Acres	Restricted Acres
#147	16	10	6
TOTAL ACRES	16	10	6

Table I-6 continued

DOUGLAS-FIR SAWTIMBER, WELL-STOCKED (DF9W)

Stand No.	Stand Acres	Nonrestricted Acres	Restricted Acres
#101	2	0	2
TOTAL ACRES	2	0	2

II. Forest Management Objectives

Management objectives are:

A. To manage 2,548 acres of productive forest land on a sustained yield basis.

B. To protect 694 acres, not suitable for intensive forest management until such time as it is feasible to manage them intensively.

C. To develop an access plan for timber harvesting. Haul roads will tie into the Routt National Forest System and will be constructed with minimal environmental damage.

D. To identify intensive forest management opportunities and practices that are consistent with the principle of sustained yield and multiple use resource management.

E. To coordinate with multi resource objectives.

Details for planned actions are found in chapter V. Chapter V also states how assumed general objectives for other resources would be facilitated through the forest management objective.

Objectives are normally defined in RMP's and are based on a decision made as a result of that process. In this case, basic forest management assumptions were made in the absence of a completed planning document. Objectives will be aimed at the lodgepole sedge type. Other types will be maintained in keeping with objective "B".

Basic assumptions made are:

1. Revisions will be made to the plan as a result of RMP decisions to be made in 1983.
2. Timber harvest and intensive forest management is consistent with established Bureau policy and practices.
3. Timber harvesting and production is important to the national and local economy.
4. A transportation system must be developed in order to manage the timber resource.
5. The Black Mountain unit does not qualify as a wilderness area.
6. Conflicts with other resources can be resolved readily and will not be of major significance.
7. Cultural values, scenic quality, recreation values, wildlife, fisheries, range, water quality and minerals management will receive equal consideration in implementing forest management actions.
8. All management actions will be in conformance with accepted procedures, existing regulations and policy.

UNITED STATES
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BUREAU OF LAND MANAGEMENT

MANAGEMENT FRAMEWORK PLAN – STEP 1
ACTIVITY OBJECTIVES

Name (MFP)	Black Mountain
Activity	Forest Management
Objective Number	A

A. To manage 2,548 acres of productive forest land on a sustained yield basis.

Rationale:

Demand for wood products is increasing and the resource base is shrinking. In order to contribute to future needs, wise use of all resources is necessary and profitable. It is good stewardship to improve, renew and maintain the public resources.

Planned Actions

1. Conduct timber production capability classification inventory on these acres.
2. Harvest 3 million board feet in 1981 and 2 MMBF in 1985 in order to reduce stands that are overmature. Harvest 750,000 board feet at 3-year intervals beyond 1985. The 1981 sale of 3 million board feet will be integrated with a Forest Service sale of 4 million board feet. The Environmental Assessment for this sale addresses 7 million board feet.
3. Commercially thin 45 acres in pole stands annually.
4. Construct approximately 4 miles of 14 feet wide road with turnouts in conjunction with the USFS under cooperative agreement, and an added 2 miles in conjunction with the 1985 sale.
5. Obtain cultural clearance.

Benefits to other resource objectives: (1) increased forage and grass production for range and wildlife and (2) improved access for administration of all resources.

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MANAGEMENT FRAMEWORK PLAN – STEP 1
ACTIVITY OBJECTIVES

Name (MFP)	Black Mountain
Activity	Forest Management
Objective Number	B

B. To protect all stands, 694 acres, not suitable for intensive forest management until such time as it is feasible to manage them intensively.

Rationale:

Stands not immediately suitable for harvest may be suitable for commercial harvest as value increases and technology advances.

Planned actions

1. Protect from fire
2. Monitor insect and disease activity
3. Conduct TPCC inventory

Benefits to other resource activities

1. Soil is protected by maintenance of forest cover
2. Cover for wildlife is maintained
3. Maintenance of visual quality
4. Maintenance of watershed quality

C. Develop an access plan for timber harvesting. Haul roads will tie into the Routt National Forest System and will be constructed with minimal environmental damage.

Rationale:

Access is a necessary part of timber harvest.

Planned Actions:

1. Obtain access from USFS under existing cooperative agreements.
2. Survey, design, and construct actual road.
3. Rehabilitate cuts and fills.
4. Obtain easement for south side access across the private inholdings for future sales, 3/4 mile.

Benefits to other resources:

Improved access for administration of all resources, i.e., range use supervision and fire suppression.

D. Identify intensive forest management opportunities and practices that are consistent with the principle of sustained yield and multiple use resource management.

Rationale:

The identified harvest includes enhancement of the resource. Total management requires development of the resource as well as harvest through thinning and silvicultural practices.

Planned Actions:

1. Identify commercial and precommercial thinning areas on a timber type map.

2. Inventory areas needing reforestation.

3. Plan for seed collection and subsequent growing of planting stock. This stock will be used in the event that natural regeneration is inadequate, 5 years following harvest. Stocking will be judged adequate if there are a minimum of 300 established seedlings per acre.

4. Identify silvicultural practices that will:

   a. Secure the prompt establishment of stands of optimum stocking through natural means.

   b. Prevent or relieve the stagnation of young stands.

   c. Maintain a high rate of growth in developing stands.

   d. Produce a final timber product of desired size and quality.

   e. Accomplish different multi-resource objectives on forest areas through a defined level of timber harvest.

   f. Protect timber-growing environments for the sustained yield of timber products.

Benefits to other resources

a. Increased forage for wildlife and cattle

b. Increased water yields and streamflows through increased snowpacks and less loss of soil moisture through transpiration.

E. Coordinate with multi-resource objectives.

Rationale: Multiple use management policy requires trade-offs, co-ordination and development of many resources. Often one can enhance the other through cooperation. See chapter IV for details on co-operation with others.

Planned actions:

1. Develop an FPM that considers all forest uses as opposed to a timber management plan that considers only single use timber.

2. Revise according to input from RMP to be completed in 1983.

Benefits to other activities

See chapter IV, co-ordination, for benefits to each resource activity.

III. Constraints

Necessarily the Forest Management and Harvest Origin has been constrained by very limited access (both legal and physical). The only vehicle allowed to access a miles of private land trail. Cooperation with the Forest Service will enable us to plan for access across. Plan the march across the Forest Service under a land lease agreement.

Other constraints are listed in table III-1. This was done before considering resource constraints and after the basic considerations mentioned in chapter II along with personnel and equipment facilities. A total of 206 acres are constrained to other multiple use considerations.

Table III-1

FOREST LAND CONSTRAINED BY OTHER MULTIPLE USE CONSIDERATIONS

Type of Restriction	Acres Restricted	Percent Restricted
Stream edge	130	60
Non-commercial Aspen type	149	68
Topographic	55	100
Watershed, esthetic(Eyes) only	0	0
Wildlife, ecological only	0	0
Total acres	204	

Total 100 acres = 2,248
Net acres restricted = 2,248
Net acres used = 206

There were no archeological sites identified due to archeological constraints. Therefore, additional restrictions are placed on the timber program because of unrecorded cultural values. The necessary

III. Constraints

Historically the timber management and harvest program has been constrained by very limited access both legal and physical. The only vehicle access is across 6 miles of private jeep trail. Cooperation with the Forest Service will enabled us to plan to obtain access from the north across the Routt Forest under a joint timber sale contract.

Other constraints are listed in table III-1. They were derived by consulting resource specialists and using the basic assumptions mentioned in chapter II along with the allowable cut plan decisions. A total of 694 acres are constrained by other multiple use considerations.

Table III-1

FOREST LAND CONSTRAINED BY OTHER MULTIPLE USE CONSIDERATIONS

Type of Restriction	Acres Restricted	Percent Restriction
Stream side	130	100
Noncommercial Aspen type	169	100
Topographic	395	100
Watershed, silvicultural only	0	0
Wildlife, silvicultural only	0	0
Total acres	694	

Total PFL acres = 3,242
PFL not restricted = 2,548
PFL constrained = 694

There were no constraints identified due to archeological considerations. Therefore, whenever constraints are placed on the timber programs because of overriding cultural values, the necessary

adjustments must be made in the allowable cut calculations. Cultural values, if present, will be identified in the associated Environmental Assessment.

Table III-2

PERCENT OF ACRES RESTRICTED BY STAND

Stand Number	% of Acres Restricted *
171	100
132	100
133	100
130	60
129	40
151	100
115	100
137	100
112	15
117	100
116	100
142	75
172	20
145	10
144	20
147	40
141	20
107	100
105	30
Unnumbered	100
102	100
104	20
103	40
100	100
101	100

*Restricted - Productive forest land with no planned harvest due to other multiple use constraints.

[illegible] Compatibility with other Activities

A. Wildlife Management Considerations

Landscape [illegible] constitute the most economical forest [illegible] habitat [illegible] to [illegible] area. Commercially, forest practices of [illegible] have not [illegible] or [illegible] affect wildlife habitat to a [illegible] degree.

Silvicultural [illegible] to protect [illegible] values. See Manual [illegible] and [illegible] and [illegible] for [illegible] (Appendix [illegible]).

A Habitat Management Plan has not been developed for the [illegible]. A Resource Management Plan (RMP) will be completed in Fiscal Year [illegible] and will provide additional information and direction concerning wildlife and forest management [illegible]. The environmental assessment for each project [illegible] to identify elk calving areas and deer [illegible] areas in the [illegible]. At the beginning of each field season a tour conducted by the biologist and forester should be scheduled to review planned silvicultural projects and to identify potential wildlife problems.

B. Fisheries Management Coordination

The fishing potential is limited in Whiskey Creek and Black Creek. A [illegible] may be [illegible] in an attempt [illegible] the [illegible] buffer strips along streams, [illegible] logging [illegible] are [illegible] across [illegible] and limiting [illegible] harvesting to [illegible] parcels of less should adequately protect fisheries values in the [illegible]. Harvest [illegible] will result in increased [illegible] and [illegible] flows. All [illegible] will be subject to [illegible] by an [illegible] which will include a fisheries [illegible].

IV. Coordination with Other Activities

A. Wildlife Management Coordination

Lodgepole pine stands constitute the most extensive forest type on public lands in the FMP area. Consequently, forest practices on these lands can enhance or adversely affect wildlife habitat to a significant degree.

Stipulations have been developed to protect important wildlife values. See Manual 6512 and 5400 and instruction memorandums No. CSO 75-254, (appendix C).

A Habitat Management Plan has not been developed for the unit, however, a Resource Management Plan/EIS will be completed in Fiscal Year 1983 and will provide additional information and direction concerning wildlife and forest management coordination. The environmental assessment for each project needs to identify elk calving areas and deer fawning areas in the interim. At the beginning of each field season a trip conducted by the biologist and forester should be scheduled to inspect planned silvicultural projects and to identify potential wildlife problems.

B. Fisheries Management Coordination

The fishing potential is limited to Whiskey Creek and Black Creek. A small population may be maintained in an existing beaver dam. Maintaining buffer strips along streams, keeping logging equipment out of stream channels, and limiting clearcut harvesting to 40-acre parcels or less should adequately protect fisheries values in the area. Harvest methods will result in increased snow packs and enhance streamflows. All actions will be subject to analysis by an interdisciplinary team which will include a fisheries biologist.

C. Livestock Management Coordination

Ranchers use the area April 1 through October for grazing with a total of 48 cattle. The land is not grazed uniformly due to heavily forested areas that do not support forage. The lower elevations receive most of the use. Timber harvesting should initially increase the carrying capacity. Range managers will need to identify potential water developments and fencing needs through the EA or 1983 EIS and coordinate with forestry personnel on installation and financing. A cattleguard will be installed at the forest boundary on the proposed timber haul road. The road does not cross any other fences.

Currently there are no grazing allotment management plans (AMP's) developed for the unit. AMP's may be developed after the EIS is completed.

These two resources are, fortunately, mostly complementary to each other. Basically, timber harvest allows initial increased production of grass, shrubs, and forbs in the understory, which is beneficial to livestock, especially during the first few years after harvest.

Standard timber sale contract stipulations currently allow the forester to specify closing of gates, protection of range improvements, and use of the contract area by livestock during operations. No significant problems are anticipated at this time.

D. Recreation Management Coordination

Recreational, visual, and cultural objectives as they relate to the forestry program deal mainly with the visual aspects of land treatments and the protection of cultural sites. Therefore, archeological clearance will be done before each timber sale.

Any significant cultural site will be protected per requirements outlined in 36CFR800. Stipulations may be included in the terms of the timber sale contract. Also, contrast ratings will be included in all forest management actions and projects will be kept within established criteria.

There are no planned or developed recreation sites and timber access will provide for public use on a limited basis. Because of the limited access recreation development would be limited to hiking, crosscountry skiing and horseback activities such as hunting and riding. Silvicultural practices will maintain a green aspect through partial cutting and small clearcuts.

An old cabin in Section 14 on private land is the only known cultural site. See photo 3-Chapter I.

E. Watershed Management Coordination

Increased reproduction that results from overstory removal will in the long term maintain soil stability. Some soil movement can be expected for the short term. Increased turbidity can occur during peak run-off periods.

Late season stream flow can be increased when the overstory is removed since this increases available soil moisture and interflow to streams.

Timber cutting will increase the snow pack since less is lost to interception and wind deposits snow in openings.

Stipulations will be coordinated with the watershed management specialist that will protect or rehabilitate the watersheds.

F. Minerals Management Coordination

There is no evidence of past exploration or mining. There are no known existing coal, oil or gas leases, or applications for leasing in the unit, and there are no recorded mining claims.

G. Fire Management Coordination

Fire can be useful to prepare sites for reforestation, dispose of right-of-way slash not suitable for fuelwood and in reducing fire hazard. Certain stand conditions exist, i.e. stagnated doghair stands and heavy concentrations of ground fuels, which may benefit from prescribed burning. Close coordination with the District fire management specialist on such projects will be necessary.

Fire management plans will be prepared for each proposal.

As it has in the past, fire suppression in the Black Mountain area will continue to be under the District fire management program. Suppression within the Resource Area consists of aerial patrol and twenty-four hour "on-call" initial attack crews.

H. Forest Pest Management Coordination

Normal insect and disease activity occurs in the Black Mountain area. Overall the activity is in an endemic stage. Small isolated stands may have a higher degree of infestation. Silvicultural practice, such as small patch cuts, selective cuts, overstory removal, or thinning may be necessary to aid in insect and disease control. The silvicultural prescription will be based on the degree of activity present and the current condition of the stand.

Mistletoe is present but like the insect problem, it can be managed in conjunction with normal forest silvicultural practices.

I. Support Activities

1. Engineering: Survey and design and route analysis for South Side Easement, 3/4 mile. Fiscal Year 1981 and 1982.
2. Cadastral survey 30 miles of property line determination, average of 6 miles per year for 5 years. The township has a brass cap survey and most corners are located.
3. Approximately 1,000 acres will need cultural clearance in Fiscal Year 1980-81.

Planned Actions

The planned actions for the first 10-year period are discussed for the Black Mountain Forest Management Area. These actions, listed by fiscal year, are directly referenced to the strategies or objectives presented in chapter II (see page 3[illegible]). In some instances, a planned action may extend over a series of years.

A FMP project map is provided as shown previously with locations (see map V-1). Also included on page [illegible] is a bar graph illustrating the planned actions to be taken each fiscal year.

An environmental assessment (EA) has been completed and approved for the Black Mountain - Little Whiskey [illegible] Sale (Black Whiskey Sale), a cooperative BLM-USFS sale offered. This EA is a separate document detailing the proposed management actions of the sale. With the writing of this FMP, a [illegible] base is provided for necessary EA's and timber sale plans on proposed projects in the FMP area.

[illegible] of the Planned Actions Resource Management [illegible] (RMP) [illegible] planned actions [illegible].

V. Planned Actions

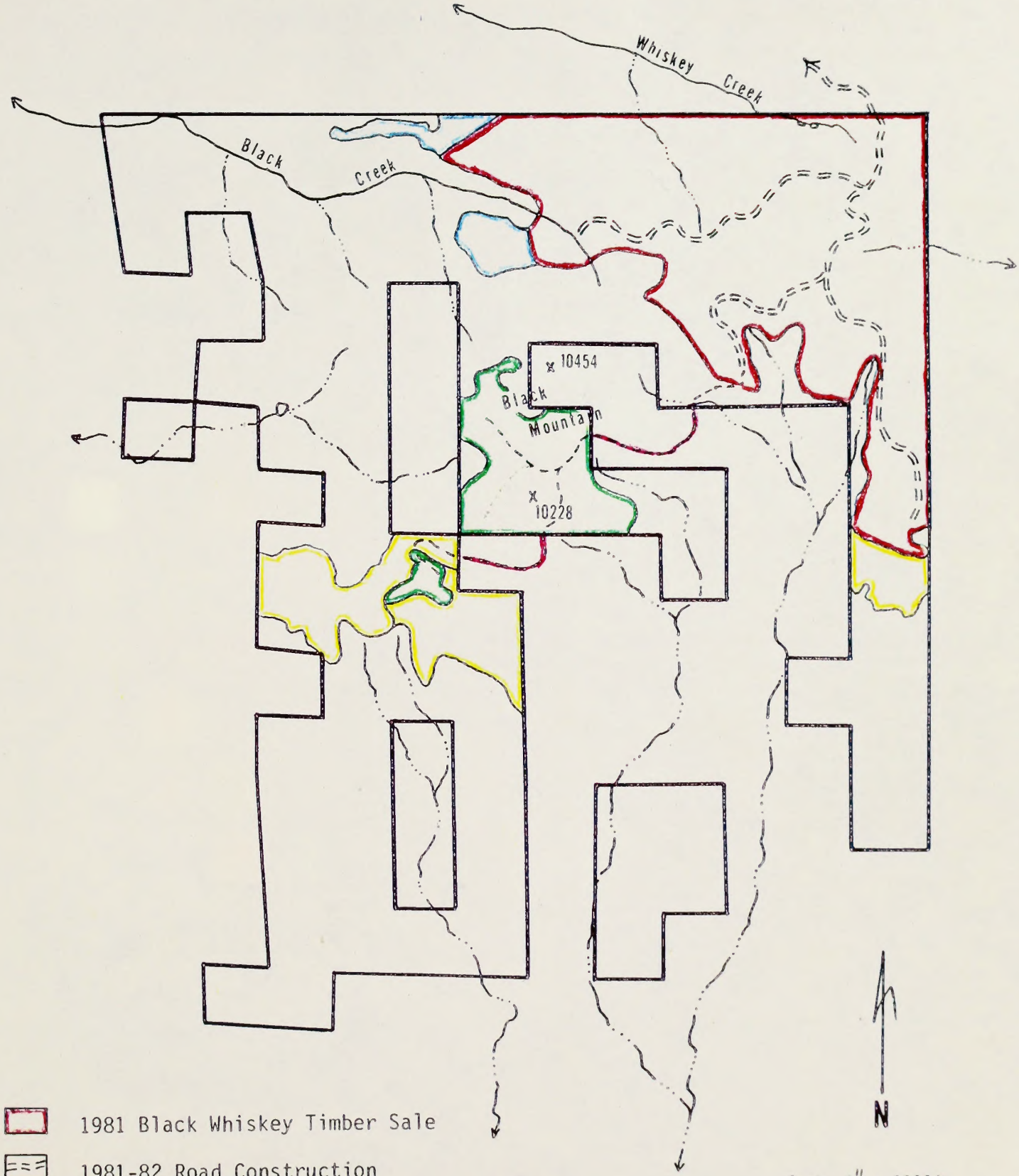
The planned actions for the first 10-year period are presented for the Black Mountain Forest Management Area. These actions, listed by fiscal year, are directly referenced to the management objectives presented in chapter II (see page 33). In some instances, a planned action may extend over a period of years.

A FMP project map is provided to show proposed timber sale locations (see map V-1). Also included on page 66 is a bar graph illustrating the planned actions to be taken each fiscal year.

An environmental assessment (EA) has been completed and approved for the Black Mountain - Little Whiskey Creek Timber Sale (Black Whiskey Sale), a cooperative BLM-USFS sale effort. This EA is a separate document detailing the proposed management actions of the sale. With the writing of this FMP, a management base is provided for necessary EA's and timber sale plans on proposed projects in the FMP area.

Upon completion of the Glenwood Springs Resource Management Plan (RMP)/Environmental Impact Statement (EIS), revisions of these planned actions may be desired.

BLACK MOUNTAIN PROJECT MAP



Scale 1" = 3000 ft

- 1981 Black Whiskey Timber Sale
- 1981-82 Road Construction
- Easement Acquisition
- 1985 2MMbf Timber Sale
- 1988 750Mbf Timber Sale
- Commercial Thinning

Fiscal Year 1980

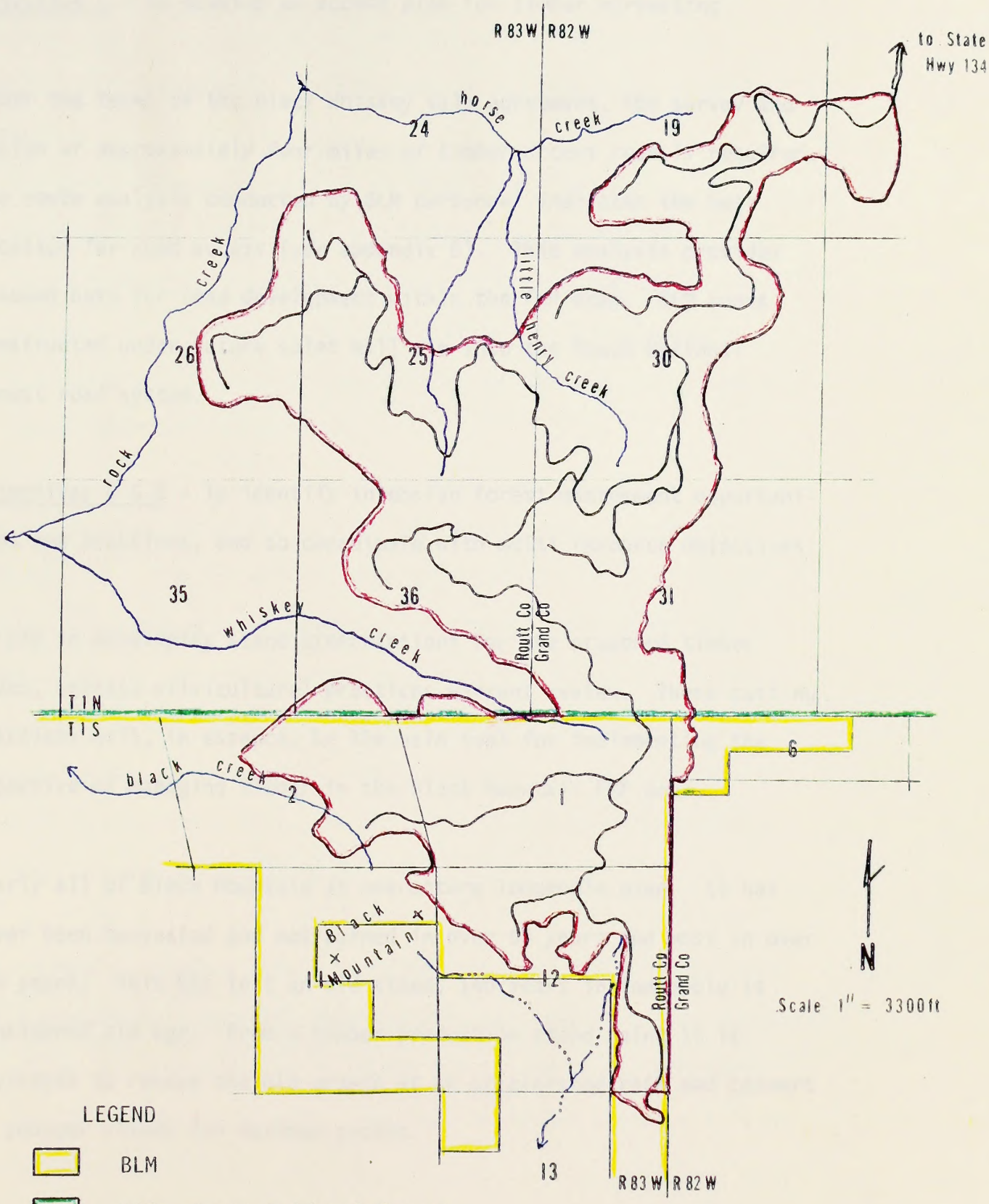
Objective A - To manage 2,548 acres of productive forest land on a sustained yield basis.

Complete the Black Whiskey Timber Sale layout and cruise. Refer to Project Map and also Map V-2 on page 51 for the sale area. Under the BLM - USFS cooperative agreement, BLM will contribute three million board feet (3 MMbf) of lodgepole pine to the overall 7 MMbf sale volume. USFS cruise procedures will be used to assure continuity necessary for an accurate volume determination.

Aside from the forester's normal sale layout and prep duties to be completed, he should arrange for six miles of section corner location with the USGS. Cadastral Survey Section corners adjacent to the sale boundary should receive priority, and once placed, can assist the Forester in determining private boundary lines and exact road and sale boundary locations.

Finalize Timber Production Capability Classification (TPCC) for the acreage identified in this objective. Developed procedures will be used as directed in BLM Manual 5450.1 and 5450.2 - CSO operational Inventory - TPCC instructions.

BLACK WHISKEY TIMBER SALE



LEGEND

- BLM
- USFS, Routt National Forest
- Approximate Sale Boundary
- Approximate Road Location

Objective C - To develop an access plan for timber harvesting.

Under the terms of the Black Whiskey sale agreement, the survey and design of approximately four miles of timber access road is required. The route analysis conducted by BLM personnel indicates the best location for road access (see appendix D). This analysis provides a sound base for road development within the FMP area. BLM roads constructed under future sales will tie into the Routt National Forest road system.

Objectives D & E - To identify intensive forest management opportunities and practices, and to coordinate with multi resource objectives.

To aid in developing stand prescriptions for the proposed timber sales, certain silvicultural practices warrant review. These cutting practices will, in essence, be the main tool for implementing the objective of managing timber in the Black Mountain FMP area.

Nearly all of Black Mountain is overmature lodgepole pine. It has never been harvested and not burned in over 60 years and most in over 140 years. This has left an old stand; 140 years in lodgepole is considered old age. From a timber production stand point it is desirable to remove the old growth at an accelerated rate and convert to younger stands for maximum growth.

From a silvicultural point of view, clearcutting is a sound and practical way of bringing mature and overmature lodgepole pine forests under management. Clearcutting is desirable for several reasons:

a. Lodgepole pine is intolerant to shade, and regenerates best when overstory competition is removed or significantly reduced.

b. Dwarf mistletoe, a parasite present in varying degrees in the stands, is best controlled by separating old and new stands.

c. Blowdown, while not a serious problem in the unit, is always a threat when partial cutting.

Timber Management however, is only one resource use of lodgepole pine forests. The FMP unit is also important for water yield and quality, wildlife habitat, hunting, recreation, and scenic beauty. Clearcutting is not always compatible with the objectives of these other multiple use resources. What is needed are silvicultural practices that can be used in combination with clearcutting to maintain forest cover while the old stand is being replaced with a healthy vigorous new stand.

The following research papers represent the state of our knowledge and the most up-to-date and accepted silvicultural practices available. It will be the standard and guide for our silvicultural management actions in this planning area. The papers, listed below, are filed in the forestry library.

Table V-1

SILVICULTURAL REFERENCE LIST

Alexander, Robert R., 1972.
Partial cutting practices in old-growth lodgepole pine. USDA Forest Service Research Paper RM-92, 14 p.

Alexander, Robert R., 1971.
(Revised 1972) Initial partial cutting in old-growth spruce-fir. USDA, Forest Service Research Paper RM-76, 10 p.

Alexander, Robert R., 1973.
Partial cutting in old-growth spruce-fir USDA, Forest Service Research Paper RM-110, 16 p.

Alexander, Robert R., 1974.
Silviculture of the subalpine forests in the central and southern Rocky Mountains: A status of our knowledge. USDA, Forest Service Research Paper RM-121, 88 p.

Jones, John R., 1974.
Silviculture of southwestern mixed conifers and Aspen: The status of our knowledge. USDA, Research Paper RM-122, 44 p.

Alexander, Robert R., 1974.
Silviculture of central and southern Rocky Mountain forests: a summary of the status of our knowledge by timber types. USDA, Forest Service Research Paper RM-120, 36 p.

Alexander, in his 1972 publication "Partial Cutting Practices in Old-Growth Lodgepole Pine", describes several partial cut alternatives for enhancement of other resources while meeting the forest management needs of a particular stand. The Black Mountain unit will apply

Alexander's individual and group tree selection method of partial cutting in combination with clearcutting of patches up to 5 or 6 times the average tree height of the stand but in no instance larger than 40 acres in size.

Field personnel will need to familiarize themselves with the guidelines and use professional judgment as to which cutting practice will be applied to each stand. Generally, partial cutting will not remove more than 30 percent of the crown cover, and will be used to maintain a forest canopy. Clearcutting will be used on disease and insect infested areas and will promote regeneration and maximum growth.

Fiscal Year 1981

Objective A - To manage 2,548 acres of productive forest land on a sustained yield basis.

Under the terms of the Black Whiskey Timber Sale agreement, the BLM and USFS will jointly offer for sale 3 MMbf of BLM lodgepole pine. Contract, sale and administration procedures are to be conducted according to policies set forth in the cooperative agreement and BLM Manual 5400 (see appendix B).

Four miles of road construction will begin under timber sale contract provisions. The flow of timber hauling will be north across new USFS roads and onto the existing USFS road system. It is the forester's responsibility to coordinate with USFS personnel on administration of road construction and logging operations on BLM lands. The 7 MMbf sale volume suggests a period of 3 to 5 years to complete the road work and timber harvest.

Objectives B & D - To protect 694 acres, not suitable for intensive forest management until such time as it is feasible to manage them intensively. To identify intensive forest management opportunities and practices that are consistent with the principle of sustained yield and multiple use resource management.

The BLM forester will conduct a thorough reforestation study of the Black Mountain FMP area. Findings will be incorporated into the ongoing RMP process, identified on timber type maps, and added to the TPCC data.

Objective C - To develop an access plan for timber harvesting.

A route analysis will be initiated to ascertain the best access route to the proposed 1985 timber sale. An estimated two miles

of additional road will be necessary to harvest the volume in the 1985 sale (see Project Map). In conjunction with the route analysis, an EA will be completed. The EA will ensure the BLM of a working base with which to negotiate an easement across private holdings.

Fiscal Year 1982

Objectives A & C - To manage 2,548 acres of productive forest land on a sustained yield basis. To develop an access plan for timber harvesting. Haul roads will tie into the Routt National Forest System and will be constructed with minimal environmental damage.

The forester will assist in conducting a survey and design of the estimated two miles of road required for the 1985 timber sale (see Project Map). Proceedings to acquire 3/4 mile of easement for the timber haul road should begin. The District Access Specialist will take lead responsibility on this project.

In conjunction with these easement proceedings, an additional 6 miles of Cadastral Survey will be needed in the project area. Corner locations will be essential for an exact survey and legal documentation.

Objective D - To identify intensive forest management opportunities and practices that are consistent with the principle of sustained

yield and multipe use resource management.

Based on the findings of the reforestation studies conducted in FY 1981 on the FMP area, a reforestation plan should be developed. Considerations should be made for seed collection within the FMP area.

Fiscal Year 1983

Objective A & C - To manage 2,548 acres of productive forest land on a sustained yield basis, and to develop an access plan for timber harvesting.

Under the direction of the District access specialist, easement proceedings will be finalized. This will allow the BLM an access route to the 1985 sale area.

Cadastral Survey work will continue on section corner subdivisions and property line locations pertaining to the 1985 sale area.

Interest expressed by adjacent landowners to participate in a separate and/or joint timber sale with the BLM should be monitored. Should such interest exist, the forester will coordinate with the Colorado State Forest Service in arranging a joint sale or sale adjacent to

public lands that would require use of public roads. An interest in such sales has been expressed by adjacent landowners.

Objective D - To identify intensive forest management opportunities and practices that are consistent with the principle of sustained yield and multiple use resource management.

As harvest operations continue on the Black Whiskey sale, contract modifications should be made to log any areas of blowdown or windfall.

Objective E - To coordinate with multi resource objectives.

With the completion of the RMP/EIS in 1983, this FMP should be revised with the specific goal of incorporating the recommendations of the RMP/EIS into the document.

Fiscal Year 1984

Objective A - To manage 2,548 acres of productive forest land on a sustained yield basis.

Timber sale layout and cruise will be conducted for 2 MMbf of lodgepole pine located in Section II on the southern slope of Black Mountain (see Project Map). The sale will be accessible across the

3/4 mile easement segment of private land and 1¼ mile piece of BLM. Road construction will be completed under the terms of the timber sale contract.

An environmental assessment will be completed to identify and mitigate the impacts of the timber sale. Resource specialists will be consulted to assure an accurate assessment of the sale's impacts. Cultural clearance will also be conducted.

Additional section corner placement should be completed prior to sale layout. Coordination with Cadastral crews will be necessary.

An EA will also be written, reviewed and approved for 150 acres of commercial thinning. This sale is projected for FY 1985 (see Project Map).

Fiscal Year 1985

Objective A - To manage 2,548 acres of productive forest land on a sustained yield basis.

The 2 MMbf of lodgepole pine south of Black Mountain will be offered for sale. Under the contract provisions, road construction will begin and cross segments of private land. The road work will branch from

the existing road system built under the 1981 Black Whiskey timber sale. BLM will be responsible for all contract administration of the sale.

The forester will identify layout, and offer for sale approximately 150 acres of lodgepole pine. The project goal is to offer the 150 acres as a commerical thinning, specifically treating pole-sized stands which are easily accessible with the existing road system. Providing the 1981 sale has been completed and closed, such pole stands within the Black Whiskey boundary may be thinned.

Objective D - To identify intensive forest management opportunities and practices that are consistent with the principle of sustained yield and multiple use resource management.

Slash material and concentrations of blowdown on the Black Whiskey sale will be made available to the public as fuelwood. Maps, permits and suitable advertisement should be provided as early as spring, as weather conditions may prohibit access in the fall when fuelwood demand is greatest.

Fiscal Year 1986

Objective A - To manage 2,548 acres of productive forest land on a sustained yield basis.

An EA will be required for a 750 Mbf sawtimber sale. The sale date is targeted for FY 1988. The forester should consider species marketability, road access and diseased or insect infested stands in choosing a sale location.

The slash material and any subsequent blowdown from the 1985 thinning will be offered for fuelwood. If public access is not feasible, a commercial firewood sale is recommended to help reduce the fire hazard present with slash buildups.

Objective D - To identify intensive forest management opportunities and practices that are consistent with the principle of sustained yield and multiple use resource management.

Reforestation surveys will be completed on the sale areas of the past five years. Based on the surveys results, seed collection, nursery orders, and planting contracts should be prepared.

Objective E - To coordinate with multi resource objectives.

A re-evaluation of cadastral survey needs should be considered; future corner placements and subdivisions should be identified and routed to USGS in Denver. Corner needs for the 1988 sale should

be specifically addressed.

Fiscal Year 1987

Objective A - To manage 2,548 acres of productive forest land on a sustained yield basis.

Preparation for a Lodgepole pine sawtimber sale targeted for 750 Mbf in 1988 will be done. The layout and cruise are to be completed prior to FY 1988 (see Project Map). Archeological clearance is to be conducted by the BLM archeologist.

Objective D - To identify intensive forest management opportunities and practices that are consistent with the principle of sustained yield and multiple use resource management.

Based on the results of a reforestation survey done in FY 86, planting operations will be used to upgrade any deficient stocking levels existing on the FMP area. Based on funding, this planting can be contracted or done "in-house" with the help of the District Force Account crew.

Fiscal Year 1988

Objectives A & D - To manage 2,548 acres of productive forest land

on a sustained yield basis. To identify intensive forest management opportunities and practices that are consistent with the principle of sustained yield and multiple use resource management.

The 750 Mbf of Lodgepole pine sawtimber will be offered for sale. The forester will be responsible for sale advertisement, proceedings, and administration.

The forester will layout, cruise and offer for sale approximately 150 acres of pole-sized timber to help meet the district thinning commitment (see Project Map). The sale will be marked as a commercial thinning. An EA will be prepared and approved prior to any fieldwork. Suitable stands which will respond to release from a thinning should be identified for the sale volume.

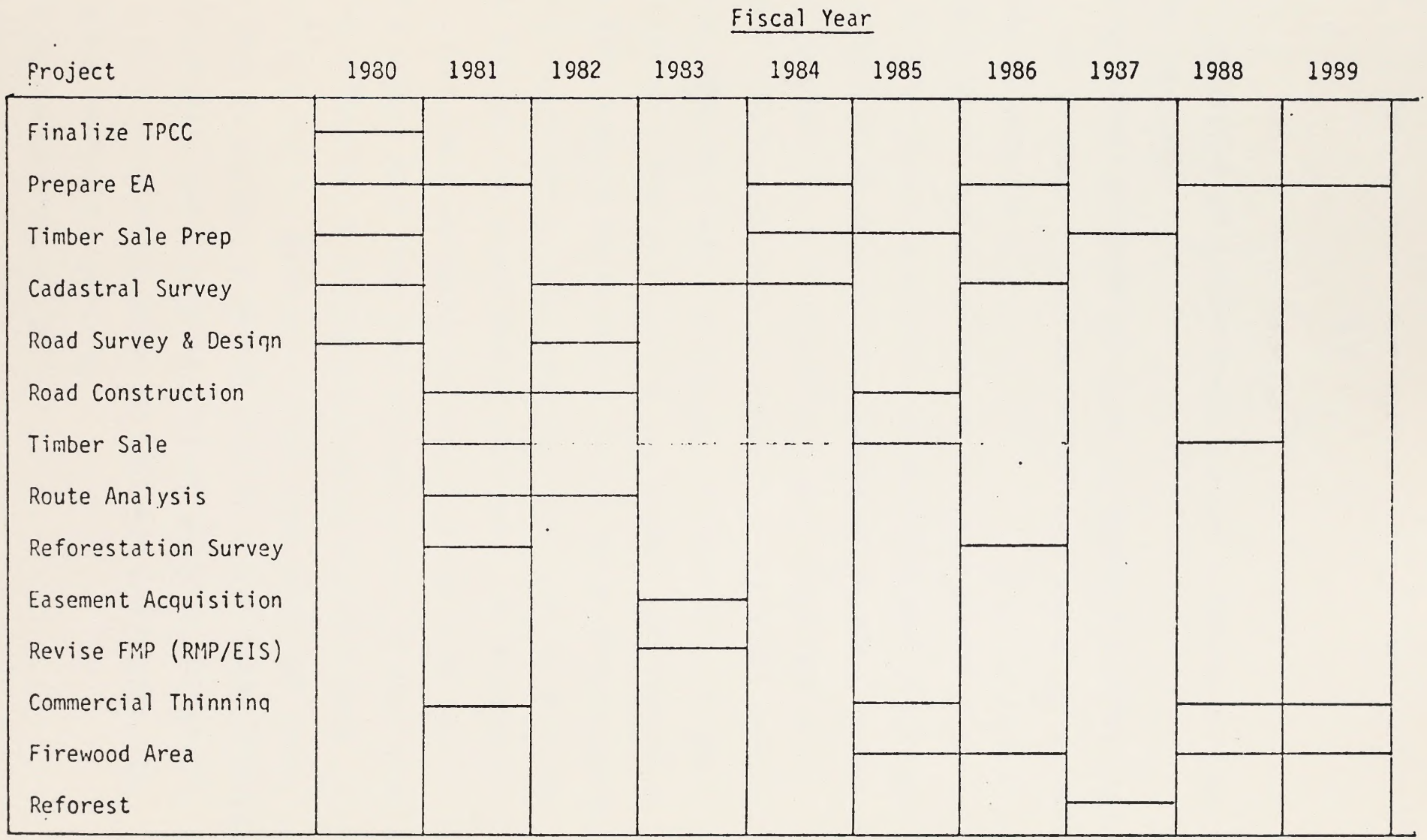
Disposal of slash material should be considered, i.e., pile and burn, lop and scatter, or sell as fuelwood.

Fiscal Year 1989

Objectives A & D - To manage 2,548 acres of productive forest land on a sustained yield basis. To identify intensive forest management opportunities and practices that are consistent with the principle of sustained yield and multiple use resource management.

An additional 150 acres of commercial thinning will be offered for sale. Stands capable of a measured release from such a treatment should be identified. An EA will be required for this project. Access should be a priority consideration for the sale site.

Contract modifications will be utilized to clean up any blowdown resulting from the thinning operation. Slash or blowdown may also be disposed of through a fuelwood sale.



PROJECT SCHEDULE

Graph V-1

Colorado State land. Approximately 3.1 miles of easement would be required.

C. Black Mountain - Route C

This route would begin on Colorado State Hwy. 134 approximately nine (9) miles east of Toponas, Colorado. From here it follows a county road up Jolley Creek approximately 3.2 miles. From the county road the route would follow a proposed U. S. Forest Service mainline road into a timber sale area near Whiskey Creek. A spur road would then leave the mainline road in Section 36, T1N, R83W, 6th PM. and enter public land near the northeast corner of Section 1, T1S, R83W, 6th PM. The route would then pass through heavy timber on the north face of Black Mountain to a saddle on top of the ridge. The saddle is located approximately one-quarter (¼) mile east of the section corner common to Sections 1, 2, 11 & 12, T1S, R83W, 6th PM. At this saddle the road would fork with one branch going east and one branch going west. These two branches would duplicate the approximately 3.2 miles of road across the south face of Black Mountain as described in Routes A & B.

It is assumed that the county road and U. S. Forest Service roads, as proposed, will be entirely adequate for timber hauling.

Beginning in Public Lands the route passes through

it crosses the railroad tracks in three (3) locations. The width of this county road is approximately 24-30 feet.

From the county road the route climbs the west face of Congor Mesa, a distance of approximately two (2) miles, to the top of the mesa. This section of road is on cross-slopes of 40-50 percent. The vegetation is mostly sagebrush so the heavy cuts and fills would be very visible in this area.

From the top of Congor Mesa the route climbs the south face of a ridge ascending toward Black Mountain into Section 14, T1S, R83W, 6th PM. This section of road is also on cross-slopes of 30-40 percent. The vegetation is sagebrush and low mountain shrubs which also makes this section highly visible.

The last approximately 3.2 miles of this road, across the south face of Black Mountain, duplicate Route A. This section is in heavy timber and would not be very visible.

Most of Route B is also very rocky with some ledges. Grades on this route would average 7-8 percent. Four (4) cattleguards and numerous culverts would be required.

Elevations on this route vary from 6690 feet at McCoy to 10,000 feet on top of Black Mountain.

Total length of this route is 12.5 miles including 4.9 miles of county road. Approximately 0.1 mile is

Colorado State land. Approximately 3.1 miles of easement would be required.

C. Black Mountain - Route C

This route would begin on Colorado State Hwy. 134 approximately nine (9) miles east of Toponas, Colorado. From here it follows a county road up Jolley Creek approximately 3.2 miles. From the county road the route would follow a proposed U. S. Forest Service mainline road into a timber sale area near Whiskey Creek. A spur road would then leave the mainline road in Section 36, T1N, R83W, 6th PM. and enter public land near the northeast corner of Section 1, T1S, R83W, 6th PM. The route would then pass through heavy timber on the north face of Black Mountain to a saddle on top of the ridge. The saddle is located approximately one-quarter (¼) mile east of the section corner common to Sections 1, 2, 11 & 12, T1S, R83W, 6th PM. At this saddle the road would fork with one branch going east and one branch going west. These two branches would duplicate the approximately 3.2 miles of road across the south face of Black Mountain as described in Routes A & B.

It is assumed that the county road and U. S. Forest Service roads, as proposed, will be entirely adequate for timber hauling.

Beginning in Public Lands the route passes through

shown in black. Forest Service roads are shown in green.

Each route will require all new construction except for county road segments leaving Colorado State Hwy. 131. The route selected should be gravelled for all weather use. Snow will probably block the roads at least five (5) months of each year.

II. Analysis

A. Black Mountain - Route A

This route begins at Hwy. 131 approximately 1.5 miles south of McCoy, Colorado. It then follows a county road up an unnamed drainage to the Copper Spur Ranch - a distance of 3.6 miles. Approximately half of the county road is gravelled. Grades, alignment and width are not acceptable in some areas. Drainage structures are not adequate to carry flood runoff.

From the Copper Spur Ranch the route swings east and north into the Craig District and then back into the Grand Junction District as it climbs onto Black Mountain. It then swings back to the southwest across the south face of Black Mountain for approximately 3.2 miles.

This route passes through three (3) counties (Eagle, Routt and Grand) and two (2) Resource Areas (Glenwood Springs and Kremling).

Black Mtn.

BLACK MOUNTAIN - ROUTE ANALYSIS

I. Introduction

This analysis was made to facilitate selection of an access route into the Black Mountain area for timber harvest. This area consists of approximately four (4) sections of land in T1S, R83W, 6th PM. This public land is intermingled with approximately two (2) sections of private land. Most of the timber observed was quite small and ranged from two (2) inches dbh to 12 inches dbh. Some of this area has been cut over in the past.

The area appears to have limited recreation potential other than hunting. No water is available in the immediate area.

No information is available concerning present use. All existing access roads are controlled by private land owners and locked at times. Public access would probably not increase use of the area very much for recreation, even with an improved road. Timber harvest could begin with improved access.

Three (3) potential access routes are considered for this area. All three (3) routes would duplicate the approximately 3.2 miles across the south slope of Black Mountain. The major differences will be access points and total miles of construction required to reach the top of Black Mountain.

The three (3) routes are shown on the attached map as A, B & C. County roads are shown in blue. Proposed roads are

Re-establishment of forest cover provides definite benefits to the watershed, particularly in stabilizing soils and water flow. Obviously, this is beneficial to stream fish. It also insures continuous habitat required by forest-wildlife species.

On the other hand, scattered forest openings in extensive, dense forests (notably those of the Pacific slope) improve the habitat for most species. This is due to production of a more abundant food supply. During the period of forest re-establishment, these openings are a tremendous improvement for deer and elk. Studies of black-tailed deer in Oregon, for example, show that the population in virgin coastal forests may average 2 deer per square mile while on clear-cuts there may be 40 or more deer per square mile.

The heavy feeding demands of these large population build-ups of big game animals, and of rabbits and rodents as well, have an adverse effect on forester's efforts to re-establish trees. One controlled experiment with deer in the Tillamook Burn in northwestern Oregon showed that 29 deer per section caused a 5 to 7 percent seedling loss, while 62 deer per section resulted in a 40 percent loss. Research is underway on methods of alleviating animal damage with emphasis on repellent treatments.

Forest rehabilitation sometimes includes use of herbicides for site preparation and insecticides for protection of timber stands.

Some insecticides and herbicides, even in minute concentrations, are destructive to wildlife food and other habitat requirements.

When applications are necessary, use the least toxic and most specific compounds and formulations.

Carefully observe all manufacturer's recommendations, Bureau and other instructions for the proper use of pesticides.

Careful application will further minimize needless losses of wildlife.

In summary, to quote a paragraph from the U. S. Department of the Interior Conservation Yearbook #3, "The Third Wave" -

> "Increasing needs of the American people require close analysis of the role of BLM forest lands. Through proper management a forest can produce wood products, recreational sites, improved wildlife habitat, and increased water quantity without damage to quality. This is the new conservation of the forest lands. Some uses will not be developed to their individual optimum, but the combination eventually adopted will yield the largest net benefits for the most people."

Shaded water is important for maintaining cool temperatures. Some increase in insect food supply may result from overhanging vegetation.

On very steep slopes, leave slash unburned.

Provide adequate drainage for roads and landings.

Seed skid trails, roadsides, and other highly erodable disturbed areas.

Leave nesting trees and selected snags for use by small animals and bir

Reserve from cutting small areas around seeps and small meadows.

On sites subject to excessive erosion, special precautions should be tak or logging should be excluded.

Logging during periods of wet soil conditions is potentially the most destructive.

Conduct slash burning with care, if at all, on areas of important game habitat. Avoid burning browse ranges. Scattered slash piles provide upland bird cover.

Modification of logging practices may be necessary to minimize run-off and erosion.

The preceding section on road construction includes recommendations to minimize soil erosion which are applicable here. The productivity of soil can be maintained, restored, or destroyed depending upon mana ment practices applied. All disturbance of soil should be kept to a minimum. Disturbed soils should be restored, as much as possible, to the former undisturbed status.

In some timber types research could indicate ways to improve wildlife habitat through modified timber cutting and stand improvement practices so that wildlife production would be encouraged, while watershed values are maintained or enhanced.

Forest rehabilitation

Forest rehabilitation, as used here, relates principally to re-establishing the desired tree species on logged or burned forest sites. It includes site preparation, seeding or planting selected tree species, and providing necessary protection until trees become established.

Consult fisheries specialists on timing of project work, on special situations, and on measures for enhancement of fish habitat.

Trail systems help spread out the fishing pressure and contribute to the aesthetic values of fishing. A good trail system, properly maintained means more public access and better harvest of the wildlife resource.

Timber harvesting

To the extent that logging opens up a closed canopy and results in the production of abundant ground cover valuable as forage, it is beneficial to wildlife.

Because logging may drastically alter ecological conditions of streams, it can be very detrimental to fish.

Removal of mature trees in the dense forests, as of the Pacific slope where understory vegetation is scarce, permits the growth of a great variety of vegetation - much of which provides excellent food and cover for wildlife. Habitat is greatly improved, or even created, for many large and small mammals and birds for a period of years following logging.

Timber harvesting is most likely to be injurious to stream fish. Principal causes are: debris in channel obstructing fish passage; mechanical disturbance or destruction of the stream bottom - particularly gravel spawning beds; siltation; and removal of stream bank vegetation.

Effects of sedimentation are increased during low flows when fish cannot escape from the sediment.

Logging
Recommendations

Keep equipment out of streams
Keep streams free of logs and debris
Avoid heavy siltation at time of removing logjams.
Keep landings out of draws and away from streams
Avoid tractor logging on steep terrain
Except for careful removal of selected trees, avoid removal or unnecessary disturbance of stream bank vegetation.

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Except for careful removal of selected trees, avoid removal or unnecessary disturbance of stream bank vegetation.

Install at the minimum grade necessary. Large culverts should be set at the original streambed gradient if migrating fish are to pass. In streams the flow line should be at or below the lowest stream bed elevation adjacent to the end of the culvert.

Protection should be given to the substrate at the outflow end to prevent formation of a drop at that point.

Rock-stilling basins or splash pads should be provided if needed.

Culverts with a natural bottom are preferred; round bottoms are superior to flat ones. Corrugated, round culverts are satisfactory.

Headwall the upper end when inlet faces into a bank and riprap the bank at that point.

Use an adequate number of diversion culverts so that some of the sediment from ditch water will settle out in the slash rather than accumulate at the drainage.

Road maintenance concerns the fisheries resource through effects of erosion on stream siltation.

Eroded materials removed from roadways should not be dumped into streams.

Drainage ditches and culverts should be maintained.

Debris should be kept out of stream channels above culverts to prevent clogging.

Washouts should be filled and seeded to grass.

Close roads to travel when surface conditions present danger of excessive erosion.

Upon abandonment of roads, provide adequate erosion prevention measures; and, if roads are not to be used, take measures to make them impassable.

Consult with the State wildlife agency when planning to divert, obstruct or change the natural flow or bed of any stream. Be advised of precautions to minimize damage to fish or wildlife habitat.

Keep construction equipment out of stream channels.

Avoid changing or straightening stream channels

Sluiceways of continuous fast-running water lack necessary resting places for fish. Erosion and siltation may be increased. Fish food production usually is reduced.

Unavoidable channel changes should be held to a minimum. Complete the change before turning water into it. Riprap channel sides. Restore natural fish habitat as much as practical. Spawning gravel could be introduced where applicable.

A permit from the State wildlife agency may be required before blasting in any waters of the state.

Deposit fill or waste material where it will not reach streams - even at flood stage.

End-haul material if necessary to keep it out of streams. Riprap any fill material on stream banks.

Seed cuts, fills and scarred or disturbed areas to grass-legume mixtures.

Non-sod forming varieties of grass, locally recommended, can be used where competition with tree seedlings is a consideration. Legumes improve a grass mixture and also provide desirable food and cover for game birds and big game. Omit varieties attractive to wildlife when seeding along high-speed roadways.

Plan grades and drainage so that runoff does not enter streams directly.

Avoid excessive grades. Soil on steep slopes and in drainages should be stabilized, as by seeding grass.

Sediment settling basins may be constructed to remove silt from water before it reaches a stream.

Culvert installation needs two principal considerations: upstream passage of fish; and, erosion control.

Lay culvert so that both ends are in the natural channel for fish passage.

stream bank vegetation. Extreme fluctuation of water levels and pollution are decimating factors common both to streams and impoundments.

Siltation results in covering gravel-bed spawning sites, smothering eggs, covering and suffocating tiny food organisms, and reducing sunlight penetration to stream-bottom vegetation thus breaking the food chain. Disturbing gravel beds may destroy eggs or ruin the site for future spawning. Straightening stream channels resulting in sluiceways of continuous fast-running water removes necessary resting places for fish and may increase erosion and siltation. Barriers due to debris, incorrectly laid culverts, waterfalls, dams or other causes, impede movement of anadromous fish to and from spawning areas. Pressure barriers (velocities in excess of 12 feet per second for more than 20 feet) may effectively bar upstream movement of fish. Removal of shade-producing vegetation along stream banks results in raising water temperatures, possibly rendering the habitat unsuitable for desirable species of fish (optimum for trout is between 50 and 65 degrees). Accelerated erosion and increased siltation follow removal of ground cover. Extreme water fluctuation produces lethal effects through oxygen depletion, excessive temperature, predation, or losses of food organisms. Pollution substances may be toxic to fish or fish-food species, cause oxygen depletion, or produce the same results as siltation.

Effects of road and trail construction on wildlife, other than fish, are principally due to loss of habitat. Wildlife should not be encouraged to inhabit rights-of-way along high-speed roads. Cover along other roads and trails should not be needlessly destroyed.

The following recommendations pertaining to road and trail construction are presented to assist those concerned to cause minimum losses, or to enhance, wildlife habitat.

Road and Trail Construction
Recommendations

Keep roadways away from stream channels

An undisturbed buffer strip should remain, wherever possible, to reduce stream siltation and provide shade. This will also enhance recreation and esthetic values. Careful removal of at least some mature trees may be accomplished with a minimum of detrimental results.

Likewise, wildlife managers must consider the forestry programs. Animal damage to trees, pest control operations, and sportsman behavior are sometimes serious problems to the forester. Educational efforts to attain public realization of these conflicts of interest and the desirability of cooperation for mutual benefits is the sound, long-range solution. The State game agency, which is already aware of the problems, has the major responsibility but all interests should actively cooperate in attainment of this goal.

The Job Corps program provides an opportunity to accomplish needed multiple use practices in the forests beyond our present capacity. Erosion control projects, timber stand improvement, stream-habitat improvement, and similar jobs requiring hand labor are possibilities.

The principal BLM forest management activities influencing the wildlife resource through effects upon its habitat are: construction of access roads, harvesting of forest products, reforestation, timber stand improvement, and pest control.

The material presented here provides guidelines recommended as having long-range public benefits. Suggested actions or modifications of programs must be practical if they are to be implemented. Economic feasibility is usually a requirement. These facts have been kept in mind during preparation of this paper.

Road and trail construction

Roads and trails make a valuable contribution to modern game management and are essential in providing access for most recreationists. Public access should be provided for - physically and legally - whenever possible, on roads constructed for the purpose of conducting our own programs or when granting a right-of-way to other users. A good trail system contributes to the better management and utilization of the wildlife resource - a fact to consider when planning truck or foot trails.

Damages to wildlife resulting from road construction principally concern fish habitat in streams. These losses are usually due to siltation, disturbance of gravel beds, straightening stream channels, barriers of debris, blocking passage at culverts, and removal of

Interrelationships Between the Forest and Wildlife Management Programs

Frank W. Stanton

Wildlife Staff
Portland Service Center
Bureau of Land Management

Introduction

Forests and wildlife are two important natural resources recognized by the Multiple Use Act as requiring management on the public lands.

Forest management and wildlife management can and should be compatible. The relationship is entirely natural. Forests provide much wildlife habitat and are favorite recreation areas for the angler. If each resource is managed with consideration for the other, the two interest groups can function harmoniously.

Recreation demands, including hunting, fishing and just looking, are rapidly increasing while available space and wildlife habitat on a nation-wide basis are steadily decreasing. Both foresters and wildlife workers are aware that this will bring new problems and will demand their close cooperation.

General considerations

Management of wildlife habitat on the public lands is a BLM responsibility. State wildlife agencies have the responsibility for managing most forms of wildlife. Cooperation is both necessary and desirable for proper management of these resources.

The fundamental need of wildlife is maintenance of adequate habitat of suitable quality and quantity. Cover, food and water are basic requirements. Space requirements may also limit the population.

These requirements can be protected and often enhanced when carrying out forest management practices just by giving wildlife due consideration. This is most important. In addition, there are some opportunities for developing forest-wildlife habitat. Habitat development, however, does not replace the essential need for habitat management.

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cover (coniferous trees at least 40 feet tall with average crown closure of over 80 per cent, 30 to 60 acres in extent), plus 10 per cent additionally of either thermal or hiding cover. Additionally, where deer are concerned, maintain fawning cover of low shrubs or small trees 2 to 6 feet tall, 50 per cent overstory crown cover, slopes less than 15 per cent within areas where vegetation is succulent and plentiful in June, with water available within 600 feet, and of an optimum size of 1 to 5 acres.

Protect moist summer sites (Schneider 1975). Do not permit logging in delimited calving areas between May 1 and July 15 (Davis 1970), or while cows and calves are present on calving grounds (Roberts 1974).

Maintain a balance between acreages cut on north and south slopes (Lemos and Hines 1974a, Harper 1973).

4. Reseed grasses and legumes on sites where natural revegetation is slow or not practical, on bare exposed soils and on clearcuts to provide ground cover and more rapid wildlife forage (Harper 1971, Lemos and Hines 1974a, Ward 1974). Fertilize such seedings if on rocky or dry sites (Harper 1971).
5. Leave standing snags and defective trees for small wildlife species habitat requirements for nesting, denning, perching, roosting, feeding and cover (Williamson 1974, U.S.F.S. Region 6 policy).
6. Consider prescribed burning on low elevation forests of submarginal or non-commercial quality, and within known deer and elk winter ranges, on a rotation basis for maximum sustained browse production (Leege 1969).

Sincerely,

Richard N. Denney
Big Game Supervisor

RND:am

Enclosure - Bibliography

cc: Bob Evans
Bob Tully
Pete Greene

3. The size of a clearcut will vary with local conditions, but specifications for certain dimensions have been suggested. Non-continuous patches of remaining timber should not be separated by more than 300 feet (Black et al. 1976), and standing timber should be available within 200 yards of any logged unit (Harper 1971). Clearcuts should not be more than 500 yards across, nor more than 40 acres in size (Ward 1975). Square cuts should not exceed 40 to 50 acres, especially on steep terrain (Lemos and Hines 1974a), and the maximum width of cuts should not exceed 1,200 to 1,500 feet (twice the distance deer are likely to move from the forest edge). Clearcuts should be kept as small as practical for the greatest edge effect, such as 25 acres (Anonymous 1974). Deer and elk prefer small openings of less than 20 acres in spruce-fir, and up to 45 acres in ponderosa pine (Patton 1974). Clearcuts of 40 acres are recommended for greatest benefits to deer and elk in the dense coastal forests (Pengelly 1972).
4. Cutting adjacent to clearcut areas should be postponed until sufficient cover has developed to create an edge bordering the area to be harvested and so that various aged units are available to game (Lemos and Hines 1974a), Harper 1971, Edgerton 1972, Pengelly 1972).

Logging Debris

1. If slash is not destroyed in some manner, do not allow it to form barriers in the shape of windrows or piles (Pengelly 1972). However, in some cases slash is beneficial if utilized in windrows or piles and as road screens (Black et al. 1974a), and slash cleanup may be detrimental to deer use in ponderosa pine (Clary and Larson 1971).
2. Logging debris should be broadcast burned (Harper 1971, Lemos and Hines 1974a, Harper and Swanson 1967, Roberts 1974, Black et al. 1976).

General Wildlife Considerations

1. Any timber management or harvest operations should be concentrated within the shortest time period and smallest possible areas (Black et al. 1976; Ward 1974, 1975; Pengelly 1972).
2. Maintain non-activity or security areas adjacent to concentrated activity areas (Black et al. 1976, Schneider 1975, Ward 1975). Buffer strips or security zones should be left around, adjacent to, or connecting clearcut areas, along streams, around natural parks and meadows, along ridgetops, finger ridges, at the heads of draws, and in draws and gulches (Harper 1973, Anonymous 1974, Black et al. 1976). These should be at least 100 yards wide (Ward 1975), but the optimum width is 450 to 600 feet (Black et al. 1976, Harper 1971, Ward 1974).
3. Identify and plan for deer and elk movement routes and behavioral characteristics such as key areas for cover requirements, calving and fawning grounds, feeding and bedding areas seasonally, and rutting areas (Schneider 1975, Bartels and Denney 1969, Harper 1971, Lemos and Hines 1974a, Roberts 1974, Edgerton 1972, Pengelly 1972, Resler 1972). Cover specifications recommended by Black et al. (1976) should be followed: maintain a mixture of cover types in a ratio of 40 per cent cover to 60 per cent openings, on summer and transition ranges consisting of 20 per cent hiding cover (600 to 1,200 feet wide), 10 per cent thermal

6. Roads should be laid out to facilitate closure and should be closed securely after logging (Black et al. 1976, Harper 1971, Roberts 1974, and Anonymous 1974).
7. Roads should have security cover along them (Black et al. 1976, Schneider 1975, Anonymous 1974 and Lemos and Hines 1974a).
8. Roads should not be more than one-quarter mile tangents and straight stretches should be kept to a minimum (Black et al. 1976, Anonymous 1974).
9. Roads should be held to a minimum (Black et al. 1976, Anonymous 1974).
10. Logging road systems should be administered by regulations and off-road travel prohibited (Schneider 1975, Harper 1971).
11. Roads should be located for minimum impact on elk calving grounds, bedding areas, winter ranges, or other elk concentration sites (Harper 1971, Lemos and Hines 1974a).
12. Abandoned roads should be artificially seeded to ground forage species (Lemos and Hines 1974a).

Implementation of these recommendations in forest management operations would go far toward alleviating the stresses and impacts on wildlife in general, and elk in particular, as well as reducing some of the erosion associated with logging and access roads.

Thinning

For maximum benefit for deer habitat, precommercial thinning should be performed as early in the rotation as possible, and prior to interspace closure of sapling crowns (Lemos and Hines 1974a).

In Douglas-fir forests, a stocking of less than 600 boles per acre is of most benefit to deer (Lemos and Hines 1974a), and basal areas of less than 70 square feet per acre in ponderosa pine (Clary and Ffolliott 1966).

Maintain escape corridors of unthinned timber within thinned units of at least 100 yards in width (Harper 1971, Bartels and Denney 1969). These also serve as hiding and thermal cover (Edgerton 1972, Lonner 1975, Resler 1972 and Black et al. 1976).

Clearcutting

1. Clearcutting should be accomplished in strips alternating with uncut timber, or in patches, to create a maximum edge effect (Lemos and Hines 1974a; Harper 1971, 1973; Black et al. 1976; Schneider 1975; Mace 1971; Ward 1975; Roberts 1974; Wallmo 1969; Patton 1969, 1974; Edgerton 1972; Resler 1972; Pengelly 1972). Clearcutting is not recommended in the spruce-fir type when it occurs in moose habitat (Schladweiler 1974).
2. The shape of a clearcutting unit is generally considered to be a choice between alternating strips, rectangular units, square-shaped areas, or circular patches. Most investigators advocate long and narrow strips of rectangular areas as most beneficial to wildlife (Mace 1971; Harper 1971; Lemos and Hines 1974a; Wallmo 1969; Patton 1969). Ward (1974) stated that the shape of clearcut openings was more important than the size, which may be correct, but within limits!

We have dealt primarily with the relationships of timber management, especially harvest and associated impacts, with elk, and deer to some extent, but a number of investigators have delved into effects on small game and nongame birds and mammals (Gashwiler 1970, summarized from the literature by Resler 1972, Harper 1973 and Bramble and Byrnes 1972). The lack of emphasis on other than big game in this report does not imply that they are any less important in the consideration of the ecological impacts of logging, but time does not permit treating the full wildlife spectrum in relation to forest management.

Pengelly (1972) put it very well in stating that the aim of forest managers has been to get forests back into production as soon as possible after logging, which makes good sense economically, but it defeats the purpose and mandates of multiple-use management. Intensive forest management is seldom compatible with wildlife interests, therefore goals and priorities, based on public needs and desires, should be established for any area before intensive timber harvest begins. As he observed so aptly, some clearcut logging benefits some species of wildlife in some areas some of the time, and that animals adapt, move, or die if their environment is altered radically. "Benefits to wildlife should be planned for in advance and not be achieved accidentally."

There are still many questions in relation to big game ecology that remain unanswered, and are prime targets for intensive research. Lemos and Hines (1974a) wondered if using a selective harvest method would permit reestablishment and normal growth of desirable conifers, though more acreage would be logged to crop a comparable volume of logs. They also questioned whether or not more frequent but less intensive disturbance by such harvests would better sustain or stabilize wildlife populations at lower levels, and if both the wildlife and soil resources would benefit more from partial harvests.

No panacea has been found, but it is quite apparent that each timber sale and forest management practice must be tailored to the specific site. Considerations can be advocated, however, but will be governed by the variables previously listed, such as the criticality of the impact on a given wildlife species; the timber type, species, density and habitat involved; elevations, aspects and slopes; climatic conditions and geographical location; and soils. In view of these, then, the following recommendations are made, as drawn from various sources in the literature, as guidelines to be considered in any forest management application affecting wildlife in general, but specifically elk and deer.

Roads

A number of recommendations have been evolved from the suggestions of eight literature sources to reduce the impact of logging roads on wildlife, especially elk;

1. Roads should not bisect cover areas (Black et al. 1976).
2. Roads should not be in riparian zones (Black et al. 1976, Ward 1975).
3. Meadows and openings should be screened from main roads with a buffer zone of timber (Black et al. 1976, Lemos and Hines 1974a, and Roberts 1974), up to 100 yards wide (Ward 1975).
4. Cuts and fills should be properly designed, located and maintained (Black et al. 1976). Debris barriers from roads should be broken in draws and at ridge-points to allow animals to move unimpeded up or down the slope (Pengelly 1972).
5. Roads should have minimum rights-of-way (Black et al. 1976).

tall shrubs or trees. The latter supplied food throughout the year, but were particularly valuable as emergency feed during deep snow cover in the winter. The right-of-way was heavily used by white-tailed deer, rabbits, grouse and wild turkey.

An indication of the effect of herbicide spraying on elk calving behavior was reported by Ward (1973) in a four-year study on the Big Horn National Forest in Wyoming. Elk did not change their calving or grazing behavior patterns in an area where 96.7 per cent of the big sagebrush cover was killed with 2,4-D in 85 and 45-acre areas. Fecal sample analysis showed no significant changes in the grass-forb ratios consumed, and feeding elk showed no indication that they preferred to stay close to timber. Ward concluded that sagebrush control in limited and scattered areas had no detrimental impact on elk during the calving period. Mule deer feeding patterns remained unchanged, though they remained closer to tree cover.

Winter ranges previously available to wild ungulates have been and are being lost to agricultural uses, roads, human settlement, intensive domestic grazing, recreational development and natural reforestation of prime elk winter range (Black et al. 1976, Recreation News 1975). Of all these winter range decimating factors, only the latter is within the scope of control or manipulation by foresters and wildlife managers. Habitat improvement possibilities exist on elk winter range in the form of prescribed burning (U. S. Forest Service 1975). Thomas Leege, Idaho Fish and Game Department, said that "northern Idaho elk are declining because of advancing forests and will continue to decline until low elevation timber lands are set aside and managed as elk winter range" (Recreation News 1975). The primary type of management Leege referred to is prescribed burning in such areas as 300,000 acres of elk range in the St. Joe and Clearwater drainages of Idaho that are in need of rejuvenating. Leege (1969) reported that grasses and forbs immediately take over sites on which conifer stands are destroyed, then are taken over by shrub seedlings which form dense brushfields. Browse production is mainly effected through prescribed burning, by reduction in height of existing browse, and the addition of new browse species increased as plants were browsed more heavily on burned areas after one growing season than on adjacent control areas.

In the case of an insect epidemic of the proportions which occurred on the White River in Colorado, there is an abundance of standing snags. Snags are important habitat requirements for small mammals and birds such as the pileated woodpecker (Harper 1973) and the spotted owl. A progressive step was taken by Region 6 of the U. S. Forest Service in providing assistance to cavity-nesting birds and other animals in the Pacific Northwest, by a new policy which calls for the retention of an adequate number of dead and defective trees in forest management. The trees are used by at least 43 species of birds and 11 species of mammals for nesting, denning, perching, roosting, feeding and cover (Williamson 1975). This new policy, instituted in 1975, has generated some sharp criticism from timber production sources, but it is hailed as reflecting the increased concern within the Forest Service for all the land resources.

harvest methods applied to clearcutting and the reforestation measures employed in cutover areas are many and variable. Other factors to be considered in properly judging the removal of all trees from a prescribed area are number, size, and species of trees; size and shape of clearcut units; location with respect to other logging areas; elevation, aspect and latitude; slope; underlying soil composition, chemical and physical; and annual precipitation.

Harper (1971, 1973) correlated the amount of elk use of cutover lands to logging practices, treatment of logging debris, habitat type, distance from cover and water, aspect and steepness of slope. He observed that it is oversimplification to state that one factor is any more important than another, and that what works well in one region may not apply in others. Since each factor plays an interrelated role in creating favorable elk range, the alteration of any one factor will affect elk use.

The utilization of an area by elk was found by Harper and Swanson (1967) to be governed by vegetative changes brought about by seasonal weather changes. Elk used north slopes the least, east and south slopes moderately, and west slopes the heaviest in winter in Oregon. Conversely, in the summer months use was heaviest on north slopes, moderate on east and west slopes, and lightest on south aspects. Elk used all areas equally until slopes exceeded 80 per cent, and use generally decreased as the distance from water increased. These factors all have application in consideration of timber harvest procedures in any given timber sale.

Ward (1974) stated that the potential for making clearcut areas more usable for wildlife prior to the reestablishment of trees is high if preferred wildlife vegetation were seeded rather than leaving revegetation to nature. Harper (1971) also advocated seeding palatable grasses or legumes after burning logging debris, particularly if native vegetation doesn't provide adequate forage and soil protection. Fertilization with urea along with reseeding on roads and other disturbed areas, as well as drainage, liming and planting of swamps, swales and wet spots, are practical improvements, according to Harper. Fertilization and seeding are also applicable to areas with soil depths insufficient to produce timber, such as ridgetops and rocky outcrops. Herbicidal sprays have been used on dense stands of alder, vine maple, cascara and other shrubby vegetation (Harper 1971), in areas up to 150 acres, leaving sufficient shrub growth for cover.

A long-term ecological study of game food and cover on a sprayed utility right-of-way in central Pennsylvania illustrates what can result from intensive application of herbicides (Bramble and Byrnes 1972). In this 19-year study different spray techniques yielded distinct variations in the development of ground layer vegetation. Treatments varied from drastic broadcast sprays of ammonium sulfamate and 2,4-D+2,4,5-T to semi-basal treatments with emulsifiable acids of 2,4-D+2,4,5-T, varying from first-year low plant cover of 10 per cent to 25 per cent, respectively. A diversity of food plants valuable to wildlife developed on the right-of-way after spraying, which included common herbs of the forest and invaders. These herbs were highly nutritious and provided both summer and winter food for wildlife. The woody plants were interspersed throughout the plant community and included common blueberries, huckleberry and teaberry as low shrubs, with sweetfern and bear oak as

hard D. Lamm, Governor
EPARTMENT OF NATURAL RESOURCES
IVISION OF WILDLIFE
Grieb, Director
00 Broadway
, Colorado 80216 (825-1192)

'76 JUL 26 AM 10:

July 21, 1976

Mr. Ed Roberts
Wildlife Management Biologist
Bureau of Land Management
Colorado State Office
Room 700, Colorado State Bank Bldg.
1600 Broadway
Denver, Colorado 80202

Dear Ed:

Reference your note of June 28, 1976, just received, with the enclosures of the Oregon State Office (BLM) information memo and the guidelines on elk cover requirements in western Oregon and Washington.

guidelines submitted appear to be identical to those recommended for eastern gon and Washington by Black, Hugh, Richard J. Scherzinger and Jack Ward Thomas, 6. How well they may serve in other areas remains to be verified, but on general principles they sound effective. As you well know, the basic forest types, precipitation, and other environmental conditions in Washington and Oregon, particularly the western portions, are very different from those in eastern Oregon, and exceedingly different from most of the central Rocky Mountain region.

In establishing guidelines for Colorado a thorough review of the pertinent literature is required, as well as necessary investigations to fill the voids for this geographic area and its timber types. Other aspects may be of equal or more importance than cover considerations alone, such as logging roads, forage production and use, etc. We may have to borrow from data derived in similar types, but in other areas, such as Arizona, Montana, or Wyoming.

Pengelly (1963) has stated that logging is the most effective and least expensive habitat management tool at the disposition of the game manager. Clearcutting is the method of harvest that is most controversial, but in discussing the effects of clearcutting on wildlife it is important to remember that most investigators report effects on selected species within a broad spectrum of wildlife existing or potentially available in the study area (Resler 1972). The impacts of clearcutting on terrestrial game animals, particularly deer and elk, have received considerable attention in the past five years. Resler (1972) observed that the

COLORADO DIVISION OF
WILDLIFE LETTER (Big Game)

and as near water as possible. Some live standing cover of any kind makes the leave site more usable.

2. If snags are not available or cannot be retained, the equivalent number of live, cull trees should be left to assure a future snag supply.

In addition, unless mandatory safety regulations prohibit, leave all snags in streamside buffers, scenic corridors, and all other leave sites on all BLM lands. Snags left within these leave sites can be used to satisfy the requirement of 1 snag for every 5 acres of commercial timber land.

Obviously, for the best distribution of cavity-dwelling wildlife, snags and dead trees should be as evenly distributed as possible. If an even distribution is not possible, any grouping or density is better than no snags at all.

Distribution
WO - 412 - 2
DSC - (D-531) - 3
WO (360) - 1
DSC (360) - 1

The latest guidelines effort resulted in the distribution of "Guidelines for Maintaining and Enhancing Wildlife Habitat in Forest Management in the Blue Mountains of Oregon and Washington," by Thomas, Miller, Black, Rodick and Maser. This report covers the requirements of cavity-dwelling wildlife in northeastern Oregon. A subsequent paper, prepared by Wm. Mannon, Fish & Wildlife Service, presents further snag preservation needs for western Oregon cavity-dwelling wildlife species.

These biologists have determined that if the needs of the pileated woodpecker are met, most of the requirements of other cavity-dwellers will also be accommodated (200 snags per sq. mile with a dbh of ± 20" or roughly 1 snag per 3 acres). Also, a minimum of 3 dead snags--with a dbh of 7" either standing or down should be left for feeding trees. The above data is for a 60% to 80% potential population density for pileated woodpeckers and other cavity dwellers--a 100% possible density would raise snag requirements to 1 snag for every 2 acres.

At the present time, factors influencing the needs for snag preservation can be summarized as follows:

1. Over 40 species of birds and 11 species of mammals are dependent on dead or defective trees for their habitat in Oregon and Washington.

2. Most of these birds are insect eaters and are valuable in the prevention of insect buildups, and their subsequent control.

3. Present timber management practices and State Industrial Accident regulations have caused a severe reduction in snags and potential snags on most BLM forest lands.

4. A snag enhancement program is in keeping with the BLM wildlife general objective of stabilizing unsatisfactory or declining wildlife habitats, and in maintaining a maximum diversity of wildlife species through habitat management.

Policy

To satisfy the minimum requirements for most cavity dwellers, the following practices should be met on each section of BLM managed timber lands to assure a continuing supply of essential habitat.

1. Where snags are present, preserve at least 1 snag with a minimum size of 17" dbh and 25' height for every 3 acres of commercial forest lands. A minimum of 2 dead feeding trees, 7" dbh or greater, either standing or fallen, per acre should also be available for feeding. For optimum wildlife use, snags should be in groups of up to 1/2 dozen

IN REPLY REFER TO:
6824 (932)

United States Department of the Interior

BUREAU OF LAND MANAGEMENT

OREGON STATE OFFICE
P.O. Box 2965 (729 N.E. Oregon Street)
Portland, Oregon 97208

MAY 12 1976

Instruction Memorandum ORE No. 76- 199
Expires 12/31/76

To: All District Managers

From: State Director, Oregon

Subject: Policy for Wildlife Snag Preservation

This office has been attempting to initiate a logical snag protection policy for the past two years. The major difficulty has been in coordinating with State Industrial Accident policies that prohibit any timber falling or other similar activity within the "near proximity" or falling radius of any snags or other so called "danger trees." State Fire Prevention administrative rules are less restrictive.

Since 1973, we have been a party to the Interagency Wildlife Habitat Guidelines Coordination Committee. The main working committee consists of Forest Service, Dept. of Fish & Wildlife (Ore.), Washington Dept. of Fish & Game, Bureau of Sport Fish & Wildlife, and BLM. Objectives included:

(1) Document fish & wildlife habitat requirements

(2) Establish fish & wildlife management objectives

(3) Describe habitat types which will meet fish & wildlife management objectives.

This committee is preparing data on the protection and management of aquatic habitat, guidelines on elk escape and thermal cover requirements for eastern and western Oregon, and guidelines for maintenance and enhancement of wildlife habitat in eastern Oregon forest lands. BLM has signed an interagency mission statement agreeing to this concept of guideline preparation and distribution.

INSTRUCTION NO.
ORE 76-199 (Snag
Preservation)

A Partial List Of Wildlife Species That Gain Benefits from Cover Guidelines

Mammals

Some bats
Brush rabbit
Mountain beaver
California ground squirrel
Mazama pocket gopher
White-footed vole
Creeping vole

Reptiles

Western fence lizard
Gopher snake

Birds

Savannah sparrow
Vesper sparrow
White-crowned sparrow
Song sparrow
Night hawk
Oregon junco
Fox sparrow
Chipping sparrow
Rufous-sided towhee
American goldfinch
Bewick's wren
Lazuli bunting
Swainson's thrush
Varied thrush
Robin
Scrub jay
Stellar's jay
Calliope hummingbird
Mourning dove
Mountain quail
Blue grouse
Ruffed grouse
Long-earred owl
Rufous hummingbirds
Great-horned owl
Crow
Flicker
Red-tailed hawk
Band-tailed pigeon
Downy woodpecker
Olive-sided flycatcher
Townsend's solitaire
Pine siskin
Vaux's swift

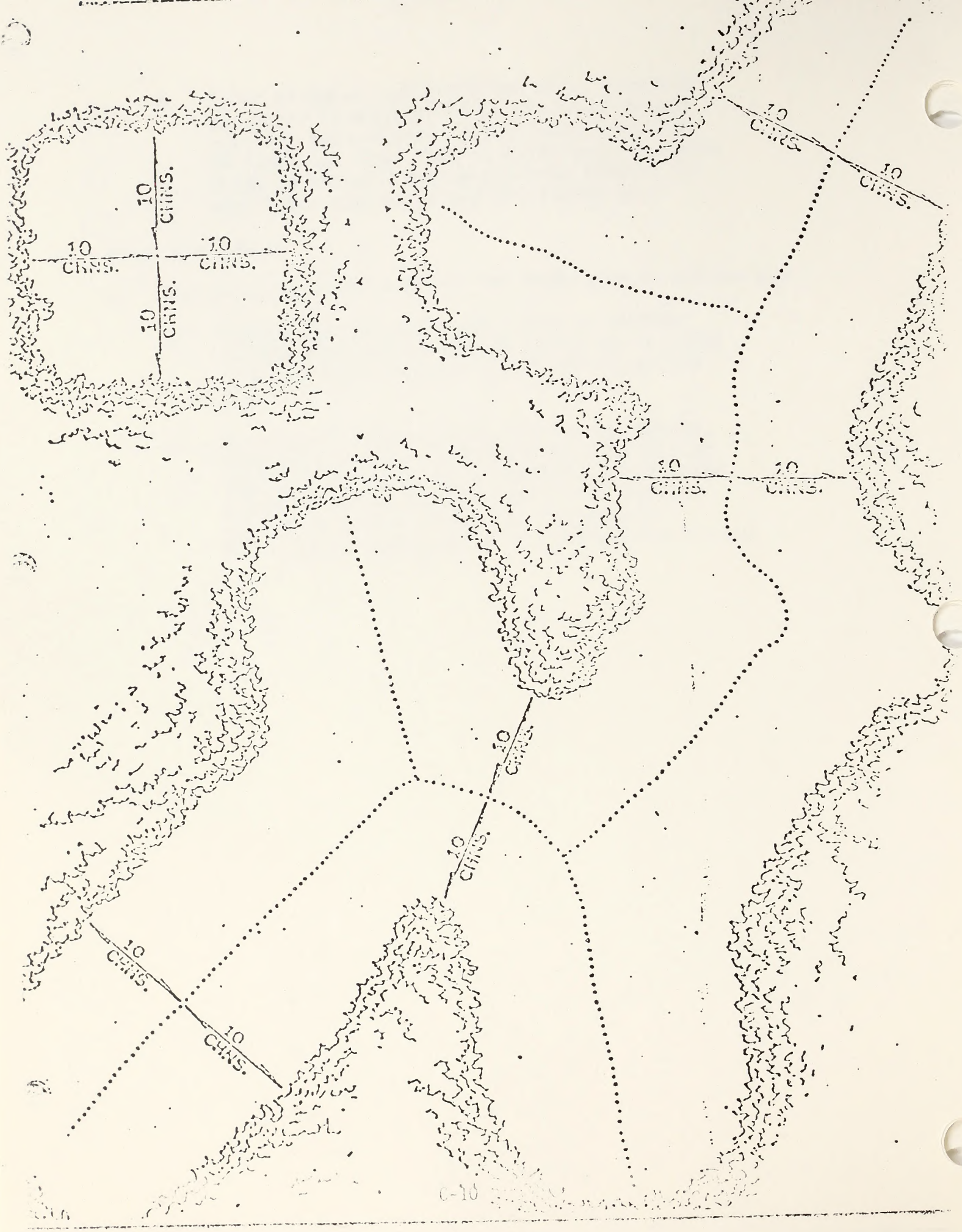
b. Cover strips around sensitive areas should be connected to adjacent cover stands by travel ways for the animals. Travel ways should be at least two times the sight distance in width, based on the most open conditions planned for the timber that comprises the travel way.

D. Cover Along Roads

1. The following guidelines are for roads open to public use:

a. Topographic breaks, brush growth or conifer reproduction should provide screening benefits to animals both upslope and downslope of the road.

b. Preferably, within 3 years following logging, vegetative strips along roads running through logged units should be of sufficient width and height to screen animals from view. Normal vegetative growth in western Oregon and Washington should provide the necessary criteria.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b. Cover strips between clearcut units should be a minimum of two times the sight distance in width. Sight distance (the distance you can see animals) varies with vegetative densities, but the following can be used as guides:

(1) Reproduction, 15-35 feet in height	1 chain
(2) Thinned areas -	
First stage	3 chains
Second stage,	
with understory	6 chains
without understory	10 chains
(3) 100-year-old stand,	
with understory	2 chains
without understory	3 chains
(4) Undisturbed old-growth	3 chains

c. Sight distance for cover strip width should be based on the silvicultural practice planned for the stand that will result in the most open conditions. For example, sight distance for a stand of young fir reproduction planned for two stages of thinning should be based on the chain distance required for the second stage, not the 1 chain for reproduction.

2. Regeneration and intermediate cutting (Includes shelterwood, seed tree, selective, thinning)

a. Regeneration and intermediate cuts do not provide adequate cover until crown closure reaches a minimum of 60 percent and coverage of understory species (at least 4 feet in height) attains 50 percent.

C. Protection of Sensitive Areas

1. Definition of sensitive Areas:

a. Bogs, marshes, naturally occuring openings;

b. Physical features that provide cover; i.e., rocky bluffs, rimrock, stands of timber on nonproductive forestlands.

2. Protect sensitive areas by maintaining strip of cover around such areas.

a. Width of cover strip should be a minimum of two times the sight distance, based on the silvicultural practice that will produce the most open conditions within the cover strip.

Explanatory Notes

In densities and stem diameter outlined on the recommended stocking curve, after trees reach an average diameter of 7-8 inches at stocking levels of 250-300 stems per acre, Douglas-fir stands provide cover needs of Roosevelt elk; provided, at least a 50 percent ground cover of understory species 4 or more feet in height is present.

Age at which various sites produce 7- to 8-inch trees at stocking levels of 250-300 stems per acre is as follows:

Site 170	20-25 years
Site 140	25-30 years
Site 110	30-35 years

Site index is a measure of site quality based on the height of dominant trees at 100 years. A site index of 170 indicates a site that will grow a 170-foot tree in 100 years.

COVER GUIDELINES

A. Cover Characteristics

1. Protection from summer heat can be furnished either by conifers or by deciduous species; provided,

   a. crown closure is 60 percent or greater;

   b. cover stands are available along streams, on north slopes, ridgetops or other areas where free wind circulation or ground moisture provides cooling effect.

2. Protection from winter weather is provided by stands of conifers that are:

   a. comprised of trees with average diameters of at least 7-8 inches in densities of a minimum of 250-300 stems per acre; and

   b. available along streams, on lower south slopes and adjacent to bogs, marshes and other sites which deter deep snow accumulation.

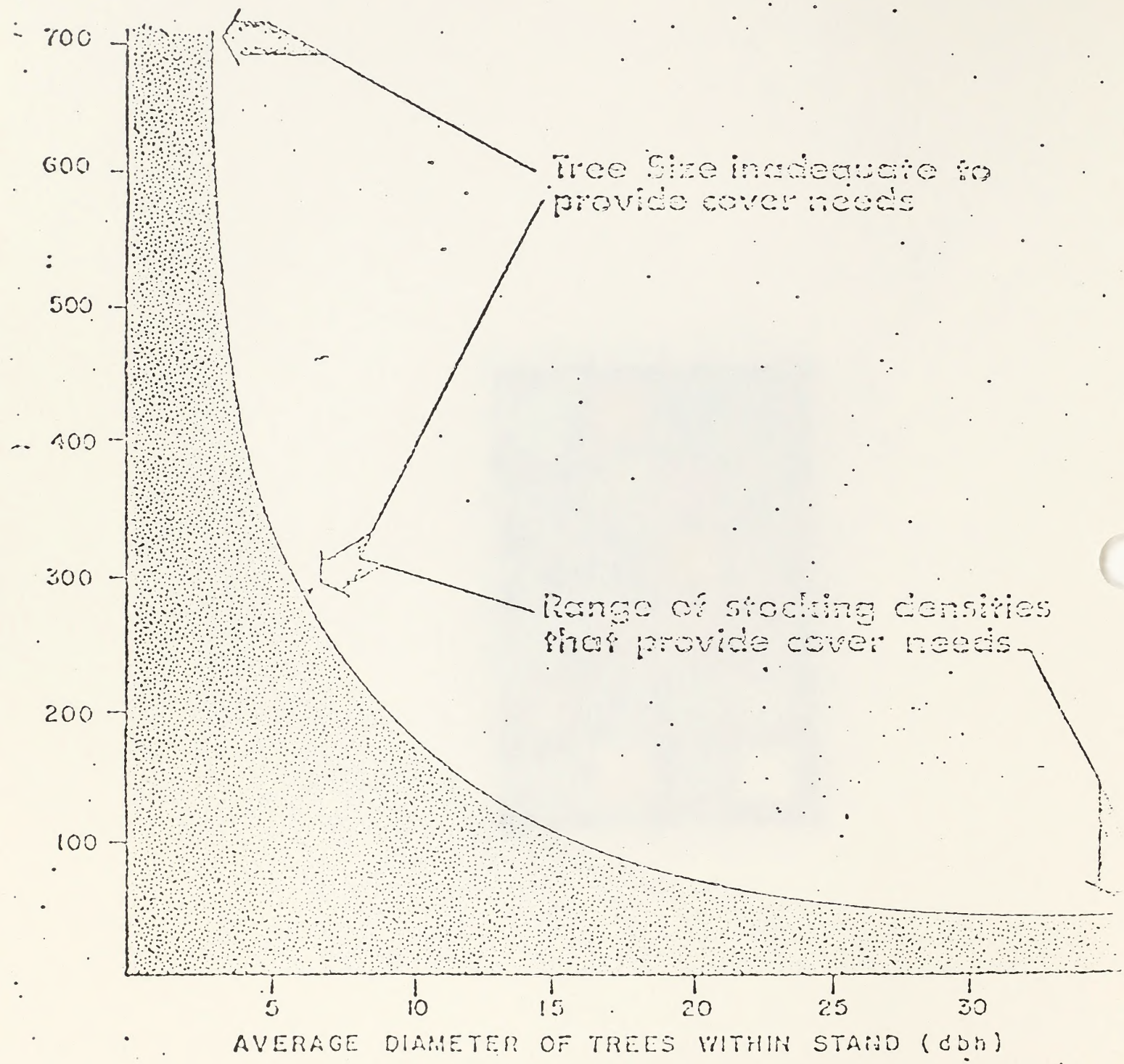
B. Cutting Practices

1. Clearcut logging

   a. Cover should be available within 10 chains of any point within a clearcut unit.

(R-6, USFS) IN RELATION TO COVER REQUIREMENTS OF BLACK TAILED DEER AND ROOSEVELT ELK

(SEE OPPOSITE PAGE FOR EXPLANATORY NOTES)



GUIDELINES FOR PROVIDING COVER FOR WILDLIFE ON FOREST LANDS OF WESTERN OREGON AND WASHINGTON

The guidelines are based on the premise that quality wildlife habitat can be maintained on lands where commercial timber is being produced and harvested. The intent of the guidelines is to coordinate cover needs of black-tailed deer and Roosevelt elk with the various silvicultural practices utilized to produce commercial timber on a sustained yield basis. Although designed for deer and elk, the cover guidelines will also benefit other wildlife species. A partial list of those species is appended.

Numerous studies have shown the dependence of wildlife on adequate cover. To include the results of those studies would only add volume and detract from the primary purpose of the guidelines.

In addition to commercial timber, cover requirements of wildlife can be met by isolation, rugged terrain, noncommercial timber stands and rocky outcroppings. The more such alternate cover is affected by road building and other silvicultural practices, the more important commercial timber becomes as a cover source.

The effects of roads on animal seclusion are considered in these guidelines, but road construction and use, per se, are not. Those factors, however, largely determine the adequacy of a given strip of cover and a road management program is essential to the effectiveness of the guidelines.

These guidelines are designed primarily for practices relating to Douglas-fir harvest and growth in western Oregon and Washington. Tree densities, understory growth and other factors relating to cover may also apply to other conifer stands, but time required to provide adequate cover will vary.

Cover needs of black-tailed deer and Roosevelt elk are not identical. However, the needs of elk are more specific and are herein outlined. Black-tailed deer can adapt readily to a variety of conditions, including timberlands managed for elk.

COVER CRITERIA

Elk require cover to escape harassment, gain protection from the weather, and provide isolation to bear young. Conifer reproduction at various ages and densities can provide one or the other of those needs. However, at certain stocking levels and tree size, conifer reproduction can furnish all cover needs of elk. The following graph identifies that point in relation to the recommended stocking curve for Douglas fir.

United States Department of the Interior

BUREAU OF LAND MANAGEMENT

OREGON STATE OFFICE
P.O. Box 2965 (729 N.E. Oregon Street)
Portland, Oregon 97208

6512 (932)

JUN 15 1976

Information Memo No. ORE-76 - 116
Expires 12/31/76

To: All District Managers

From: State Director, Oregon

Subject: Elk Cover Requirements in Western Oregon and Washington

Enclosed is a copy of "Guidelines for Providing Cover for Wildlife in Forest Lands of Western Oregon and Washington."

These guidelines were produced by the Oregon Department of Fish & Wildlife, through the Interagency Wildlife Management Coordination Guidelines Committee, of which BLM is a member. They have been reviewed by the State Office Branches of Forestry and Range, Watershed & Wildlife, and have been accepted as general guidelines for elk habitat preservation in the timberlands of western Oregon and Washington.

Because of high elk population in the Coos Bay area, that district has been selected for intensive field testing of guidelines application, and will be contacted soon by Department of Fish & Wildlife personnel.

It is anticipated that these guidelines can be integrated into basic forestry management planning wherever it is shown that such crucial habitat needs exist.

E. J. Peterson
Acting

Enclosure
Distribution: w/out encls.
WO 412 - 2
DSC 531 - 4

INFORMATION MEMO NO.
ORE 76-116 (Elk Cover)

ATTACHMEN

6. Leaving raptor nest trees undisturbed and buffer areas around them;

7. Closure of spur roads and other roads during the winter to avoid harassment to wintering big game;

8. Revegetation of disturbed areas with a variety of plant species useful to wildlife as food or cover;

9. Leaving of some specific slash piles to provide cover for small mammals and birds;

10. Compliance with site-specific MFP decisions relating to forestry and wildlife.

Charles W Lenhart

Attachments

Recent Federal legislation - the Sikes Act of 1974 and the Endangered Species Act of 1973 - could affect wildlife considerations in areas identified for specific forest practices. This includes, but is not limited to: timber sales (harvesting), commercial and precommercial thinning, type conversion, site preparation, planting, insect and disease control, and pest control. If such forestry practices have been prescribed for an area and it is found that Endangered Species are present or Sikes Act coverage is involved, the "legal compliance" aspects of these laws safeguarding wildlife habitat must be adhered to prior to the initiation of any forestry operations.

Notebook attachments providing useful guidelines for wildlife consideration input toward timber sales are:

1. Information Memorandum No. ORE 76-116: "Elk Cover Requirements in Western Oregon and Washington."

2. Instruction Memorandum No. ORE 76-199: "Policy for Wildlife Snag Preservation."

3. Letter from Colorado Division of Wildlife Big Game Supervisor, Richard N. Denney, concerning deer and elk food and cover requirements.

4. "Interrelationships Between the Forest and Wildlife Management Programs." (F.W. Stanton, BLM, retired)

On Colorado NRL, guidance provided by Richard Denney in his letter of July 21, 1976, shall take precedence over other information and will serve as our basis for discussing wildlife-forestry considerations with Colorado Division of Wildlife personnel. In Colorado, the most common terrestrial wildlife considerations which must be addressed in timber sale contract stipulations are:

1. Snag protection for raptors and cavity-dwelling species;

2. Leaving selected live flat-topped and open-limbed trees for turkey (where appropriate);

3. Buffer strips along streams for aquatic and riparian habitat dependent species;

4. Dense tree patches to provide cover for elk;

5. Road locations which avoid elk calving areas and wet meadow forage sites;

COMPARTMENT PRESCRIPTION

54929

ROCK CREEK

Routt National Forest

Yampa Ranger District

Prepared By

9/28/79

Date

Approved By

Date

Compartment Description

Compartment 54929 lies west of Little Henry Creek and south of Horse Creek in T1N, R82 and 83W, Routt and Grand Counties.

Access is by foot, horseback, or jeep trail.

The compartment is composed of young growth lodgepole pine which developed under Aspen after fire. Some pockets of old growth lodgepole remain mixed in with extensive stands of pole timber and some mixed pole-sawtimber. Small aspen stands are found throughout.

Windrisk is moderate to high.

Ground fuels are light

Prescription Summary

Detailed prescriptions for each stand are attached.

Timber Harvest

Shelterwood and Patchcut.
366 acres yielding 1.15 MMBF

Thinning

280 acres commercial thinning

Reforestation

None

Salvage

21 acres yielding 50 MBF

No Treatment

For 100 acres of nonforest, aspen, and marginal areas.

The timber harvest is to be in conjunction with the Little Whiskey Timber Sale.

A stand map and proposed transportation system are attached.

For Nonforest - Noncommercial Stands.

COMPARTMENT DATA ELEMENTS SUMMARY

Form I

Compartment No. 549 29

Stand No.	01				
Acres					
Type	Non forest	[illegible]	[illegible]		
Stand Size					
Type of Survey					
Ground Land Use Class					
Component					
Slope Position					
Elevation					
Slope					
Aspect					
Soil Erosion					
Productivity Class					
Site Index					
Structure					
Distribution					
Softwood/Acre					
Volume					
BA					
Growth					
DBH					
No Stem S/S					
No Stem Poles					
No Stem St					
Hardwood/Acre					
Volume					
BA					
Growth					
DBH					
No Stem S/S					
No Stem Poles					
No Stem St					

STAND PRESCRIPTION SUMMARY

Compartment # 549-29 Stand # 03

Type	Lodgepole	Acres	222
Stand Size	Sawtimber	Stand Origin	
Year of Survey		Land Use Class	
Component			
Slope Position	Ridgetop	Elevation	9400
Slope	16 - 25 %	Aspect	NE
Distribution		Structure	
Site Index	38	Survey Yield	
Windthrow Hazard	Moderate	Soil Erosion	

Softwood/Acre			
Volume	13942	Basal Area	131
Growth(cub.Net)	32	DBH (Ave.)	10.3
S/S Stems	345		
Pole Stems	42		
ST Stems	537		

Hardwood/Acre			
Volume		Basal Area	
Growth(cub.Net)		DBH=(Ave.)	
S/S Stems			
Pole Stems			
ST Stems			

Stand Description & History

Pine → Fire → Aspen → Pine

This area is on or near the ridgetops and is of generally larger size timber than the other stands.

① Old Growth pockets that survived the fire (≈ 30 ac.)

② Pole Patches - dog haired and stagnant (≈ 90 ac.)

③ MIXED YOUNG + OLD Growth (≈ 55 ac)

④ Aspen outcrops on south aspects (≈ 30 ac)

Nonforest (≈ 15 ac)

Detailed Prescription, T.S.I. Needs

TREAT EACH COMPONENT:

) OLD GROWTH - patchcut to remove mistletoe, and overmature trees. This will stimulate reproduction.

) POLE TIMBER - No treatment at this time. Thin when sale is closed and roads allow access

) MIXED - remove overmature trees and young trees of poor form and vigor.

) ASPEN - no treatment

NON FOREST — no treatment

Timber and Other Resource Coord. Sum.

RAM Prescription

PATCH CUT, THIN, SHELTERWOOD

RAM Yield

RAM Class

RAM Decade

Other Resource Coord. and Constraints

Restricted cutting along drainages

Protection Measures

YIELDS/ACRE	LEAVE	HARVEST	TOTAL
Acres	137	85	222
Stems (Poles, ST)	539	40	579
Basal Area	86	45	131
MBF	3000	4200	7200
Cords	—	—	—
CBF	—	—	—

Total Cut Vol. 357 MBF (Softw.) Cut Vol. — (Hwdw.)

Compartment # 54727 Stand # 02

Type	Lodgepole	Acres	536
Stand Size	1 polyhedron	Stand Origin	—
Type of survey	—	Land Use Class	—
Component	Standard		
Slope Position	Midslope	Elevation	—
Slope	16-25	Aspect	N
Distribution	—	Structure	—
Site Index	33	Survey Yield	—
Windthrow Hazard		Soil Erosion	—

Softwood/ Acre			
Volume	6837	Basal Area	164
Growth(cub.Net)	25	DBH - (Ave.)	7.5
S/ S Stems	465		
Pole Stems	272		
ST Stems	735		

Hardwood/ Acre			
Volume		Basal Area	
Growth(cub.net)		DBH (Ave.)	
S /S Stems			
Pole Stems			
ST Stems			

Stand Description & History

Pine → Fire → Aspen → Pine

This stand is just off the ridge tops and is made up of slightly smaller timber - still variable.

1) Scattered and sparce pockets of OLD GROWTH ≈ 60 ac.
2) Extensive pole timber patches ≈ 190 ac.
3) Limited Mixed Large and small pine. ≈ 200 ac.
4) Aspen 50 ≈ ac.

Non Forest ≈ 35 ac.

Detailed Prescription, T.S.I. Needs

TREAT EACH COMPARTMENT!

1) OLD GROWTH - patch cut to remove overmature stems, mistletoe, and to stimulate reproduction.
2) POLE TIMBER - no treatment at this time. Thin when gain access.
3) MIXED - remove overmature stems and young trees of poor form and vigor.
4) Aspen - no treatment

Apx. 55 ac. of Non forest and WIZ

TM Plan- RAM Class

RAM Prescription

RAM Yield

Activity (from TM Plan EIS)

Schedule- RAM Decade:

Prescription
PATCH CUT - ITM / SHELTERWOOD

MUM --Coordination

Constraints

Selected Activity- Method

Constraints

YIELDS / ACRE Treatment

	LEAVE	HARVEST	TOTAL
Acres	296	240	536
# Stems (Poles, ST)	421	585	1006
Basal Area	114	55	169
MBF	3838	3000	6838
Cunits	—	—	—
Dead MBF	—	—	—

Total Cut Vol. 720 MBF (Softw.) Cut Vol. — (HARDW.)

Compartment # 54929 Stand # 04

Type	[illegible]	Acres	21
Stand Size	[illegible]	Stand Origin	—
Type of survey	—	Land Use Class	—
Component	[illegible]		
Slope Position	[illegible]	Elevation	—
Slope	16-[illegible]	Aspect	[illegible]
Distribution	—	Structure	
Site Index	0	Survey Yield	—
Windthrow Hazard		Soil Erosion	—

Softwood/ Acre			
Volume	8235	Basal Area	125
Growth(cub.Net)	0	DBH - (Ave.)	9.5
S/ S Stems	1200		
Pole Stems	125		
ST Stems	1325		

Hardwood/ Acre			
Volume		Basal Area	
Growth(cub.net)		DBH (Ave.)	
S /S Stems			
Pole Stems			
ST Stems			

Stand Description & History

This small stand is a North slope and very wet. Aprx. 2500 BF/ac of dead volume is present and was killed by the high water table. A new stand of spruce fir is developing with the majority of the stems in the small diameter class. 21 Acres.

Detailed Prescription, T.S.I. Needs

Remove the dead volume. Sanitize the remaining stems and remove mortality trees.

TM Plan- RAM Class

RAM Prescription

RAM Yield

Activity (from TM Plan EIS)

Schedule- RAM Decade:

Prescription SHELTERWOOD

MUM -- Coordination

Constraints

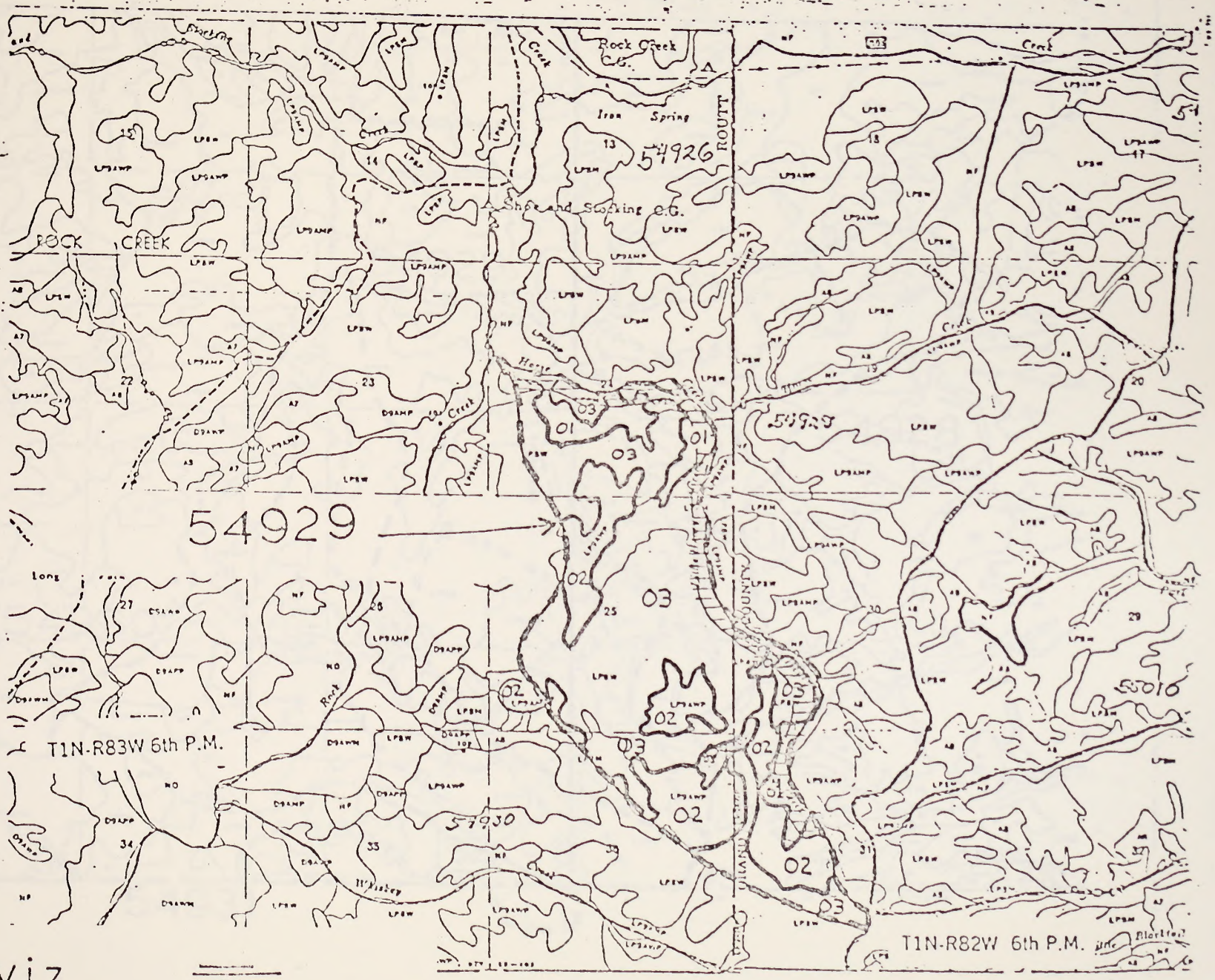
Selected Activity- Method

Constraints

YIELDS / ACRE Treatment _____

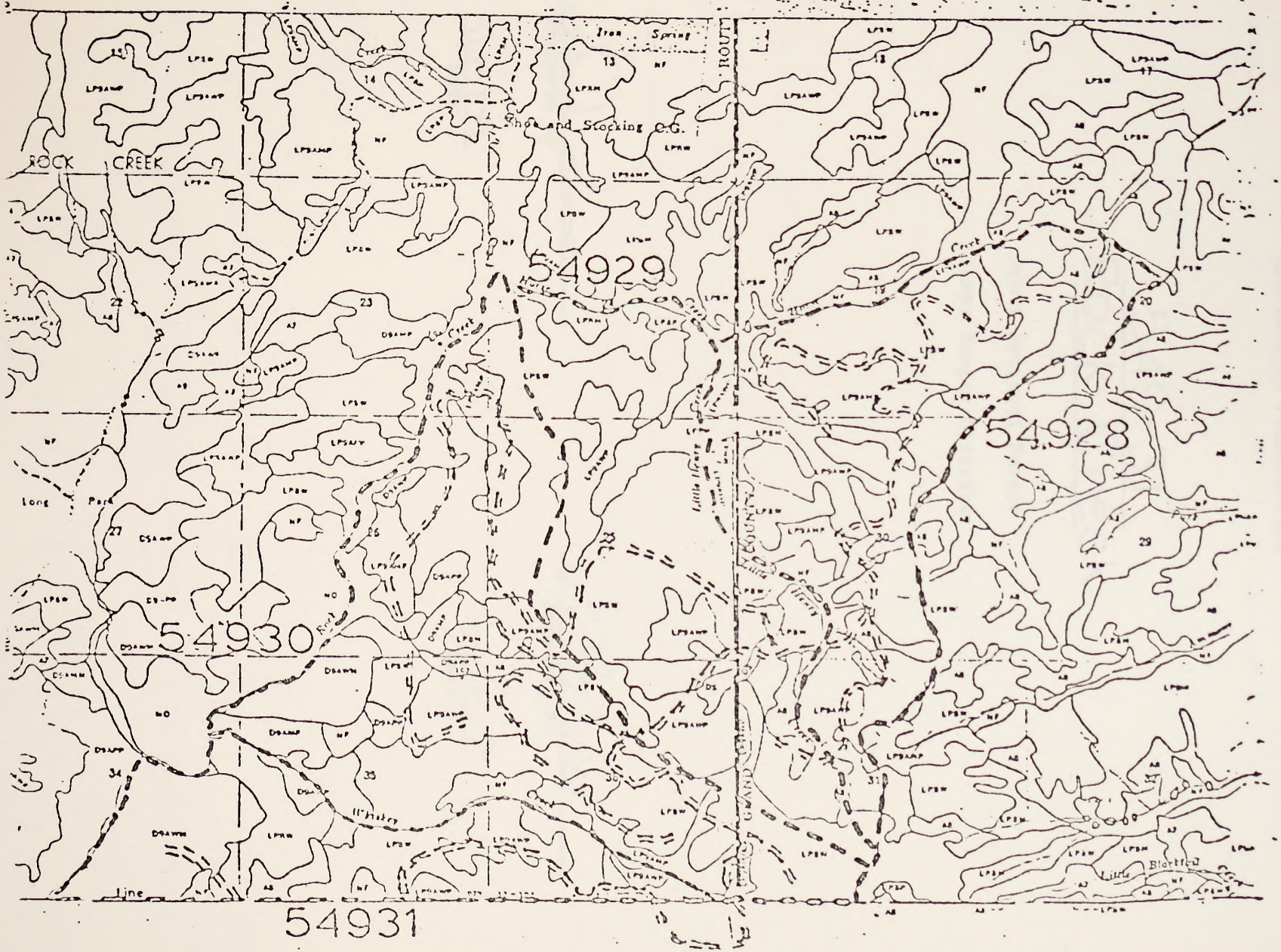
	LEAVE	HARVEST	TOTAL
Acres	0	21	21
# Stems (Poles, ST)	1350	50	1400
Basal Area	85	40	125
MBF (Cubical [illegible])	6500	3500	10 000
Cunits	—	—	—
Dead MBF	—	—	—

Total Cut Vol. 73500 BF (Softw.) Cut Vol. _____ (HARDW.)


ROCK CREEK
Rock Creek
Iron Spring
54926
ROUTT
Shore and Stocking e.G.
54929
54930
54928
54910
T1N-R83W 6th P.M.
T1N-R82W 6th P.M.

WiZ

LITTLE WHISKEY SALE
PROPOSED ROADS



COMPARTMENT PRESCRIPTION

549-31
Rock Creek

Routt National Forest

Yampa Ranger District

Prepared By

9/27/79
Date

Approved By

11/21/79
Date

Compartment Description

Compartment 549-31 lies in T1N, R83W, of Routt County Colorado. It is bounded on the south by the Forest Boundary and the base line, on the north by Whiskey Creek and on the west by Rock Creek.

Currently, the only access into the area is by foot, horseback or jeep trail.

The compartment is primarily composed of young growth lodgepole pine that developed under aspen which followed after fire. Stands are large and variable, often containing pockets of old growth that were not destroyed in the fire and that are now falling apart, as well as large areas of small poletimber that has begun to thin. All stands are interspersed with small aspen sawtimber.

Windrisk throughout the area is low to moderate. Ground fuels are very light.

Prescription Summary

Detailed prescriptions for each stand are attached. In general, they call for the following:

Timber Harvest

(Sanitation and patchcut) 212 ac. yielding 750 MBF.

Thinning

(Commercial) 234 acres.

Reforestation

NONE

Salvage

NONE

No Treatment

390 acres.
A stand map and map of proposed roads for the area are also attached.

Compartment # [illegible] Stand # 1

Type [illegible]	Acres 36
Stand Size [illegible]	Stand Origin
Type of survey [illegible]	Land Use Class
Component	
Slope Position	Elevation
Slope	Aspect
Distribution	Structure
Site Index	Survey Yield
Windthrow Hazard	Soil Erosion
Softwood/ Acre	
Volume	Basal Area
Growth(cub.Net)	DBH = (Ave.)
S/ S Stems	
Pole Stems	
ST Stems	
Hardwood/ Acre	
Volume	Basal Area
Growth(cub.net)	DBH (Ave.)
S /S Stems	
Pole Stems	
ST Stems	

Stand Description & History

[illegible]

Detailed Prescription, T.S.I. Needs

TM Plan- RAM Class

RAM Prescription

RAM Yield

Activity (from TM Plan EIS)

Schedule- RAM Decade:

Prescription

[illegible]

MUM --Coordination

Constraints

Selected Activity- Method

Constraints

YIELDS / ACRE Treatment _____

	LEAVE	HARVEST	TOTAL
Acres			
# Stems (Poles, ST)			
Basal Area			
MBF			
Cunits			
Dead MBF			

Total Cut Vol. _____ (Softw.) Cut Vol. _____ (HARDW.)

Compartment #549-31 Stand #[illegible]

Type [illegible]	Acres 27
Stand Size [illegible]	Stand Origin
Type of survey 9123	Land Use Class
Component UNSUCCESSFUL	
Slope Position	Elevation
Slope	Aspect
Distribution	Structure
Site Index	Survey Yield
Windthrow Hazard	Soil Erosion
Softwood/ Acre	
Volume	Basal Area
Growth(cub.Net)	DBH = (Ave.)
S/ S Stems	
Pole Stems	
ST Stems	
Hardwood/ Acre	
Volume	Basal Area
Growth(cub.net)	DBH (Ave.)
S /S Stems	
Pole Stems	
ST Stems	

Stand Description & History

[illegible] Acres.

Detailed Prescription, T.S.I. Needs

No Treatment this decade.

TM Plan- RAM Class

RAM Prescription

RAM Yield

Activity (from TM Plan EIS)

Schedule- RAM Decade:

Prescription

No Treatment

MUM --Coordination

Constraints

Selected Activity- Method

Constraints

YIELDS / ACRE Treatment _____

	LEAVE	HARVEST	TOTAL
Acres			
# Stems (Poles, ST)			
Basal Area			
MBF			
Cunits			
Dead MBF			

Total Cut Vol. _____ (Softw.) Cut Vol. _____ (HARDW.)

STAND DESCRIPTION SURVEY

Department # 549-31	Stand # 03		
Type: Lodgepole	Acres 85		
Sawtimber	Stand Origin		
Survey 933	Land Use Class		
Stand			
Position Ridge Top	Elevation 9800		
16- 25 %	Aspect N		
Distribution 10	Structure 10		
Index 41	Survey Yield		
Hazard Moderate	Site Index 01		
Softwood/Acre			
Volume 9937	Basal Area 135		
Growth (cub. Net) 38	DBH (Ave.) 8.7		
S/S Stems 370			
Pole Stems 105			
T/S Stems 181			
Hardwood/Acre			
Volume -0-	Basal Area -0-		
Growth (cub. Net) -0-	DBH=(Ave.) 1.5		
S/S Stems 120			
Pole Stems -0-			
T/S Stems -0-			

Stand Description & History

Stand is composed primarially of under rotation LPP (80-100) with scattered old growth trees (>200 yr. old) dispersed throughout. In addition, pockets of small poletimber are common as are occasional pakt of decatent old growth concentrations. The stand has developed under aspe following fire, and scattered young growth aspen can still be seen.

Detailed Prescription, T.S.I. Needs

T. 3 seperate components of this stand will seperate silvicultural treatments.

1) Areas of primarially young growth will be TMed to remove old growth trees and Risk young growth.

2) OLD growth patches that survived the fire be patch cut to stimulate growth in young understory and enhance natural regeneration

3) Poletimber areas will be thinned commercially posts and poles following the timber sale.

Slope: >40% will not be logged

Timber and Other Resource Coord. Sum.

RAM Prescription: ITM SHELTERWOOD

RAM Yield

RAM Class

RAM Decade

Other Resource Coord. and Constraints: No timber harvest adjacent to creek.

Protection Measures: WIZ along Whiskey Crk.

YIELDS/ACRE	LEAVE	HARVEST	TOTAL
Trees	35	50	85
Stems (Poles, ST)	103	78	181
Basal Area	83	45	128
MBF	6.6	3.3	9.9
	—	—	—
	—	—	—

Total Cut Vol. 165 MBF (Softw.) Cut Vol. _____ (HARDW.)

STAND PRESCRIPTION SUMMARY

Compartment # 549-31 Stand # 04

ype	Lodgepole	Acres	272
and Stat	Pole timber	Stand Origin	01
f Survey	933	Land Use Class	01
ment	Stand		
lope Position	Ridgetop	Elevation	9500
lope	16-25 %	Aspect	N
istribution	10	Structure	10
ite Index	38	Survey Yield	—
indthrow Hazard	Moderate	Soil Erosion	01

Softwood/Acre			
olume	5689	Basal Area	105
rowth(cub.Net)	33	DBH (Ave.)	7.8
/S Stems	195		
ole Stems	1100		
T Stems	159		

Hardwood/Acre			
olume	—	Basal Area	—
rowth(cub.Net)	—	DBH=(Ave.)	—
/S Stems	30		
ole Stems	—		
T Stems	—		

Stand Description & History

Stand developed under Aspen following fire and now consists of 4 main components.

1) Large areas of small poles and large saplings (≈170 Ac)

2) Scattered pockets of interspersed young and old growth LPP (≈ 70 ac)

3) Isolated pockets of old growth LPP that survived the fire and are rapidly deteriorating. Reproduction has begun to develop under neath (≈ 22 Ac)

4.) Scattered residual of Aspen (≈ 10 AC.)

tailed Prescription, T.S.I. Needs

-1 component will be treated as follows—

Poles - commercially thinned following mber harvest

2) Mixed young and old growth - remove vermature and high risk trees.

3) Old growth - Patch cuts and group lection to eliminate mistletoe and mulate reproduction.

4) Aspen - No treatment this decade

Timber and Other Resource Coord. Sum.

RAM Prescription

ITM - Intermediate Cut - Patch Cut

RAM Yield

RAM Class

RAM Decade

Other Resource Coord. and Constraints

No harvest along creeks

Protection Measures

WIZ along Whiskey Crk.

IELDS/ACRE	LEAVE	HARVEST	TOTAL
cres	180	92	272
Stems (Poles, ST)	248	48	296
asal Area	7.5	3.0	10.5
BF	1.8	3.9	5.7
S	—	—	—
BF	—	—	—

Total Cut Vol. 350 MBF (Softw.) Cut Vol. _____ (HARDW.)

Compartment #549-31 Stand #05

Type LTP/DF	Acres 182
Stand Size SAWTBR	Stand Origin 01
Type of survey 923	Land Use Class 01
Component STANDARD	
Slope Position SIDEHILL	Elevation 9,200
Slope 20-30%	Aspect N
Distribution 10	Structure 10
Site Index 40	Survey Yield —
Windthrow Hazard MOD.	Soil Erosion 01

Softwood/ Acre	
Volume 6.5	Basal Area 100
Growth(cub.Net) —	DBH = (Ave.) —
S/ S Stems 250	
Pole Stems 120	
ST Stems 150	

Hardwood/ Acre	
Volume	Basal Area
Growth(cub.net)	DBH (Ave.)
S /S Stems	
Pole Stems	
ST Stems	

Stand Description & History

STAND IS A MIXTURE OF LTP AND SCATTERED DF THAT DEVELOPED FOLLOWING A FIRE. APPROXIMATELY 1/3 OF THE STAND IS INOPERABLE DUE TO STEEP SLOPES (≈60 ACRES) THE REMAINDER CONSISTS OF -
1. INTERMINGLED YOUNG AND OLD GROWTH LTP - (≈50 AC)
2. OLD-GROWTH LTP THAT IS DETERIORATING [illegible] INFECTED. (≈20 AC)
3. ASPEN (≈20 AC)
4. AREAS OF PLANT POLLINATOR SAPLINGS (≈30 AC)

Detailed Prescription, T.S.I. Needs

THE COMPONENTS OF THIS STAND WILL BE TREATED AS FOLLOWS -
1. YOUNG/OLD GROWTH - OVER-MATURE AND HIGH RISK TREES WILL BE REMOVED.
2. OLD GROWTH - PATCH CUT TO ELIMINATE [illegible] MID-[illegible] [illegible].
3. POLE[illegible] - COMMERCIAL [illegible] AFTER THERM. HARVEST.
4. ASPEN - [illegible] THIS DECADE.

TM Plan- RAM Class

RAM Prescription

RAM Yield

Activity (from TM Plan EIS)

Schedule- RAM Decade:

Prescription
ITM-SHELTERWOOD PATCH CUT

MUM --Coordination
W12 - ALONG [illegible]

Constraints - [illegible] HAR-VEST [illegible]

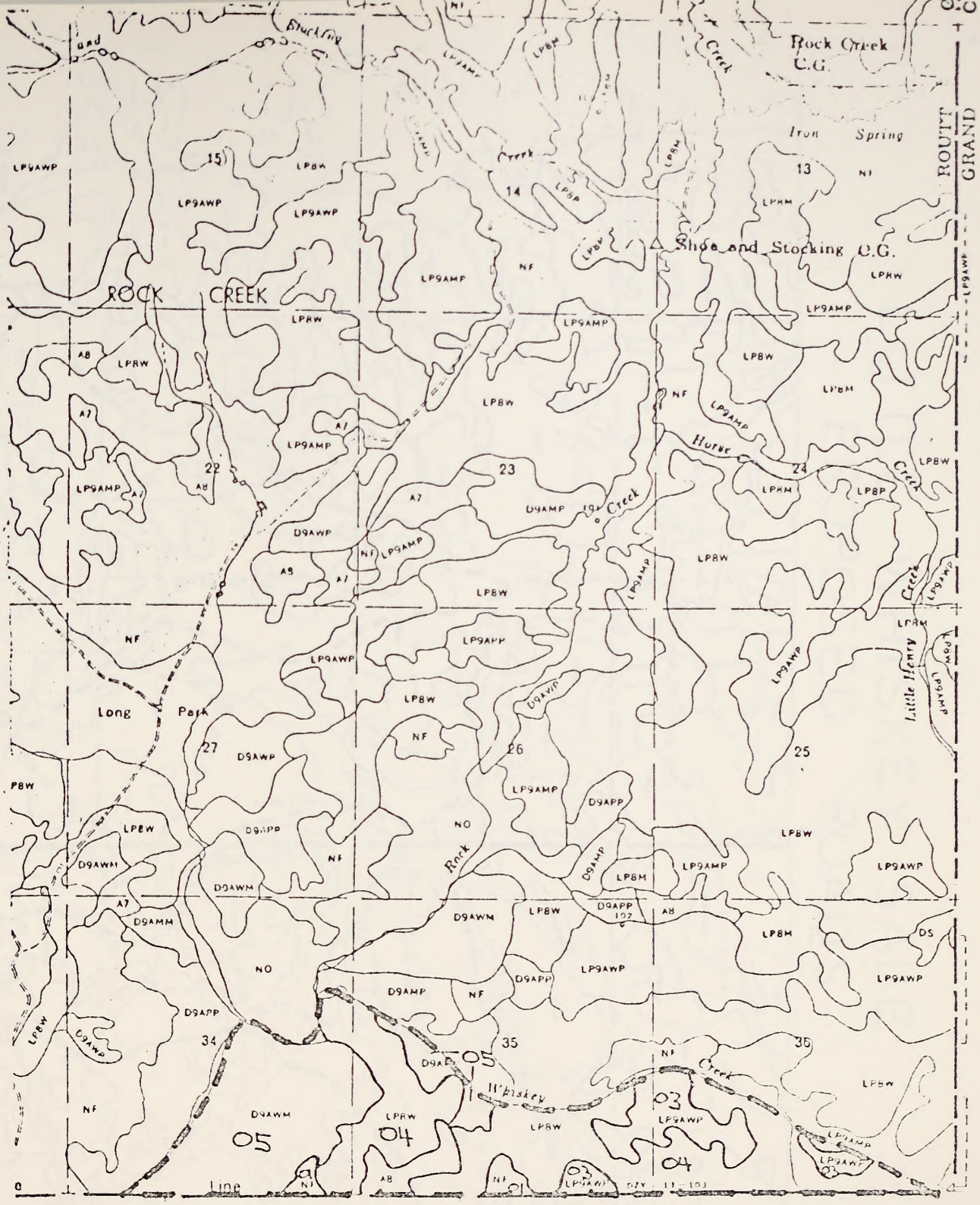
Selected Activity- Method

Constraints

YIELDS / ACRE Treatment

	LEAVE	HARVEST	TOTAL
Acres	112	70	182
# Stems (Poles, ST)	200	70	270
Basal Area	70	30	100
MBF	3.0	3.5	6.5
Cunits	—	—	—
Dead MBF	—	—	—

Total Cut Vol. 245 [illegible] (Softw.) Cut Vol. _____ (HARDW.)



54931

STAND MAP

Definite land line

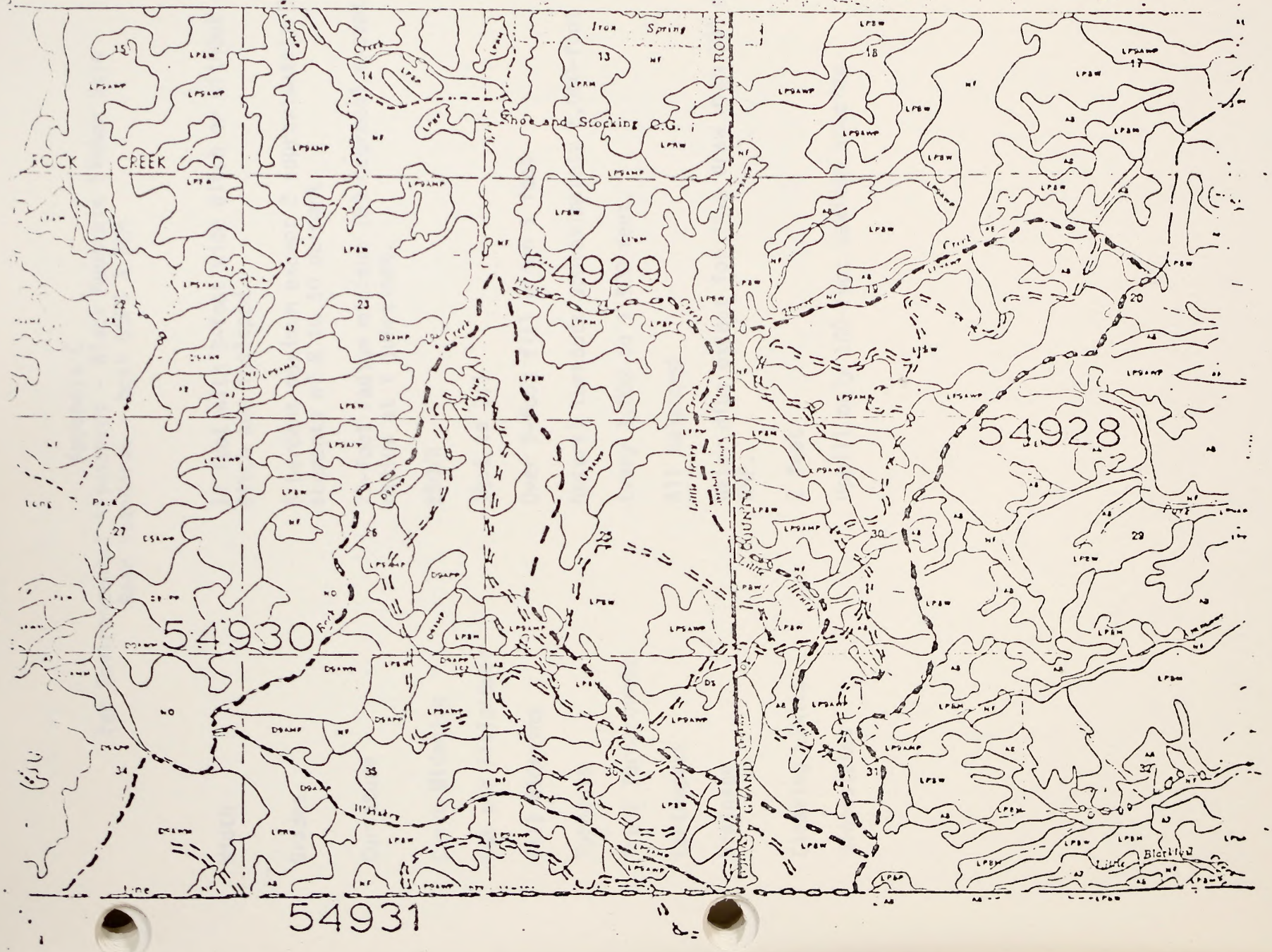
Approximate land line

Unsurveyed– FS protracted land line

Land lines shown solid are surveyed by found corners or are surveys made since 1910

2 Miles

LITTLE WHISKEY SALE
PROPOSED ROADS



Appendix C
For Environmental Assessment - Black Mountain Timber Sale
Road Standards : both USFS & BLM

Width	14 feet with 3-foot wide ditch or without ditch and insloped.
Grades	8 percent maximum except 2 approximately 500-foot segments of 8 to 10 percent.
Curvature	75-foot radium minimum (80 degrees) except 50-foot radius at Y junctions.
Curve Widening	250/R
Cut and Fillslopes	1½:1 to 3:1
Fill Widening	Over 5-foot fill widen 1 foot
Turnouts	Natural turnouts approximately 1,000-foot spacing.
Truck Turnarounds	Every 1,000 to 1,500 feet.
Earthworks	All balanced
Drainage	Water dips except for live draw with 18" minimum CMP.
Clearing Limits	2 feet
Slopestakes	Uphill only 100-foot maximum spacing.

JOINT BLM - USFS BLACK MOUNTAIN T.S.

8% GRADE JUSTIFICATION T15 R83W

Black Mountain Timber Sale Grade Justification

Introduction

This road is for a combination Forest Service BLM timber sale; the access road is on the BLM portion of the sale. The road length above 8 percent grade is 2 segments approximately 500 feet long with probably 8 to 10 percent grades.

Topography

The general topography in this area is rolling hills, shallow wide draws and swales, short spur ridges and in places, somewhat sustained slopes of approximately 40 percent.

The location of the over 8 percent road segments is in a wide, shallow dry swale. The swale bottom is rounded approximately 110-feet or inches wide, and slopes 5 to 10 percent downstream. There is no evidence of overland water flow.

The area is vegetated with lodgepole pine, brush, and grass.

Proposed Route

The flagged line goes up the right hand side of the swale near the steeper sideslopes and stays approximately 2 to 5 feet above the swale bottom. When far enough up the swale, the road crosses the drainage (no overload flow evidence but 18" CMP necessary anyway) with little fill and climbs at 5 to 6 percent out of the drainage.

The flagged location at the two over 8 percent segments and the segment in between is on approximately 10 percent sideslopes and has relatively straight alignment.

Alternative Routes

There is no practical major route change that will still serve the requirements of the timber sale. The only localized alternative would be to lengthen the segment in the swale by immediately crossing the drainage, switchback, recrossing the swale, etc. at 8 percent or less until getting high enough to tie back into the proposed route and climb out of the drainage.

Justification for Proposed Route

The proposed route is the most direct route, has the fewest drainage crossing, least earthworks, and it is far enough out of the swale bottom to not cause any significant erosion problems.

Although over 8 percent in 2 segments, both segments are only approximately 500 feet long and will only have grades of 8 to 10 percent.

Since sideslopes are only approximately 10 percent no significant overland flow, sides, or slumps will threaten the road, and therefore the road drainage. Drainage control will be by ditching, insloping at 3 to 5 percent and water dips.

Although over 8 percent, this road segment will only be approximately 1,300 feet overall, not long enough to build up large water velocities and massive erosion.

Approvals

Robert B. Nova	1-24-80
Grand Junction District Engineer	Date
[illegible]	1-25-80
Grand Junction Chief of Operations	Date
David A. Jones	1/28/80
Grand Junction District Manager	Date
[illegible]	2/21/80
Colorado State Office Engineer	Date
Charles W. [illegible]	3/5/80
ACTING Colorado State Director	Date

Glossary

Air dry herbage	- The weight of vegetation after drying naturally. Air dry weight.
Bole	- The central stem of a tree.
C.M.P.	- Corrigated Metal Pipe, it provides cross drainage for roads.
Compartment	- Geographic area that lends itself to like management techniques or can be logically managed as a unit.
Cruising	- The measurement of standing trees to be harvested. Usually expressed in terms of board feet volume.
DBH	- In measuring trees it is the diameter of a tree at breast height or 4½ feet above ground level.
Layout	- Pertains to the on-the-ground preparations that identify timber stands for harvest.
lopping	- The cutting of leftover tree limbs and tops into smaller segments.
MBF	- One thousand board feet measure of tree volume.
Silviculture	- Pertaining to the culture or treatment of a forest.
Stand	- A group or community of plants that have homogenous characteristics.
Station	- In engineering, a distance of 100 feet.
Swale	- Broad bottom drainage that is a depression without a well defined water course or none at all.
Trend	- In range managment the direction or the condition it is going i.e. improving or deteriorating.

VIII. Management Evaluation and Revision

With the writing of this FMP, the proposed projects are realistic, practical and economically desirable. However, five to ten years into the future, they may be unnecessary or obsolete. Provisions to evaluate and modify the FMP content and objectives are addressed.

Through the examination of sale records, direct on-the-ground observation, and periodic inventories, modifications in the management plan can be made. Periodic examination of forest management activities by the various resource specialists will aid in coordination of future activity plans.

Upon completion of the FMP in 1983 and the subsequent 5, major revisions in the forest management plan may occur. To aid in analyzing the forest resource, a power readjustment of the extensive forest inventory is also scheduled for 1983.

The five and ten year plan should be readjusted annually to coincide with other forest activity program adjustments on FMP revisions.

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The five and ten year plan should be readjusted annually to coincide with other forest activity program adjustments on RMP revisions.

IX. Public Affairs

This plan should be presented to the public, and other governmental agencies after tentative approval. A copy has been sent to the Routt Forest for information and coordination.

The Steamboat Springs Colorado State Forest Office should receive a copy for their information. Various county and state departments should receive copies for information and review. These could include the county commissioners, planner, highway department, and wildlife conservation officer.

Informal comments from these agencies can be incorporated into the plan. The plan should be presented to local area residents to include them in the process and to head off any misunderstandings that would retard cooperation between BLM and local residents. There would be information meetings aimed at giving the plan integrity with the public.

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ALLOWABLE CUT PLAN

Grand Junction portion of the Glenwood Springs Inventory Unit.

This plan deals with the steps involved in evaluation of alternative levels of timber production and selection of a level of cut.

The figures for evaluation were extracted from the 1977 Forest Inventory Data. The inventory unit includes 171,157 acres in the Craig and Grand Junction Districts. This area represents the Sustained Yield Unit (SYU). (See Manual 5360 for definition of Sustained Yield Unit - S.Y.U.)

The allowable cut for this unit has been allocated between the Craig and Grand Junction Districts to facilitate administrative requirements. The cut will be adjusted between the administrative units to reflect a S.Y.U. program for the total area.

The allowable cut reflects only those lands that have been identified as capable of continuously producing timber under economically, environmentally sound practices. Forested lands to be managed for aesthetics, recreation, watershed, and wildlife to the exclusion of timber cutting are also excluded from the allowable cut calculations.

The allowable cut figure reflects the effects of multiple use management on these lands available for timber production.

The following table shows acreages affected or deleted from the allowable cut due to multiple use considerations.

ALLOWABLE CUT PLAN

Grand Junction portion of the Glenwood Springs Inventory Unit.

This plan deals with the steps involved in evaluation of alternative levels of timber production and selection of a level of cut.

The figures for evaluation were extracted from the 1973 Forest Inventory Data. The inventory unit includes 171,157 acres in the Craig and Grand Junction Districts. This area represents the Sustained Yield Unit (SYU). (See Manual 5240 for definition of Sustained Yield Unit - S.Y.U.)

The allowable cut for this unit has been allocated between the Craig and Grand Junction Districts to facilitate administrative requirements. The cut will be adjusted between the administrative units to reflect a S.Y.U. program for the total area.

The allowable cut reflects only those lands that have been identified as capable of continuously producing timber under economically, environmentally sound practices. Forested lands to be managed for aesthetics, recreation, watershed, and wildlife to the exclusion of timber cutting are also excluded from the allowable cut calculations.

The allowable cut figure reflects the effects of multiple use management on those lands available for timber production.

The following table shows acreages affected or deleted from the allowable cut due to multiple use considerations.

dix B.

State lorado

Sustained Yield Unit Glenwood Springs

IIC. FOREST LANDS CONSTRAINED BY NON-TIMBER USES

ltiple Use Factor: *

Types of Restrictions	PFL (Acres) S.Y.U.	PFL (Acres) G. Junction	% Restriction
Wildlife (Total Restriction)			
Wildlife (Partial Restriction)	* Cutting practice restriction only		
Streamside (Total)	5,048	2,551	100
Streamside (Partial)			
Watershed (Total)	2,400	0	100
Watershed (Partial)			
Scenic Corridors (Total)			
Scenic Corridors (Partial)			
Recreation (Total)			
reation (Partial)			
graphic (Total)	61,215	31,981	100
Topographic (Partial)			
Rights-of-ways (Total)			
Rights-of-ways (Partial)			
Research, Natural (Total)	5,039	1,288	100
Research, Natural (Partial)			
Other (Total) Aspen-Alpine fir Forest Type	18,175	20,538	100
Other (Partial) Silvicultural	5,019	0	100
Total (Total)	112,014	56,358	
Total (Partial)			

* dlife, scenic corridors and recreation partial restrictions show up . silvicultural restriction that satisfies these multiple uses by fying the cutting practice.

Eighteen alternatives were considered in evaluating the allowable cut. The final alternative selected reflects a level of intensive management as well as the multiple use, economic, and environmental factors.

In discussing the intensive management practices, it is necessary to know how they were fit into the forest inventory data.

In order to computerize the forest inventory and also have a program giving output relative to the planning system, it was necessary to insert the intensive management assumptions into the program prior to any output.

Assumptions were made in regard to management decisions that would normally come out of the planning process, but since the planning was not completed subjective decisions were made. In addition to the multiple use restrictions already mentioned a level of intensive management was assumed using the inventory data and the plots were then classified and plugged into the computer program.

The preliminary steps for the plot classification of the productive forest plots in the Extensive Forest Inventory 1973 started with basic data accumulation. The plot sheets from the 1973 Glenwood Springs Extensive Forest Inventory were gathered along with the Location Observation Worksheets. Also included were the aerial photos used to locate the field plots and all of the maps that were used in the Denver Service Center showing all of the restrictions, planning units, ownership, and the photo points for the photo portion of the inventory. The Summary Tables 1 through 5 from the inventory field data were used. The tables

most used were Table 3, which lists the plot summary, stand density, and stocking by specie; Table 4, which lists volume per acre by diameter class; and Table 5, which lists stocking and volume per acre by age classes. An extensive review of the previous plot classification submissions was then performed. These were sent to the Denver Service Center for their preliminary allowable cut runs.

The attached K-2 alternative is the allowable cut run finally selected and reflects the intensive management level shown on the following page.

ALLOWABLE CUT - INTENSIVE MANAGEMENT PRACTICES

INTENSIVE MANAGEMENT PRACTICE	ACRES TREATED				
	Grand Junction		Craig		S.Y.U.
Pre-Commercial thin only @ age 20	20 ac. / decade	+	42 ac.	=	62 ac.
Pre-Commercial thin @ age 20 followed by commercial thin at age 80	310 ac. / decade	+	619 ac.	=	929 ac.
Commercial thin Clear Cut acres @ age 40	500 ac. / decade	+	788 ac.	=	1288 ac.
Commercial thin Clear Cut acres @ age 80	450 ac. / decade	+	795 ac.	=	1245 ac.
Commercial thin Partial Cut acres @ age 80	500 ac. / decade	+	795 ac.	=	1295 ac.
Total	1,780 ac. / decade	+	3,039 ac.	=	4,819 ac.

DECADE VOLUME - SCRIBNER LOG RULE		ACRES
Grand Junction	19 MMb.f.	18,926
Craig	51 MMb.f.	40,217
Sustained Yield Unit	70 MMb.f.	59,143

	Sustained Yield Unit	Grand Junction
Acres excluded for multiple use considerations -	112,013	56,358
Total acres inventoried -	171,156	75,408
Base acres for Allowable Cut Plan -	59,143	19,050

GLENWOOD SPRINGS
Public Domain Forest Inventory
Unit 06

Simulated Allowable Cut Model
Alternative: K-2 — Selected Alternative

SIMIX Identification.
Batch 676 ; Master File 2 ; Columns 8, 9, 10
Tape 7110 .

Area Included in Forest Simulation Model
The Glenwood Springs Inventory Unit consists of the former Glenwood Springs District, and the Craig and Grand Junction Districts. District boundaries have been changed since the inventory design was developed. Field plot locations have been reclassified.

This alternative includes the entire inventory unit.

Timber Management Regimes

	CC	PCO	PC1	PC2	Total
Acres	36,532	15,029	3,796	3,786	59,143
S.I.	42.58	44.33	35.00	35.33	42.08
# Plots	29	12	3	3	47

Sustained Yield Allowable Cut Results

	Million Bd. Ft.
International 1/3" Log Rule	81.094 per decade
Scribner Log Rule	67.454 85.9

Area Excluded from this Allowable Cut Alternative.

All multiple use restrictions are applied to forest lands. All slopes 40% and steeper are restricted from harvesting. These restrictions cause 65.4% of the commercial forest acreage to be taken out of the productive timber producing base acreage.

Glenwood Springs, Alternative: E-2

Timber Production i.e., harvest yields are reduced because of multiple use restrictions applied to acreages within the inventory unit.

Master File 2 Col. 8, 9, 10

Code	Title	Plots	Acreage	Restriction %
00	No Restrictions	47	59,143.165	None
610	Spruce Fir Forest Type	12	15,117.542	100%
620	(Streamside Protection Corridor)	4	5,048.216	100%
630	Watershed Protection	2	2,399.815	100%
660	Topographic 40% + Slopes	48	61,215.043	100%
670	Aspen Forest Type	14	18,174.650	100%
680	(Research Natural Areas)	4	5,039.235	100%
690	Silvicultural	4	5,019.193	100%
	S. Totals	88	112,013.694	100%

Total for Inventory Unit

135 plots 171,156.859 acres

Glenwood Springs, Alternative: K-2

Management Options - Volume Indicators:

Combine partial cut and clear cut harvest systems. Harvest mature PC stands with a three stage 10 year interval removal procedure.

Schedule all existing 10 and 20 year old stands and all future stands for either (1) non-treatment; (2) precommercial thinning only; (3) precommercial thinning followed by commercial thinnings - for the next 40 decades.

Yield Equations for Non-Treated Stands (Present).

Volume per acre of existing stands

CC Vol/Acre = -229.88 +154.79478(Age) -0.47431(Age^2)

PCO " = +1487.327 +113.56318(Age) -0.089974(Age^2)

PC1 " = 55% of revised PCO

PC2 " = 27% of revised PCO

Future Yield Equations for Non-Treated Stands

Present yield curves reach future yield curve at the end of 10 decades.

CC Stands (Vol/Acre)

0 - 100 years = -3344.03251 +161.44084(Age) -0.35671(Age^2)

100+ years = -5895.49109 +198.53634(Age) -0.47604(Age^2)

PCO Stands (Vol/Acre)

0 - 100 years = -3265.12920 +190.80668(Age) -0.479148(Age^2)

100+ years = -6213.09031 +233.74873(Age) -0.66016(Age^2)

Intensive Management:

A summary of individual plot classification results showed the following:

CC Regime

Present Stands	Future Int. Mgmt.	Future Harvest	# Plots	% Acreage
No treatment	20-50-80	CC	21	72
Thin @ 80	20-50-80	CC	4	14
None	None	PC	3	10
Thin @ 40 & 80	20-80	PC	1	4

PC Regime

No treatment	None	PC	4	22
"	20-80	PC	11	61
Thin @ 80	20-80	PC	3	17

The printout of existing immature stand data show the planned intensive management action.

First Decade

Regime	Age Class	% Acres	Vol/Acres	Acres Thinned	MBF Vol. Removed
CC	40	100	2740	1288	3,529
CC	80	14	2236	1245	2,784
PCO	80	50	2236	1295	2,896
				3028	9,209
Second Decade					
CC	80	100	2651	3825	10,140
PCO	None				
Third Decade					
CC	None				
PCO	70	100	1865	1283	2,402
Fourth Decade					
CC	70	100	2297	1288	2,959
PCO	50 (PCT & CT)		2078	929	1,930
					2,889

Glenwood Springs, Alternative: K-2

Precommercial Thin Only: PCT only 5% of the clearcut acreage and also 5% of the PC acreage as stands enter the 20 year age class. There are the stands that will not be thinned again. Harvest volumes are higher than non-treated stands but less than stands that have been both precommercially and commercially thinned.

Regime	Acres	Total
First Decade		
CC	None	
PCO	62	62
Second Decade		
CC	61	
PCO	62	123
Third Decade		
CC	108	
PCO	58	166
Fourth Decade		
CC	288	
PCO	151	439

Precommercial Thin Followed by Commercial Thinnings as Stands Reach Merchantable Size: Thin 85% of the CC acreage and 75% of the acreage of PC stands as they enter the 20 year age class. Manage these stands on a 20-50-80 year thinning prescription. Alternative K-2 gives the following projected job level.

Regime	Acres Thinned	Age Thinned	Volume per Acre	Total Vol. MBF
First Decade				
CC	None			
PCO	929	20	0	0
Second Decade				
CC	1032	20	0	0
PCO	929	20		
Third Decade				
CC	1834	20		
PCO	863	20		
Fourth Decade				
CC	4903	20		
PCO	2258	20		
PCO	929	50	2078	1,930.0

Glenwood Springs, Alternative: K-2

Acreage Deletion - Accretion

Delete -37 acres per decade from the clearcut stands, and -23 acres per decade from the partial cut stands for the first 5 decades to account for timberlands taken out of production due to the construction of permanent roads, etc.

Reforestation Lag

Allow +8 years for CC stands and -3 years for partial cut stands (from data of final harvest) to obtain full stocking of acceptable tree species.

Minimum Cutting Age

Do not allow the program to select stands under the age of 90 for initial harvest cutting.

Initial Entry Period

During the first decade only, apply the principal cut to CC and PCO (virgin) stands. Note that some cutting may be programmed in PC1 and PC2 stands. Allow the final harvesting priority system to control future cuttings during subsequent decades.

Mortality Salvage

No mortality-salvage program is planned. If catastrophic timber losses, equivalent to one-half years annual cut, occur, the allowable cut may be recomputed.

Flow Type

Program this initial run to compute the cut on a fixed-even-flow, sustained yield level basis. Due to a general uneven distribution of acreages by age classes and conditions, a modulation cut may be more appropriate under some conditions.

Percent of Total Final Harvest
Program this model to begin harvesting the oldest age class first. Other simulated model runs may be run with provisions for harvesting a percentage of younger age classes along with harvesting the oldest age classes.

Timber Utilization Standards:

A. Present Utilization Standards
Apply to First Decade Only; Use Scribner Log Rule

Species: 108 - Lodgepole Pine
Min. 6.0" DBH to a 5.0" Fixed Top

Species: 019 - Subalpine Fir
093 - Engelmann Spruce
Min. 8.0" DBH to a 5.0" Fixed Top

Species: 202 - Douglas Fir
Min. 10.0" DBH to a 5.0" Fixed Top

Species: 015 - White Fir
122 - Ponderosa Pine
746 - Aspen
Min. 12.0" DBH to a 5.0" Fixed Top

Non-commercial Species:
060 - Juniper
102 - Bristlecone Pine
106 - Pinon Pine
113 - Limber Pine
747 - Cottonwood

B. Future Utilization Standards
Use Int. 1/8" Fixed Top Log Rule

Species: 093 & 108
Min. 6.0" DBH to a 5.0" Fixed Top

Species: 015, 019, 122, 202, 746
Min. 8.0" DBH to a 5.0" Fixed Top

Non-commercial species: 060, 102, 106, 113, 747

Testing

Test 5 trial runs. Print the 5th test. Run the model for 30 decades per test.

The initial bounds for trial cuts were set at 60 and 85 million board feet per decade.

The trial run results were as follows:

Run #	Projected Cut 60 to 85	Analysis
1	72.50	Too low
2	78.75	Too low
3	81.875	Too high
4	80.313	Too low
5	81.094	Print

First Decade Management Harvest Plan
Final Harvest for Decade

Regime	Age Class	Acres	Million Board Feet Int. 1/8"	Scribner	
CC	110	1383	15.770	[illegible]	[illegible]
	120	2547	30.179	[illegible]	[illegible]
	170	1259	15.528	[illegible]	[illegible]
	250	1239	10.409	[illegible]	[illegible]
		6428	71.885	60.475	.8412
PCO	None				
PC1	None				
PC2	None				
		6428	71.885		
P Comm only		62			
P Comm thinning		929			
Comm. thinning		3828	9.209	9.203	
Total		11247	81.094	69.657	.8593

Testing

Test 3 trial runs. Prove the fan test. Run the model for 30 min. per test.

The initial bounds for trial cuts were set at 50 and 85 million dollars per decade.

The trial run results were as follows:

Run #	Projected Cut 60 to 85	Analysis
1	72.50	Too low
2	78.75	Too low
3	81.875	Too high
4	80.313	Too low
5	81.094	Print

First Decade Downgrade Distribution Plan
Final Survey for Decade

Degree	Age Class	Active	Military Retirees Total Time	Non-Retirees
GC	110	1064	15.7%	2.4%
	120	2147	30.1%	4.3
	170	1.5%	[illegible]	[illegible]
	750	1.5%	10.1%	[illegible]
		5029	71.2%	[illegible]
FCG	None			
FC1	None			
FC2	None			
		5029	71.2%	
R Comm only		82		
R Comm Commissioned		920		
Comm. Totals		5929	8.2%	[illegible]
Totals		11242	21.1%	[illegible]

Glenwood Springs, Alternative: K-2

Second Decade Management Harvest Plan
Final Harvest For Decade

Regime	Age Class	Acres	Million Board Feet Int. 1/8"	Scribner
CC	100	40	.448	
	120	2442	29.378	
		2482	29.826	
PCO	100	26	.130	
	110	3751	20.835	
PC1	90	1259	3.472	
	120	1288	4.902	
PC2	90	1249	3.321	
	100	1249	3.740	
	120	1288	4.727	
		12592	70.953	
P Comm only		61		
P Comm thinning		929		
Comm. thinning		3825	10.140	
Total		17407	81.093	

Third Decade Management Harvest Plan
Final Harvest for Decade

Regime	Age Class	Acres	Million Board Feet Int. 1/8"	Scribner
CC	110	3693	43.067	
PCO	110	2339	12.774	
PC1	110	26	0.088	
	120	3751	14.002	
PC2	100	1259	3.711	
	130	1288	5.048	
		12356	78.690	
PCO Comm thin		1288	2.402	
		13644	81.092	

Analysis: As noted in the third decade, all stands over 100 years of age have been cleaned up. During the 10th decade, initial entries are being made in 100 and 110 year old stands. Growing stock is then being built up faster than harvesting is deleting volume so that by the 20th decade the 130 year age class timber remains uncut. This trend continues at a very slow rate, and by the 40th decade final harvesting is being done in the 150 to 180 year old stands.

Appendix B

UNITED STATES DEPARTMENT OF AGRICULTURE
FOREST SERVICE
Routt National Forest
P.O. Box 1198
Steamboat Springs, CO 80477

2430
May 2, 1980

Mr. David A. Jones, District Manager
Bureau of Land Management
Grand Junction District
764 Horizon Drive
Grand Junction, CO 81501

Dear Mr. Jones:

Enclosed is a signed copy of the Interagency Agreement for the Little Whiskey Creek - Black Mountain Integrated Timber Sale. Exhibit A, which describes the lands involved, was not attached to the signed draft you submitted to us. Please send us a copy of Exhibit A so we can complete our copy of the Agreement.

The cooperation of your staff in completing this Agreement is greatly appreciated. The phase of completing the Environmental Assessment should go smoothly as our April 4, 1980 review of that document indicated that it would require little change.

If you have any questions or care to discuss the E.A. further, please contact Miller T. Ross of my staff.

Sincerely,

Miller T. Ross

for JACK WEISSLING
Forest Supervisor

Enclosure

RECEIVED
MAY -5 1980
BUREAU OF LAND MGMT.
GRAND JUNCTION

6200-11 (1/69)

Interagency Agreement
Between
Bureau of Land Management, U.S. Department of Interior
and
Forest Service, U.S. Department of Agriculture

This INTERAGENCY AGREEMENT made and entered into by and between the Bureau of Land Management, Grand Junction District Manager; herein referred to as the B.L.M., and the Forest Service, Routt National Forest Supervisor; herein referred to as the F.S., under the provisions of the Act of June 30, 1932 (31 U.S.C. 686).

WITNESSETH:

WHEREAS, the timber on the lands described on the exhibit A attached hereto and made a part hereof is administered either by the B.L.M. or the F.S.; and

WHEREAS, it is desirable to include timber administered by the B.L.M. and timber administered by the F.S. as a portion of a single timber sale to be offered for sale by the F.S. in the fiscal year 1981:

Now, THEREFORE, the two parties hereto agree as follows:

1. The F.S. and B.L.M. will assume individual responsibility for sale layout, road location and volume determination. The said timber shall be offered for sale on the basis of combining both agencies' field work. The F.S. will assume responsibility for all the engineering services for survey, design, estimating, and construction supervision of the system roads to be constructed under this timber sale. If appropriated funds are not adequate to finance construction supervision of B.L.M. roads, the B.L.M. will contribute to this cost, not to exceed $2000.

2. The F.S. and the B.L.M. shall jointly participate in the development of a logging operations plan.

3. Each agency shall obtain rights-of-way from the other for system roads to be constructed under terms of this timber sale, where said roads are needed for efficient system development. Such rights-of-way and road use license shall be obtained under existing procedures currently in effect between the parties.

4. The purchaser shall be responsible for the maintenance of all roads constructed under the terms of the timber sale contract. The purchaser shall be responsible for construction of all temporary spur roads on B.L.M..

5. The F.S. shall appraise the entire sale volume and prepare the contract for the entire sale on standard F.S. timber sale contract forms. B.L.M. and the F.S. will jointly review both the appraisal and the contract prior to advertising the sale.

The timber shall be offered for sale on the basis of contract stumpage rate with escalation except for when the sale appraises deficit. A sale that is deficit (indicated stumpage lower than base rates) when appraised at normal profit will be offered on a flat rate basis. To satisfy individual agency accounting requirements, volumes and values of timber administered by F.S. and B.L.M. shall be separately identified by mill yard scaling as stated in paragraph #6. Separate volume identification shall be used for interagency purposes only and shall not appear in the timber sale contracts.

6. Upon completion of bidding the F.S. shall sample log scale the timber from the sale area as it is removed. The F.S. and B.L.M. volume shall be kept separate. The actual scaled volume and the current contract rates shall be used to calculate each agency's share of the total proceeds from the timber sale. The proceeds will be separated on a percentage by species basis, calculated from the sample cruise in the following manner:

EXAMPLE:

Species	LP	DEAD	Sale Total
F.S. Volume M.B.F. (cruise)	500	400	900
B.L.M. Volume M.B.F. (cruise)	500	600	1100
Bid Value per M (dollars)	12	6	
F.S. Share of Bid	6000	2400	8400
B.L.M. Share of Bid	6000	3600	9600
TOTAL			18000
F.S. Share	50%	40%	
B.L.M. Share	50%	60%	

The actual computed percentage will appear in the contract file and made a part of such file upon the sale of the timber.

7. The F.S. shall advertise and conduct the proposed timber sale offering, and shall award the sale contract to the highest bidder.

8. The F.S. shall administer the timber sale contract, billing the purchaser as necessary and making all collections specified in the contract.

9. Annually the F.S. shall transfer to the B.L.M. its share of receipts, calculated by the scaled volume and current contract rate described in paragraph 6 (above). Quarterly the F.S. shall furnish the B.L.M. with a record of the volume and value of material removed during the quarterly period.

10. The F.S. and B.L.M. shall jointly prepare the slash disposal plan and estimated cost for inclusion in the appraisal. The F.S. and B.L.M. shall each be responsible for slash disposal on their area of responsibility.

11. The contract shall contain provisions for performing erosion control measures on the contract area.

12. Each agency shall plan and execute needed reforestation measures on lands under its administration.

13. B.L.M. will deposit with the F.S. $13,900 as reimbursement for their share of costs for survey, design and engineering of B.L.M. roads, timber appraisal, timber sale contract preparation and administration and scaling. Not less than 50% of this amount to be paid in FY 1981 and the remainder in FY 1982.

    In the event that the purchaser elects to turn the road construction back to the Forest Service, the F.S. will contract for the construction of all roads except roads on B.L.M. The timber sale prospectus will state that only the roads on National Forest land will be eligible for purchaser-elect construction.

    Temporary roads which are needed by B.L.M. will be costed against B.L.M. timber. B.L.M. standard clauses for these roads will be inserted into the timber sale contract.

14. B.L.M. will prepare an environmental assessment report. F.S. will review and jointly approve the E.A..

15. This agreement shall remain in full force and effect until all work herein contemplated is completed and all obligations stated herein or in the timber sale contract are satisfied: that is, until the purchaser has been released, all sale proceeds have been distributed, slash plan has been fulfilled and road maintenance and erosion control measures have been completed. If no contract for the sale of timber is entered into, this agreement shall be terminated upon mutual agreement of the parties.

IN WITNESS WHEREOF, the parties hereto have executed this agreement as of the last date written below.

April 25, 1980
DATE

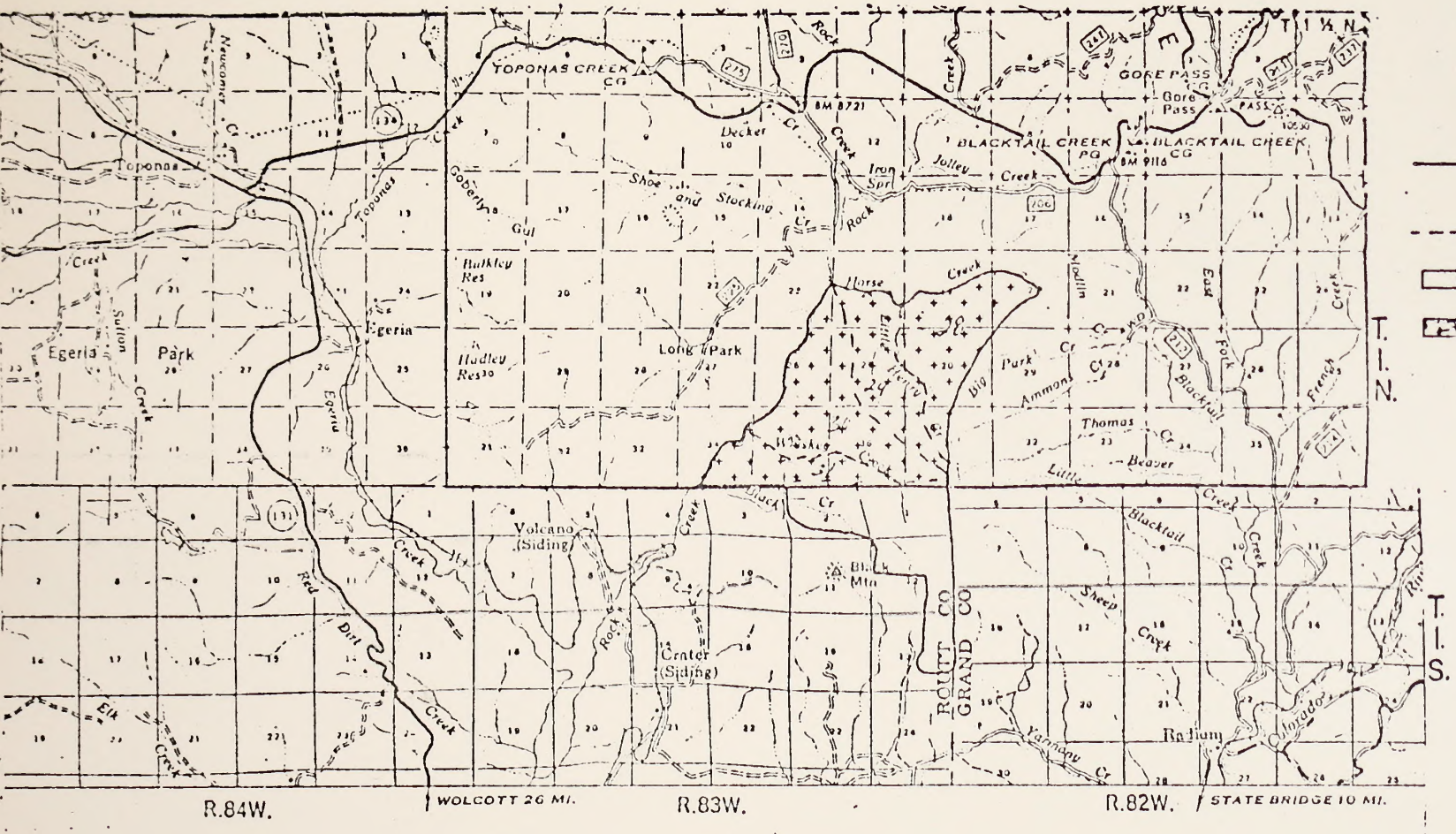
David A. Jones
District Manager
B.L.M.

May 1, 1980
DATE

Jack Weiss
Forest Supervisor
Routt National Forest

DAT -80
FIGUR

WHISKEY CREEK - BLACK MOUNTAIN
EXHIBIT - A



LEGEND

— BOUNDARY OF AREA IN WHICH TREES ARE TO BE CUT.

- - - COMPARTMENT BOUNDARY

▭ BLM.

▭ F.S.

½" = 1 MI. SCALE

N

Appendix "C"

6512.2/5716

TERRESTRIAL WILDLIFE CONSIDERATIONS
FOREST MANAGEMENT

INSTRUCTION MEMORANDUM NO. CSO 76-254

Appendix "C"

6512.2/5716

TERRESTRIAL WILDLIFE CONSIDERATIONS
FOREST MANAGEMENT

INSTRUCTION MEMORANDUM NO. CSO 76-254

IN REPLY REFER TO

CO-933
6512.2
5716

United States Department of the Interior

BUREAU OF LAND MANAGEMENT
COLORADO STATE OFFICE
ROOM 700, COLORADO STATE BANK BUILDING
1600 BROADWAY
DENVER, COLORADO 80202

DEC 3 1976

Instruction Memorandum No. CSO 76-254
Expires 6/30/77

To: District Managers

From: State Director, Colorado

Subject: Terrestrial Wildlife Considerations - Forest Management

It is the purpose of this Instruction Memorandum in notebook form to summarize guidance information relating to terrestrial wildlife habitat considerations in the forest management program. Aquatic species/fisheries considerations will be covered under separate guidance, to be issued in the near future. The thrust is informational in nature rather than an "only-way-to-do-it" approach. The attached notebook information can be a vital and time-saving data source for all aspects of forest management practices, including the URA/MFP, EAR, Forest Management Plan and individual timber sale contracts. It should be emphasized that wildlife considerations must be approached on an area-by-area basis with close coordination between the District and local Colorado Division of Wildlife field personnel.

Bureau manual sections providing guidance for wildlife considerations in forestry practices are:

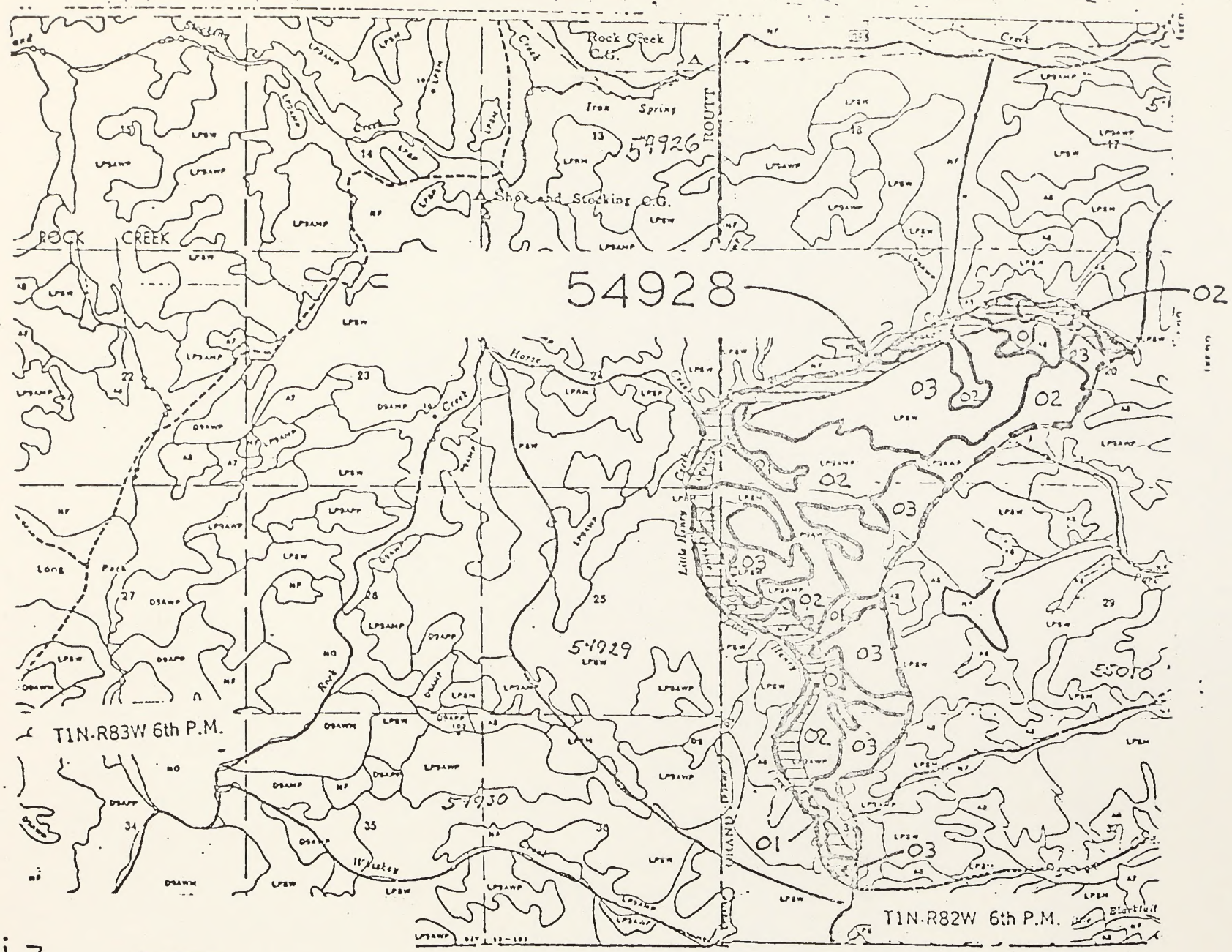
1. 1602 and 1603 - Basic and Supplemental Guidance;

2. 2031 - Environmental Quality and National Beauty;

3. 5110 - Stream Protection;
   5421 - Sale Layout;
   6512 - Stream Protection;
   6762 - Stream Management;
   7420 - Forest Watershed Contract Stipulations;

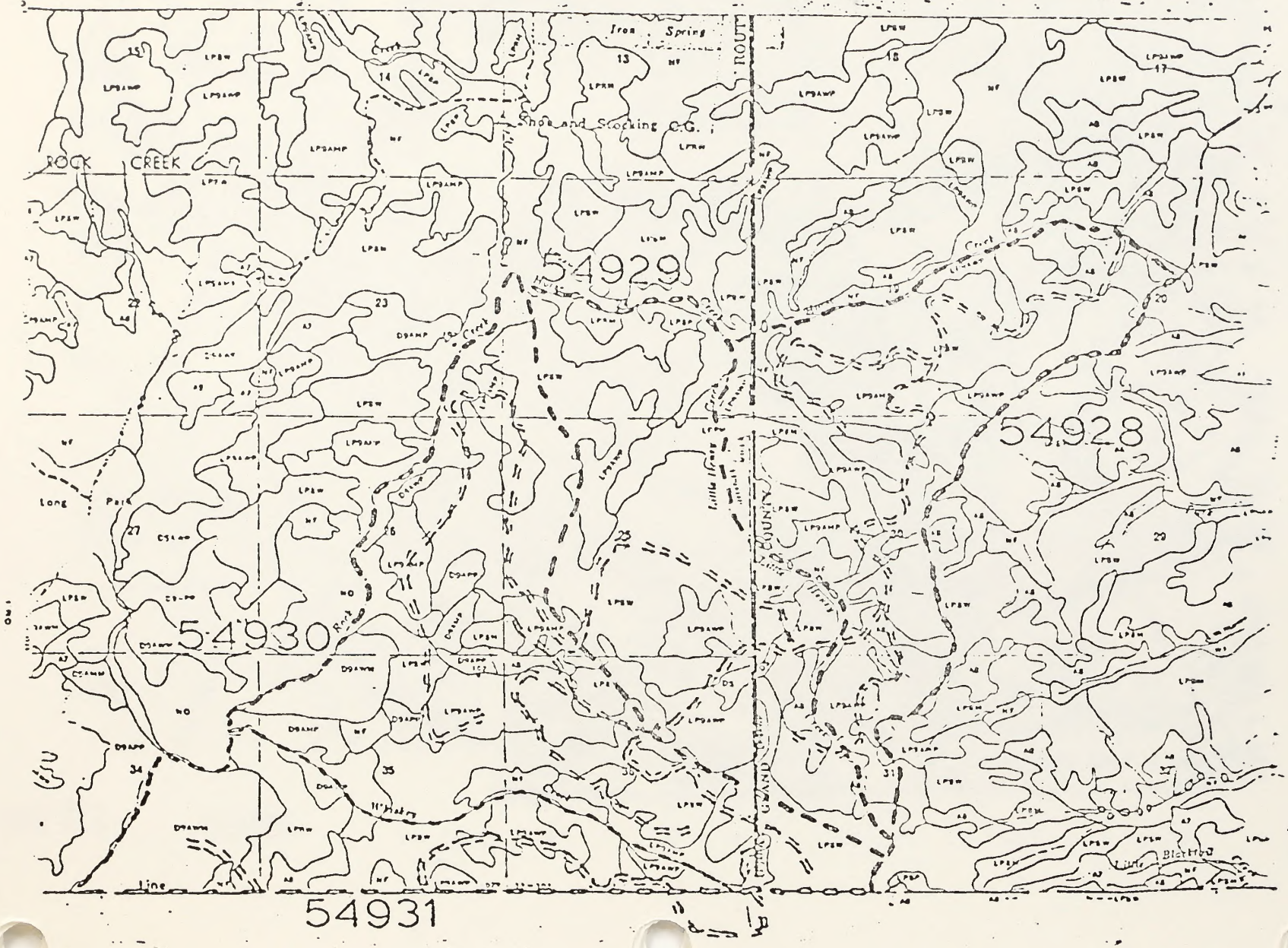
4. 1790 - Environmental Quality;

5. 1608 - Step 1, MFP, for wildlife recommendations related to forest management.


Rock Creek C.G.
Iron Spring
5-1926
ROUTT
Shop and Stocking C.G.
ROCK CREEK
54928
02
03
02
02
03
02
01
03
ESTOS
Long Park
5-1929
Little Stony Creek
Rock Creek
T1N-R83W 6th P.M.
5-1930
W. Lake
01
03
T1N-R82W 6th P.M.

W.i.Z.

LITTLE WHISKEY SALE
PROPOSED ROADS



COMPARTMENT PRESCRIPTION DATA

Compartment # 547 78 Stand # 07

Type	Lodgepole	Acres	485
Stand Size	Pole timber	Stand Origin	-
Type of survey	-	Land Use Class	-
Component	Stand		
Slope Position	Ridge Top	Elevation	-
Slope	26-35	Aspect	N
Distribution	-	Structure	-
Site Index	35	Survey Yield	
Windthrow Hazard	-	Soil Erosion	-

Softwood/ Acre			
Volume	7918	Basal Area	172
Growth(cub.Net)	29	DBH = (Ave.)	7.7
S/ S Stems	285		
Pole Stems	705		
ST Stems	309		

Hardwood/ Acre			
Volume		Basal Area	
Growth(cub.net)		DBH (Ave.)	
S /S Stems			
Pole Stems			
ST Stems			

Stand Description & History

Pine → Fire → Aspen → Pine

This area has generally smaller pine and fewer patches of old growth and is located mostly on or near ridge tops.

1) Widely seperated patches of old growth ≈ 90 ac.
2) Extensive pole patches ≈ 290 ac.
3) Limited combined young and old growth ≈ 60 ac.
4) Small patches of Aspen ≈ 30 ac. | Nonforest 15 Ac

Detailed Prescription, T.S.I. Needs

4 Seperate Components &

1) Old Growth - patch cut to remove overmature trees and stimulate reproduction.
2) Poles - no treatment at this time, possible pole sales later.
3) Mixed Stands - remove overmature trees and younger trees of poor form and vigor.
4) Aspen - no treatment at this time.

Aprx. 30 ac. of Nonforest and V&I 2

TM Plan- RAM Class

RAM Prescription

RAM Yield

Activity (from TM Plan EIS)

Schedule- RAM Decade:

Prescription: Patch Cut, TTM- Shelterwood

MUM --Coordination

Constraints

Selected Activity- Method

Constraints

YIELDS / ACRE Treatment

	LEAVE	HARVEST	TOTAL
Acres	355	130	485
# Stems (Poles, ST)	713	58	
Basal Area /ac.	112	60	172 sq ft. /ac
MBF /ac.	4417	3500	7917
Cunits	—	—	—
Dead MBF (Sound)	—	—	—

Total Cut Vol. 455,000 BF (Softw.) Cut Vol. ——— (HARDW.)

COMPARTMENT PRESCRIPTION DATA

Compartment # 549 28 Stand # 02

Type Lodgepole		Acres 384	
Stand Size Sawtimber		Stand Origin	
Type of survey		Land Use Class	
Component Standard			
Slope Position Ridge Top		Elevation –	
Slope 26 - 35 %		Aspect W	
Distribution		Structure	
Site Index 33		Survey Yield	
Windthrow Hazard		Soil Erosion	
Softwood/ Acre			
Volume 10784		Basal Area 157	
Growth(cub.Net) 26		DBH = (Ave.) 9.1	
S/ S Stems 345			
Pole Stems 139			
ST Stems 216			
Hardwood/ Acre			
Volume		Basal Area	
Growth(cub.net)		DBH (Ave.)	
S /S Stems			
Pole Stems			
ST Stems			

Stand Description & History

Fire → Fire → Aspen → Fire

Area now consist of large patches of poles (≈ 95 ac.), scattered pockets of old growth that survived the fire (≈ 60 ac.), extensive old and young growth combined (≈ 130 ac.), and varrious small areas of Aspen (≈ 60 ac), and aprx. 40 acres non-forest.

≈ Total 285 Ac.

Detailed Prescription, T.S.I. Needs

Treat each component separately:

1) Old Growth – patch cut to eliminate mistletoe and stimulate reproduction

2) Young and Old Growth – remove high risk trees and overmature trees

3) Poles – no treatment at this time

4) Aspen – no treatment at this time

Aprx. 50 Acres { non workable slope, VIII %

TM Plan- RAM Class

RAM Prescription

RAM Yield

Activity (from TM Plan EIS)

Schedule- RAM Decade:

Prescription

PATCH CUT, ITM - SHELTERWOOD

MUM --Coordination

Constraints

Selected Activity- Method

Constraints

YIELDS /_ACRE Treatment

	LEAVE	HARVEST	TOTAL
Acres	245	140	285
# Stems (Poles, ST)/ac	484	66	550
Basal Area /ac	101	56	157 sq.ft.
MBF /ac	2110	3750 BF/ac	5860
Cunits	—	—	—
Dead MBF (Sound)	—	—	—

Total Cut Vol. 525,000 BF (Softw.) Cut Vol. ——— (Hardw.)

For Nonforest - Noncommercial Stands.

COMPARTMENT DATA ELEMENTS SUMMARY

Form I

Compartment No. 549 28

Stand No.	01				
Acres	15.5				
Type	Nonforest	and	Aspen		
Stand Size	—		Mixed		
Type of Survey	—		—		
Ground Land Use Class	NF		A		
Component	Special		Special		
Slope Position	—		—		
Elevation	—		—		
Slope	—		—		
Aspect	—		—		
Soil Erosion	—		—		
Productivity Class	—		—		
Site Index	—		—		
Structure	—		—		
Distribution	—		—		
Softwood/Acre					
Volume					
BA					
Growth					
DBH					
No Stem S/S					
No Stem Poles					
No Stem St					
Hardwood/Acre					
Volume					
BA					
Growth					
DBH					
No Stem S/S					
No Stem Poles					
No Stem St					

No Treatment

Compartment Prescription

Compartment 549-28 is located in T1N, R82 and 83W of Routt and Grand counties. It is bordered on the west by Little Henry Creek, the north by Horse Creek, and the east by a ridge.

Access is by foot, horseback, or a jeep trail.

Young growth lodgepole pine which developed after fire makes up most of the compartment.

Extensive stands of lodgepole pine pole timber are found with small pockets of old growth pine and some small patches of aspen.

Windrisk is moderate to high. Ground fuels are very light.

Prescription Summary

Detailed prescriptions attached.

Timber Harvest

Shelterwood and patchcut 270 acres yielding 980 MBF.

Thinning

385 acres of commercial posts and poles.

Reforestation

None

Salvage

None

No Treatment

For 435 acres of nonforest, aspen, and marginal (steep) areas.

Timber harvest will be in conjunction with the Little Whiskey Timber Sale.

Attached: Sample map and proposed transportation system.

COMPARTMENT PRESCRIPTION

54928
ROCK CREEK

Routt National Forest

Yampa Ranger District

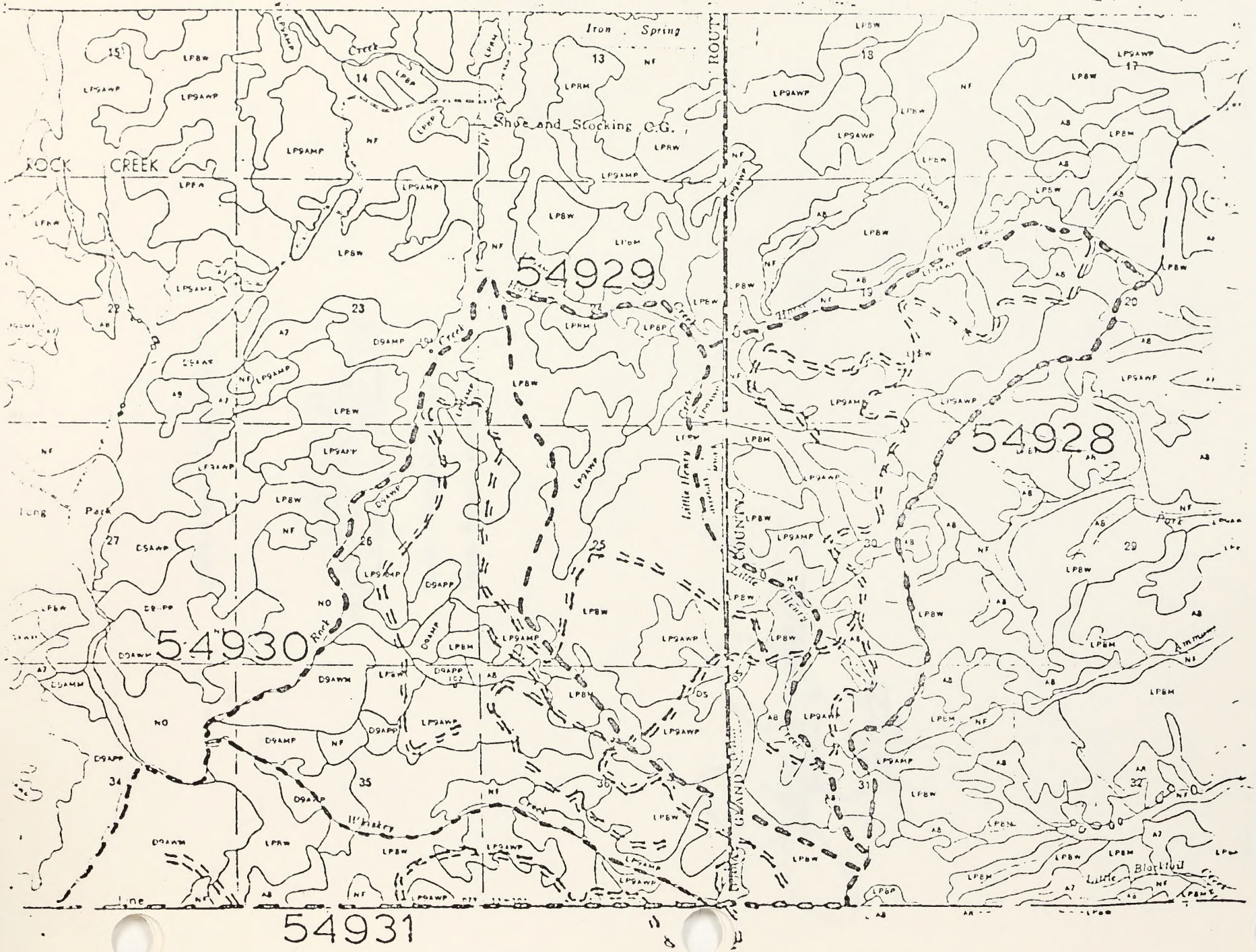
Prepared By

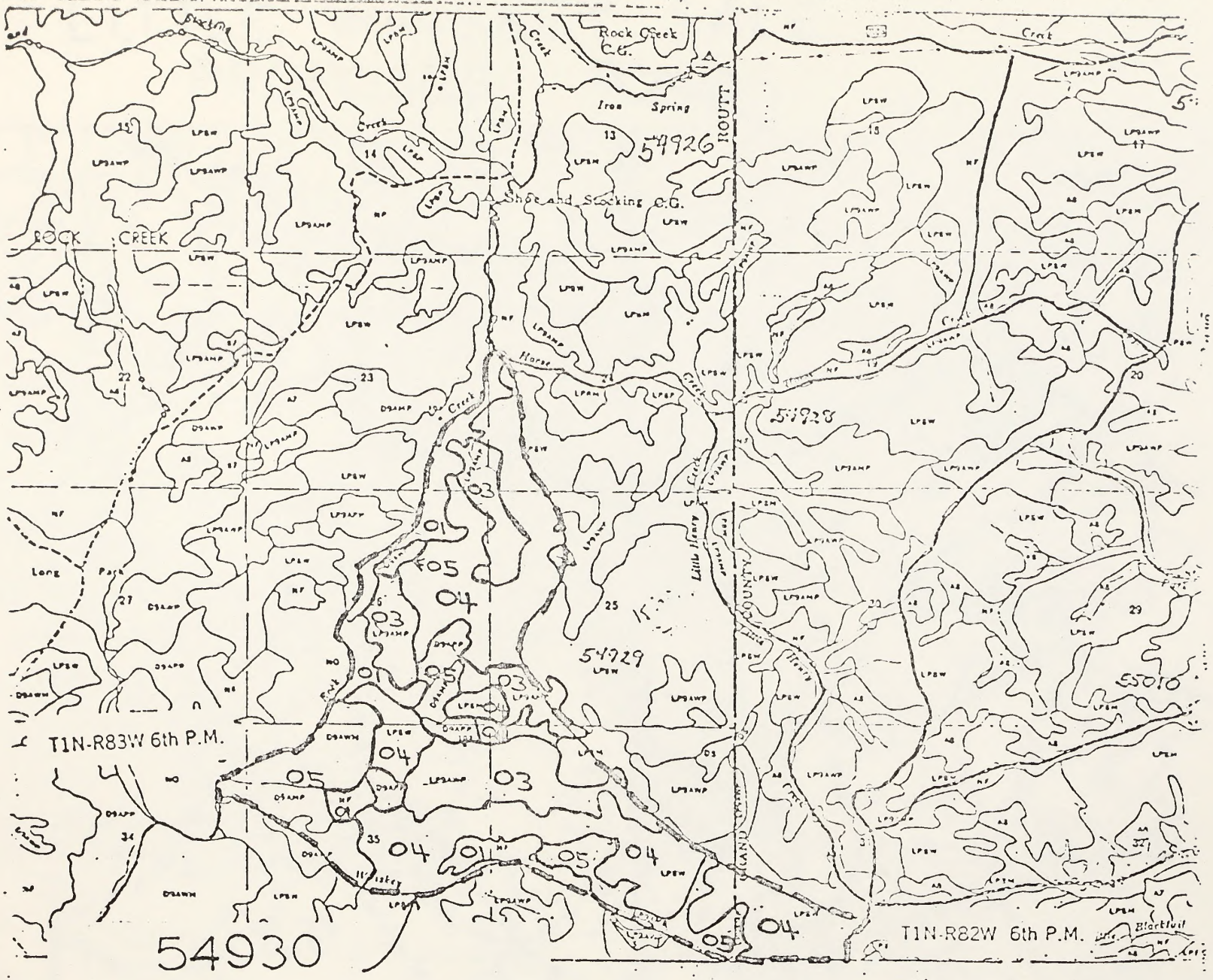
9/27/79
Date

Approved By

Date

LITTLE WHISKEY SALE
PROPOSED ROADS




Rock Creek C.G.
Iron Spring
54926
Shoe and Stocking C.G.
ROCK CREEK
ROUTT
COUNTY
Horse Creek
Little Henry Creek
54928
54929
55010
T1N-R83W 6th P.M.
T1N-R82W 6th P.M.
54930

STAND MAP

STAND PRESCRIPTION SUMMARY

Compartment # 54930 Stand # 05

ype	Douglas Fir	Acres	192
tand Size	Sawtimber	Stand Origin	01
t survey	933	Land Use Class	20
ment	Stand		
lope Position	Ridge Top	Elevation	---
lope	46-55	Aspect	W
istribution	10	Structure	30
ite Index	48	Survey Yield	74
indthrow Hazard	High	Soil Erosion	01

Softwood/Acre

olume	5472	Basal Area	109
rowth(cub.Net)	19.4	DBH (Ave.)	9.5
/S Stems	315		
ole Stems	71		
F Stems	459		

Hardwood/Acre

olume	-	Basal Area	-
rowth(cub.Net)	-	DBH=(Ave.)	-
/S Stems	225		
ole Stems			
F Stems			

Stand Description & History

Stand is composed primarily of Douglas fir with scattered aspen and LPP. Many large diameter trees are present, but most are badly fire scarred and many are cull.

Approximately 20 acres are inoperable or inaccessible.

ailed Prescription, T.S.I. Needs

of high windrisk, shelterwood system will be r harvest. Approximately 15-20% of the sal area will be removed from ridgetop areas, and -35% in areas of lower wind risk.

itial cut - 3 step shelterwood

Timber and Other Resource Coord. Sum.

RAM Prescription
Shelterwood-ITM

RAM Yield

RAM Class

RAM Decade

Other Resource Coord. and Constraints

No harvest along creek

Follow Alexander's wind marking guides.

Protection Measures

WTZ - Along Rock Creek

Shelterwood system.

ELDS/ACRE	LEAVE	HARVEST	TOTAL
res	20	172	192
Stems (Poles, ST)		27	
sal Area	82	27	109
F	3.0	2.5MBF	5.5
F			

Total Cut Vol. 430 MBF (Softw.) Cut Vol. (Hrdw.)

STAND PRESCRIPTION [illegible]

Compartment 54930 Stand # 04

ype	Lodgepole	Acres	505
and Size	Poletimber	Stand Origin	01
[illegible]	933	Land Use Class	20
opement	Standard		
lope Position	Ridge Top	Elevation	---
lope	0-15	Aspect	W
istribution	10	Structure	10
ite Index	38	Survey Yield	32
indthrow Hazard	Mod.	Soil Erosion	01

Softwood/Acre

olume	7804	Basal Area	202
rowth(cub.Net)	86.7	DBH (Ave.)	7.7
/S Stems	165		
ole Stems	307		
T Stems	291		

Hardwood/Acre

olume	-	Basal Area	--
rowth(cub.Net)		DBH=(Ave.)	
/S Stems	15		
ole Stems			
T Stems			

Stand Description & History

Stand developed under aspen following fire. It is made up of the following components.

1. LPP poletimber in dense stands. (≈ 243 ac.)

2. Mixed stands of young and old growth in scattered pockets. (≈ 76 ac)

3. Scattered pockets of old growth LPP that survived the fire but is now rapidly deteriorating. (51 ac.)

4. Inoperable terrain. (135 ac.)

tailed Prescription, T.S.I. Needs

ch component will be treated as follows:

[illegible] oletimber - Commercial thin following timber sale.

. Mixed young/old growth - Remove overmature and gh risk trees.

. Old Growth - Patchcuts to eliminate mistletoe stletoe and stimulate reproduction.

. Inoperable terrain - No treatment.

Timber and Other Resource Coord. Sum.

RAM Prescription Intermediate patchcut.

RAM Yield

RAM Class

RAM Decade

Other Resource Coord. and Constraints

No harvest along creeks.

Protection Measures

WIZ - Along Whiskey Creek and Rock Creek.

ELDS/ACRE	LEAVE	HARVEST	TOTAL
res	447	58	505
Stems (Poles, ST)	275	114	389
sal Area	136	66	202
	4.6	3.2	7.8

S

F

Total Cut Vol. 186 MBF (Softw.) Cut Vol. (Hardw.)

STAND PRESCRIPTION SHEET

Compartment # 51930 Stand # 05

Type	Lodgepole	Acres	300
Stand Size	Sawtimber	Stand Origin	01
Last survey	935	Land Use Class	20
Management	Stand.		
Slope Position	Ridge Top	Elevation	---
Slope	0-15	Aspect	W
Distribution	-10	Structure	-10
Site Index	28	Survey Yield	--
Windthrow Hazard	Moderate	Soil Erosion	-01

Softwood/Acre			
Volume	14667	Basal Area	142
Growth(cub.Net)	19	DBH (Ave.)	10.9
S/S Stems	225		
Pole Stems	-40		
ST Stems	-200		

Hardwood/Acre			
Volume		Basal Area	
Growth(cub.Net)		DBH=(Ave.)	
S/S Stems	300		
Pole Stems			
ST Stems			

Stand Description

Approximately 75 acres of this stand are inoperable due to steep slopes. The remainder of the stand is composed of the following:

1. Extensive areas of young and old growth LPP that developed under aspen following fire (≈ 105ac.)

2. Pockets of small poles and large saplings (≈ 70 ac.)

3. Scattered pockets of old growth LPP that survived the fire. (≈ 30 ac.)

4. Scattered aspen patches with small sawtimber. (≈ 20 ac.)

Detailed Prescription, T.S.I. Needs

Each component will be treated as follows:

Sawtimber

- Young/old growth mix-Remove overmature and high risk trees.
- Old Growth- Remove through patch cuts and group selection, to stimulate reproduction and reduce mistletoe risk.
- Poles-Commercially thin following sale.
  Aspen - No treatment this decade.
- Steep slopes-No treatment.

Timber and Other Resource Coord. Sum.

RAM Prescription
ITM - Shelterwood and Patch cut

RAM Yield

RAM Class

RAM Decade

Other Resource Coord. and Constraints

No harvest adjacent to either creek.

Protection Measures

WIZ - Whiskey Creek & Rock Creek.

YIELDS/ACRE	LEAVE	HARVEST	TOTAL
Acres	165	135	300
Stems (Poles, ST)	127	113	240
Basal Area	92	50	142
DBH	8.9	5.8	14.7
Cords			
MBF			

Total Cut Vol. 780 MBF (Softw.) Cut Vol. _____ (Hardw.)

Compartment # _____ Stand # _____

Type	Acres
Stand Size	Stand Origin
Type of survey	Land Use Class
Component	
Slope Position	Elevation
Slope	Aspect
Distribution	Structure
Site Index	Survey Yield
Windthrow Hazard	Soil Erosion
Softwood/ Acre	
Volume	Basal Area
Growth(cub.Net)	DBH = (Ave.)
S/ S Stems	
Pole Stems	
ST Stems	
Hardwood/ Acre	
Volume	Basal Area
Growth(cub.net)	DBH (Ave.)
S /S Stems	
Pole Stems	
ST Stems	

Stand Description & History

Detailed Prescription, T.S.I. Needs

TM Plan- RAM Class

RAM Prescription

RAM Yield

Activity (from TM Plan EIS)

Schedule- RAM Decade:

Prescription

MUM --Coordination

Constraints

Selected Activity- Method

Constraints

YIELDS / ACRE Treatment _____

	LEAVE	HARVEST	TOTAL
Acres			
# Stems (Poles, ST)			
Basal Area			
MBF			
Cunits			
Dead MBF			

Total Cut Vol. _____ (Softw.) Cut Vol. _____ (HARDW.)

Compartment # _____ Stand # _____

Type	Acres
Stand Size	Stand Origin
Type of survey	Land Use Class
Component	
Slope Position	Elevation
Slope	Aspect
Distribution	Structure
Site Index	Survey Yield
Windthrow Hazard	Soil Erosion
Softwood/ Acre	
Volume	Basal Area
Growth(cub.Net)	DBH = (Ave.)
S/ S Stems	
Pole Stems	
ST Stems	
Hardwood/ Acre	
Volume	Basal Area
Growth(cub.net)	DBH (Ave.)
S /S Stems	
Pole Stems	
ST Stems	

Stand Description & History

Detailed Prescription, T.S.I. Needs

TM Plan- RAM Class

RAM Prescription

RAM Yield

Activity (from TM Plan EIS)

Schedule- RAM Decade:

Prescription

MUM --Coordination

Constraints

Selected Activity- Method

Constraints

YIELDS / ACRE Treatment _____

	LEAVE	HARVEST	TOTAL
Acres			
# Stems (Poles, ST)			
Basal Area			
MBF			
Cunits			
Dead MBF			

Total Cut Vol. _____ (Softw.) Cut Vol. _____ (HARDW.)

Compartment Description

Compartment 549-30 lies in T1N, R82 & 83W of Routt County Colorado. It is bordered on the south by Whiskey Creek and on the west by Rock Creek. The northeast boundary lies along the divide between Rock Creek and Little Henry Creek.

Currently, the only access to the compartment is by foot, horseback or jeep trail.

The compartment is primarially composed of young growth lodgepole pine which developed under aspen following a large fire.

Stands are large and variable. The young pine is widely dispersed with aspen, old growth pine and Douglas Fir, as well as extensive dense stands of small lodgepole pine, poletimber and saplings.

Windrisk throughout the area ranges from moderate to high.

Ground fuels are light.

Prescription Summary

Detailed prescriptions for each stand are attached. They call for the following action.

Timber Harvest

Shelterwood and patchcut - 365 acres yielding 1.4 MMBF

Thinning

Commercial posts and poles - 313 acres

Reforestation

None

Salvage

None

No Treatment

For 802 acres of nonforest, aspen and marginal areas.

All timber harvest is expected to be in conjunction with the Little Whiskey Timber Sale.

A stand map and map of proposed transportation system are attached.

COMPARTMENT PRESCRIPTION

549-30
Rock Creek

Routt National Forest

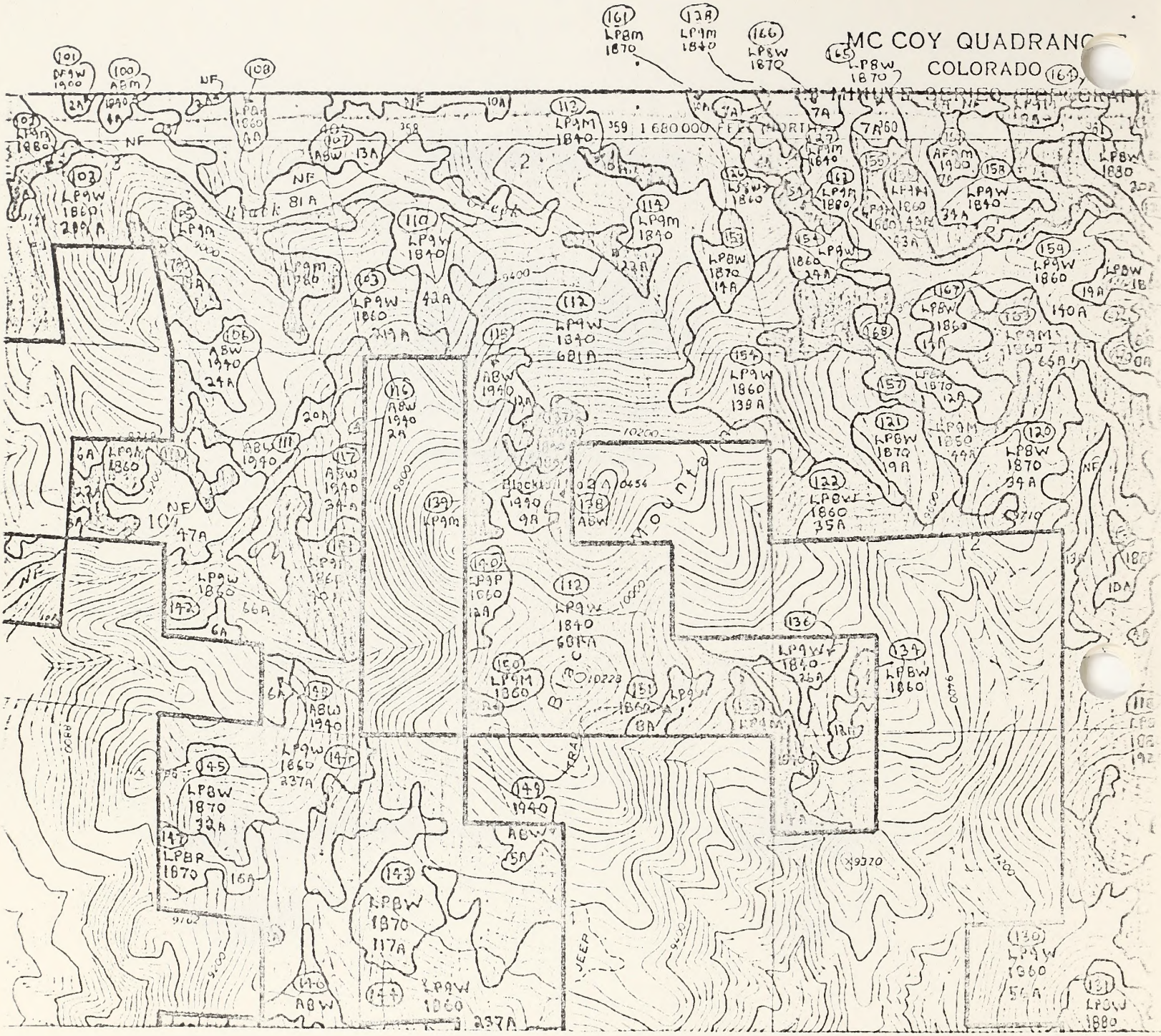
Yampa Ranger District

Prepared By

9/28/79
Date

Approved By

Date


MC COY QUADRANGLE
COLORADO
1 680 000 FEET
NORTH
Black Creek
Black Mesa
JEEP

Treatment - In low windfall risk situations, 40 to 50 percent of the basal area will be removed, with emphasis on removal of intermediates. This cutting will be heavy enough to be considered a regeneration cut, but marking will follow the rules for individual tree selection. The cut will be distributed over the entire area. In moderate windfall risk stands 30 percent of the basal area will be removed on an individual tree basis. Codominant and intermediate trees will represent at least one half of the basal area removed.

Provisions will be made to salvage blowdowns. In high windfall risk stands, clearcut openings up to 5 acres will be interspersed with uncut areas.

Acreage and Volume -

280 acres will be treated.
980 MBF will be removed.

BLM Stands numbered, 118, 119, 120, 121, 122, 124, 125, 126, 153, 161, 165, 166, 167, 168, 170, on the type map for the Black Mountain Forest Management Plan.

Stand description - These are pole size stands of lodgepole, with an average diameter breast high of 8.7 inches. They are to be commercially thinned using separate pole sales after this sale is terminated. The stands are 80 to 110 years old and generally disease and insect free.

Treatment - They will be entered with a partial cut where 8 and 9 inch diameter trees exist. Individual tree selection rules will apply. Usually not ore more than 20 percent of the basal area will be removed. Stands where the trees are 5" to 8" diameter breast high will not be treated by this sale.

Area	Volume
537 ac. will be treated.	250 MBF will be removed.

Stand location - BLM stands numbered 112 and all mistletoed stands in the BLM portion of the sale area.

Stand Description - This lodgepole is a heavily mistletoed, 160 acre portion of the stand. Trees are over mature, stocking is poor to medium. There is a high volume of mortality, a high percentage of defect and little advance reproduction.

Treatment - Clear cut long corridors on perimeter of infected stand to separate it from healthy stands and intersperse clearcuts up to 10 acres in size over one half the area. Remove the remaining stand within 10 years and sanitize reproduction at that time.

Other small infections in other stands will be clearcut considering cutting guides established for that stand.

Acreage and Volume -

160 acres will be treated. 200 MBF will be removed.

Appendix B

Silvicultural Prescriptions for Forest Service Stands and BLM Stands

Introduction

Stand maps and prescriptions for the various stands are presented here. The formats used fit the way each agency presented its data so they are different but the same kind of information is presented.

From a silvicultural point of view clearcutting is a sound and practical way to harvest lodgepole pine, however, in order to accomodate other important uses a form of partial cutting is most generally prescribed. The primary purposes of the prescriptions to be used are to maintain a continuous forest cover of lodgepole pine while minimizing the limitations of partial cutting because of sivical requirements, stand conditions, wind, insects, and disease.

Stand location - BLM stands numbered 112, 123, 130, 154, 154A, 158 and 159 on the type map for the Black Mountain Forest Management Plan.

Stand Description - These are 120-140 year old stands of well stocked, mature and overmature lodgepole, saw timber, 9" to 15" diameter at breast height. They are characterized by single stories, even aged, varying in age from place to place but uniform within any given stand. Small patches or a scattering of aspen may be present. They are generally insect and disease free.

Treatment - Treatment will consist of removal of 30 percent of the basal area using individual tree selection and patch cuts 2-3 times the average tree height in size, where windfall risk is low.

In moderate windfall risk situations 20 percent of the basal area will be removed and in high windfall hazard areas the stand will be clearcut in 5 acre blocks or less or left untreated. This is an intermediate cut.

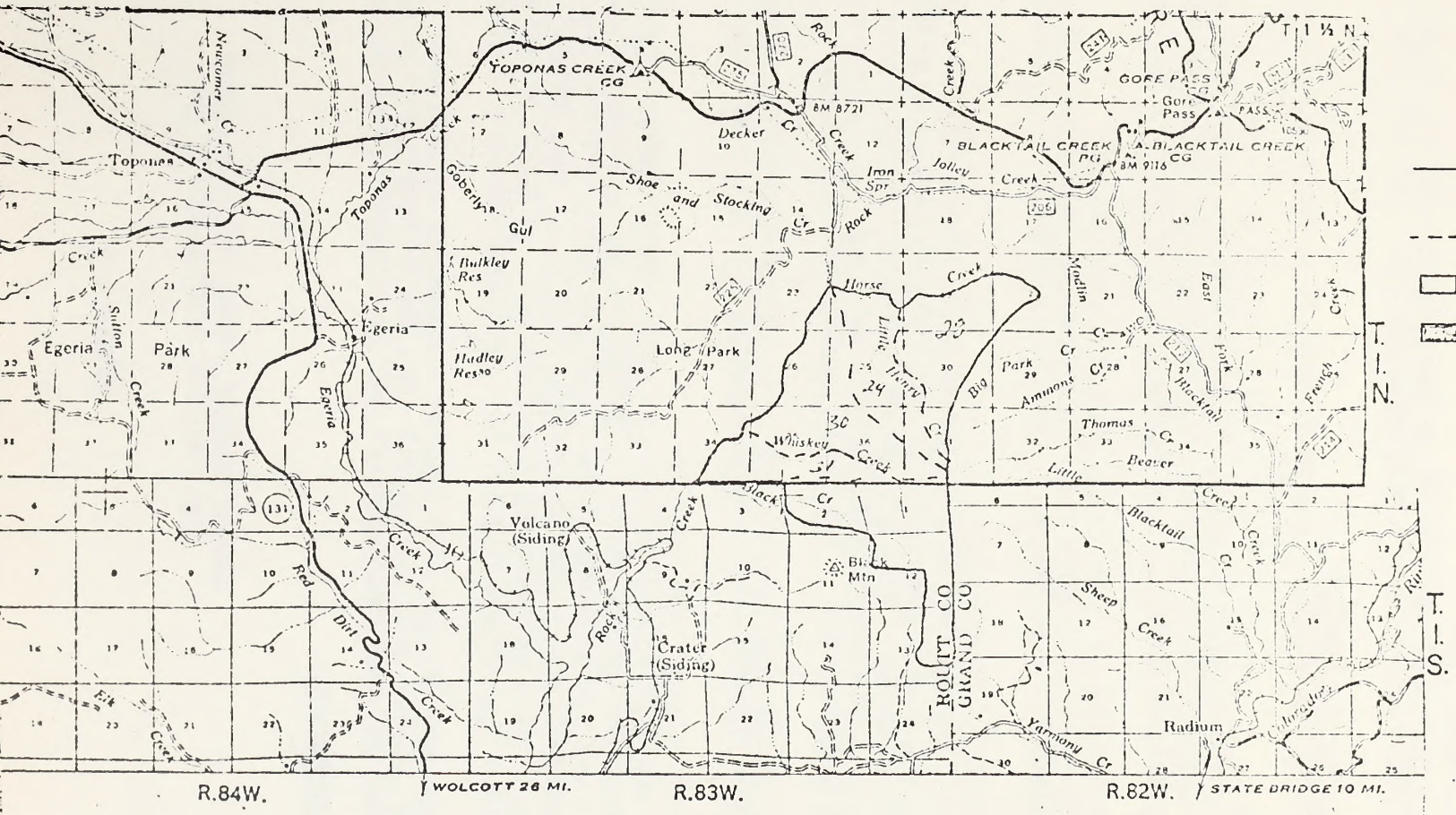
Acreage and Volume - 450 acres will be treated in these stands. 1,575 MBF will be removed.

Stand Location - BLM stands numbered 113, 114, 127, 128, 129, 155, 156, 157, 162, 163, 164 and 169 on the type map for the Black Mountain Forest Management Plan.

Stand Description - These are 120-140 year old stands of medium stocked mature and overmature lodgepole saw timber, 9 to 15 inches diameter at breast height. The overstory in these stands resembles single story stands but are two stories. The stocking of the overstory may be irregular, but overall stocking is uniform. The second story may be poles, saplings or seedlings. Trees in the top story tend to be more wind firm than in single story stands. These stands contain pockets of dead material and very localized insect or disease problems.

ENVIRONMENTAL ANALYSIS MAP
WHISKEY CREEK - BLACK MOUNTAIN
EXHIBIT - A

FIGURE



LEGEND

- BOUNDARD OF AREA IN WHICH TREES ARE TO BE CUT.
- COMPARTMENT BOUNDARY
- BLM.
- F.S.

½" = 1 MI. SCALE

IN WITNESS WHEREOF, the parties hereto have executed this agreement as of the last date written below.

April 25, 1980
DATE

David A. Jones
District Manager
B.L.M.

May 1, 1980
DATE

Jack Weiss
Forest Supervisor
Routt National Forest

7. The F.S. shall advertise and conduct the proposed timber sale offering, and shall award the sale contract to the highest bidder.

8. The F.S. shall administer the timber sale contract, billing the purchaser as necessary and making all collections specified in the contract.

9. Annually the F.S. shall transfer to the B.L.M. its share of receipts, calculated by the scaled volume and current contract rate described in paragraph 6 (above). Quarterly the F.S. shall furnish the B.L.M. with a record of the volume and value of material removed during the quarterly period.

10. The F.S. and B.L.M. shall jointly prepare the slash disposal plan and estimated cost for inclusion in the appraisal. The F.S. and B.L.M. shall each be responsible for slash disposal on their area of responsibility.

11. The contract shall contain provisions for performing erosion control measures on the contract area.

12. Each agency shall plan and execute needed reforestation measures on lands under its administration.

13. B.L.M. will deposit with the F.S. $13,900 as reimbursement for their share of costs for survey, design and engineering of B.L.M. roads, timber appraisal, timber sale contract preparation and administration and scaling. Not less than 50% of this amount to be paid in FY 1981 and the remainder in FY 1982.

    In the event that the purchaser elects to turn the road construction back to the Forest Service, the F.S. will contract for the construction of all roads except roads on B.L.M. The timber sale prospectus will state that only the roads on National Forest land will be eligible for purchaser-elect construction.

    Temporary roads which are needed by B.L.M. will be costed against B.L.M. timber. B.L.M. standard clauses for these roads will be inserted into the timber sale contract.

14. B.L.M. will prepare an environmental assessment report. F.S. will review and jointly approve the E.A..

15. This agreement shall remain in full force and effect until all work herein contemplated is completed and all obligations stated herein or in the timber sale contract are satisfied: that is, until the purchaser has been released, all sale proceeds have been distributed, slash plan has been fulfilled and road maintenance and erosion control measures have been completed. If no contract for the sale of timber is entered into, this agreement shall be terminated upon mutual agreement of the parties.

5. The F.S. shall compute the entire sale volume and prepare the contract for the entire sale on standard F.S. timber sale contract forms. B.L.M. and the F.S. will jointly review both the appraisal and the contract prior to advertising the sale.

The timber shall be offered for sale on the basis of contract stumpage rate with escalation method for when the sale appraises difficult. A sale that is difficult (initiation stumpage lower than base rate) when appraised at normal profit will be offered on a flat rate basis. To totally individual agency accounting requirements, volumes and values of timber sold/harvested on F.S. and B.L.M. shall be separately identified by unit and cutting as stated in paragraph #6. Separate volume identification shall be used for inventory purposes only and shall not appear in the timber sale contracts.

6. Upon completion of staking the F.S. shall sample log scale the timber from the sale area as it is removed. The F.S. and B.L.M. volume shall be kept separate. The actual scaled volume and the current contract rate shall be used to calculate each agency's share of the total proceeds from the timber sale. The proceeds will be supported on a percentage basis based on calculation from the sample cruise in the following manner:

EXAMPLE:

Species	AF	DEAD	Sale Total %
F.S. Volume M.B.F. (cruise)	200	400	600
B.L.M. Volume M.B.F. (cruise)	500	600	1100
Bid Value per M (dollars)	12	6	
F.S. Share of Bid	1200	2400	3600
B.L.M. Share of Bid	6000	3600	9600
TOTAL			13200

F.S. Share	50%	40%
B.L.M. Share	50%	60%

The actual contract execution will appear in the contract file and make a part of both FTIS upon the sale of the timber.

5. The F.S. shall appraise the entire sale volume and prepare the contract for the entire sale on standard F.S. timber sale contract forms. B.L.M. and the F.S. will jointly review both the appraisal and the contract prior to advertising the sale.

The timber shall be offered for sale on the basis of contract stumpage rate with escalation except for when the sale appraises deficit. A sale that is deficit (indicated stumpage lower than base rates) when appraised at normal profit will be offered on a flat rate basis. To satisfy individual agency accounting requirements, volumes and values of timber administered by F.S. and B.L.M. shall be separately identified by mill yard scaling as stated in paragraph #6. Separate volume identification shall be used for interagency purposes only and shall not appear in the timber sale contracts.

6. Upon completion of bidding the F.S. shall sample log scale the timber from the sale area as it is removed. The F.S. and B.L.M. volume shall be kept separate. The actual scaled volume and the current contract rates shall be used to calculate each agency's share of the total proceeds from the timber sale. The proceeds will be separated on a percentage by species basis, calculated from the sample cruise in the following manner:

EXAMPLE:

Species	LP	DEAD	Sale Total
F.S. Volume M.B.F. (cruise)	500	400	900
B.L.M. Volume M.B.F. (cruise)	500	600	1100
Bid Value per M (dollars)	12	6	
F.S. Share of Bid	6000	2400	8400
B.L.M. Share of Bid	6000	3600	9600
TOTAL			18000
F.S. Share	50%	40%	
B.L.M. Share	50%	60%	

The actual computed percentage will appear in the contract file and made a part of such file upon the sale of the timber.

Appendix A

Interagency Agreement
Between
Bureau of Land Management, U.S. Department of Interior
and
Forest Service, U.S. Department of Agriculture

This INTERAGENCY AGREEMENT made and entered into by and between the Bureau of Land Management, Grand Junction District Manager; herein referred to as the B.L.M., and the Forest Service, Routt National Forest Supervisor; herein referred to as the F.S., under the provisions of the Act of June 30, 1932 (31 U.S.C. 686).

WITNESSETH:

WHEREAS, the timber on the lands described on the exhibit A attached hereto and made a part hereof is administered either by the B.L.M. or the F.S.; and

WHEREAS, it is desirable to include timber administered by the B.L.M. and timber administered by the F.S. as a portion of a single timber sale to be offered for sale by the F.S. in the fiscal year 1981:

Now, THEREFORE, the two parties hereto agree as follows:

1. The F.S. and B.L.M. will assume individual responsibility for sale layout, road location and volume determination. The said timber shall be offered for sale on the basis of combining both agencies' field work. The F.S. will assume responsibility for all the engineering services for survey, design, estimating, and construction supervision of the system roads to be constructed under this timber sale. If appropriated funds are not adequate to finance construction supervision of B.L.M. roads, the B.L.M. will contribute to this cost, not to exceed $2000.

2. The F.S. and the B.L.M. shall jointly participate in the development of a logging operations plan.

3. Each agency shall obtain rights-of-way from the other for system roads to be constructed under terms of this timber sale, where said roads are needed for efficient system development. Such rights-of-way and road use license shall be obtained under existing procedures currently in effect between the parties.

4. The purchaser shall be responsible for the maintenance of all roads constructed under the terms of the timber sale contract. The purchaser shall be responsible for construction of all temporary spur roads on B.L.M..

3. The seeding of disturbed areas will be done as is necessary.

4. Practices provide for the regeneration of trees and for monitoring its progress.

Other

1. A plan for disposal of logging and road right-of-way slash is required.

2. Cultural resources are provided protection and will be inventoried.

3. Stipulations will address fire prevention and suppression.

4. Litter control is stipulated.

5. The protection of existing facilities is addressed.

All other aspects of this alternative would be the same as for the preferred alternative except that certain segments of society are more exposed to disruption and energy requirements would be slightly less because of the improved efficiency due to greater volumes per area.

Summary List of Mitigating Measures for the Preferred Alternative

Roads

1. Logging spurs will be restricted on the ground.

2. Road construction and maintenance are specified in Appendix "C" and the contract standard specifications.

3. Erosion data will be required, where necessary.

4. Litterations are placed on road cuts

Logging

1. There will be no planned harvesting on slopes greater than 40 percent.

2. Trees to be harvested will be designated individually.

3. Wood utilization requirements will be specified.

4. Timing of harvest, and continuing on scale, also will be specified.

5. A large logging plan will be developed requiring felling and skidding and loading requirements.

Wildlife

1. The protection of active nest sites is stipulated.

2. Native seed mixes should have higher forbs, legumes.

3. Snag and mast trees are provided protection from cutting.

4. Size of meadows are limited to maintain cover for wildlife.

5. Locations and timing of activities is defined to benefit big game.

6. Preserve timber in sensitively protected from cutting.

Watershed

1. Road stabilization already mentioned will benefit watershed.

2. Silvicultural requirements must be along contour, selective harvest method and alternate uphill and downhill for.

All other aspects of this alternative would be the same as for the preferred alternative except that certain segments of society are more opposed to clear-cutting and energy requirements would be slightly less because of the improved efficiency due to greater volumes per acre.

Summary List of Mitigating Measures for the Preferred Alternative

Roads

1. Logging spurs will be designated on the ground.
2. Road construction and maintenance are specified in Appendix "C" and the contract standard provisions.
3. Erosion Bars will be required, where necessary.
4. Limitations are placed on road use.

Logging

1. There will be no planned harvesting on slopes greater than 40 percent.
2. Trees to be harvested will be designated individually.
3. Wood utilization requirements will be specified.
4. Timming of harvest and construction activities will be specified.
5. A joint logging plan will be developed regarding falling and skidding and landing requirements.

Wildlife

1. The protection of active nest trees is stipulated.
2. Buffer zones along streams have limited harvest requirements.
3. Snag and roost trees are provided protection from cutting.
4. Size of patchcuts are limited to maintain cover for wildlife.
5. Localization and timming of activities is defined to benefit big game.
6. Reserved timber is specifically protected from cutting.

Watershed

1. Road specifications already mentioned will benefit watershed.
2. Silvicultural requirements such as slope restrictions, selection harvest method and streamside buffer zone are provided for.

activity. (3) The manner in which clearcutting had been applied in some instances, including examples when there were large blocks, 1,000 acres or more, cutting on steep slopes, large amounts of slash, accelerated erosion and a generally devastated appearance. (4) Increased National attention to the environment by the public.

Controversies that became highly emotional developed over the Monangahela, Bitterroot, Tongass and Bridger National Forests. In 1973 conservation groups went to court to try and stop clear-cutting. The public began to think of clear-cutting as a "great ripoff" by the timber industry. As a result the public is generally unreceptive and critical of clear-cutting practices, also Congress has set forth restrictive guidelines concerning clear-cutting. Generally stated the guidelines are:

1. Harvesting limitations

   Clear-cutting should not be used as a cutting method on Federal land areas where:

   a. Soil, slope or other watershed conditions are fragile and subject to major injury.

   b. There is no assurance that the area can be adequately restocked within five years after harvest.

   c. Aesthetic values outweigh other considerations.

   d. The method is preferred only because it will give the greatest dollar return or the greatest unit output.

2. Clear-cutting should be used only where:

   a. It is determined to be silviculturally essential to accomplish the relevant forest management objectives.

   b. The size of clear-cut blocks, patches or strips are kept at the minimum necessary to accomplish silvicultural and other multiple-use forest management objectives. (40 acres)

   c. A multidisciplinary review has first been made of the potential environmental, biological, aesthetic, engineering and economic impacts on each sale area.

   d. Clear-cut blocks, patches or strips are, in all cases, shaped and blended as much as possible with the natural terrain.

In view of these considerations it is felt that clear-cutting as an alternative would be viewed unfavorably by the public as a method preferred only because of the dollar return.

Adverse Impacts Which Cannot Be Avoided

These are the same as for the preferred alternative except that soil movement and over land flows would increase proportionately. Visual requirements would not be met.

Clearcutting Alternative

Impacts (Environmental Consequences)

The impact of this proposal will be the same as those discussed in the preferred alternative with the exception of vegetation, visual, soil, water/and economics.

Vegetation

Timber

The overstory would be removed. This would be especially advantageous where short rotation intervals are desired. Full sunlight is necessary for lodgepole regeneration, therefore, adequate reforestation would be expected within 5 years. There would be no residual stand to damage from logging.

Range

When overstory vegetation is removed increases in palatable shrubs, forbs and grasses follow. Clearcutting materially thins forestand with benefits livestock and wildlife in the form of increased forage.

Other correspondence would be similar to the preferred alternative.

Visual

The clearcutting technique would not meet the requirement of the visual classification of the area.

Soil and Water

A greater degree of soil movement would occur in proportion to the increase in soil disturbance. However, quantitatively its less acreage would be involves than is with the preferred alternative. Also a larger increase in run-off from the affected areas would be expected.

Economic Considerations

The main difference here is cost to the government to strip the site, approximately 25 percent of the site harvest costs could be avoided by clearcutting. Also, logging costs would be reduced on undetermined but significant amount because the value is more concentrated and utilization goes up.

Social Considerations

Environmentalists have said that clearcutting is strongly restrictive to young trees, harmful to wildlife, and the cause of economic erosion and utilization of forest stands.

The present concept with a horizontal development which has not focused on the national forests. It was probably brought about by: (1) Smaller application of clearcutting in Eastern Hardwoods, (2) Increased attention into on National Forests and the corresponding accelerated rate of timber sale and harvesting

Clearcutting Alternative

Impacts (Environmental Consequences)

The impact of this proposal will be the same as those discussed in the preferred alternative with the exception of vegetation, visual, soil watershed and economics.

Vegetation

Timber

The overstory would be removed. This would be especially advantageous where dwarf mistletoe infections are present. Full sunlight is necessary for lodgepole regeneration, therefore, adequate regeneration would be expected within 5 years. There would be no residual stand to damage from logging.

Range

When overstory vegetation is removed increases in understory shrubs, forbs and grasses follow. Clearcutting maximizes these increases which benefits livestock and wildlife in the form of increased forage.

Other consequences would be similar to the preferred alternative.

Visual

The clearcutting technique would not meet the requirement of the visual classification of the area.

Soil and Water

A greater degree of soil movement would occur in proportion to the increase in soil disturbance, however, approximately 2/3 less acreage would be involved than is with the preferred alternative. Also a larger increase in run-off from the affected areas would be expected.

Economic Considerations

The main difference here is cost to the government to offer the sale, approximately 75 percent of the sale marking costs could be avoided by clearcutting. Also, logging costs would be reduced an undetermined but significant amount because the volume is more concentrated and efficiency goes up.

Social Considerations

Environmentalists have said that clearcutting is unsightly, destructive to young trees, harmful to wildlife, and the cause of enormous erosion and siltation of forest streams.

The present concern with clearcutting developed since 1964 and focused on the National Forests. It was probably brought about by: (1) General applicatio of clearcutting to Eastern hardwoods, (2) Increased allowable cuts on National Forests and the corresponding accelerated rate of timber sale and harvesting

The Relationship Between Short-Term Uses of Man's Environment and the Maintenance and Enhancement of Long-Term Productivity

Present uses would continue with some gradual decrease in forage. The present naturalness would be maintained but at the expense of long-term production of both forage and timber. Productivity would most certainly be decreased. Old decadent stands do not grow fast enough to offset normal mortality losses.

Under this alternative the vegetative resource would not be maintained or enhanced.

Irreversible or Irretrievable Commitments of Resources Should The Alternative Be Implemented

If the timber is allowed to reach pathological rotation volume and value becomes irretrievable and the same thing results from a decision to take no action.

Possible Conflicts Between the Alternative and the Objectives of Federal, Regional, State and Local Land Use Plans, Policies and Controls for the Area

The no action alternative conflicts with multiple use policy guidelines of both agencies, the Black Tail Land Use Plan and Environmental Statement and the Black-Mountain Forest Management Plan.

Energy Requirements and Conservation Potential of the Various Alternatives

The preferred action would require energy in the form of gasoline and diesel fuel for operating log trucks, bull dozers, chain-saws and passenger trucks. This alternative can make the most efficient use of energy because it is a combined sale that eliminates move-in cost and coordinates the construction of one common transportation route or system.

The action will also make an undetermined amount of fuelwood available to be marketed, which would supplement the use of fossil fuels.

The consumption of fuel by implementing this action would produce seven million board feet of lumber or other wood products for human benefit and will allow management of the forest resource.

The no action alternative, would conserve the energy that would be expended by the preferred alternative; however, forest management opportunities and the opportunity to make more fuelwood available would be foregone.

Adverse Environmental Effects which Cannot Be Avoided Should the Alternative Be Implemented

Items are discussed qualitatively under "Impacts" but are summarized below. Generally, the positive benefits would not occur and negative impacts could be avoided.

Soils

A slight amount of erosion presently occurring would continue.

Water

Positive benefits in the form of increased snow packs and increased available soil moisture would not occur and erosion from water would be avoided.

Vegetation

Fire risk and stress would increase annually. Insect and disease increase would increase.

Forage plant species diversity would remain static or deteriorate. Aspen stands would be expected to diminish or disappear. Forage production would decrease on these sites.

Positive benefits of the preferred alternative would not be realized. Wildlife habitat diversity would be reduced and generally less wildlife forage would be produced in the absence of a national monument. Negative impacts of the preferred alternative would not occur.

Wildlife

Human presence and activity would not occur and wildlife would not be displaced or have added stress.

Visual

Gradual deterioration of visual resources would occur as overstory trees also causing a loss in the scenic aspect of the landscape. Large amounts of dead timber can be visually undesirable.

Recreation

There will be reduced potential for future recreation development.

Social Aspects

Agencies may receive criticism for failure to manage the timber resource.

Economics

There can be economic benefits from timber in some alternatives.

Land Uses

Multiple uses would be limited to matching use under this alternative.

Adverse Environmental Effects Which Cannot Be Avoided Should the Alternative be Implemented

These are discussed previously under "impacts" but are summarized below. Generally, the positive benefits would not occur and negative impacts would be avoided.

Soils

A slight amount of erosion presently occurring would continue.

Water

Positive benefits in the form of increased snow packs and increased available soil moisture would not occur and erosion from water would be avoided.

Vegetation

Fire risk and slash would increase annually. Insect and disease incidence would increase.

Forage plant species diversity would remain static or deteriorate. Aspen stands would be expected to disappear through successional change. Forage production would decrease on these sites.

Positive benefits of the preferred alternative would not be realized. Wildlife habitat diversity would be reduced and gradually less wildlife forage would be produced in the absence of a national catastrophy. Negative impacts of the preferred alternative would not occur.

Animals

Human presence and activity would not occur and animals would not be displaced or have added stress.

Visual

Gradual degradation of visual resource would occur as overmature timber dies causing a loss in the green aspect of the landscape. Large amounts of dead timber can be visually undesirable.

Recreation

There will be limited potential for future recreation development.

Social Aspects

Agencies may receive criticism for failure to manage the timber resource.

Economics

There are no economic benefits from timber in this alternative.

Land Uses

Multiple uses would be limited to existing use under this alternative.

Range

No additional forage would be produced and species diversity would remain static.

Aspen stands will continue to degenerate and proceed toward a conifer climax.

This will be accompanied by a decrease in forage production on these sites.

Animals

Domestic

No increase in cattle drift should occur. Less livestock pressure on fences may necessitate less maintenance. No additional forage will be made available.

Where poor access exists, range use supervision, care and supervision of livestock as well as fence maintenance would remain difficult.

Wildlife negative impacts of the proposed action would not occur. The current wildlife population would remain stable, favoring birds and mammals associated with a mature lodgepole pine forest. Increased herbaceous vegetation would not occur and aspen inclusions would gradually become coniferous forest with very little habitat diversity.

Cultural Resources

This alternative would not create an opportunity to inventory or investigate the cultural resource.

Visual

Some degradation of the visual resource could occur should the green aspect of the forest be lost to wild fire, large insect or disease outbreaks or large acreages of dead timber due to natural mortality.

Recreation

Recreation use would be limited to existing use.

Social Conditions

Agencies may receive criticism for failure to manage the timber resource.

Economics

Economic benefits described under impacts of the proposed action would not be realized. This could also have social implications.

Land Uses

Land would retain more natural aspects.

Uses would be limited to present uses. There would be no use made of the timber resource.

The 32 acres to be devoted to roads would not be lost to vegetation production for the foreseeable future.

Irreversible or Irretrievable Commitments of Resources Under the Alternative as Implemented

A minor, unmeasured amount of soil would be broken and is irretrievable. Approximately 20 acres of land would be taken out of production by roads. By retention these roads would be reclaimed and then take use of the land is irretrievable. These are a renewable resource and retrievable however they are not immediately recoverable and removal of old growth timber climax, that type takes from a period of 30-120 years.

The visual character is most obviously affected. Two years elapse before grasses and forbs are reestablished. The stump remains a visual impact as long as they are maintained. The visual characteer of a transit relates in about 30 years.

The forest resource is retrievable but is monitored because it is not immediately recoverable or is irretrievable for a long period of time.

Possible Conflicts Between the Alternative and the Objectives of Federal, Regional, State and Local Land Use Plans, Policies and Controls

The preferred alternative has been designed to incorporate the local land use plans which were previous according to accepted and established policies. The Forest Service Plan has received public input and review, for these reasons conflicts should be minimal.

One one possible source of conflict that may result is the potential status of the road as proposed in the alternative. Closure to vehicle use of Forest Service roads by the public may be in conflict with multiple use policies of both agencies and appropriate operations from the public.

No Action Alternative

Impacts on:

Climate and Air Quality - none

Topography - none

Soils

A slight amount of erosion presently occurring would continue.

Water

Positive benefits in the form of increased water yields and increased available soil moisture would not occur and erosion from water would be avoided.

Vegetation

Flora

As the timber regained maturational relation, the resources would be wasted and slowly accumulate, increasing the risk of fire. Insects and diseases are more prevalent in overmature and decadent stands. Economic benefits would not be realized from the sale of the timber.

Irreversible or Irretrievable Commitments of Resources Should the Alternative be Implemented

A minor, unmeasured amount of soil would be eroded and is irretrievable. Approximately 32 acres of land would be taken out of production by roads. By intention these roads would be permanent and thus this use of the land is irretrievable. Trees are a renewable resource and retrievable however they are not immediately retrievable and removal of old growth timber changes that type for a period of 80-140 years.

The visual character is most obviously affected. Two years elapse before grasses and forbs are reestablished. The roads remain a visual impact as long as they are maintained. The visual character of a forest returns in about 20 years.

The Forest resource is retrievable but is mentioned because it is not immediately retrievable it is irretrievable for a long period of time.

Possible Conflicts Between the Alternative and the Objectives of Federal, Regional, State and Local Land Use Plans, Policies and Controls

The preferred alternative has been designed to incorporate the local land use plans which were developed according to accepted and established policies. The Forest Service Plan has received public input and review, for these reasons conflicts should be minimal.

The one possible source of conflict that may remain is the proposed status of the road as proposed in the alternative. Closure to vehicle use of Forest Service roads by the public may be in conflict with multiple use philosophies of both agencies and precipitate questions from the public.

No Action Alternative

Impacts on:

Climate and Air Quality - none

Topography - none

Soils

A slight amount of erosion presently occurring would continue.

Water

Positive benefits in the form of increased snow packs and increased available soil moisture would not occur and erosion from water would be avoided.

Vegetation

Timber

As the timber reached pathological rotation, the resources would be wasted and slash would accumulate, increasing the risk of fire. Insects and disease are more prevalent in overmature and decadent stands. Economic benefits would not be realized from the sale of the timber.

The Relationship Between Short-Term Uses of Man's Environment and the Maintenance and Enhancement of Long-Term Productivity

Short-term use of this area provides wood products and causes impacts associated with soil disturbance, visual change and a loss of natural solitude. These changes may persist from 2 to 20 years.

By changing the density of the trees the number and size of herbaceous plants would increase having an effect for approximately 15 years. When the age class of the timber is lowered by removing old growth and through thinning, long-term productivity can nearly be doubled due to the faster growth that occurs in younger stands.

Through the application of environmental protection measures most adverse impacts are short-term and slight or minor in their impact. Long-term productivity can be greatly enhanced and many short-term benefits are realized in the form of increased forage, less insects, disease, and fire risk and increases in water yield and snow packs.

Vegetation

Moderate long-term change in stand age and composition.

Slight amount of physical damage to residual stand from removal of crop trees.

There would be a 5 to 7 year tree regeneration lag by waiting for natural regeneration.

Long-term loss of vegetation on roads, approximately 32 acres.

Animals

Increased livestock mobility would require increased supervision, and fence maintenance.

There would be a moderate, seasonal increase in stress to wildlife by human activity. There would not be any adverse impact on fisheries. There would be a decrease of overmature foodpole pine habitat.

Cultural Resources

No impacts. Clearance is pending and potential impacts to a cultural resource would be mitigated.

Visual Resource

Change in naturalness of the area.

Visual change by introduction of line that sometimes would not be subordinate to landscape.

Temporary impact from color change not subordinate to existing color because of logging slash.

Recreation Resource

Loss of naturalness due to roads.

Developed recreation opportunities would be limited due to Forest Service and BLM road closures to motor vehicles.

Social

None.

Economic

None.

Vegetation

Moderate long-term change in stand age and composition.

Slight amount of physical damage to residual stand from removal of crop trees.

There would be a 2 to 7 year tree regeneration lag by waiting for natural regeneration.

Long-term loss of vegetation on roads, approximately 32 acres.

Animals

Increased livestock mobility would require increased supervision, and fence maintenance.

There would be a moderate, seasonal increase in stress to wildlife by human activity. There would not be any adverse impact on fisheries. There would be a decrease of overmature lodgepole pine habitat.

Cultural Resources

No impacts. Clearance is pending and potential impacts to a cultural resource would be mitigated.

Visual Resource

Change in naturalness of the area.

Visual change by introduction of line that sometimes would not be subordinate to landscape.

Temporary impact from color change not subordinate to existing color because of logging slash.

Recreation Resource

Loss of naturalness due to roads.

Developed recreation opportunities would be limited due to Forest Service and BLM road closures to motor vehicles.

Social

None.

Economic

None.

Transportation Value

Public travel in the area would be limited to foot, snowmobile or snowshoe. The number of hunters or visitors is not expected to change from past levels. However road restrictions would increase time spent walking, and as a result, increase the number of animals seen and generally increase the kill. The restrictions would generally be accepted as providing a higher quality hike or hunt. Where cover is good (at least 1/3 of total area) and well distributed, restrictions will probably have little effect on elk distribution. Where cover is poor (1/3 or less of the total area) also restrictions would reduce harassment of elk. (Montana Cooperative Elk-Logging Study, Progress Report, 1980.)

Land Uses

Current land uses include livestock grazing, deer and elk hunting, and snowmobile touring.

A recent inventory has eliminated this area from wilderness designation. The impacts on these uses are discussed previously.

Adverse Environmental Effects which Cannot be Avoided

Climate and Air Quality

Minute, temporary adverse impact from dust particles in the air, and other temporary local impacts due to motor from slash disposal.

Geology and Minerals

None.

Soils

Approximately 80 acres of land would be taken out of production because of roads.

Water

Slight, local short-term adverse impacts on, onsite erosion, permeability, and infiltration.

Slight adverse impact on soil fertility from burning slash.

Water

Slight, short-term temporary increase in downstream water quality due to sediment.

Slight, short-term temporary increase in downstream water quality due to sediment.

Transportation System

Public travel in the area would be limited to foot, horseback or snowmobile. The number of hunters or visitors is not expected to change from past levels, however road restrictions would increase time spent walking, and as a result increase the number of animals seen and possibly increase the kill. The restrictions would generally be accepted as providing a higher quality hike or hunt. Where cover is good (at least 2/3 of total area) and well distributed, restrictions will probably have little effect on elk distribution. Where cover is poor (1/3 or less of the total area then restrictions would reduce harassment of elk. Montana cooperative Elk-Logging study, Progress Report, 1980.)

Land Uses

Current land uses include livestock grazing, deer and elk hunting, and snowmobile touring.

A recent inventory has eliminated this area from wilderness designation. The impacts on these uses are discussed previously.

Adverse Environmental Effects Which Cannot Be Avoided

Climate and Air Quality

Minute, temporary adverse impact from dust particles in the air, and minor temporary local impact due to smoke from slash disposal.

Geology and Minerals

None.

Topography

Approximately 32 acres of land would be taken out of production because of roads.

Soils

Slight, local short-term adverse impact on, onsite erosion, permeability, and infiltration.

Slight adverse impact on soil fertility from burning slash.

Water

Minor short-term increase in overland flow in proportion to the amount of soil compaction.

Slight, short-term temporary decrease in downstream water quality due to sediment.

Recreation Resources

The primary recreation impact is a loss of naturalness due to road construction and tree removal. For a discussion of the visual impact, see the Visual section. Loss of naturalness may result in a loss of recreation opportunities because many primitive recreation activities such as backpacking are based on a natural environment. However, tree removal may increase browse species and open up the forest stand which could increase wildlife viewing and hunting opportunities. Off-road-vehicle opportunities may also be enhanced because of the increased number of roads. Again, vehicle access would have to be from the adjacent private lands. Overall, primitive recreation activities would tend to decrease while motorized activities would increase if the proposed action is implemented.

Social Conditions

Any decision affecting the allocation of resources has social implications. The forest resource base is shrinking, demand for all resources is increasing; this causes conflicts in social attitudes, i.e. environmental concern versus resource development and special interest versus special interest.

The Wilderness Preservation Act of 1964, the National Forest Management Act of 1974 and the Federal Land Policy and Management Act of 1976 all lend direction to identifying and establishing land for wilderness use. In Colorado, in 1979 the U.S. Forest Service identified 1,959,523 acres that have been recommended to Congress for inclusion in the wilderness system. Presently the BLM is studying 815,048 acres of public lands that may be suitable for wilderness use. This represents a significant reduction in the timber resource base. This shrinking timber production base means that the remaining timber land would become even more important to society as our population and resource demands grow. For this reason management and harvest of all our forest lands, including Black Mountain-Little Whiskey Creek area is socially important. This sale should generate positive social reactions. Environmental protection has been thoroughly examined and public input has come through the Forest Service Blacktail Environmental Impact Statement and Land Use Plan (USDA 1978). Adjacent landowners have been initially receptive since it affords an opportunity for them to improve their roads and harvest their timber resource.

Economic Considerations

This proposal would have significant short-term and long-term, positive, economic impacts. The more important ones include the sale of timber products, more efficient administration for grazing, fire and other land management functions.

The Forest Service (USDA-Forest Service Res. pap. RM-92 1975) estimated that $122,000 and 9-man years of employment are generated in the local economy for every 1 million board feet of timber harvested. This sale of 7 million board feet represents 27 to 28 percent of the total combined annual production of the two largest lumber mills in the market area. Both mills produce far below capacity. This is partly due to available timber supply. The Kaibab mill at Eagle processes about 13 million feet annually but has a capacity of 20 million feet annually. Thirteen million feet is about what is offered by the White River National Forest. One to two million feet change in available timber can be important to small mills.

Wildlife

Initial road construction, timber harvest and continuing commercial contribution would result in a large increase in human activity and noise on a portion of 9,800 acres of BLM, Forest Service and private lands. The exact portion affected would be quite variable depending on location of the activity in relation to topography, the wildlife species and type of activity. The impact of human activity would significantly affect wildlife populations using the area. During road building and timber harvest activities, studies have found that elk usually cease until topography provides an effective visual and sound barrier. This can be a distance of several miles.

Forage production for deer, elk and small herbivores would increase as the forest canopy is opened to allow production of herbaceous plants. Wildlife species associated with a dense lodgepole pine forest would decrease. The more common of these include the pine marten, several woodpeckers, nuthatches, jaybirds, and grouse. Clearcutting would affect these species most, while partial cutting would only cause a minor impact. Conversely, chipmunks, deer mice, mountain chickadee, ponderosa chickadee, and sharptailed hawk are some species likely to benefit from forest openings.

Fisheries

Impacts on fisheries would not be measurable. The increase in sediment load to Rock Creek is anticipated to be slight, and of short duration. Late season flows may increase, benefiting the fishery by helping to keep water temperatures lower during the hottest time of the year.

Cultural Resources

No impacts would occur to cultural resources or prehistoric sites as a result of mitigate-impacts.

Visual Resources

The proposed action (or road construction, timber removal, slash disposal, etc. would initiate the first substantial alteration of the mountain landscape from its natural state. The degree of impact would result from the cumulative effects of road construction, slashing, watching and clearcut; each would have to be specifically located on the ground and evaluated by the Visual Condition Rating System to determine their influence on the various visual zones especially the "partial retention" zone.

Visual impacts related to logging operations have short-term and long-term impacts. The former are normally more noticeable and certainly until revegetation is fully established. All of the affected visual classes and landscape situations that previous alternatives should repeat the form, line, color and texture factors of the existing landscape, so that the visual impacts are not as obvious as those of the clearcut.

Accessibility within the surrounding area. Thus, these general guidelines have been incorporated. The duration of the "short-term" period is reduced, and the long-term problems are essentially eliminated.

Wildlife

Initial road construction, timber harvest and continuing contract administration would result in a large increase in human activity and noise on a portion of 9,500 acres of BLM, Forest Service and private lands. The exact portion affected would be quite variable depending on location of the activity in relation to topography, the wildlife species and type of activity. The impact of human activity would significantly affect elk populations using the area. During road building and timber harvest activities, studies have found that elk usually move until topography provides an effective visual and sound barrier. This can be a distance of several miles.

Forage production for deer, elk and small herbivores would increase as the forest canopy is opened to allow production of herbaceous plants. Wildlife species associated with a dense lodgepole pine forest would decrease. The more common of these include the pine squirrel, several woodpeckers, nuthatches, sapsuckers, and goshawk. Clearcutting would affect these species most, while partial cutting would only cause a minor impact. Conversely, chipmunks, deer mice, mountain bluebird, mountain chickadee, and sharpshinned hawk are some species likely to benefit from forest openings.

Fisheries

Impacts on fisheries would not be measurable. The increase in sediment load to Rock Creek is estimated to be slight, and of short duration. Late season flows may increase, benefiting the fishery by helping to keep water temperature lower during the hottest times of the year.

Cultural Resources

No impacts would occur to cultural resources or provisions will be made to mitigate impacts.

Visual Resource

The proposed action for road construction, timber removal, slash disposal, etc. would initiate the first substantial alteration of the mountain landscape from its natural state. The degree of impact would result from the cumulative effects of road construction, thinning, patchcuts and clearcuts; each would have to be specifically located on the ground and evaluated by the Visual Contrast Rating System to determine their influence on the various visual zones, especially the "partial retention" zone.

Visual impacts related to logging operations have short-term and long-term impacts: the former are normally more noticeable and persist until revegetation is firmly reestablished. All of the affected visual classes and landscapes stipulate that proposed alterations should repeat the form, line, color and texture patterns of the existing landscape, so that the visual appearance of the change would be those of natural occurrence within the surrounding area. Once these general guidelines have been incorporated, the duration of the "short-term" period is reduced, and the long-term problems are essentially eliminated.

Buffer strips are to be maintained along stream channels. These would function as sediment filters minimizing the quantity of sediment introduced by overland flow.

Vegetation

Timber

Approximately 32 acres would be removed from the production of timber because of the construction of permanent roads. The harvest of timber would reduce the average size of the stands and the average age. The stands would be younger due to the removal of the oldest age classes. Younger stands have positive benefits in that they are faster growing and healthier.

Harvest methods would leave healthy and phenotypically superior trees. A minor amount of physical damage would occur to the residual stand during the falling and skidding operation.

Range

Selective and patchcutting results in eliminating some of the competition between plants for space, nutrients and light. As a result there would be an increase in grasses, forbs and shrubs pending reestablishment of the tree canopy. This would create more species diversity and more available forage. Skidding results, in exposure of mineral soil making a better seed bed for grasses, forbs and shrubs. This may result in more short-term forage production. Increased livestock mobility resulting from new roads, and more open stands of timber, as well as, new forage production, may result in better patterns of utilization and indirectly some improvement in trend in some areas. Aspen regeneration may be enhanced.

Some insignificant amounts of vegetation would be temporarily lost due to skid trail, landing, and spur road construction and usage.

Approximately 32 acres would be lost to the production of vegetation for the foreseeable future due to the construction of 19 miles of new road.

Animals

Domestic

An unknown amount of additional forage would become and remain available to cattle pending closure of the tree canopy. Improved livestock mobility would result from new road construction and opening of the timber stands. This should result in additional forage being physically available to grazing. The additional roads and improved access would help to make range use super-vision, livestock supervision and care, as well as range improvement maintenance more effective and efficient.

The increased livestock mobility resulting from new road construction may create problems with cattle drift from areas of customary use. This may result in a need for more riding by the operators to keep the livestock where they belong. The increased livestock mobility may result in more livestock pressure against existing fencing. The fence on the forest boundary is in poor repair in places. If the pressure increases, fence maintenance requirements would also increase.

Water

Timber harvesting would impact the hydrologic resources on and downstream of the Black Tail Unit. The intensity and duration of impact would vary depending on the treatment (severity of vegetal cover change), exposure and compaction of the mineral soil, and the proportion of the watershed affected (Megahan 1972, Stone 1973). Timber harvesting affects the water resource by influencing various hydrologic processes.

Interception is the process whereby vegetation interrupts the fall of precipitation onto the soil surface. The precipitation that enters the tree canopy may adhere to leaves and branches. Some of the moisture then evaporates back into the atmosphere, some drips to the ground (through fall) and some flows down stems to the ground (stemflow). Interception by conifers may amount to 30 percent of the annual precipitation. Timber harvest would decrease interception possibly resulting in increased streamflow. The interception loss can last 50 years or more.

Snow accumulation and snow melt rates are markedly affected by timber harvesting. Snow accumulations are greatest in forest openings and their margins. In lodgepole pine type in Colorado, harvesting timber in narrow strips and small patches increased snow accumulation by at least 30 percent compared to the remainder of the forest. Forest cover delays snowmelt times by shading and thus extends the time snow is held in surface storage. Anderson (1969) estimated forest shading reduced melt rates by 40 percent. Although snow under the forest canopy lasts longer and melts later than snow in the open, it may melt more rapidly once it begins, potentially causing greater peak flows. This can be contributed to the higher daily temperatures later in the season. Increased water yields can be expected from clearcut areas due to reduced transpiration losses, greater unit-area concentration of snowmelt water, and greater year-to-year carryover soil moisture. This water yield increase may last for decades, i.e., until the forest vegetation and condition approaches pre-treatment condition.

Overland flow is essentially absent from mature undisturbed forests. It's generally dependent on infiltration capacity, storage opportunity, and rain fall intensity. Forest practices that reduce infiltration rate usually results in increase overland flow. Merely cutting trees does not affect infiltration capacities, however compaction and exposure of mineral soil does. This results from road building, and skidding and hauling of logs. The amount of overland flow that occurs following logging seems to be directly related to the percent of soil exposed and compacted.

In summary, increased water yield would occur from logging the Black Mountain Unit primarily by reducing evapotranspiration and interception, increasing overland flow, and increasing snow pack. Increases in stream discharge would occur especially during the spring and early summer as snowpack melts.

Minimal water quality impacts would also occur. Logging roads and their unprotected cuts and fills are primary sources of sediment from forested watersheds. Movement of sediment downslope from a road is dependent on runoff volumes and velocities, availability of erodible soil, and the obstructions to sediment transport (Haupt 1959). Eroding stream channels are another significant sediment source. As stream discharges increase, i.e. water yields increased from treated areas, the channel banks may become overtaxed and erosion occurs. This increase channel erosion would occur until the streambanks stabilize.

ENVIRONMENTAL CONSEQUENCES

Preferred Alternative

Climate and Air Quality

Air quality would be affected temporarily because of dust particles that were stirred into the air during the road construction and from the movement of log trucks along the main haul roads. This is a local, temporary, slight impact. "The air quality would also be affected by any slash burning that may occur. This would be a moderate, local, short-term impact."

Geology and Minerals

There are no environmental consequences.

Topography

Approximately 32 acres would be impacted by 19 miles of 14 foot haul roads. These roads interrupt the topography causing visual impacts and a slight amount of erosion. These impacts are further discussed under soil and visual impacts.

Soils

Disturbances from road construction, logging activities and slash disposal would cause short-term, adverse impacts to the soil resource.

Impacts due to road construction would be the most significant. The physical properties of soils would be altered, especially those of structure, infiltration, and permeability. Onsite erosion would initially increase, but would decrease after the cut and fill slopes are revegetated. Assuming adequate drainage facilities are planned and properly constructed, impacts of erosion would be minor. No problems with slope failures are anticipated because the soils are coarse textured well drained, and surface disturbances are restricted on the steeper slopes.

Soil compaction would occur from logging operations, but this impact would be minor. Recovery is anticipated to be rapid.

Impacts arising from slash disposal would depend upon the method that was used. If the slash is lopped and scattered, impacts would be beneficial. This method would insure adequate ground cover to protect the soil from raindrop impact and surface runoff.

However, if burning is the prescribed method of slash disposal, the mineral soil would be exposed and erosion would increase.

In addition to a decrease in ground cover by burning, significant amounts of nitrogen, phosphorus, and sulfur could be lost through volatilization or increased erosion. However, the availability of potassium, calcium and magnesium could increase through burning. The productivity of the land would probably not be impaired by burning.

TABLE 3

Allotment	Number of Cattle	Season of Use	Animal Unit Months Authorized
Horn	21	May 1 to Oct. 31	249
Copper Spur	15	Apr. 1 to Feb. 25	211
Black Mountain	9	June 1 to Feb. 28	100
Total	45	Total	559

Forest Service Land. Only one Forest Service allotment (Horse Creek) is located within the proposed sale area. Table 4 gives number of cattle and animal unit months authorized for this allotment.

TABLE 4

Allotment	Number of Cattle	Season of Use	Animal Unit Months Authorized
Horse Creek	45	July 16 to Oct. 16	183
Used by 3 ranchers	55	July 01 to Sep. 25	158
	42	July 01 to Sep. 25	121
Total	145	Total	472

Wilderness

The area has been reviewed for Wilderness designation and does not qualify.

TABLE 3

Allotment	Number of Cattle	Season of Use	Animal Unit Months Authorized
Horn	21	May 1 to Oct. 31	249
Copper Spur	18	Apr. 1 to Feb. 28	211
Black Mountain	9	June 1 to Feb. 28	109
Total	48	Total	569

Forest Service Land. Only one Forest Service allotment (Horse Creek) is located within the proposed sale area. Table 4 gives number of cattle and animal unit months authorized for this allotment.

TABLE 4

Allotment	Number of Cattle	Season of Use	Animal Unit Months Authorized
Horse Creek	68	July 16 to Oct. 10	193
Used by 3 ranchers	55	July 01 to Sep. 25	158
	42	July 01 to Sep. 25	121
Total	165	Total	472

Wilderness

The area has been reviewed for wilderness designation and does not qualify.

Social Conditions

The social setting is quite rural. Kremmling, Colorado is the largest nearby town with an estimated population of 1,400. Yampa, the nearest town has a population of about 327; population has decreased since 1960. Employment for the area is provided by agriculture, construction, wholesale and retail trade, services including about 1/3 in public administration, services, mining and manufacturing.

For additional details regarding social conditions see the Black Tail Environmental Impact Statement and Land Use Plan (USDA, Forest Service 1976).

Economic Conditions

This proposal will influence the timber processing and sawmilling portion of the economy and the discussion will be limited to that. Sawmills at Kremmling and Eagle, Colorado are the major milling points for the saw timber from the proposed sale. Three small mills cut timber from Forest Service and Bureau of Land Management lands.

The demand for wood products will increase nationally and locally. Prices are also increasing. Current lumber selling prices, wholesale, in the central rocky mountain area are slightly over $320.00 per thousand board feet. Seven million board feet has a realization value of approximately 2¼ million dollars.

Transportation System

The proposed roads will provide access for the harvesting and management of the timber resource. Forest Service roads are closed to public motorized travel in order to minimize the stress to wildlife from human contact. This recommendation comes from the Forest Service Blacktail land use plan and E.I.S.. The BLM is recommending the same kind of road closure in order to lend consistency to the management of the area.

The roads will be open to snowmobile use and other permitted administrative uses.

If BLM were to leave their roads open in view of the Forest Service decision it wouldn't mean anything since public access to BLM is through the National Forest. It would possibly create administrative problems for the Forest Service.

These proposed roads will, from a recreation stand point change the area from a non-motorized area to a motorized area.

Land Uses

Range

Six ranchers (BLM and Forest Service) have season-long use on four allotments in the proposed sale area. Approximately 213 head of cattle graze the area; no sheep or other livestock are present.

BLM Land. Segments of three BLM allotments are located with the proposed sale area. Table 3 gives number of cattle and animal unit months authorized on these allotments.

Visual Resources

The low rolling hill country of the proposed sale area remains in a natural state. Open parks are interspersed with predominantly conifer forests so that aspen, sage, and grasses break up the continuous green colors of the forest canopy.

Some dirt roads bisect the area but the character is natural.

The proposed timber sale has been assessed according to Forest Service and BLM visual resource management procedures. The northern, Forest Service portion of the sale is divided into three visual management classes, 3A -partial retention, MG-1B, partial retention and 3B, modification. The partial retention classification stipulates that changes remain visually subordinate to the landscape and that they repeat the form, characteristic, line, color, and texture common to that landscape.

The modification category allows that a proposed change can become a focal element and visually dominant but the alterations should borrow from existing form, line, color, and texture patterns.

The 3A and Mg-1B areas noted in the Black Tail Forest Service, Environmental Impact Statement are visually sensitive because of State Highway 134 which is rated as a secondary observation corridor.

The southern portion of the proposed sale area has been evaluated according to BLM procedures. The C-level scenic quality landscapes are background or seldom seen landscapes which qualify them for management Class IV. This class allows visual contrasts to attract attention and to be dominant in terms of scale relationships; but existing form, line, color, and texture patterns should be repeated. (BLM Manual 8411.6)

Recreation Resources

Currently, the Black Mountain area is a forested, mountainous area that provides for nonmotorized, primitive recreation. The area is largely natural except for a 4-wheel drive trail. The area has potential to provide for many recreational activities, such as hiking, backpacking, cross-country skiing, scenic viewing and big game viewing and hunting. Existing visitor use data are not documented. Some big game hunting is known to occur but this has not been qualified. Occasional snowmobiling does occur in the area; and one snowmobile club has expressed interest in obtaining access to the unit for snowmobiling and 4-wheeling.

Legal vehicle access is prohibited into the area except for snowmobiles because it is surrounded by private land and Forest Service land which is designated "closed." The adjacent private land owners do allow some hunters to cross their lands to reach BLM lands. Fee hunting and guiding/outfitting are believed to occur in the area to be cut. Several hunter camps are located in the area.

Aspen, Forb, and Grass. This occurs as small inclusions throughout the proposed sale area as well as one larger stand in the northeast portion of the area. It exists generally on south facing slopes that are nearly level to moderately steep. Eventually, the site will ecologically progress to coniferous vegetation. It covers 3 percent of the area. Elevation varies from 8,500 to 9,600 feet. Precipitation varies from 20 to 25 inches a year.

Young aspen dominate the site with a forb and grass understory that includes wildrye, mountain brome, junegrass, bluegrasses, wheatgrasses, sedges, loveroot, blue bells, polamonium, aster, larkspur, fleabane, yarrow, geranium, peavine, lupine, and groundsel. Other species occur but do not make up a significant portion of the vegetative composition. This unit produces an average of 2,400 pounds of air dry herbage per acre annually. It supplies an important part of the forage for big game and domestic livestock. Growth potential for aspen as a timber species is 20 to 30 cubic feet per acre per year.

Willow and Wet Meadow. This unit occurs along streams and flood plains in the shallow drainages of the north portion of the area. It covers 1 percent of the proposed sale area. Elevations range from 8,600 to 9,200 feet. Precipitation averages about 26 inches a year.

Water sedge and willows that line the stream banks dominate the site. Other vegetative species that occur include tufted hairgrass, meadow foxtail, clover, and rushes. During dry periods the site can produce an average of 4,000 pounds of air dry herbage per acre per year. The area is grazed by elk and deer during the late summer and fall.

Wildlife

Elk and mule deer are the primary big game species utilizing the sale area. Use is primarily during the summer months with the animals migrating to lower elevations to the south and east during the winter. The number of animals utilizing the area is unknown at this time.

Smaller animals on the area include snowshoe hare, chipmunk, pine squirrel, porcupine, coyote, red-tail hawk, owls, blue grouse, and passerine birds typical of the lodgepole pine forest.

Trout populations and beaver are found in Black, Whiskey, Horse, and Little Henry Creeks.

There are no known or suspected state or federally listed threatened or endangered species occurring on the area. There are no wild horses and cattle are the only domestic animal using the area. See land use in this section for details on livestock.

Cultural Resources

There are no recorded cultural resource sites within the proposed sale area; however, a cultural resource survey would be conducted prior to the sale of timber in conformance with applicable laws. See the preferred alternative for comments regarding mitigation. Comments will be solicited from the Advisory Council on Historic Preservation and the State Historic Preservation Officer.

Vegetation

No threatened or endangered plants are known to occur in the proposed sale area.

Range condition on the National Forest is rated as fair to excellent. Trend is upward. On BLM land, ecological conditions in the sagebrush grass is rated as fair while the timbered areas are rated as poor. No data is available on trend.

Lodgepole pine forests are mature or overmature and the trend is moving toward deterioration. Overstory stands have varying degrees of dwarf mistletoe infections. As lodgepole stands reach maturity, root rot, subalpine fir reproduction occupies the site as a climax species replacing the lodgepole stands.

The following Forest Service Ecological land units is combination of vegetation type and land form. Are found in the sale area. (USDA, Forest Service 1977). They are given here in order of decreasing size.

Ecological Land Units

Lodgepole Pine and Sedge. This Ecological Land Unit covers 45 percent of the proposed sale area. Elevations range from 5,800 to 10,000 feet on nearly level to moderately steep slopes. Precipitation varies from 30 to 40 inches a year.

Young and mature lodgepole pine dominate the site. Some subalpine fir is also present. Sedge is the most common species in the understory, but wheatgrass, pinegrass, ground juniper, milkvetch, and Oregon-grape are common.

Growth potential for lodgepole is 30 cubic feet per acre per year. Average production is less than 400 pounds of air dry herbage per acre.

Douglas Fir and Sedge. This unit occurs in isolated tracts on the west, central portions of the proposed sale area on steep north facing slopes. It covers 3 percent of the area. Elevations range from 6,400 to 7,800 feet. Precipitation averages about 21 inches a year.

Douglas-fir trees dominate the site. Some subalpine fir is also present. Sedge is the most common species in the understory although wheatgrass, pinegrass, ground juniper, and Oregon-grape occur.

Growth potential for Douglas-fir is 30 cubic feet per acre per year. Average production is less than 400 pounds of air dry herbage per acre.

Sagebrush and Grass. This unit is scattered throughout the proposed timber sale area and occurs on moderately steep to level slopes and on shallow soils of alluvial fans. It covers 2 percent of the area. Elevations range from 7,000 to 8,000 feet. Precipitation varies from 20 to 27 inches a year. Sagebrush dominates the site with an understory of numerous grasses including tufted hairgrass, Idaho fescue, western wheatgrass, blue bunch wheatgrass, Sandberg bluegrass, Kentucky bluegrass, mountain brome, nodding brome, and sedges. Numerous forbs occur but no single species dominates the site.

Potentially, the site can produce an average of 3,000 pounds of air dry herbage per acre annually. It is presently grazed by cattle, elk and deer during the summer months.

Vegetation

No threatened or endangered plants are known to occur in the proposed sale area.

Range condition on the national forest is rated as fair to excellent. Trend is upward. On BLM land, ecological condition in the sagebrush grass is rated as fair while the timbered areas are rated as poor. No data is available on trend.

Lodgepole pine forests are mature or overmature and the trend is moving toward deterioration. Overmature stands have varying degrees of dwarf mistletoe infections. As lodgepole stands reach pathological rotation, subalpine fir reproduction occupies the site as a climax species replacing the lodgepole stands.

The following Forest Service Ecological land units (a combination of vegetation type and land form are found in the sale area.(USDA, Forest Service 1976). They are given here in order of decreasing size.

Ecological Land Units

Lodgepole Pine and Sedge. This Ecological Land Unit covers 82 percent of the proposed sale area. Elevations range from 8,400 to 10,400 feet on nearly level to moderately steep slopes. Precipitation varies from 20 to 28 inches a year.

Young and mature lodgepole pine dominate the site. Some subalpine fir is also present. Sedge is the most common species in the understory; but whortleberry, pinegrass, ground juniper, wildrose, and Oregon-grape are common.

Growth potential for lodgepole is 35 cubic feet per acre per year. Forage production is less than 400 pounds of air dry herbage per acre.

Douglas Fir and Sedge. This unit occurs in isolated tracts in the west-central percent portion of the proposed sale area on steep north facing slopes. It covers 9 percent of the area. Elevations range from 8,400 to 9,600 feet. Precipitation averages about 23 inches a year.

Douglas-fir trees dominate the site. Some subalpine fir is also present. Sedge is the most common species in the understory although whortleberry, pinegrass, ground juniper, and Oregon-grape occur.

Growth potential for Douglas-fir is 30 cubic feet per acre per year. Forage production is less than 400 pounds of air dry herbage per acre.

Sagebrush and Grass. This unit is scattered throughout the proposed timber sale area and occurs on moderately steep to level slopes and on shallow soils of ridge tops. It covers 5 percent of the area. Elevations range from 7,800 to 9,000 feet. Precipitation varies from 20 to 27 inches a year. Sagebrush dominates the site with an understory of numerous grasses including Idaho fescue, Thurber fescue, western wheatgrass, blue bunch wheatgrass, junegrass, Kentucky and Sandberg bluegrasses, mountain brome, onion grass and sedge. Numerous forbs occur but no single species dominates the site.

Potentially, the site can produce an average of 1,600 pounds of air dry herbage per acre annually. It is presently grazed by cattle, elk and deer during the summer months.

TABLE 1

SOIL PROPERTIES TABLE

Soil Name	Depth to Bedrock (inches)	Soil Drainage	Surface Texture (thickness in inches)	Subsurface Texture (thickness in inches)	Subsoil Texture (thickness in inches)	Permeability	Available Water Capacity	Surface Runoff	Erosion Hazard
Bundo	60+	Well drained	Cobbly sandy loam (8)	Sandy loam (24)	Sandy clay loam (7)	Moderate	Moderate	Medium	Moderat
Unnamed	10 to 20	Well drained	Gravelly loam (2)	Gravelly sandy loam (13)	Very gravelly sandy clay loam (3)	Moderate	Low	Medium	Moderat

TABLE 2

MEAN MONTHLY SNOW DEPTH MOISTURE EQUIVALENT FOR 1963 TO 1977

Month	Snow Depth (Inches)	Water Equivalent (Inches)
February 1	33	7.5
March 1	39	10.3
April 1	42	12.6
May 1	25	8.7

Soils

The Soil Conservation Service completed soil mapping on public lands on Black Mountain during the 1979 field season. The Bundo-Unnamed mapping complex soil mapping unit encompasses the entire conifer area. Table 1 summarizes properties of the two soils. Similar soils are expected to occur on the national forest lands.

Water

The proposed sale area lies within the Rock Creek watershed a tributary to the Colorado River. Horse, Little Henry, Whiskey, and Black Creeks are the prinicple streams in the unit and generally flow north-westerly. No specific streamflow data are available, however, streams in the area typically exhibit seasonal discharge variation. Generally, 60 to 70 percent of the flow occurs in May and June in response to snowmelt. Average annual water yields are estimated at 1.5 acre-feet per surface acre of land (USDA, Forest Service 1976).

Snow depth and moisture equivalent data are available for the Lynx Pass Snow Course (No. 6J06S) located approximately 3 miles north of the northern unit boundary. Mean values for 15 years of record (1963 to 1977) are included in table 2.

No water quality baseline has been established for streams in the unit. Field observations indicate high water quality exceeding the Colorado State Water Quality Standards for Class B-1, cold water fisheries (USDA, Forest Service 1976).

Water rights have been granted for utilization of a portion of Rock Creek's streamflow for irrigation purposes. Water needs for fishery and aesthetic purposes have not been determined.

AFFECTED ENVIRONMENT

Climate and Air Quality

The climate has wide seasonal variations in temperatures ranging from 40 to 80 degrees F. Summertime temperatures average 60 degrees F. Annual precipitation varies between 20 and 30 inches and occurs mostly as snow, with some summer thunder showers. Snow occurs between November and May, and can reach depths of 3 to 4 feet.

There are no population centers or industries to cause air pollution. This area has a high quality mountain airshed.

Geology, Topography, Minerals, and Alluvial Valleys

Geology

The proposed timber sale area lies within the northeastern portion of the White River Plateau, an apparent northwestward extension of the Sawatch Mountains.

The formations outcropping within the area include Middle Tertiary intrusives (Oligocene). These include granodiorite and quartz monzonite in stocks, dikes, and sills. The Minturn Formation (Pennsylvania) consists of sandstone, grit, conglomerate, shale, and scattered beds of reefs and carbonate rocks. The Mississippian, Devonian, Ordovician, and Cambrian rocks include sandstone, limestone, dolomite and quartzite. The Precambrian consists of granite of approximately 1.7 million years of age.

Minerals

There are no mining claims of record with BLM, and no mining claims are known to exist within the proposed sale area. There are no mineral leases on the area. There is mining activity on the volcanic cinders to the west, but the nearest occurrence of cinders is a mile from this area.

Topography

Topography is moderately steep to steep. Some slopes are in excess of 40 percent with the majority of slopes being between 15 and 40 percent. The lowest elevation is Rock Creek near the Forest boundary, about 8,000 feet with the highest elevation of 10,400 feet occurring on Black Mountain. The average elevation is approximately 9,400 feet. Additional details on topography can be found in the Black Tail Multiple Use Environmental Impact Statement prepared by the Forest Service and the Black Mountain Forest Management Plan, prepared by the BLM.

Alluvial Valleys

No alluvial valleys exist in the proposed sale area.

4. The greatest potential for growth in lodgepole pine can be realized through clearcutting.

5. Economically, it is less costly to clearcut because greater volume per acre is harvested so cost per acre goes down and less labor is expended as opposed to marking for partial cutting. (David Tackle, Silvics of lodgepole pine (Revised) U.S.D.A., F.S. 1961)

For these reasons clearcutting is discussed as a valid alternative.

10. Biological Mass of Loblolly Pine. Loblolly Pine is the major species that would be harvested. An understanding of its biological characteristics helps in understanding the aspects of this alternative (see BLM Manual 5601.1).

11. Cutting and Removal. This action is carried out by bucking at the designated trees the stems with a chainsaw, removing the limbs and top, bucking the bole of the tree into logs lengths and dragging the logs to a central point, called a landing, where they can be loaded onto trucks for transportation to a sawmill. The logs will be moved to the landing point by means of a track-type tractor or rubber-tired skidder.

12. Transportation System. Approximately 22 miles of 12-foot wide roads, barricade, gravel or surfaced, maintained, and constructed for the purpose of removing logs.

Approximately 4 miles would be constructed on BLM and 18 miles on Tenneco lands. All road grades would be less than 8 percent except for two segments, one 1/2 mile long and one 2 miles long. A justification is included in appendix C. Refer to appendix D for road construction and design specifications.

Forest Service and BLM roads would be closed to public motor vehicle use, except for landowners, and administrative use.

13. Slash. Slash treatment would not be carried out until the sales have had time to dry out and burn up. Where a residual stand remains, treatment would be limited to lopping and scattering. Where necessary and if equipment is available, slash would be carried along the roadway. In some instances that piling and burning would be used to eliminate slash. In sensitive areas, concentrations may be machine piled for firewood or burning if not utilized for fuelwood. In the greatest number possible, slash and other cut material will be made available for firewood.

14. Cultural. Protections must be made in the sale contract to note and protect cultural resource encountered during operations under the contract.

Characterizing Alternatives

Unit attributes will affect resources such like the preferred alternative except for size of area, visual, soil, watershed, and wildlife habitat. See table V-1, Desired Levels of Water Tables Management Activities on Selected Environmental Components, 1981, BLM, Tiger Management E.I.S., 1978. The economic aspects would also be different. From a silvicultural point of view, clearcutting is a sound and practical way of growing mature and overmature Loblolly pine forests under management. There are several reasons for clearcutting:

1. Loblolly pine, in shade intolerant and regenerates best when overstory competition is removed.

2. Dwarf mistletoe, present in varying degrees, is best controlled by eliminating old and new stands.

3. Windfall, white ventilate, is always a threat in lodgepole pine forests.

10. Biological Needs of Lodgepole Pine. Lodgepole Pine is the major species that would be harvested. An understanding of its biological requirements helps in understanding the aspects of this alternative (see BLM Manual 5611.1).

11. Cutting and Removal. This action is carried out by cutting of the designated trees from the stump with a chainsaw, removing the limbs and top, bucking the bole of the tree into log lengths and dragging the logs to a central point, called a landing, where they can be loaded onto trucks for transportation to a sawmill. The logs will be moved to the landing point by means of a track-type tractor or rubber-tired tractor.

12. Transportation System. Approximately 19 miles of 14-foot wide road with turnouts would be surveyed, designed, and constructed for the purpose of transporting logs.

Approximately 4 miles would be constructed on BLM and 15 miles on Forest Service lands. All road grades would be less than 8 percent except for two segments, four to five hundred feet long, on BLM. A justification is included in appendix C. Also, refer to appendix C for road construction and design specifications.

Forest Service and BLM roads would be closed to public motor vehicle use, except for snowmobiles, and administrative use.

13. Slash. Slash treatment would not be carried out until the cones have had time to dry out and open up. Where a residual stand remains, treatment would be limited to lopping and scattering. Where necessary, and if equipment is available, slash would be chipped along the roadway. In some instances hand piling and burning would be used to minimize damage. In cleared openings, concentrations may be machine piled for firewood or burning if not utilized for fuelwood. To the greatest extent possible slash and other dead material will be made available for fuelwood.

14. Cultural. Provisions would be made in the sale contract to note and protect cultural resource encountered during operations under the contract.

Clearcutting Alternative

This alternative will affect resources much like the preferred alternative except for size of area, visual, soil, watershed, and vegetative habitat. See table V-1, Residual Impacts of Major Timber Management Activities on selected Environmental Components, USDI, BLM, Timber Management E.I.S., 1976. The economic aspects would also be different. From a silvicultural point of view, clearcutting is a sound and practical way of bringing mature and overmature lodgepole pine forests under management. There are several reasons for clearcutting:

1. Lodgepole pine, is shade intolerant and reproduces best when overstory competition is removed.

2. Dwarf mistletoe, present to varying degrees, is best controlled by separating old and new stands.

3. Windfall, while variable, is always a threat to lodgepole pine forests.

8. Wildlife Considerations. The Black Tail Land Use Plan and Environmental Impact Statement (USDA, Forest Service 1976) and the Black Mountain Timber Sale Plan appendix "C" (BLM) have identified management requirements and procedures to minimize impacts on wildlife habitat. These are summarized below as suitable requirements for timber harvest activities on all land covered in this analysis.

a. Snag Management. Snags, roost trees, and raptor nest trees will be left in partial cutting areas; this is optional for clearcut areas.

Each sale area will be examined by a wildlife biologist and forester prior to marking in order to identify specific valuable wildlife trees.

A buffer zone up to a quarter mile to restrict activity during the nesting season will be established around all snags with active raptor nests.

When available, three or more snags of varied height and diameter would be left per acre.

On the edge of clearcuts and adjacent to water areas all snags would be left. Vegetative edges and water sites are preferred sites for cavity nesters.

b. Wildlife Cover. Patchcuts will not exceed 40 acres and would be irregular in shape to maximize edge effect.

Adequate escape cover surrounding elk wallows, natural water holes, and big game travel ways will be maintained.

c. Aquatic and Riparian Habitat. Streamside vegetation would be managed to protect and maintain water quality. Managed strips of riparian vegetation would be left along all perennial streams. These will vary from 50 to 200 feet in width.

On Black, Whiskey, and Horse Creeks, buffer strips would be adequate to maintain water temperature, streambank stability, and act as sediment filters.

No equipment would be allowed in unmanaged buffer strips or streams except at approved crossings.

d. Vegetative Diversity. Manage aspen inclusions in the coniferous forest to perpetuate aspen on the site to enhance habitat diversity.

Apply a grass and forb seed mixture to road cuts and fills, landings, and permanently closed roads, when necessary.

e. Road Management. Road construction and timber management would be timed to reduce disturbance to elk, particularly during calving in June.

9. Visual Considerations. These include natural shaping of Patchcuts, reseeding, minimum road widths with minimum cuts and fills and partial cutting to maintain a green aspect.

LITTLE WHISKEY-SALE
proposed roads

-permanent
ogging Roads

: Existing 4WD
Roads

Proposed BLM
Temporary spur
roads.

R. 83 W.

b. Old Growth. Patchcut and group tree selection to eliminate mistletoe and stimulate reproduction, applies to all compartments.

c. Mixed Species Stands. Remove overmature trees and trees with poor form and vigor, applies to all compartments.

d. 21 acres in Compartment 54929. Remove dead volume and near dead and sanitize remaining stems.

e. 20 acres in Compartment 54930. Remove 15 to 20 percent of basal area in high wind risk-portion and 25 to 35 percent of basal area in moderate wind risk portion.

BLM Treatments. Stands numbered 112, 123, 130, 154, 154A, 158, and 159. Remove 30 percent of the basal area using individual tree selection and patch cuts for low windfall risk situations. This is an intermediate cut. In moderate windfall risk situations stands would be clearcut and not to exceed 5-acre blocks, or will be left untreated. See appendix B for stand locations.

Stand numbers 113, 114, 127, 128, 129, 155, 156, 157, 162, 163, 164, and 169. In low windfall risk situations remove 30 to 40 percent of the basal area with emphasis on removal of intermediates. This is a regeneration cut. Marking rules for individual tree selection will apply. In moderate windfall risk areas 30 percent of the basal area will be removed first. Low risk area marking rules apply. Provision will be made to salvage blowdowns. In high risk situations cleared openings (up to 5 acres) will be harvested. The remaining stand will be left uncut.

Stand 112 and pockets in stands already mentioned will have long clearcut perimeters along edge of mistletoe infections and interspersed clearcuts up to 10 acres in size on half the area. Remove the remaining stand within 10 years.

Stands numbered 118, 119, 120, 121, 122, 124, 125, 126, 153, 161, 165, 166, 167, 168, 170. These stands are pole stands and will be partially cut using an individual tree selection cut removing trees 8 and 9 inches diameter at breast height. Five to 8 inches diameter at breast height stands will not be treated now, but will be commercially thinned for poles later. See appendix B for more detail.

5. Road Locations. See map 2.

6. Regeneration and Revegetation. Reforestation will be by natural means. Silvicultural practices are designed to promote natural regeneration to an acceptable stocking level within 5 years. Cuts, fills and temporary spur roads and skid trails will be rehabilitated, as necessary, by broadcast seeding. The poundage per acre and species will be specified in the timber sale contract.

7. Streamside and Watershed Protection. Timber harvesting in buffer strips will generally be limited to that needed for public safety and control of insects and diseases. Occasional overmature trees may be selected for harvest to improve the stand. Carefully controlled, light selection cutting and thinning may be permitted where esthetics are kept in mind, but the area will not be clearcut. No tractor logging on slopes over 40 percent.

No Action Alternative

This alternative would represent the present status. No timber sales would be offered. No roads would be constructed and cooperation between agencies would not be needed. The timber resource would not be utilized and would not receive silvicultural management.

Preferred Alternative for an Integrated Timber Sale

An integrated BLM/Forest Service timber sale would offer for sale through public auction and sealed bids 7 million board feet of lodgepole pine, aspen, douglas-fir, subalpine fir saw timber and poles, for harvest. The sale would be carried out cooperatively between the Routt National Forest, Yampa Forest Service District and the Glenwood Springs Resource Area, Grand Junction District BLM. See appendix A for the details of the interagency agreement.

Sale Preparation and Layout

A management plan for the BLM and a land use plan for the Forest Service have analyzed layout criteria that considers silvical needs of the tree species and other resource values. Specific layout procedures and other resource considerations are identified in BLM Manual 5421 and in Forest Service Manual 2400. The layout will require the marking of trees with paint to designate the trees to be selectively harvested. In Patchcut areas the cutting area boundaries would be designated with posters and/or paint.

The layout also includes cruising, an estimate of the volume expressed in board feet of the standing trees to be harvested. This would be done on the ground using a statistical sampling method. The main layout considerations include the following:

1. Multiple Use Goals. Consider scenic quality, wildlife habitat, recreation, water soil, minerals, and fisheries as other important resources. Provide for the sale of fuelwood.

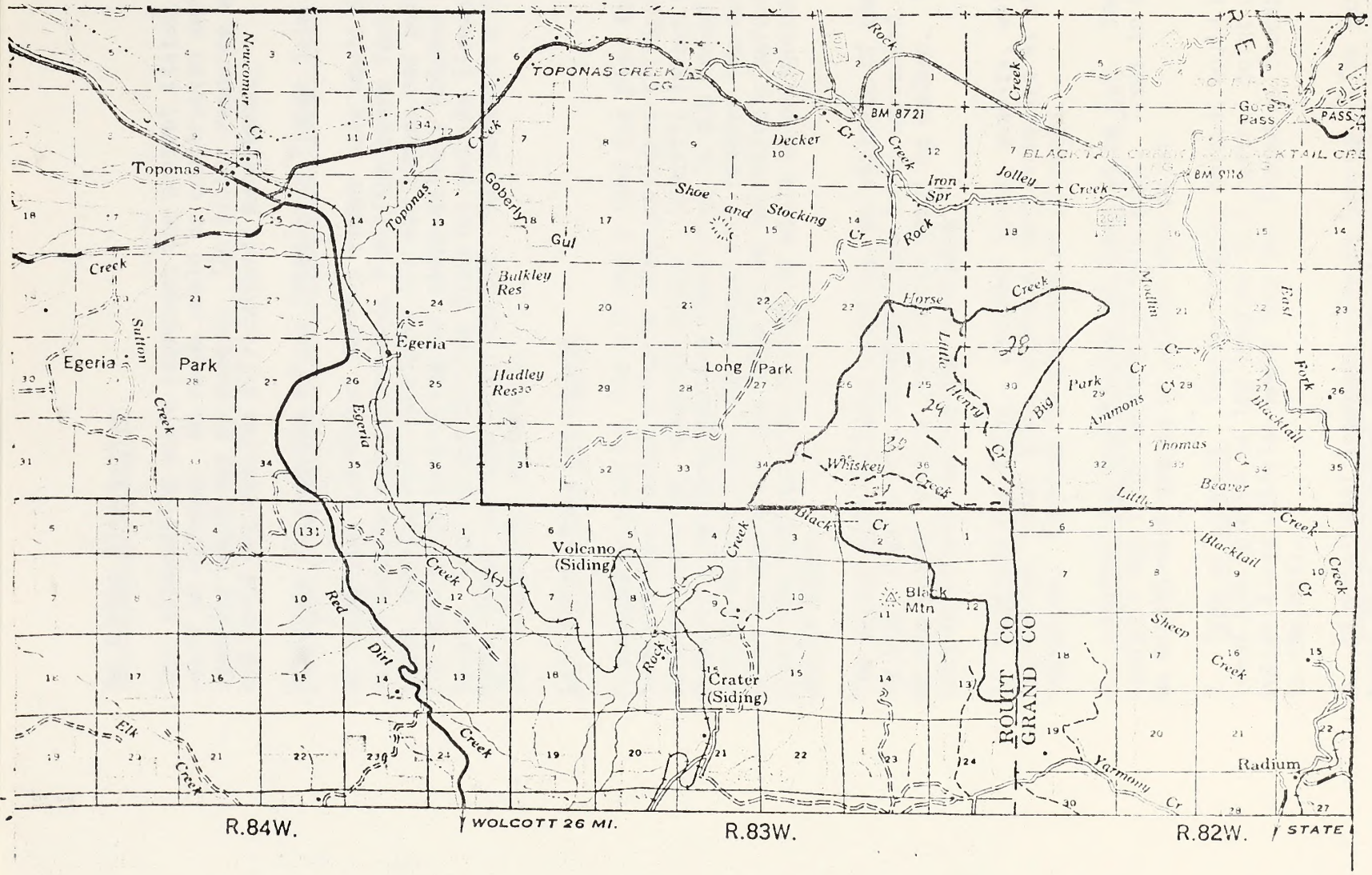
2. Location and Designation of Trees to be Cut. See environmental analysis map 1 for location of sale area. Trees to be harvested would be marked with orange or yellow tree paint.

3. Type of Logging. Tractor logging methods would be used in which trees are skidded in log lengths to a central point using track or rubber tired vehicles where they are loaded on trucks for transportation to the mill.

4. Silvicultural Treatment--Forest Service. The Forest Service would treat four management compartments containing a total of 1,213 acres. The following is a general summary of the cutting practices. A detailed description of the stands and treatments along with a location map are contained in appendix B.

a. Young and Old Growth. Remove high risk and overmature trees, applies to all compartments.

ENVIRONMENTAL ANALYSIS MAP / WHISKEY CREEK - BLACK MOUNTAIN



Black Mountain Little Whiskey Creek
Environmental Assessment for Integrated Forest Service and
Bureau of Land Management Timber Sale

PURPOSE OF AND NEED FOR THE ACTION

Background

As a result of the 1973 extensive forest inventory, plot classification and allowable cut plan, the Grand Junction District Bureau of Land Management (BLM) has identified certain timber lands as productive forest lands planned for harvest. The Yampa District, Forest Service action is developed in the Yampa District multiple use plan and consistent with Forest Objectives and Policy Guides (USDA, Forest Service 1970) and the Black Tail Land Use Plan and Environmental Impact Statement (USDA, Forest Service, 1976).

Authorizing Actions

The Forest Service Black Tail Land Use Plan and Environmental Impact Statement, the Black Mountain route analysis, Forest Service Manual 2400, and BLM Manual 5400 and 9113 were used to analyze and establish accepted criteria for this and similar actions. Alternatives considered fall within these accepted standards. Alternatives outside these standards were not considered.

The management of these stands would produce wood products, convert older stands to younger stands that will grow wood faster, and be more vigorous and resistant to insect and disease attack.

The proposed actions are intended to carry out management and harvest of forest resources on these lands and are to be consistent with each agencies' policies, plans, and directions mentioned. The preferred action was developed from information analyzed in the Black Tail Land Use Plan, Environmental Impact Statement and the Black Mountain Forest Management Plan (USDI, Bureau of Land Management 1980).

ALTERNATIVES

Three alternatives are considered for the Black Mountain-Little Whiskey Creek Timber Sale. The preferred alternative proposes an integrated BLM, Forest Service partial cut timber sale. The second alternative considers the same type of sale employing clear cutting methods as opposed to partial cutting techniques, and the third alternative is a no action alternative whereby timber resources would not be further utilized. Different cutting volumes were not considered alternatives since these are a function of sustained yields and technical and economic capabilities of the industry.

The general location of the Black Mountain-Little Whiskey Creek timber area is shown on map 1 and appendix A.

--UNITED STATES
DEPARTMENT OF THE INTERIOR

BUREAU OF LAND MANAGEMENT
GRAND JUNCTION DISTRICT

ACTIVITY _____
SERIAL No. _____

EA FACE SHEET

STATE : _____ DISTRICT : _____

COUNTY : _____ RESOURCE AREA: _____

ACTION : _____ PLANNING UNIT: _____

APPLICANT: _____ PROJECT NAME : _____

ADDRESS : _____ E.A. NUMBER : _____

_____ No. of Pages : _____

TEAM: NAME & INITIALS	TITLE	RESOURCE VALUES	HOURS
Dave Smith	Fisheries Biologist	Fisheries	8
Joe Kaelin	Engineer	Engineering	1
Dave Vesterby	Forester	Area Office Liaison and Review	

LEGAL DESCRIPTION

TOWNSHIP	RANGE	MERIDIAN	SECTION	SUBDIVISION	ACRES

_____ ENVIRONMENTAL COORDINATOR

_____ AREA MANAGER

_____ DATE

_____ DATE

_____ COMPLIANCE OFFICER

--UNITED STATES
DEPARTMENT OF THE INTERIOR

BUREAU OF LAND MANAGEMENT
GRAND JUNCTION DISTRICT

ACTIVITY 4310-4126
SERIAL No. _____

EA FACE SHEET

STATE :	Colorado	DISTRICT :	Grand Junction
COUNTY :	Routt	RESOURCE AREA:	Glenwood Springs
ACTION :		PLANNING UNIT:	Eagle
APPLICANT:		PROJECT NAME :	Little Whiskey Creek Black Mountain Timbersale
ADDRESS :		E.A. NUMBER :	CO-070-GSO-147
		No. of Pages :	80

TEAM: NAME & INITIALS	TITLE	RESOURCE VALUES	HOURS
L. Clifford Knapp	Team Leader	Forestry--Team Leader	160
John Kornfeld	Soil Scientist	Soils	24
Jim Scheidt	Hydrologist	Watershed	70
Gene Kinch	Range Conservationist	Range	16
John Crouch	Archaeologist	Cultural	2
Jim Wilkinson	Geologist	Minerals	20
Jim Keeton	Recreation Planner	Recreation	12
Rob Cleary	Landscape Architect	Visual	32
Doug McVean	Wildlife Biologist	Wildlife	56

LEGAL DESCRIPTION

(continued)

TOWNSHIP	RANGE	MERIDIAN	SECTION	SUBDIVISION	ACRES

ENVIRONMENTAL COORDINATOR

8/13/80
DATE

AREA MANAGER

Aug 5 1980
DATE

COMPLIANCE OFFICER

EA

Decision Notice
and
Finding of No Significant Impact

Black Mountain/Little Whiskey
Timber Sale
Routt and Grand Counties, Colorado

Routt National Forest
and
Glenwood Springs Area BLM

Based on the analysis and evaluation described in the attached Environmental Assessment, it is our decision to adopt the Partial Cut Alternative which will result in an integrated USDI Bureau of Land Management and USDA Forest Service timber sale in the Black Mountain/Little Whiskey Creek Area.

This alternative is preferred over the Clearcut and No Action alternatives because it provides the best compromise of effects on the various resources of the area. The Partial Cut Alternative will result in increased water yields, wood and forage productivity, social, and economic benefits.

Unavoidable adverse effects will be caused by dust and smoke particles in the air and by onsite erosion on roads and skid trails. In addition, an estimated 32 acres of land will be removed from production when roads are built.

The land area described in this Environmental Assessment has been previously analyzed in the Environmental Impact Statement and Blacktail Land Use Plan along with the Black Mountain Forest Management Plan. Both of these plans discuss the impacts and effects of timber harvest. Further analysis of the area for this Environmental Assessment has revealed no new information or data to indicate that these plans require revision. Our decision is consistent with these plans, and no new or amended Environmental Impact Statement will be prepared.

This proposal does not involve wetlands, flood plans, significcant effects on the human environment, or unprecedented actions. Therefore, implementation of this proposal will begin immediately. The Environmental Assessment is available for review at the offices of the responsible officials listed below.

Our decision may be appealed administratively by contacting us within 45 days of the date of this notice.

Lee Cave 11/21/80
DATE

Dave Jones
District Manager
BUREAU OF LAND MANAGMENT
50629 Highway 6 and 24
P. O. BOX 1009
GLENWOOD SPIRNGS, CO

(303) 945-2341

Jack Weissling 11/12/80
DATE

JACK WEISSLING
FOREST SUPERVISOR
ROUTT NATIONAL FOREST
137 10th Street
STEAMBOAT SPRINGS, CO 80477

(303) 879-1722

VII. Environmental Reporting

An environmental assessment (EA) will be prepared for an approved Black Mountain Forest Management Plan in Fiscal Year 1980 and prior to any action on the ground. This EA will cover the Forest Service portion of the joint sale scheduled in Fiscal Year 1981 and will be included herein upon completion. In addition an EA will be written for each sale or planned management action. A resource management environmental impact statement (EIS) will be completed for the Glenwood Springs Resource Area in 1983 and additional forest management data will be considered at that time.

VII. Environmental Reporting

An environmental assessment (EA) will be prepared for an approved Black Mountain Forest Management Plan in Fiscal Year 1980 and prior to any action on the ground. This EA will cover the Forest Service portion of the joint sale scheduled in Fiscal Year 1981 and will be included herein upon completion. In addition an EA will be written for each sale or planned management action. A resource management environmental impact statement (EIS) will be completed for the Glenwood Springs Resource Area in 1983 and additional forest management data will be considered at that time.

8. Assumptions

1) Duration and discount rate - A project life of 50 years is assumed. The Water Resources Council has specified that the discount rate to be used in this type of analysis during FY 80 is 7 1/8 percent.

2) Stumpage - For the major sales in 1981 and 1985, stumpage used is $25/MBF (ESO sale price minus $15 for road construction); for minor sales a $20/MBF stumpage is used ($40 minus $5 for road maintenance).

3) Fuelwood - Fuelwood harvest of 500 cords annually assumed for first 5 years, 250 cords annually after that, all prices at $5/cord.

4) "Multiple use" considerations - The value of "multiple use" benefits is assumed to equal the value of timber production lost due to multiple use (environmental) considerations, including partial cutting for visual benefit. This lost value is estimated at $8 MBF annually, prices at $20/MBF.

5) Utility values - Over the first 10 years of the plan, a 20 percent increase in the local population density of deer and elk is assumed, resulting in an annual increment of 1 deer and 1 elk. Each deer is valued at $240 and each elk at $1500. These are 1978 dollars of utility values (or values) in hand estimated upward at 50 percent.

6) Plan costs - The major plan costs are work months attributed to development of the LA and the main plan, cruising, sale administration, plan monitoring, and district work. Additional costs associated with the major sales include the acquisition of cooperators and consents for road survey and design. Work months are valued at $2,000.

7) Other direct project benefits - Tangible, but unquantified, benefits include:

a) Improved access (and thus reduced costs) for fire protection, road surveillance, and other BLM activities;
b) Increased potential for recreation use, especially in snowmobiles and hunters;
c) Improved livestock forage;
d) Watershed improvement due to greater protection.

B. Assumptions

1) Duration and discount rate - A project life of 50 years is assumed. The Water Resources Council has declared that the discount rate to be used in this type of analysis during FY 80 is 7 1/8 percent.

2) Stumpage - For the major sales in 1981 and 1985, stumpage used is $25/MBF ($40 sale price minus $15 for road construction); for other sales a $35/MBF stumpage is used ($40 minus $5 for road maintenance).

3) Fuelwood - Fuelwood harvest of 500 cords annually assumed for first 8 years, 167 cords annually after that, all priced at $5/cord.

4) "Multiple use" constraints - The value of "multiple use" benefits is assumed to equal the value of timber production lost due to multiple use (environmental) constraints, including partial cutting for visual benefit. This lost value is estimated at 68 MBF annually, priced at $35/MBF.

5) Wildlife values - Over the first 10 years of the plan, a 20 percent increase in the local population density of deer and elk is assumed, resulting in an annual increment of 3 deer and 1 elk. Each deer is valued at $240 and each elk at $1900. These are 1975 Division of Wildlife values per animal in herd adjusted upward by 50 percent.

6) Plan costs - The major plan costs are work months attributed to development of the EA and the sale plan, cruising, sale administration, plan monitoring, and clerical work. Additional costs associated with the major sales include the employment of temporaries and payments for road survey and design. Work months are valued at $2,000.

7) Other direct project benefits - Tangible, but unquantified, benefits include:

   a) Improved access (and thus reduced costs) for fire protection, range supervision, and other BLM activities;
   b) Increased potential for recreation use, especially by snowmobilers and hunters;
   c) Improved livestock forage;
   d) Watershed improvement due to greater snowpack.

TABLE VI-1

BENEFIT - COST ANALYSIS, BLACK MOUNTAIN FOREST MANAGEMENT PLAN

	BENEFITS									COSTS				
	(1) TIMBER SALE	(2) TIMBER VALUE	(3) FUELWOOD VALUE	(4) "MULTIPLE USE" VALUE	(5) WILDLIFE VALUE	ANNUAL 2+3+4	SUMS 2+3+4+5	PRESENT 2+3+4	VALUES 2+3+4+5	ALL COSTS	VARIABLE COSTS	PRESENT ALL COSTS	VALUE VAR.COSTS	PRESENT VALUE FACTORS
	(MBF)	dollars												
1980	--	--	--	--	--	--	--	--	--	56,000	23,000	52,270	21,468	.9334
1981	3,000	75,000	2,500	2,380	2,620	79,880	82,500	69,607	71,891	6,000	--	5,228	--	.8714
1982	50	1,750	2,500			6,630	9,250	5,393	7,524	8,000	--	6,507	--	.8134
1983	50	1,750	2,500			6,630	9,250	5,034	7,024	8,000	--	6,074	--	.7593
1984	50	1,750	2,500			6,630	9,250	4,699	6,556	50,000	19,000	35,440	13,467	.7088
1985	2,000	50,000	2,500			54,880	57,500	36,314	38,048	8,000	--	5,294	--	.6617
1986	50	1,750	2,500			6,630	9,250	4,095	5,714	8,000	--	4,942	--	.6177
1987	50	1,750	2,500			6,630	9,250	3,823	5,334	26,000	7,125	14,992	4,108	.5765
1988	750	26,250	2,500			31,130	33,750	16,754	18,164	14,000	2,375	7,535	1,278	.5382
1989	283	9,905	833			13,118	15,738	86,603	87,919	14,000	2,375	92,426	15,679	.5024
1990							13,118							13.1406
SUM OF PRESENT VALUES								232,322	248,174			230,708	56,000	

BENEFIT - COST RATIOS

A) $\frac{\text{DIRECT BENEFITS (minus Wildlife)}}{\text{ALL COSTS}} = \frac{232,322}{230,708} = 1.01$

B) $\frac{\text{ALL DIRECT BENEFITS}}{\text{ALL COSTS}} = \frac{248,174}{230,708} = 1.08$

C) $\frac{\text{DIRECT BENEFITS (minus Wildlife)}}{\text{VARIABLE COSTS}} = \frac{232,322}{56,000} = 4.15$

D) $\frac{\text{ALL DIRECT BENEFITS}}{\text{VARIABLE COSTS}} = \frac{248,174}{56,000} = 4.43$

VI. Economic Analysis of the Black Mountain Forest Management Plan

A. Analysis

Benefit-to-cost ratios and the figures used in their calculation are found on Table VI-1. Listed benefits are limited to those quantifiable results that are directly attributable to the management plan. Benefits to wildlife are left out of two of the ratio calculations (A&C) because they cease to increase after the first 10 years and because the wildlife values used are more subjective than the other values. Variable costs have been isolated simply to demonstrate those costs items which would occur solely because of this plan. In other words, while the clerical and professional services of the permanent staff are charged against the plan, they are in fact costs that BLM will incur regardless of the plan's implementation. The data of the benefits-to-variable-cost ratios (C&D) indicates the relatively limited marginal of existing staff and materials required for implementation of the plan. In any event, excluding wildlife benefits and including all costs, ratio A indicates that the plan would still pay for itself.

In addition to the benefits listed in Table VI-1, implementation of this plan would involve some more intangible economic benefits. The harvest of timber from this area would help sustain that portion of the regional economy dependent on the wood products industry. An input-output model of the region, recently developed for BLM use, indicates that for every million board feet of timber harvested, 11 man-years of employment and $500,000 in business activity are generated in the local economy. Under the Black Mountain Plan, 2.6 MBF would be harvested annually for the first 3 years, 283 MBF each year thereafter. These harvest levels would be associated with employment of 4 people and business activity of about $[illegible],000 annually for the first 3 years, and 3 employees and $[illegible],000 of business activity for the remaining years. 2/

1/ An Input-Output Study of the Upper Colorado Mainstream Region of Western Colorado, by Alan Nelson, Colorado State University, and J.C. Mathes, Colorado School of Mines.

2/ These results assume a timber products price of $300/MBF which was derived from BLM Instruction Memorandum No. 80-305 (2/20/80), Indices, Adjustment Factors, Appraisal Values.

VI. Economic Analysis of the Black Mountain Forest Management Plan

A. Analysis

Benefit-to-cost ratios and the figures used in their calculation are found on Table VI-1. Listed benefits are limited to those quantifiable results that are directly attributable to the management plan. Benefits to wildlife are left out of two of the ratio calculations (A&C) because they cease to increase after the first 10 years and because the wildlife values used are more subjective than the other values. Variable costs have been isolated simply to demonstrate those cost items which will occur solely because of this plan. In other words, while the clerical and professional services of the permanent staff are charged against the plan, they are in fact costs that BLM will incur regardless of the plan's implementation. The size of the benefit-to-variable-cost ratios (C&D) indicates the relatively limited purchase of outside staff and materials required for implementation of the plan. In any event, excluding wildlife benefits and including all costs, ratio A indicates that the plan would still pay for itself.

In addition to the benefits listed in Table VI-1, implementation of this plan would involve some more extended economic benefits. The harvest of timber from this area would help sustain that portion of the regional economy dependent on the wood products industry. An input-output model of the region, recently developed for BLM use 1/, indicates that for every million board feet of timber harvested, 11 man-years of employment and $600,000 in business activity are generated in the local economy. Under the Black Mountain Plan, 375 MBF would be harvested annually for the first 8 years, 283 MBF each year thereafter. These harvest levels would be associated with employment of 4 people and business activity of about $225,000 annually for the first 8 years, and 3 employees and $170,000 of business activity for the remaining years. 2/

1/ An Input-Output Study of the Upper Colorado Mainstream Region of Western Colorado, by J.R. McKean, Colorado State University, and J.C. Welser, Colorado School of Mines.

2/ These results assume a timber products price of $300/MBF which was derived from BLM Instruction Memorandum No. 80-305 (2/20/80), Indices, Adjustment Factors, and Lumber Selling Values.

VI. Economic Analysis of the Plan [illegible]

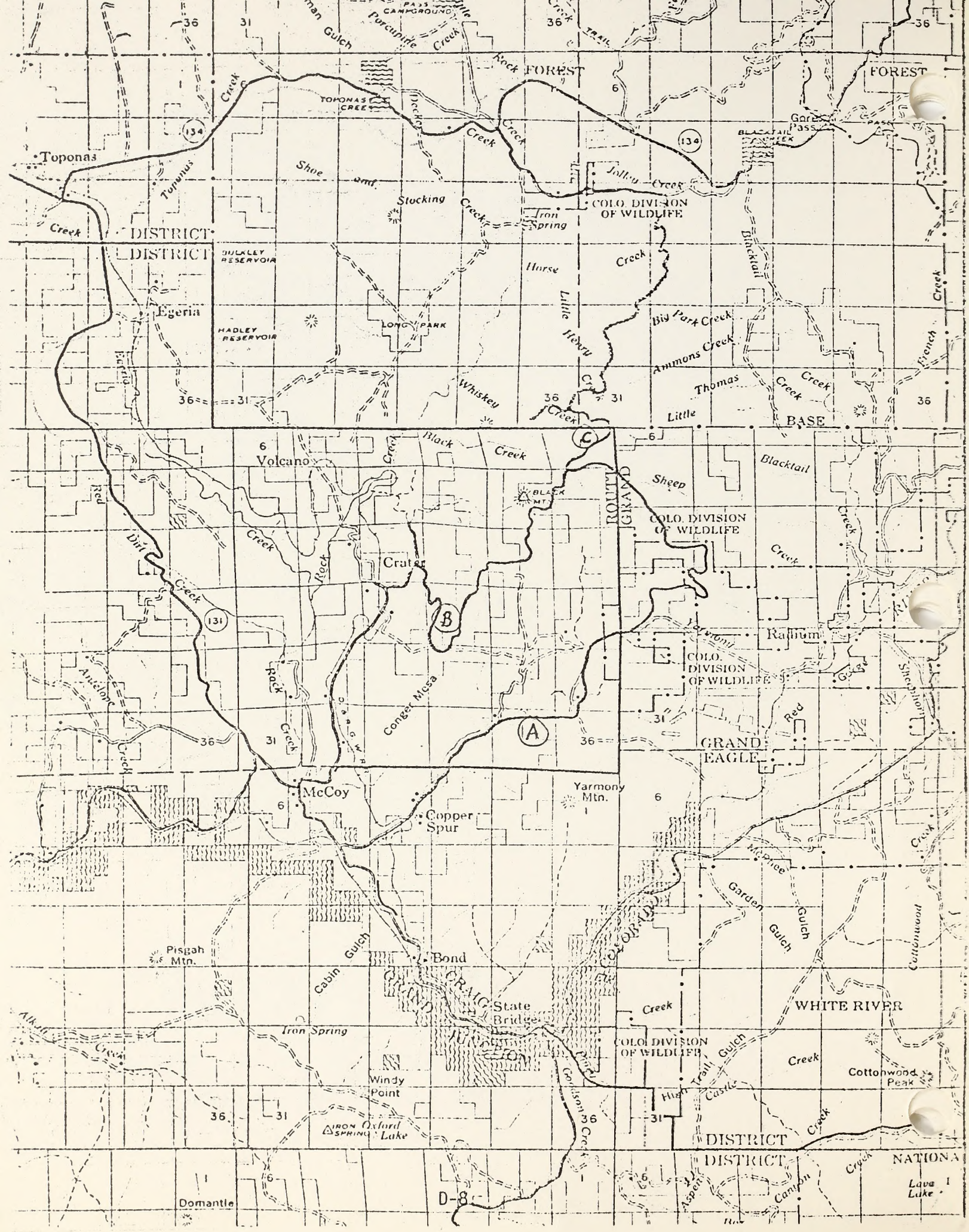
A. Analysis

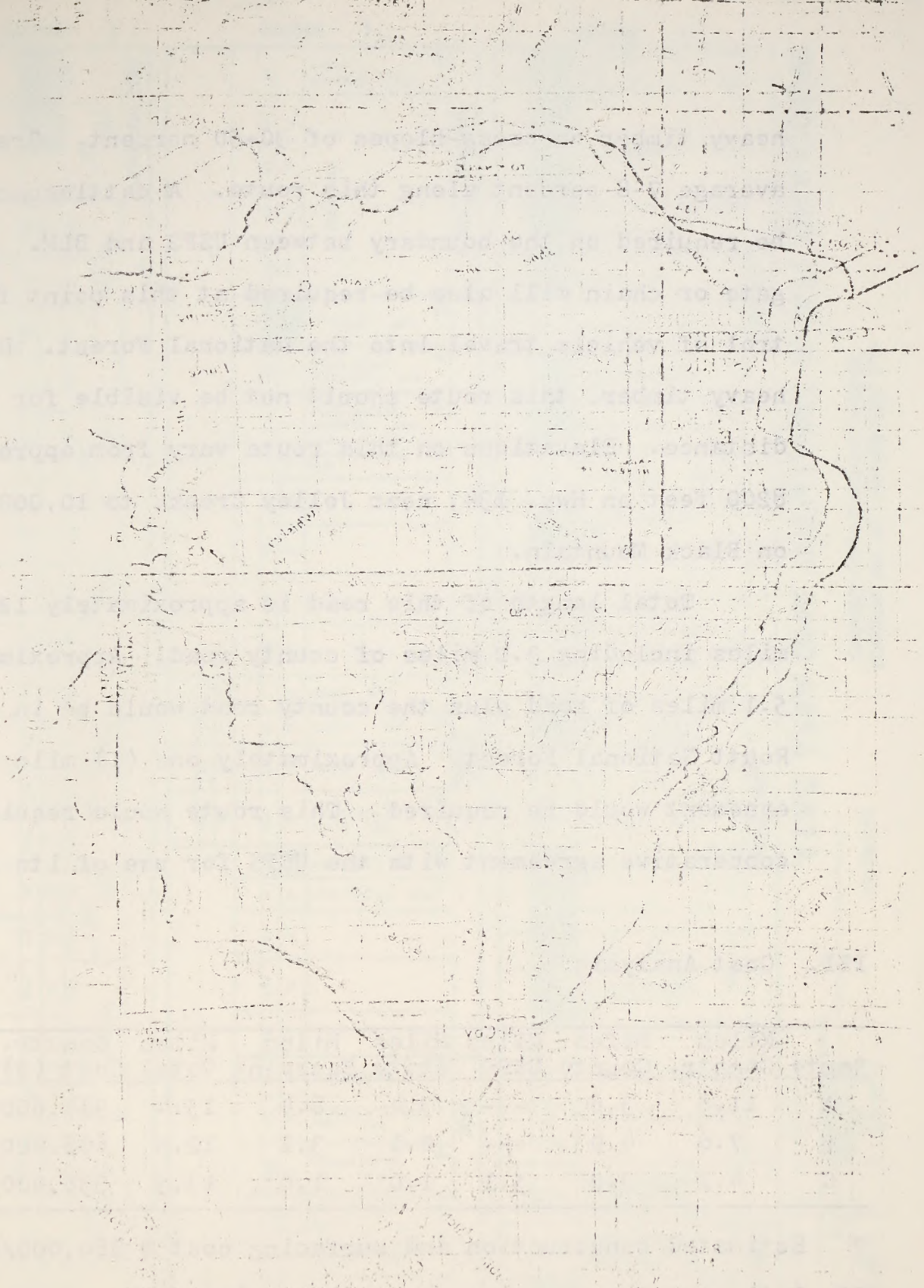
Benefit-to-cost ratios [illegible]
lation are found on Table VI-1. [illegible]
to those quantifiable [illegible]
to the management plan. [illegible]
of two of the ratio calculation [illegible]
to increase after one [illegible]
values used are more [illegible]
costs have been [illegible]
items which will [illegible]
works, while the [illegible]
permanent staff are [illegible]
fact costs like [illegible]
elementation. The [illegible]
(CRD) indicates [illegible]
staff and material [illegible]
in any event, [illegible]
costs. [illegible]
[illegible]

In addition [illegible]
of this [illegible]
fits. The [illegible]
gain the [illegible]
wood products [illegible]
presently [illegible]
mitigation [illegible]
men and the [illegible]
local economy. [illegible]
be harvested [illegible]
therefore [illegible]
employment [illegible]
also in the [illegible]
of business [illegible]

1/ [illegible]

2/ [illegible]
[illegible]
[illegible]


Toponas
Egeria
Volcano
Crater
McCoy
Copper Spur
Yarmony Mtn.
Bond
State Bridge
Pisgah Mtn.
Windy Point
Oxford Lake
Domantle
Cottonwood Peak
Lava Lake
Radium
GRAND EAGLE
WHITE RIVER
DISTRICT
FOREST
BASE
COLO. DIVISION OF WILDLIFE
HADLEY RESERVOIR
DULKLEY RESERVOIR
LONG PARK
Conger Mesa
Shoe Shop
Stocking Creek
Iron Spring
Horse Creek
Little Henry Creek
Big Park Creek
Ammons Creek
Thomas Creek
Blacktail Creek
Sheep Creek
Black Creek
Rock Creek
Dirt Creek
Red Creek
Anvilone Creek
Toponas Creek
Porcupine Creek
Decker Creek
Jolley Creek
Whiskey Creek
Garden Gulch
McPhee Gulch
Cottonwood Creek
Cabin Gulch
High Trail Gulch
Castle Creek
Canyon Creek
Aspen Creek
French Creek
Gore Pass
Shechinom
Lavoni
Gore
Gorrison Creek
GRAND JUNCTION
COLORADO
ROUTT
CRAIG
NATIONA
A
B
C
D-8



heavy timber on cross-slopes of 30-50 percent. Grades will average 7-8 percent along this route. A cattleguard would be required on the boundary between USFS and BLM. A steel gate or chain will also be required at this point for control of vehicle travel into the National Forest. Due to heavy timber, this route should not be visible for any distance. Elevations on this route vary from approximately 8200 feet on Hwy. 134, near Jolley Creek, to 10,000 feet on Black Mountain.

Total length of this road is approximately 12.5 miles including 3.2 miles of county road. Approximately 5.1 miles of road plus the county road would be in the Routt National Forest. Approximately one (1) mile of easement would be required. This route would require a cooperative agreement with the USFS for use of its land.

III. Cost Analysis

Route	Miles Constr.	Miles County	Miles USFS	Miles State	Miles Easement	Miles Total	Constr. Cost ($)*	Maint. Cost ($)**
A	11.8	3.6	---	3.4	8.4	15.4	944,000	2360
B	7.6	4.9	---	0.1	3.1	12.5	608,000	1520
C	4.2	3.2	5.1	1.0	1.0	13.5	336,000	840

* Estimated construction and surfacing cost @ $80,000/mile

** Estimated annual maintenance cost @ $200/mile

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

ENTERED BY: _____

NAME _____

ENTRY DATE 1 33 8518				YR. OF NEXT SURVEY 34 5827 2	
YR	MO	DAY		YR	
x x	x x	x x		x x	

WOODLAND STAND TREATMENT AND AREA DATA

RECORD 1

LOCATION											AREA DATA													STAND ACCESS				DATA SOURCE				
3	4	5	6	7	8	9	10	11	12		13	14	15		16	17	18	19	20				21	22	23	24	25				27
TRANSACTION CODE 6196	SUBUNIT OR BLOCK 5707	STAND NUMBER 5921	STATE GEO. 0690	DISTRICT 0543	MASTER UNIT 5891	COUNTY OR BOROUGH 0546	RESOURCE AREA 041B	PLANNING UNIT 1075	STATE ADMINISTRATIVE 0004		FOREST OWNER CLASS 5903	ACRES STAND 6520	GROUND LAND USE 6311 PRESENT	PAST	LAND FORM 5132	PHYSIOGRAPHY 5747	SLOPE PERCENT 3874	ASPECT 6523	ELEVATION MIDPOINT HUNDREDS OF FEET 0431				NEAREST USABLE ROAD STRAIGHT LINE DIST. 1/10th OF MILE 5904	NEAREST USABLE ROAD AS CONSTRUCTED 1/10th OF MILE 5905	ACCESS RIGHTS 7529	ACCESS TYPE 7528	5909 DATE OF SOURCE DATA 8518 YR	MO	26		
1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	32
x	xxxx	xxxx	xx	xx	xx	xxx	xx	xx	xx	xx	x	xxxx	xx	xx	xxx	x	xxx	x	xxx	xx	xx	xx	xxx	xxx	xx	xxxx	xx	xx	xx		

RECORD 2

HABITAT TYPE 29													PROBLEM CONDITION									TPCC											
28					30	31	32	33					34	35	36	37	38	39				40	41	42	40	41	42	40	41	42	43	44	
HABITAT REFERENCE 5719	TYPE 6533				KEY VALUE 5913	STAND COVER CONDITION 5914	STAND STOCKING CONDITION 6153	STAND CONDITION 5787					TREND 5716	SEVERITY 6021	DAMAGE 6023	PERCENTAGE OF STAND 5715	SEED SOURCE 5865	CONE SEROTINY 5931				MGT. DECISION 5817	PROBLEM SITE CLASS FIRST 5816	PERCENTAGE OF AREA 5715	MGT. DECISION 5819	PROBLEM SITE CLASS SECOND 5818	PERCENTAGE OF AREA 5715	MGT. DECISION 5821	PROBLEM SITE CLASS THIRD 5820	PERCENTAGE OF 5715	PERCENTAGE OF STAND AFFECTED BY PROBLEMS 5715	NON PROBLEM PERCENTAGE 5715	
12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41	42	43	44	45
xx	xx	xx	xx	xxxx	xx	xx	xx	x	xx	xx	xx	xxx	x	x	xx	xxx	x	x	xx	xxx	xx	x	xx	xxx	x	xx	xxx	x	xx	xxx	xxx	xxx	
													46	47	48	49																	
													x	x	xx	xxx																	

RECORD 3

PAST TREATMENT 45																																	
FIRST			SECOND			THIRD			FOURTH			FIFTH			SIXTH			SEVENTH			EIGHTH			NINTH			TENTH						
5834	5830 YR	5830 MO	5834	5830 YR	5830 MO	5834	5830 YR	5830 MO	5834	5830 YR	5830 MO	5834	5830 YR	5830 MO	5834	5830 YR	5830 MO	5834	5830 YR	5830 MO	5834	5830 YR	5830 MO	5834	5830 YR	5830 MO	5834	5830 YR	5830 MO				
12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41	42			
xxx	xx	xx	xxx	xx	xx	xxx	xx	xx	xxx	xx	xx	xxx	xx	xx	xxx	xx	xx	xxx	xx	xx	xxx	xx	xx	xxx	xx	xx	xxx	xx	xx				

RECORD 4

RECOMMENDED TREATMENT IN ORDER OF NEED 46									
FIRST		SECOND		THIRD		FOURTH		FIFTH	
5835	6513 YEAR	5835	6513 YEAR	5835	6513 YEAR	5835	6513 YEAR	5835	6513 YEAR
12	13	14	15	16	17	18	19	20	21
xxx	xxxx	xxx	xxxx	xxx	xxxx	xxx	xxxx	xxx	xxxx

REMARKS

ABCDEFGHIJKLMNØPQRSTUVWXYZ 1234567890

FLIGHT NUMBER | ROLL NUMBER | FRAME NUMBER

Entered by: _____ NAME

1 ENTRY 8518 37				2 RE-EVALUATION DATE 5827 38	
YR	MO	DAY		YR	
xx	xx	xx		xx	

UNITED STATES
DEPARTMENT OF THE INTERIOR
BUREAU OF LAND MANAGEMENT

WOODLAND STAND SUMMARY RECORD

LOCATION

LEVEL 1	3 TRANSACTION CODE 6196	4 SUBUNIT BLOCK 5707	5 STAND 5921	6 STATE GEOGRAPHY 0690	7 DISTRICT 0543	8 MASTER UNIT 5891	9 COUNTY OR BOROUGH 0546	10 RESOURCE AREA 0418	11 PLANNING UNIT 1075	12 STATE ADM 0004		13 MERIDIAN 1703	14 TWP 1695 WHOLE	14 TWP 1695 FRACTION	14 TWP 1695 DIRECTION	15 RANGE 1699 WHOLE	15 RANGE 1699 FRACTION	15 RANGE 1699 DIRECTION	16 SECTION TRACT 2506
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19
	x	xxxx	xxxx	xx	xx	xx	xxx	xx	xx	xx	xx	xx	xxx	x	x	xxx	x	x	xxx

DATA SOURCE

LEVEL 1	17 ACRES STAND 8520	18 DATA SOURCE 5909	19 DATE 8518 YEAR	19 DATE 8518 MONTH	20 VEGETATIVE SUB TYPE 2706		21 SITE CLASS TYPE 5926	21 SITE CLASS SITE 5751	22 SITE INDEX TYPE 5927	22 SITE INDEX SITE 5750	23 BAS BASAL AREA STANDARD 6142	
	20	21	22	23	24	25	26	27	28	29	30	31
	xxxx	xx	xx	xx	xx	xx	x	xx	x	xxx	xxx	

STAND DESCRIPTION

LEVEL 2	24 STAND COMPONENT 5928	25 SPECIES 6100	26 SPECIES 6100	27 SPECIES 6100	28 SIZE CLASS TYPE 5875	28 SIZE CLASS CLASS 5810	29 STOCKING CLASS 5770	30 BIRTH DATE (YEARS) EVEN AGE STAND OR START OF AGE RANGE IN UNEVEN AGE STAND 5812	30 BIRTH DATE (YEARS) DECADES IN UNEVEN AGES RANGE 5912	31 BASAL AREA PER ACRE 5781	32 DIAMETER 5930 MINIMUM	32 DIAMETER 5930 AVERAGE	32 DIAMETER 5930 MAXIMUM	33 HEIGHT MINIMUM 5495	33 HEIGHT AVERAGE 5799	33 HEIGHT MAXIMUM 5929	NO OF TREES PER ACRE 5494
	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27
	x	xxx	xxx	xxx	x	x	x	xxxx	xx	xxx	xxxx	xxxx	xxxx	xxx	xxx	xxx	xxxx
	31	32	33	34	35	36	37	38	39	40	41	42	43	44	45	46	47
LEVEL 3	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27
	31	32	33	34	35	36	37	38	39	40	41	42	43	44	45	46	47

VOLUME PER ACRE

LEVEL 4	34 SPECIES 6100	35 TYPE OF VOLUME 5908	36 UNIT OF MEASURE 5872	37 PRODUCTS 5759	38 VOLUME 5871
	11	12	13	14	15
	xxx	x	xx	xx	xxxxx
	21	22	23	24	25
	31	32	33	34	35
	41	42	43	44	45
LEVEL 5	11	12	13	14	15
	21	22	23	24	25
	31	32	33	34	35

REMARKS

ABCDEFGHIJKLMNØPQRSTUVWXYZ 1234567890

STAND 120	T 4 S	R 85 W	ACRES- 30	DATE- 10/5/79	TYPE- PPJW	PLOT # 171 C

Sec 24 Eagle

SPP.	DIAMETERS G.D.	DIAMETERS S.D.	HEIGHT	CROWN FACTOR	#.STEMS	OTHER POTENTIAL USES X-MAS	STAY	LINE	CORNER	REMARKS
P	13	12	27	1.2						
J	8	9	12	1.2	2					
J	14	14	19	1	1		1			
P	12	11	26	1						
J	6	6	9	1	1		1			
P	14	14	31	1						
J	9	8	17	1	1			1		

TRAIL DIR.	TREESPACE	UNDERSTORY COMP.	REGENERATION	GROUND TEXTURE	PHYSIOGRAPHY	ACCESS TYPE	KEY VIEW
	XX	XX	XX	XX	X	XXXX	XX
J	20	21	22	31	6	JPOI	10

TREE KIND CONDITION	STAND COMP.	PROBLEM CONDITIONS: (NOTE)-TO BE USED ONLY IF REAL PROBLEM COND. EXIST TREND	SEVERITY	DAMAGE	% OF STAND
	X	X	X	XX	XXX
	4				

SPP.	TREE #	CORDS PER ACRE UNCORRECTED	PINYON	JUNIPER	TOTAL

ERKS: P-12" diam 168 yrs.

40% slope

P- 9.0

J- 2.7