

Table D-2. (Cont.)

Alternative	Output	Type of Constraint*	Con-straint	Units**	Decade Binding
	RANGE				
	Livestock Grazing	GE	3,270.0	MAUM/Decade	2-3
	WILDLIFE				
	Aspen Habitat Improvement	LE	20,300.0	Acres/Decade	4,5
		GE	8,300.0	Acres/Decade	1-3
	Prescribed Burning	LE	60,000.0	Acres/Decade	2-5
		GE	50,000.0	Acres/Decade	1
9	TIMBER				
	Total Volume	GE	44.0	MMCF/Decade	1
			22.0	MMBF/Yr	
	Aspen Volume	LE	4.0	MMCF/Decade	1-5
			2.0	MMBF/Yr	
	Spruce-Fir Volume	LE	33.6	MMCF/Decade	1,2,4,5
			16.8	MMBF/Yr	
	Acres Clearcut Spruce-Fir	EQ	0.0	Acres/Decade	1-5
	Volume Allowed Full Road Analysis Area	LE	7.0	MMCF/Decade	1,2,4,5
			3.5	MMBF/Yr	
	Volume Allowed High Road Analysis Area	LE	10.5	MMCF/Decade	1-5
			5.2	MMBF/Yr	
	WILDLIFE				
	Aspen Habitat Improvement	LE	5,000.0	Acres/Decade	3-5
		GE	4,000.0	Acres/Decade	1,2
	Prescribed Burning	LE	23,500.0	Acres/Decade	1-5

\* LE = Less Than or Equal To

GE = Greater Than or Equal To

EQ = Equal To

\*\*MMCF/Decade = Million Cubic Feet/Decade

MMBF/YR = Million Board Feet/Year

MAUM/Decade = Thousand Animal Unit Month/Decade

**APPENDIX E**

**PRESENT NET VALUE TRADE-OFF ANALYSIS**

## PRESENT NET VALUE TRADE-OFF ANALYSIS

### THE PRESENT NET VALUE DIFFERENCE

Each alternative is economically efficient in terms of PNV and benefit/ cost ratio. Present Net Value is total benefits minus total costs associated with providing outputs. Present Net Value is a useful measure, however, it is only a partial alternative evaluation tool.

A qualitative assessment is also important. To conduct this assessment non-monetary benefits are considered. Net Public Benefit (NPB) is the overall effect of monetary and non-monetary costs and benefits.

The PNV analysis includes all costs required to manage the Forest. It also includes benefit values for recreation, wilderness use, wildlife, range, timber, and water. Other benefits are produced that are not recognized in the PNV calculation.

Table E-1 displays PNV and resource benefits by alternative.

Some costs are included in the PNV analysis but are assigned no direct public benefits. The unique goals to each alternative are presented in Chapter II. Goals common to each alternative are displayed in Appendix H. Table E-2 displays activities that produce public benefits not recognized in the PNV calculation.

TABLE E-1.

PRESENT NET VALUE TRADE-OFF ANALYSIS  
(Summary All Decades, Million 1978 Dollars)  
7 1/8% Discount Rate

	Alternative										
	BM2	BM3	Highest PNV						Lowest PNV		
			9	2	6	7	8	5	4	1	3
Discounted Costs (PVC)	86.3	65.9	62.9	88.2	82.4	92.3	95.8	95.3	88.0	99.1	108.3
Discounted Benefits (PVB)	183.4	183.4	166.3	173.3	167.2	175.2	178.4	177.7	168.6	177.6	182.6
Present Net Value, Incremental (PNV)	97.1	117.5	103.7	85.1	84.8	82.9	82.5	82.4	80.6	78.6	74.3
difference in PNV (from BM3)			-13.8	-32.4	-32.7	-34.6	-35.0	-35.1	-36.9	-38.9	-43.2
difference in PVC (from BM3)			-3.0	+22.3	+16.5	+26.4	+29.9	+29.4	+22.1	+33.2	+42.4
difference in PVB (from BM3)			-17.1	-10.1	-16.2	-8.2	-5.0	-5.7	-14.8	-5.8	-0.8
Contributions made to Total											
Discounted Benefits by Resources											
Timber		10.3	7.5	9.3	4.1	9.5	12.0	11.9	4.2	11.9	13.7
Range		57.8	45.5	47.2	45.4	48.9	47.8	48.9	45.3	47.6	48.0
Recreation											
Developed		28.4	26.5	28.5	30.4	28.5	30.4	28.5	32.3	29.9	32.2
Dispersed		16.7	16.9	16.8	16.9	16.8	16.4	16.8	16.4	16.4	16.9
Winter sports		24.1	24.1	24.1	24.1	24.1	24.1	24.1	24.2	24.2	24.2
Wilderness		14.9	14.9	14.9	14.9	14.9	14.9	14.9	14.9	14.9	14.9
Wildlife		31.0	28.8	30.1	29.2	30.1	29.9	30.1	29.1	30.2	30.2
Water		.2	2.1	2.2	2.2	2.4	2.9	2.5	2.2	2.5	2.5

TABLE E-2.

MANAGEMENT ACTIVITIES THAT PRODUCE NON-PRICED PUBLIC BENEFITS  
(Total for 50-year Planning Horizon)

Activity	Alternative									
	BM3	9	6	2	4	8	7	5	1	3
Developed Recreation Management Level (% FSM/RSM)	0/100	0/100	42/58	45/55	58/42	58/42	31/69	31/69	45/55	45/55
Trail Construction and Reconstruction (Miles)	0	0	2450	750	2450	750	750	750	2450	2120
Wilderness Management Thousand Acres (% FSM/RSM)	502 0/100	502 0/100	550 60/40	502 20/80	581 60/40	516 40/60	581 60/40	502 20/80	516 60/40	502 20/80
Fish Structure (Number)	0	0	2000	2100	2000	2000	2000	1750	2000	2000
Soil and Water Resources Improve. (Acres)	0	0	2600	3500	2600	5500	3000	5500	3200	3200
Insect and Disease Surveys (Thousand Acres)	0	0	390	205	390	205	235	165	205	205

Activities producing non-priced public benefits include trail construction, developed recreation management level, wilderness management level, prescribed burning, fish structures, and soil and water resource improvements.

Average trail construction cost is \$9,000 per mile. Trail construction varies from 0 to 2,450 miles over the 50-year planning horizon. No increased recreation use was assumed. A constant dispersed recreation value is used in the analysis. No change in discounted benefits is measured. Real benefit increases will include increased resource protection, increased safety, better recreation distribution, lower recreation density, and increased recreation quality.

Developed recreation management level includes site administration, operation, and maintenance. Management level varies from 0 to 58% Full Service Management Level in the alternatives. A constant developed recreation value is used in the analysis. Higher Reduced Service Management Level will lead to a shorter site life and an earlier capital reinvestment need. Capital reinvestment costs are not considered in the analysis. Real benefit increases from the higher Full Service Management level include increased resource protection, increased recreation quality, and decreased capital reinvestment need.

Wilderness management includes administration, operation, and maintenance. Management level varies from 0 to 60% Full Service Management level in the alternatives. A constant wilderness value is used in the analysis. Real benefit values attributable to Full Service Management but not included in the analysis include increased resource protection, increased public safety, and increased wilderness recreation quality.

Wilderness varies for 501,777 to 581,167 acres in the alternatives. Wilderness management costs are more than \$1.00 per acre higher than for non-wilderness management. Alternatives 1, 4, 6, and 7 have relatively high wilderness management level and acres. These differences are not reflected in total discounted benefits.

National Forest System winter range carrying capacity varies by alternative. Greater capacity reduces the current conflict encountered by big game using National Forest System summer range and other ownership winter range. This public benefit is not recognized in PNV. The management costs are included in the analysis .

Fish structures constructed vary from 0 to 2,000 over the 50-year planning horizon in the alternatives. These structures are necessary to mitigate damage and protect and enhance habitat. No increase in recreation numbers or change in recreation value was used in the analysis. The cost differences, however, were accounted for in the analysis.

Surveys vary from 0 to 2.3 million acres over the 50-year planning horizon in the alternatives. Protection activities contribute indirectly to benefits. Only costs are reflected in the PNV analysis.

Alternatives were constructed to address public issues and management concerns. Analytical constraints reflecting those issues and concerns were applied to alternatives in the FORPLAN model. The objective function was always the same, to maximize PNV. The set of constraints that least interfered with maximization produced the highest PNV. Alternative 9 goals required the least constraint on the objective function. The constraints on other alternatives led to greater trade-off costs between PNV and achieving the goals of the alternative.

Benchmark 3 was constructed differently. It was designed to define the maximum PNV achievable. Benchmark 3 was constrained only to ensure that it was approximately implementable. The timber harvest schedule is not subject to non-declining yield. All alternatives considered in detail were constrained by non-declining yield. An alternative departing from base sale schedule is presented in Chapter II. This alternative was considered and eliminated from detailed study.

A maximum area constraint was applied to the benchmarks and the alternatives. All alternatives started with 1,089,200 acres tentatively suitable land for timber production. Alternatives 1, 4, 6, 7, and 8 had additional acres deleted from the tentatively suitable category to recognize Cannibal Plateau Further Planning Area and Fossil Ridge Wilderness Study Area, being suitable for inclusion in the National Wilderness Preservation System. Alternatives 2, 3, 5, and 9 considered no additional acres suitable for inclusion in the National Wilderness Preservation System. Aspen habitat management varied by alternative from 0 to 830 acres required each year.

A unique constraint was the minimum timber volume harvested in the first decade. In all cases that volume was not exceeded. This implied that during the first decade, timber harvesting does not make as great a contribution to PNV as other, competitive resource management activities. That condition changes; in later decades timber harvest increases. These analytical constraints indicate opportunity costs that must be incurred to respond to issues and concerns. Minimum volume timber harvest in the first decade will respond to concerns for local income and employment. This is a non-priced public benefit that requires no direct expenditures beyond those necessary for producing priced outputs. Opportunity costs, plus differences in expenditures that do not increase priced outputs, explain the differences in PNV among alternatives.

#### ECONOMIC ANALYSIS

The Forest Service linear programming model (FORPLAN) and Regional input-output models were used to conduct economic efficiency and impact analysis.

#### TIMBER EFFICIENCY

The initial step in the efficiency analysis was to complete a FORPLAN solution where the only costs and benefits in the model were those for timber production. The timber values were entered by species. These represent gross stumpage values. The costs were those incurred by the Forest and included the following:

- Silvicultural Exam and Prescription.
- Timber Sale Preparation.
- Timber Harvest Administration.
- Reforestation.
- Timber Stand Improvement.
- Local Road Preconstruction/Engineering.
- Timber Purchaser Road Construction/Reconstruction.
- Timber Road Construction Supplementation and Contribution.
- Road Maintenance (Level 2).

Benefit values for timber approximate total revenue to the U.S. Treasury and the costs incurred are those costs to the Government. The accounting stance at this stage views the Forest as a firm seeking to maximize net revenue.

Constraints imposed on this analysis are displayed in Table E-3. Constraints 1 and 2 restrict the volume which may be harvested in "Fully-roaded" (3.5 miles/sq. mi.) and "Highly-roaded" (2.5-3.5 miles/sq. mi.) analysis areas (AA). Maximum allowable cut in fully-roaded AA's represents 10 percent of the maximum RPA timber output. Maximum allowable harvest in highly-roaded AA's represents 15 percent of the maximum RPA timber target. These two constraints limit the volume which can be harvested from highly-roaded and fully-roaded acres in each decade to less than or equal to 25 percent (11.25 MMBF/yr) of the maximum RPA timber output target.

TABLE E-3.

CONSTRAINTS FOR EFFICIENCY ANALYSIS

No.	Constraint Kind*	Unit of Measure*	Decade				
			1	2	3	4	5
1	LE	MMBF/Yr	4.5	4.5	4.5	4.5	4.5
2	LE	MMBF/Yr	6.75	6.75	6.75	6.75	6.75
3	LE	MMBF/Yr	40.8	44.0	45.0	45.0	45.0

\*LE = Less Than or Equal to  
 MMBF/Yr = Million Board Feet Per Year

These constraints were imposed to account for timber drain in those analysis areas.

Constraint 3 limits the total allowable timber volume harvested to less than or equal to the RPA levels for the five decades.

The timber volume selected by the FORPLAN model for harvest was limited to that available in fully roaded AA's in the first two decades. In the latter three decades, harvest volumes increased as the model found it economical to move into lesser roaded areas. This indicates that road costs are a deterrent to economical timber harvest. The timber volume scheduled in this solution is shown in Table E-4.

TABLE E-4.

## TIMBER VOLUME SCHEDULED BY DECADE

Unit of Measure	Decade				
	1	2	3	4	5
MMBF/Year	4.5	4.5	17.0	21.25	21.25

To verify the conclusion that road cost is the constraining factor on economic timber volumes, two additional analyses were made. These were identical to the first with the following exceptions: Full and highly-roaded constraints were changed. In one analysis the constraints were lowered to the same levels as were imposed on the current management alternative (3.5 MMBF/Yr in full and 5.25 MMBF/Yr in high). In the other analysis the full and highly roaded constraints were removed.

The economically efficient timber harvest level was controlled by the lower constraints in the first analysis. Although the model was free to schedule as much timber as possible in the full and highly-roaded AA's, it scheduled timber harvest in sawtimber size spruce-fir stands on less than 40 percent slope only.

In the first decade the model scheduled all timber available in fully-roaded AA's, then moved into the highly-roaded AA's in the second decade.

The economically efficient timber stands are sawtimber size spruce-fir on less than 40 percent slopes, in fully-roaded analysis areas. The harvest method scheduled was 3-step shelterwood. No clearcutting was scheduled due to the high cost for reforestation in the clearcut prescriptions.

Tables E-5 and E-6 display the timber values scheduled in these two analyses.

TABLES E-5.

TIMBER VOLUME WITH MORE RESTRICTIVE  
ANALYSIS AREA CONSTRAINTS  
(MMBF)

Unit of Measure	Decade				
	1	2	3	4	5
MMBF/Year	4.2	8.75	21.5	25.0	25.0

TABLE E-6.

TIMBER VOLUME WITHOUT ANALYSIS  
AREA CONSTRAINTS

Unit of Measure	Decade				
	1	2	3	4	5
MMBF/Year	8.75	15.15	36.85	36.85	36.85

The conclusions from this analysis were verified through another FORPLAN analysis. The value of all timber species, except spruce-fir, was increased by 50 percent. The model scheduled no additional timber volumes, by any other harvest method, of any species other than spruce-fir.

The analysis indicates that if the timber value is the only benefit from timber harvest operations, a cost-efficient 4.2 to 8.7 MMBF/year is the harvest level.

The following conditions and assumptions apply to this analysis.

- The costs associated with the timber prescriptions are based on current methods, regulations, and requirements.
- The rotation lengths in the model are determined by the culmination of mean annual increment (CMAI) policy.
- The timber values used were based on the years 1972 through 1977.

RESOURCE OUTPUT EFFICIENCY

This section assesses the timber harvest economics on the Forest, and takes into account other resource objectives, uses, and benefits.

The additional uses and benefits considered were:

- Livestock grazing.
- Deer and elk benefits.
- Dispersed recreation.

The procedure includes output values for these additional benefits individually. This permitted positive contributions to the objective function from not only timber, but the other outputs valued in each analysis as well. The objective function in all cases was to maximize PNV for 5 decades. The additional costs associated with the non-timber prescriptions were included.

### Livestock Grazing

In the first solution, the value charged by the Forest per AUM (\$1.97 in 1978 dollars) was entered into the model. The constraints imposed were identical to those displayed in Table E-3.

The timber harvest volumes and livestock AUM's scheduled by FORPLAN are displayed in Table E-7.

TABLE E-7.

#### TIMBER VOLUME AND LIVESTOCK USE

Unit of Measure*	Decade				
	1	2	3	4	5
MMBF/Year	4.5	11.25	20.7	25.0	25.0
MAUM/Year	160.1	160.1	160.1	160.1	160.3

\*MMBF/Year = Million Board Feet/Year.

MAUM/Year = Thousand Animal Unit Months/Year.

No additional timber volume was scheduled as a result of including the livestock grazing permit value. This indicates that any additional economic benefits which might have accrued from the grazing value were not sufficient to justify additional timber harvest.

This run was repeated with the livestock grazing value increased to the RPA "willingness to pay" value of \$8.85/AUM. While the model found it beneficial to allocate additional acres to intensive range management and schedule a large increase in livestock AUM's, it did not increase timber volume. Table E-8 displays timber volume and livestock outputs.

TABLE E-8.

#### TIMBER VOLUME AND LIVESTOCK USE

Unit of Measure*	Decade				
	1	2	3	4	5
MMBF/Year	4.5	11.0	11.0	24.2	24.2
MAUM/Year	404.0	404.0	404.0	404.2	404.4

\*MMBF/Year = Million Board Feet/Year

MAUM/Year = Thousand Animal Unit Months/Year

Deer and Elk Benefits

This next FORPLAN analysis dealt with estimating the effects on timber of deer and elk benefits. The estimated value for deer and elk AUM's (\$142.70 in 1978 \$) was used. This figure represents a value of \$23.68 per head for deer and \$85.20 per head for elk and translates into \$25.20 for a big game hunting day.

The analysis was constrained as displayed in Table E-3. FORPLAN scheduled 35.3 MMBF/yr and 37.4 MMBF/yr in first and second decades respectively. In decades 3-5 it scheduled 45.0 MMBF/yr. These volumes were achieved by clear-cutting in aspen.

The demand for aspen sawtimber on the Forest is 1-2 MMBF/yr.

A constraint was then added which would limit the aspen volume to 2 MMBF/yr, and the model was run again.

This time the very large timber volumes were not achieved in the first two decades. FORPLAN did schedule increases in timber in decades 3-5. Table E-9 displays the timber volumes scheduled in this analysis.

TABLE E-9.

TIMBER VOLUME SCHEDULED WHEN  
DEER AND ELK VALUED

Unit of Measure	Decade				
	1	2	3	4	5
MMBF/Year	11.25	13.25	40.5	45.0	45.0

Including the benefits for deer and elk it became economically efficient to harvest timber in areas of lesser road density. The model harvested in both full and highly-roaded AA's in the first decade and was harvesting in "moderately-roaded" AA's (1.5-2.5 mi/sq. mi) as early as the second decade.

Taking into account benefits attributable to deer and elk, the volume of economical timber harvest volume is increased. These volumes are less than that currently programmed for sale and harvest on the Forest.

The value used for deer and elk AUM's was comparable to the stumpage value for timber and the AUM permit value for livestock grazing. It was computed directly from the revenue paid for resident and non-resident deer and elk hunting permits only. The only difference was that the revenue does not accrue to the federal government but to the State of Colorado.

If the costs incurred by the State of Colorado, Division of Wildlife were included; the net benefit would decline and could reduce the economic efficient timber harvest level.

The analysis correlating deer and elk benefits with timber harvest activities shows that these resource benefits do provide for increased levels of economic timber harvest. The Forest has summer range capacity which could accommodate many times the current population. Summer range is not the limiting factor; winter range carrying capacity is.

Dispersed Recreation

The procedures described previously were once again followed for dispersed recreation. The RPA value of \$3 was entered using demand and valuation cut-off points in FORPLAN. The results of this analysis are displayed in Table E-10.

TABLE E-10.

TIMBER VOLUME WHEN DISPERSED  
RECREATION VALUED

Unit of Measure	Decade				
	1	2	3	4	5
MMBF/Year	11.25	11.25	41.5	45.0	45.0

The results are similar to those in the deer and elk analysis. Road building activities associated with timber harvest increase dispersed motorized recreation capacity. This provides an increased level of economically efficient timber harvest.

Current Forest policy is to close single purpose logging roads after timber harvest. The increased motorized recreation benefits may not be realized. The road maintenance costs now in the model would not be incurred.

Livestock Grazing, Deer and Elk, Dispersed Recreation Combined

The economic relationship between timber and other outputs were analyzed separately. The final step was to determine the combined effects. This run was structured similar to Benchmark #3. The harvest floor constraint was removed.

The results of this analysis are displayed in Table E-11.

TABLE E-11.

## COMBINED EFFECTS ANALYSIS

Output	Road Density Class	Unit of Measure*	Decade				
			1	2	3	4	5
<b>TIMBER</b>							
	Full	MMBF/yr	4.5	4.5	4.5	4.5	4.5
	High	MMBF/yr	6.75	6.75	6.75	6.75	6.75
	Moderate	MMBF/yr	0.0	0.0	32.4	16.0	30.6
	Low	MMBF/yr	0.0	0.0	1.3	16.0	0.4
	None	MMBF/yr	0.0	0.0	0.0	1.3	2.75
<b>LIVESTOCK</b>							
	Full	MAUM/yr	247.8	247.8	247.8	247.8	247.8
	High	MAUM/yr	814.2	814.2	814.2	814.2	814.2
	Moderate	MAUM/yr	728.3	728.3	728.3	730.5	729.4
	Low	MAUM/yr	754.4	754.4	754.4	754.4	754.4
	None	MAUM/yr	364.5	364.5	364.5	364.5	364.5
<b>DISPERSED RECREATION</b>							
		MMRVD/yr	2.22	2.25	2.33	2.72	3.99
	Full	MMRVD/yr	1.79	1.71	1.71	1.71	3.92
	High	MMRVD/yr	5.15	5.37	5.26	5.05	8.54
	Moderate	MMRVD/yr	6.93	6.92	7.68	8.27	12.30
	Low	MMRVD/yr	5.61	5.61	5.61	5.85	5.90
	None	MMRVD/yr	2.75	2.75	2.74	2.74	5.77

\*MMBF/yr = Million Board Feet Per Year

MAUM/yr = Thousand Animal Unit Months Per Year

MMRVD/yr = Million Recreation Visitor Days Per Year

Cost-efficient timber harvest is achieved in areas where significant road investment exists.

ECONOMIC AND SOCIAL EFFECTS

The Forest Service is committed to the goal of maintaining the stability of local dependent industries and communities.

The IMPLAN model was used to estimate the impacts of reduced timber harvest on employment and income. Estimates were made for a timber harvest level of 13.5 MMBF/yr and a "worst case" level which eliminated all timber harvest. Tables E-12 and E-13 display the results of the IMPLAN analysis.

TABLE E-12.

EMPLOYMENT AND INCOME CHANGES IN EIA-214\*

Employment	13.5 MMBF/Yr Timber Harvest	No Timber Harvest
Thousand Jobs		
Model Base Year	30.85	30.85
Change	.11	.21
<u>TOTAL</u>	<u>30.74</u>	<u>30.64</u>
Income (MM 1978 \$)		
Model Base Year	615.114	615.114
Change	2.107	4.052
<u>TOTAL</u>	<u>613.007</u>	<u>611.062</u>

\* Economic Impact Area #214.

TABLE E-13.

EMPLOYMENT AND INCOME CHANGES IN EIA-215\*

Employment	13.5 MMBF/Yr Timber Harvest	No Timber Harvest
Thousand Jobs		
Model Base Year	2.415	2.415
Change	.004	.008
<u>TOTAL</u>	<u>2.411</u>	<u>2.407</u>
Income (MM 1978 \$)		
Model Base Year	49.557	49.557
Change	.081	.155
<u>TOTAL</u>	<u>49.476</u>	<u>49.402</u>

\* Economic Impact Area #215.

## OUTPUT VALUES

The following displays benefits values used in the analysis.

### Deer and Elk Value

Special emphasis on deer and elk was dictated by public issues and management concerns. Deer and elk are a scheduled output in FORPLAN. As a scheduled output, deer and elk carrying capacity was tracked over time.

The following summarizes the deer and elk analysis:

--Assumption: There is a direct relationship between the number of deer and elk and big game hunting.

Changes in the deer and elk population effects a proportional change in hunter revenue.

Increments above the current population will have the current deer to elk ratio.

--Deer/Elk value conversion to hunter RVD\*.

130,079		Hunter RVD's (Deer and Elk)	
X 25.20		Big Game RVD Value	
<hr/>			
\$3,277,990	=	\$3,278,000	
\$3,378,000	÷	22,975 AUM's (Deer and Elk)	= \$142.68/AUM

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Source: \* Hunter RVD's - Forest RIM Record  
Big Game Value - RPA  
AUM's - FORPLAN

Table E-14 displays Benefit Values.

TABLE E-14.

BENEFIT VALUES AND SOURCE

Output	Value (1978 \$)	Source
Timber		
Spruce-Fir	29.38/MBF	Forest Reports
Lodgepole Pine	12.25/MBF	Forest Reports
Ponderosa Pine	33.86/MBF	Forest Reports
Aspen	1.91/MBF	Forest Reports
Livestock Grazing	10.48/AUM	Region 2
Recreation*		
General Dispersed Recreation	3.00/RVD	RPA
Fishing	15.75/RVD	RPA
Big Game Hunting	25.20/RVD	RPA
Wilderness	8.00/RVD	RPA
Developed (Public)	3.00/RVD	RPA
Developed (Private)	3.75/RVD	RPA
Water	5.00/Acre-Foot	RPA

\* No double counting occurred, deer and elk hunting RVD's were subtracted from the dispersed recreation outputs.

**APPENDIX F**  
**UNSUITABILITY ASSESSMENT FOR COAL MINING**

## UNSUITABILITY ASSESSMENT FOR COAL MINING

National Forest System land was analyzed for unsuitability if it is within a Known Recoverable Coal Resource Area as defined by the United States Geological Survey and delineated as Known Coal Resource Leasing Area on Colorado Geological Survey Map Series 9, or if it is already leased for coal production as in the Huntsman Ridge area.

### CRITERION NUMBER 1

"All Federal lands included in the following land systems or categories shall be considered unsuitable: National Park System, National Wildlife Refuge System, National System of Trails, National Wilderness Preservation System, National Wild and Scenic Rivers System, National Recreation Areas, lands acquired with money derived from the Land and Water Conservation Fund, National Forest, and Federal lands in incorporated cities, towns and villages."

National Forests are unsuitable for coal mining.

### EXCEPTIONS

National Forest System land with no significant recreational, timber, economic, or other values are suitable for underground mining.

National Forest System land with significant recreational, timber, economic, or other values which are compatible with underground mining are suitable for underground mining.

### CONCLUSION

The West Elk and Raggeds Wildernesses are unsuitable for coal mining. The rest of the Known Recoverable Coal Resource Area is suitable for coal mining if other criteria do not apply or if exceptions to applicable criteria are used.

### CRITERION NUMBER 2

"Federal lands that are within rights-of-way or easements or within surface leases for residential, commercial, industrial, or other public purposes, or for agricultural crop production on Federally owned surface shall be considered unsuitable."

This is interpreted under Forest Service regulations to mean, "Federal land with rights-of-way or easements or under special use permits for residential, commercial, industrial, or agricultural purposes shall be considered unsuitable."

### EXCEPTIONS

A lease (or special use permit) may be issued and mining operations approved if the Forest Service determines that it is impractical to exclude such areas due to the location of coal and method of mining and such areas can be protected through appropriate stipulations.

## CONCLUSION

All areas to which criterion number 2 apply are excepted because it is impractical to exclude these areas from underground coal mining and because such areas can be adequately protected with operating plan stipulations.

### CRITERION NUMBER 3

"Federal lands affected by section 522(e)(4) and (5) of the Surface Mining Control and Reclamation Act of 1977 shall be considered unsuitable. This includes lands within 100 feet of the outside line of the right-of-way of a public road or within 100 feet of a cemetery, or within 300 feet of any public building, school, church, community or institutional building or public park or within 300 feet of an occupied dwelling."

### EXCEPTIONS

A lease may be issued for land for which the Office of Surface Mining has issued a permit to have public roads relocated.

## CONCLUSION

All areas to which criterion number 3 applies are excepted under the above mitigating measure which is applicable to areas to be affected under an operating plan for underground coal mining.

### CRITERION NUMBER 4

"Federal lands designated as wilderness study areas shall be considered unsuitable while under review by Administration and the Congress for possible wilderness designation."

Since passage of the Colorado Wilderness Act of 1980 there are no Federal land designated as Wilderness Study Areas within the Known Recoverable Coal Resource Area on the Forest.

### CRITERION NUMBER 5

"Scenic Federal lands designated by visual resource management analysis as Class I (an area of outstanding scenic quality or high visual sensitivity) but not currently on the National Register of Natural Landmarks shall be considered unsuitable."

### EXCEPTIONS

A lease may be issued if the surface management agency determines that surface coal mining operations will not significantly diminish or adversely affect the scenic quality of the designated area.

## CONCLUSION

Criterion number 5 applies to those portions of the Known Recoverable Coal Resource Area that have been classified as Variety Class A (distinctive landscapes) or foreground, middleground, and background areas. These areas will

be considered suitable for leasing because the Forest has determined that the surface effects of underground mining will not diminish or adversely affect the scenic quality.

#### CRITERION NUMBER 6

"Federal lands under permit by the surface management agency, and being used for scientific studies involving food or fiber production, natural resources, or technology demonstrations and experiments shall be considered unsuitable for the duration of the study demonstration or experiment, except where mining could be conducted in such a way as to enhance or not jeopardize the purpose of the study."

This criterion does not apply within the Known Recoverable Coal Resource Area.

#### CRITERION NUMBER 7

"All districts, sites, buildings, structures, and objects of historic, architectural, archeological, or cultural significance on Federal lands which are included in or eligible for inclusion in the National Register of Historic Places, and an appropriate buffer zone around the outside boundary of the designated property (to protect the inherent values of the property that make it eligible for listing in the National Register) as determined by the surface management agency, in consultation with the Advisory Council on Historic Preservation and the State Historic Preservation Office shall be considered unsuitable."

#### EXCEPTIONS

All or certain stipulated methods of coal mining may be allowed if the surface management agency determines that the direct and indirect effects of mining, as stipulated, on a property in or eligible for the National Register of Historic Places will not result in significant adverse impacts on the property.

#### CONCLUSION

Cultural resource sites have been mapped within the Known Recoverable Coal Resource Area. All areas containing cultural sites are excepted under 3461.1 (a)(2) because the Forest Service has determined that the effects of underground coal mining can be mitigated and will not, therefore, result in significant adverse impact to the property. The Advisory Council on Historic Preservation and State Historic Preservation Office were consulted.

#### CRITERION NUMBER 8

"Federal lands designated as natural areas or as National Natural Landmarks shall be considered unsuitable."

There are no natural areas that meet these guidelines within the Known Recoverable Coal Resource Area on the Forest.

#### CRITERION NUMBER 9

"Federally designated critical habitat for threatened or endangered plant and animal species, and habitat for Federal threatened or endangered species which is determined by the Fish and Wildlife Service and the surface management agency to be of essential value and where the presence of threatened or endangered species has been scientifically documented, shall be considered unsuitable."

#### EXCEPTIONS

A lease may be issued and mining operations approved if the proposed activity is not likely to jeopardize the continued existence of the species and/or habitat.

#### CONCLUSION

Habitat for the following Federally designated threatened and endangered plant and animal species is known or suspected to be present on the Forest.

--Bald Eagle has persistently wintered on the East River and portions of the Gunnison National Forest.

--American Peregrine Falcon critical habitat has been identified on the Gunnison and Uncompahgre National Forest. A suspected active nest site will be investigated in 1981.

--Uncompahgre Fritillary Butterfly is a candidate species known to exist on the Uncompahgre National Forest.

--Whooping Crane is a migrating species seen each spring flying over the Gunnison and Grand Mesa National Forests.

None of this habitat is within the Known Recoverable Coal Resource Area.

#### CRITERION NUMBER 10

"Federal lands containing habitat determined to be critical or essential for plant or animal species listed by a State pursuant to State law as endangered or threatened shall be considered unsuitable."

#### EXCEPTIONS

A lease may be issued and mining operations approved if the proposed activity will not adversely affect the species.

#### CONCLUSION

Habitat for the following state designated endangered or threatened plant and animal species is known or suspected to be present on the Forest.

--Wolverine was reported present in 1977 by Rick Richards on the Gunnison National Forest.

--River Otter has been introduced in the Black Canyon and has not yet been seen on National Forest System land.

--American Peregrine Falcon (see Federal listed species)

--Bald Eagle (see Federal listed species)

--Whooping Crane (see Federal listed species)

--Greater Sandhill Crane migrate over the Forest each spring and fall.

None of this habitat is within the Known Recoverable Coal Resource Area.

#### CRITERION NUMBER 11

"A bald or golden eagle nest or site on Federal lands that is determined to be active and an appropriate buffer zone of land around the nest site shall be considered unsuitable. Consideration of availability of habitat for prey species and of terrain shall be included in the determination of buffer zones."

A known golden eagle nest site is on the Gunnison National Forest. The hunting territory of the nesting pair will have to be mapped and possible prey species listed. Neither of these nesting sites is within the Known Recoverable Coal Resource Area.

#### CRITERION NUMBER 12

"Bald and golden eagle roost and concentration areas on Federal lands used during migration and wintering shall be considered unsuitable."

#### EXCEPTIONS

A lease may be issued if mining activities can be carried out with such limitations of method and time period that eagles are not adversely affected.

#### CONCLUSION

No bald or golden eagle roost trees are known to exist on the Forest.

#### CRITERION NUMBER 13

"Federal lands containing a falcon (excluding kestrel) cliff nesting site with an active nest and a buffer zone of Federal land around the nest site shall be considered unsuitable. Consideration of availability of habitat for prey species and of terrain shall be included in the determination of buffer zones."

Peregrine Falcons are known to exist on the Forest, but not within the Known Recoverable Coal Resource Area. Critical habitat for American Peregrine Falcon, is mapped. Kestrels are fairly common on open areas up to 9500 feet. The Forest estimates nesting territory and hunting territory therein to be 5 acres per pair. Merlin are not common, the Forest estimates territory of those nesting near riparian sites to be 160 acres.

#### CRITERION NUMBER 14

"Federal lands which are high priority habitat for migratory bird species of high Federal interest on a regional or national basis, as determined jointly by the surface management agency and the Fish and Wildlife Service, shall be considered unsuitable."

#### EXCEPTIONS

A lease may be issued if mining activity will not adversely affect the habitat during use by the species.

These areas are considered suitable for all methods of coal mining under this exception if disturbance to the vegetative cover by surface operations and impacts is minimized.

#### CONCLUSION

No high priority habitat for migratory bird species has been identified within the Known Recoverable Coal Resource Area.

#### CRITERION NUMBER 15

"Federal lands which the surface management agency and the State jointly agree are fish and wildlife habitat for resident species of high interest to the State and which are essential for maintaining these priority wildlife species shall be considered unsuitable. Examples of such lands which serve a critical function for the species involved include:

- Active dancing and strutting grounds for sage grouse, sharp-tailed grouse, and prairie chicken;
- Winter ranges most critical for deer, antelope, and elk; and
- Migration corridors for elk."

#### EXCEPTIONS

A lease may be issued if, after consultation with the State, the surface management agency determines that all or certain stipulated methods of coal mining will not have a significant long-term impact on the species being protected.

#### CONCLUSION

Habitat essential for maintaining high interest wildlife species exists on the Forest and falls into three categories:

- Active strutting grounds for sage and sharp-tailed grouse.
- Critical winter range for deer, antelope, bighorn sheep, and elk.
- Cold water fishery for premium or blue ribbon waters.

Only elk and deer winter range are located within the Known Recoverable Coal Resource Area.

The Forest has determined that the surface impacts of underground coal mining will not have a significant long-term impact on the deer and elk herds.

#### CRITERION NUMBER 16

"Federal lands in riverine, coastal, and special floodplains (100-year recurrence interval) shall be considered unsuitable unless, after consultation with Geological Survey, the surface management agency determines that all or certain stipulated methods of coal mining can be undertaken without substantial threat of loss to people or property, and to the natural and beneficial values of the floodplain on the lease tract and downstream."

#### CONCLUSION

Each perennial and intermittent stream within the Forest has a narrow floodplain associated with it. Most of the floodplains on the Forest are not planar surfaces and are not composed of fluvial (stream deposited) sediments nor are they characterized by wetlands, riparian habitat, agricultural activities, or building sites. Usually the floodplain is simply a part of the river bed which is inundated during high water and dry during low water. The floodplain, therefore, is typically not an area where loss to people or property is a threat. Moreover, there are few natural and beneficial values to be derived from these floodplains except for the function of channeling flow from the mountains to the lowland valleys where agriculture and development can occur.

The Forest has determined, based on the above characteristics of most Forest floodplains, that the surface effects of underground coal mining will not cause substantial threat of loss to people, property, or the natural and beneficial values of the floodplain. Effects of the underground mining can be mitigated through mining method, monitoring, and restoration. Therefore, all Forest floodplains are considered suitable for coal mining.

#### CRITERION NUMBER 17

"Federal lands which have been committed by the surface management agency to use as municipal watersheds shall be considered unsuitable."

#### EXCEPTIONS

A lease may be issued where:

- The surface management agency determines, as a result of studies, that all or certain stipulated methods of coal mining will not adversely affect the watershed to any significant degree; and
- The municipality (incorporated entity) or the responsible governmental unit concurs in writing in the issuance of the lease.

## CONCLUSION

There are five municipal watersheds within the Known Recoverable Coal Resource Area on the Forest: Grand Junction, Delta, Cedaredge, Hotchkiss, and Garvin Mesa.

The above studies and consent could not take place until at least a preliminary mining plan had been submitted with the necessary baseline hydrologic data and possible mitigation measures. Therefore, the Forest cannot apply this exception at this time and municipal watersheds as defined above, will be considered unsuitable for surface and underground mining until data is available on which to base an exception.

### CRITERION NUMBER 18

"Federal lands with National Resource Waters, as identified by States in their water quality management plans, and a buffer zone of Federal lands one-quarter mile from the outer edge of the far banks of the water shall be unsuitable."

Colorado does not have a Water Quality Measurement Plan that identifies the Forest as having National Resource Waters. This criteria will not be used to declare land unsuitable for coal leasing.

### CRITERION NUMBER 19

"Federal lands identified by the surface management agency, in consultation with the State in which they are located, as alluvial valley floors according to the definition in Section 3400.0-5(a) of this title, the standards in 30 CFR Part 822, the final alluvial valley floor guidelines of the Office of Surface Mining Reclamation and Enforcement when published, and approved state programs under the Surface Mining Control and Reclamation Act of 1977, where mining would interrupt, discontinue, or preclude farming, shall be considered unsuitable."

There are no areas meeting the definition of "alluvial valley floor" within the Known Recoverable Coal Resource Area on the Forest. The criterion will not be used to identify areas unsuitable for coal leasing.

### CRITERION NUMBER 20

"Federal lands in a State to which is applicable a criterion (i) proposed by the State, and (ii) adopted by rulemaking by the Secretary, shall be considered unsuitable."

The Forest does not contain any land identified by the State of Colorado as unsuitable for coal development, therefore this criteria will not be used to determine land unsuitable for coal leasing.

### SUMMARY

Table F-1 summarizes the land unsuitable for coal leasing on the Forest. Figure F-1 displays the Known Recoverable Coal Resource Area on the Forest. Figure F-2 displays areas within the Known Recoverable Coal Resource Area unsuitable for coal leasing.

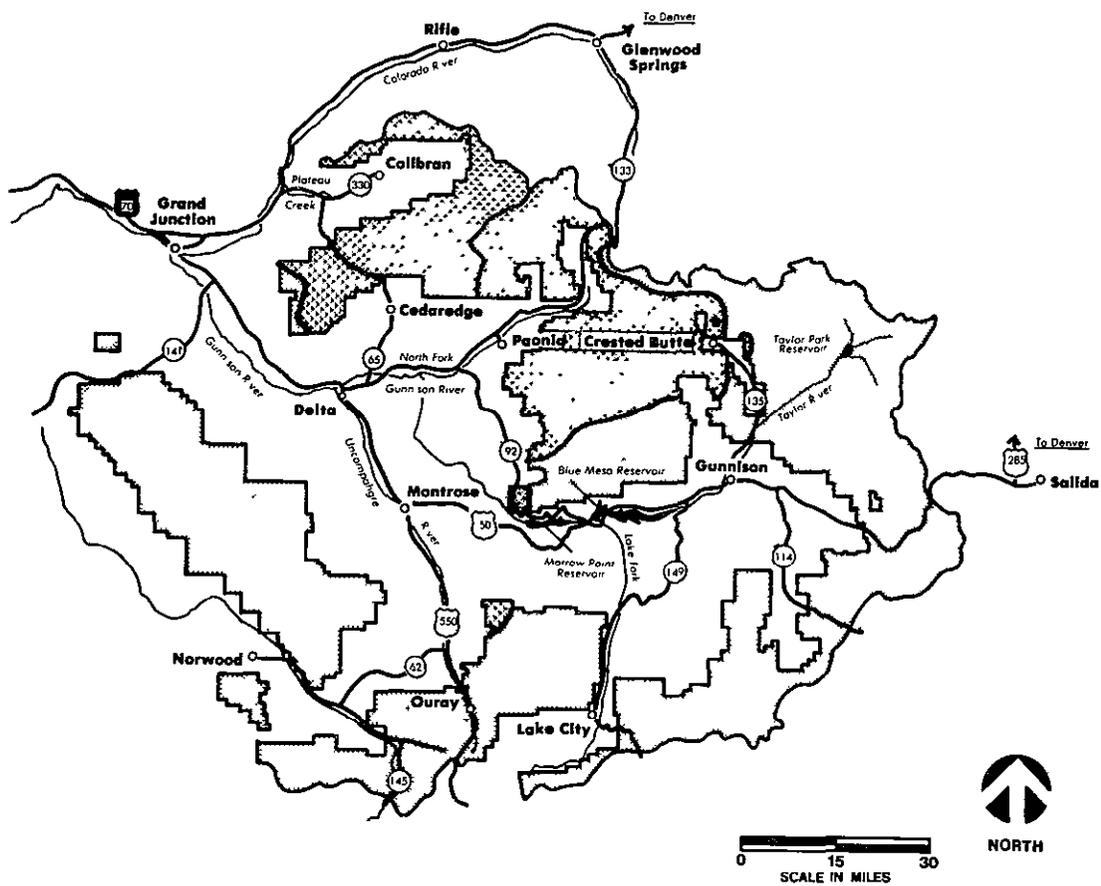
TABLE F-1.

SUMMARY TABLE FOR COAL UNSUITABILITY

Designation	Total Acres	% of Total Forest
Grand Mesa, Uncompahgre Gunnison	2,953,186	100%
Suitable	755,862	26%
Unsuitable	224,491	08%

FIGURE F-1.

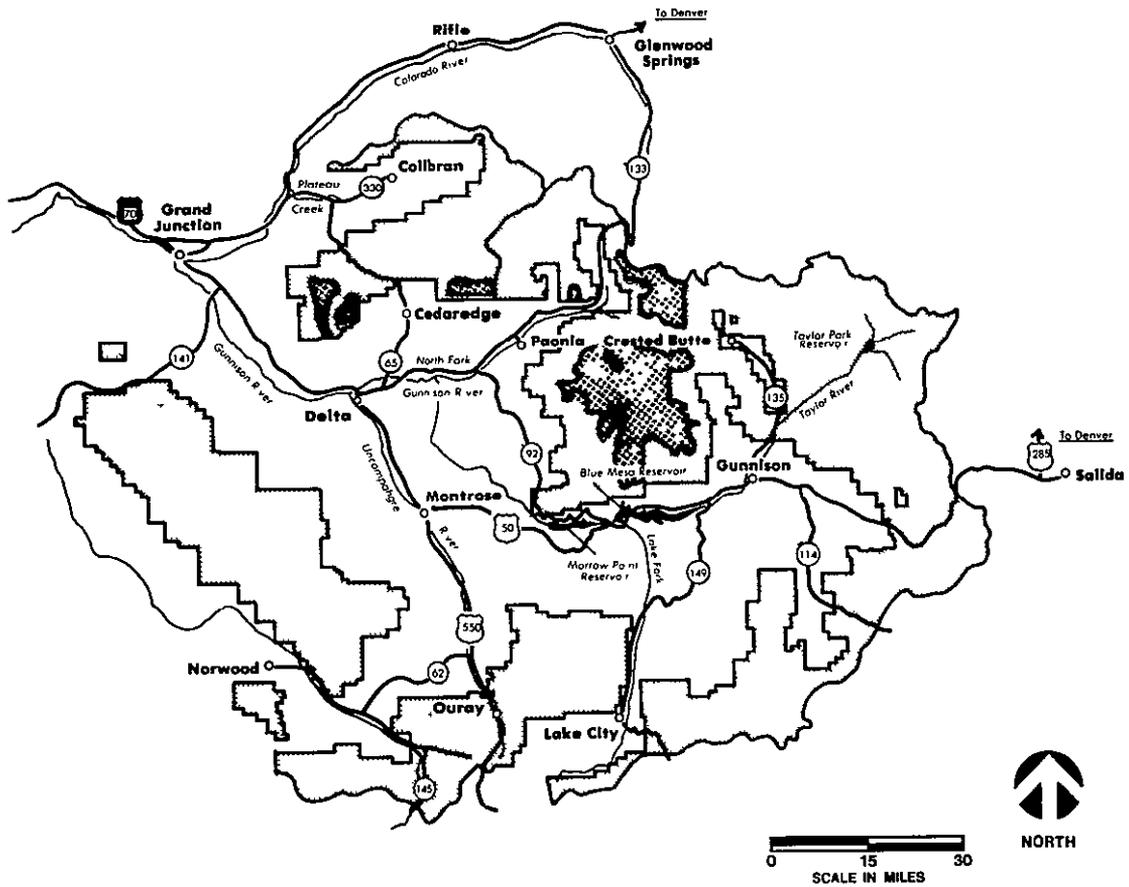
AREAS WITH HIGH/MEDIUM POTENTIAL FOR COAL



National Forest System Land   
Areas with High/Medium Potential for Coal 

FIGURE F-2.

AREAS WITH HIGH/MEDIUM POTENTIAL FOR COAL AND  
UNSUITABLE FOR COAL LEASING



National Forest System Land 

Areas with High/Medium Potential for Coal  
And Unsuitable for Coal Leasing 

APPENDIX G  
WILD AND SCENIC RIVER ELIGIBILITY REPORT  
FOR THE EAST AND TAYLOR RIVERS

WILD AND SCENIC RIVER ELIGIBILITY REPORT  
FOR THE EAST AND TAYLOR RIVERS

This Appendix includes two wild and scenic river eligibility reports. They are for the East River and Taylor River. The river length included in the two study areas is approximately 52 miles. They are both located in Gunnison County, Colorado, on the Gunnison National Forest.

EAST RIVER ELIGIBILITY REPORT

MANAGEMENT SITUATION

Physical Setting

Figure G-1 is a vicinity map displaying the East River study area.

The headwaters of the East River begin at Emerald Lake. The lake is situated one-half mile below Schofield Pass. The river was divided into 4 study segments. Beginning at Emerald Lake, the river flows southeast through the Gothic townsite. The bridge on the south end of Gothic completes the segment "A" of the river. In segment "B" the river enters a narrow canyon and then enters a relatively broad valley to its confluence with Brush Creek. Segment "C" begins at the bridge at Brush Creek. Here the river enters the broad section of the East River Valley which is bordered almost entirely by private meadow land. The Roaring Judy Fish Hatchery terminates segment "C". Segment "D" continues from the hatchery to its confluence with the Taylor River and completes the study area boundary. The four study segments are displayed in Figures G-2 and G-3.

The length of the river study area is 33 1/2 miles.

The East River flows from Emerald Lake which sits in an alpine basin at 10,600 feet elevation.

For the first 2 miles it falls rapidly into relatively flat meadow land. Segment "B" has prominent meanders as the river flows along the valley bottom. The remainder of the distance to Almont is fairly straight flowing.

The character of the East River changes dramatically near Brush Creek. Upstream, the East River is a relatively narrow "U" shaped glaciated valley. Downstream, the valley widens to about 1-2 miles. Below Brush Creek agriculture and housing development are the dominant uses. Upstream, the valley is used primarily for recreational purposes.

FIGURE G-1.

EAST RIVER VICINITY MAP

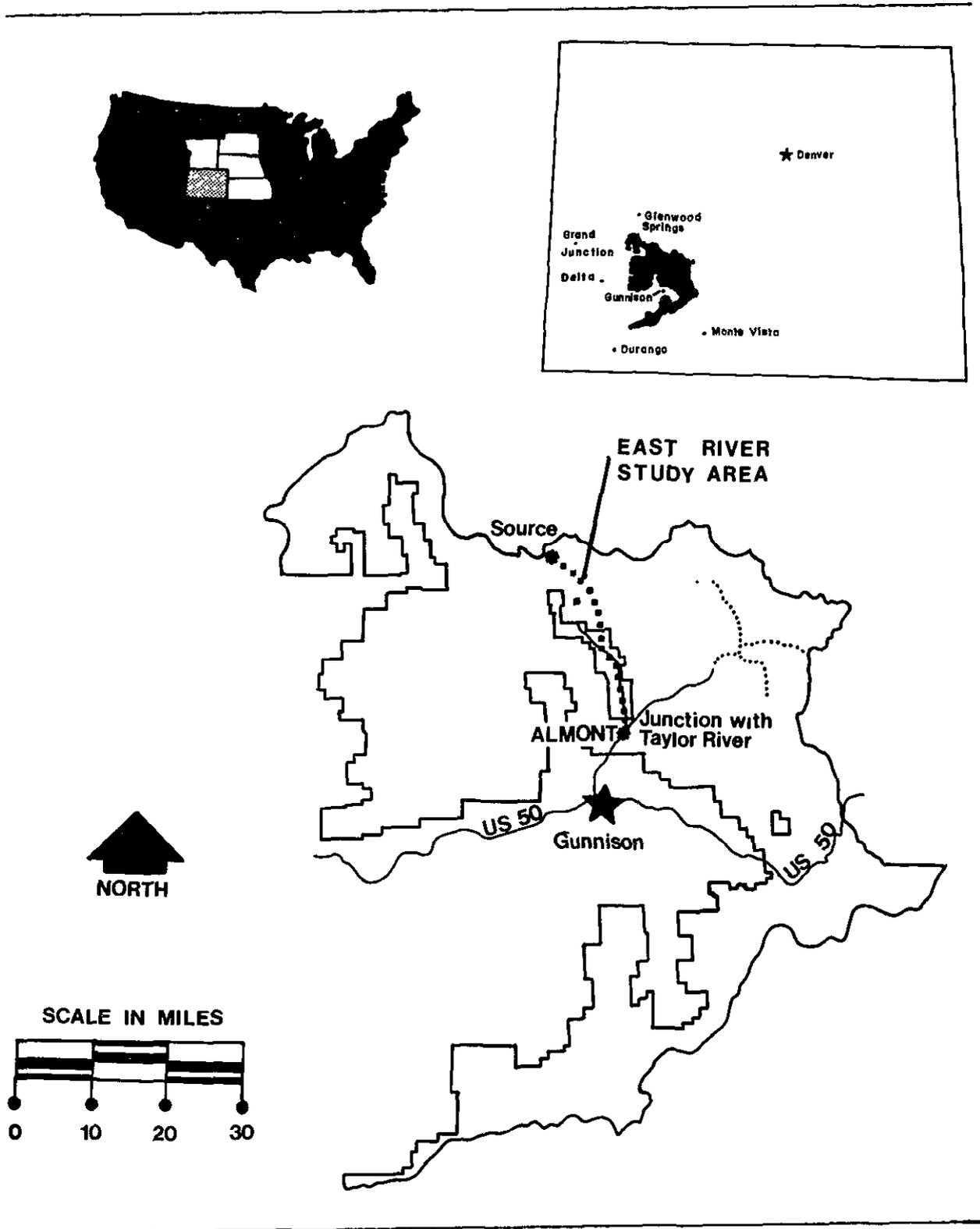


FIGURE G-2.

EAST RIVER STUDY SEGMENTS A AND B

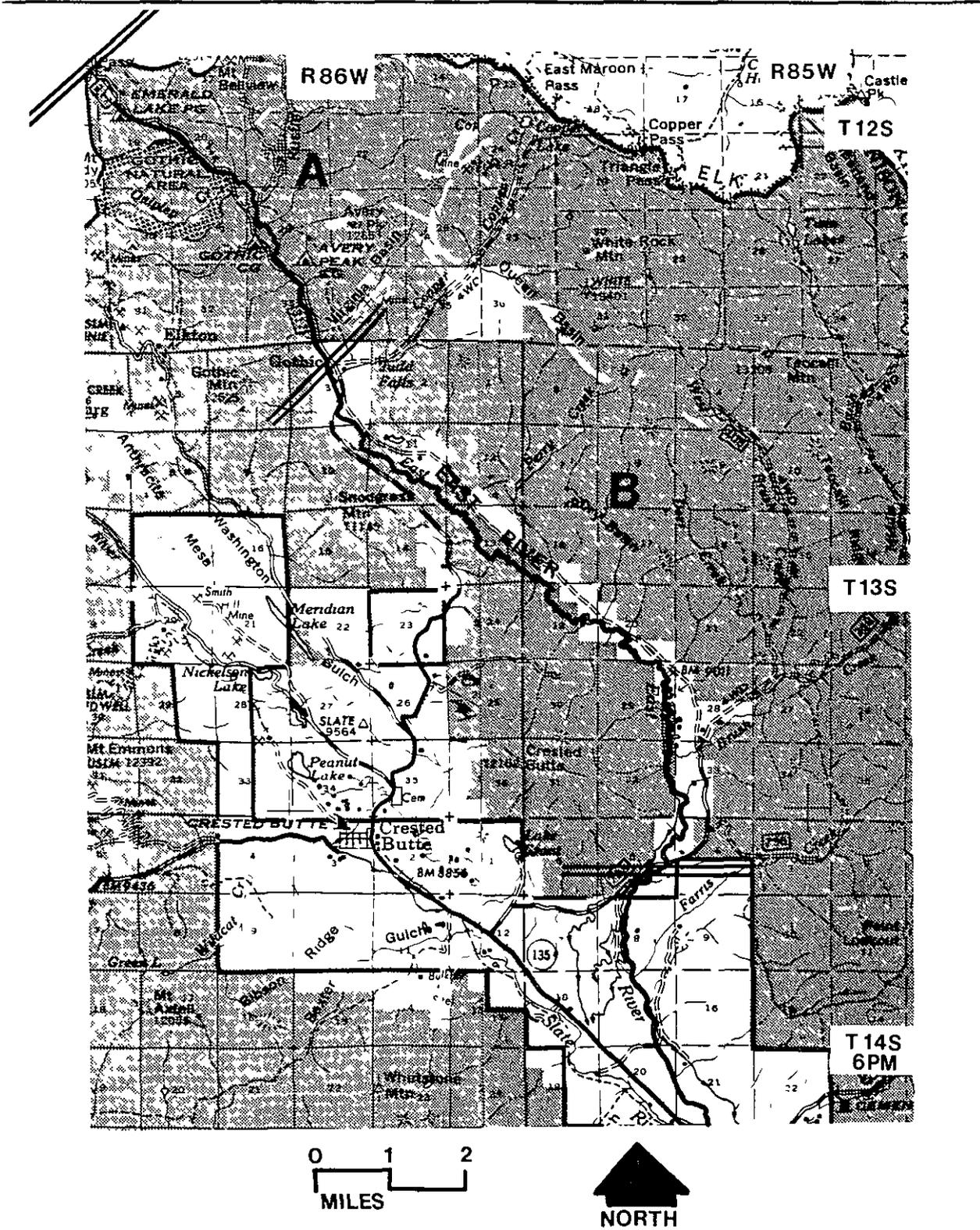
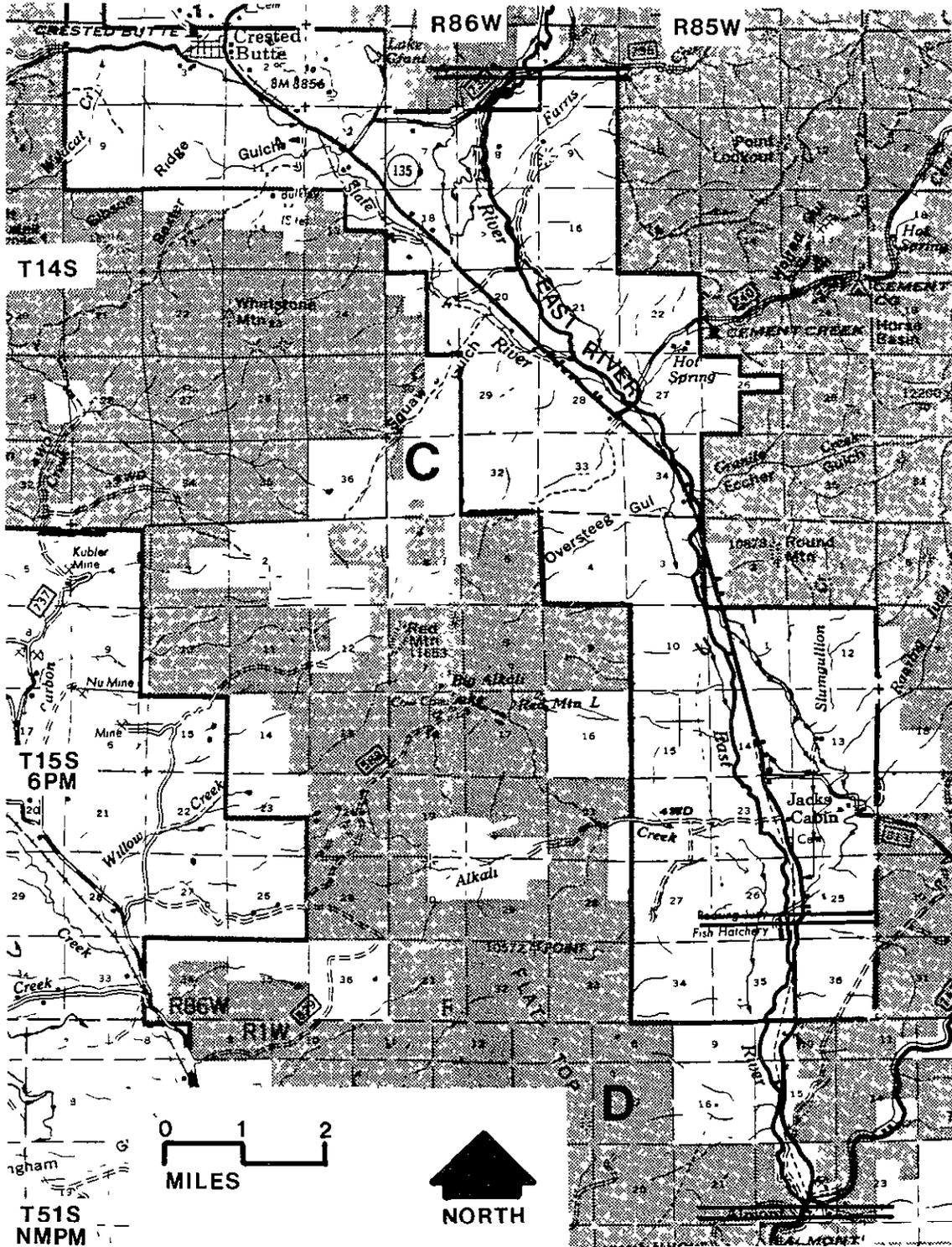


FIGURE G-3.

EAST RIVER STUDY SEGMENTS C AND D



## Social and Economic Setting

Settlement - The area surrounding the river was first explored by prospectors looking for gold and silver in the late 1800's. The river was never dredged and there is little prospecting evidence in the corridor. The area was later settled for ranching and the river was tapped as a source of irrigation water to raise hay.

Land Use - Developments other than water resource developments within the corridor include: Two campgrounds, a picnic ground, Gothic townsite, four summer homes in segment "A", a ski lift terminal in segment "B", and 15 houses in segment "C".

The primary use of the river below Gothic townsite is irrigation water. Above Gothic, fishing and scenic viewing are the primary uses.

Though essentially unregulated by impoundments throughout its length, the lower two segments of the East River have 10 major irrigation diversions. These irrigate about 7,400 acres of hay meadow. A large irrigation diversion occurs about one mile above Brush Creek. Currently, the Crested Butte Water and Sanitation District diverts up to 1.5 cubic feet per second (cfs) for municipal and recreational use at the Town of Mt. Crested Butte and the Crested Butte Ski Area. In addition, the ski area has applied for an additional diversion of up to 6 cfs during the months of November through March for snowmaking purposes for 200 acres of ski trails. Action on their filing for conditional water right is pending in the State of Colorado Water Division 4. Agreements have been reached with the Forest and the Colorado Division of Wildlife (DOW) to permit the water use, providing a 7 cfs bypass flow is maintained during the month of December. Implementation of the ski area's snowmaking plans could result in diversion of approximately half of the normal winter flow in the East River for short periods during the winter months. \*

## Economic Uses

The river's primary economic use below Gothic is to provide irrigation water for raising winter hay for cattle.

The town of Mt. Crested Butte and the Crested Butte Ski Area water intake is located approximately three miles below Gothic.

The Colorado DOW Roaring Judy Fish Hatchery diverts water for fish rearing for a six month period.

Above Gothic the river is visited mainly by vacationers for viewing, photography, camping and fishing. Summer tourists contribute heavily to the local economy.

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Source: \* Environmental Assessment, Crested Butte Mountain Resort Ski Area Artificial Snowmaking Proposal, U.S.F.S., Gunnison National Forest, Taylor River District, 1981. Decision Notice 6/25/81.

## PAST AND CURRENT MANAGEMENT

### Recreation

Segment "A" provides the greatest number of Forest visitors to the upper East River. Scenic values and fisheries are the main attraction. Most fishing activity takes place on public land. Camping at developed sites amounts to about 7,400 RVD's annually. Dispersed camping adds 10,200 RVD's and fishing another 5,000 RVD's.

In segment "B" fishing provides for about 300 RVD's per season. Length of season for segments "A" and "B" starts in mid-May and continues through October.

Segment "B" flows within 1/2 mile of the Maroon Bells-Snowmass Wilderness. No developed sites exist in this segment.

Segment "C" flows through private property. Fishing is only allowed in certain sections with permission of the private landowner. Estimated RVD's in this area are 3,000. Two hundred RVD's of rafting and kayak use occur on the entire river.

Segment "D" runs parallel to State Highway 135. Access for fishermen is provided by certain private landowners in cooperation with the DOW. The Roaring Judy Fish Hatchery is located in this segment. Only fly fishing is allowed on this river segment. Approximately 6,000 RVD's for fishing occur.

Cultural Resources - Present Forest Service survey data indicates a potential for 6 significant cultural resources per square mile for the East River area south of Crested Butte and no significant cultural resources above Crested Butte. This is very low site density and cultural resources are not abundant along the river to be a significant resource.

Within segment "A" is the Gothic Research Natural Area. During the summer months, the Rocky Mountain Biological Laboratory at Gothic becomes a research and instructional facility for the study of high altitude organisms.

Visual Resources - The East River study corridor and its visual areas are inventoried as variety class B (common) with identified visual quality objectives of retention and partial retention. In general, the study corridor contains landform, vegetative, and waterform characteristics which are not unusual or distinct to the area.

Corridor segments "A" and "B" are not unusual or distinct to the area. However, the viewshed surrounding these segments is very scenic. Attention should be focused on segment "A" in relation to the combination of landform and vegetative types as they relate to the corridor. These elements describe the view within the landscape and when combined contribute in making the area very scenic. Segment "B" is visually characterized by a broad glaciated valley surrounded by high mountain peaks. Of specific interest within this segment are the truncated meander patterns of the East River and their visual relationship to the valley bottoms as viewed within the enclosed landscape.

### Fish and Wildlife

The study area is noted for trout fishing. The river is stocked with rainbow and cutthroat trout from Emerald Lake to Gothic. Segment "D" has been set aside for artificial fly fishing only by the DOW.

The only threatened - endangered species within the study area is the Bald Eagle which winters on the East River near the Roaring Judy Fish Hatchery. As many as 5 Bald Eagles have been observed. However, none are known to nest along the river.

### Water

Water quality and stream channel conditions are generally good. Eleven years of streamflow records (1940-1950) indicate an average yearly flow at a point about 1.2 miles below Brush Creek of 96,960 acre feet, or 1.7 acre feet per acre per year. Approximately 65% of the total annual streamflow occurs in late May and June.

### Geology

The upper East River above Brush Creek flows in a "U" shaped valley formed by Pleistocen glaciers. The glaciers left extensive moraines and outwash on the surface. Bedrock consists of Cretaceous age Mancos shale pierced by resistant igneous rocks. The East River, with the exception of the compressed meander pattern discussed above, is typical of streams in the general area. The igneous intrusives of various shapes and sizes are typical of the general area.

### Lands

Table G-1 displays the percentage of private, State, and National Forest System land by segment.

TABLE G-1.

LAND PERCENTAGE BY SEGMENT

Segment	Percentage	Type of Land*
A	90%	NFS Rangeland
	10%	Private Rocky Mountain Biological Laboratory
B	25%	NFS Rangeland
	75%	Private Rangeland
C	100%	Private Agricultural Land
D	3%	NFS Rangeland
	47%	State Agricultural Land
	50%	Private Land (10% urban-40% agricultural)

\* NFS = National Forest System

Current Land Use

The headwaters and upper East River basin is a major all-season recreation area. The report previously described the diversity of recreational, cultural, educational, and agricultural opportunities. All these activities make large contributions to the Gunnison County economy. The social impacts change with the type of activity, the time of year and specific location. The 1979 Land Management Plan for the East River Unit and Final EIS completed by the U.S. Forest Service displayed the alternatives for management of 179,027 acres of National Forest System land. The EIS states:

"The selected alternative places emphasis on wildlife and dispersed non-motorized recreation and retains opportunities for wilderness, downhill skiing, and other developed recreation. Timber harvest and water production are de-emphasized. These impacts will result in both favorable and adverse effects on the environment. The adverse effects include: Slight increases in soil loss and slight decreases in water quality, scenic quality, and air quality in the short-term. Slight long-term decreases in water and air quality may occur off-Forest as a result of induced growth. The potential for wildlife disturbance will increase. Existing roadless and undeveloped areas will be decreased.

Full implementation of this plan will result in some changes in the physical, social, and economic aspects of the environment. These changes are quantified and evaluated to the degree feasible in this statement. The primary effects in carrying out this action are the allocation of 24,984 acres for wilderness and the allocation of 120,812 acres of inven-

toried roadless area for non-wilderness uses. The potential yield of wood fiber for the Forest would be reduced by 467 thousand board feet; domestic grazing capacities will be increased by 310 animal unit months; summer big game populations will be slightly increased; downhill skiing opportunities will be increased by 110,000 visitor days; developed recreation opportunities will be increased by 86,970 visitor days; dispersed motorized recreation will be reduced by 4,704 visitor days while non-motorized recreation will increase by 44,966 visitor days; permanent population levels will increase by 17 percent; economic growth will increase by 14 percent; 68 miles of road will be constructed or reconstructed."

RECOMMENDATION

Table G-2 displays a summary of East River resource qualities.

TABLE G-2.

ELIGIBILITY SUMMARY OF EAST RIVER

Resource Qualities	Outstanding and Remarkable Value
Scenic	No*
Recreation	No
Geologic	No
Fish and Wildlife	No
Historic	No
Cultural	No
Similar Values	No

\* Only segments "A" and "B" could merit further study.

Based on the available information, even though segments "A" and "B" are very scenic, the East River is not eligible for further consideration for inclusion in the Wild and Scenic River System.

TAYLOR RIVER ELIGIBILITY REPORT

MANAGEMENT SITUATION

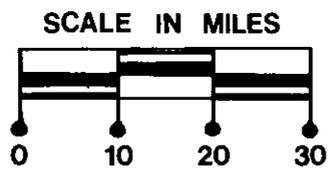
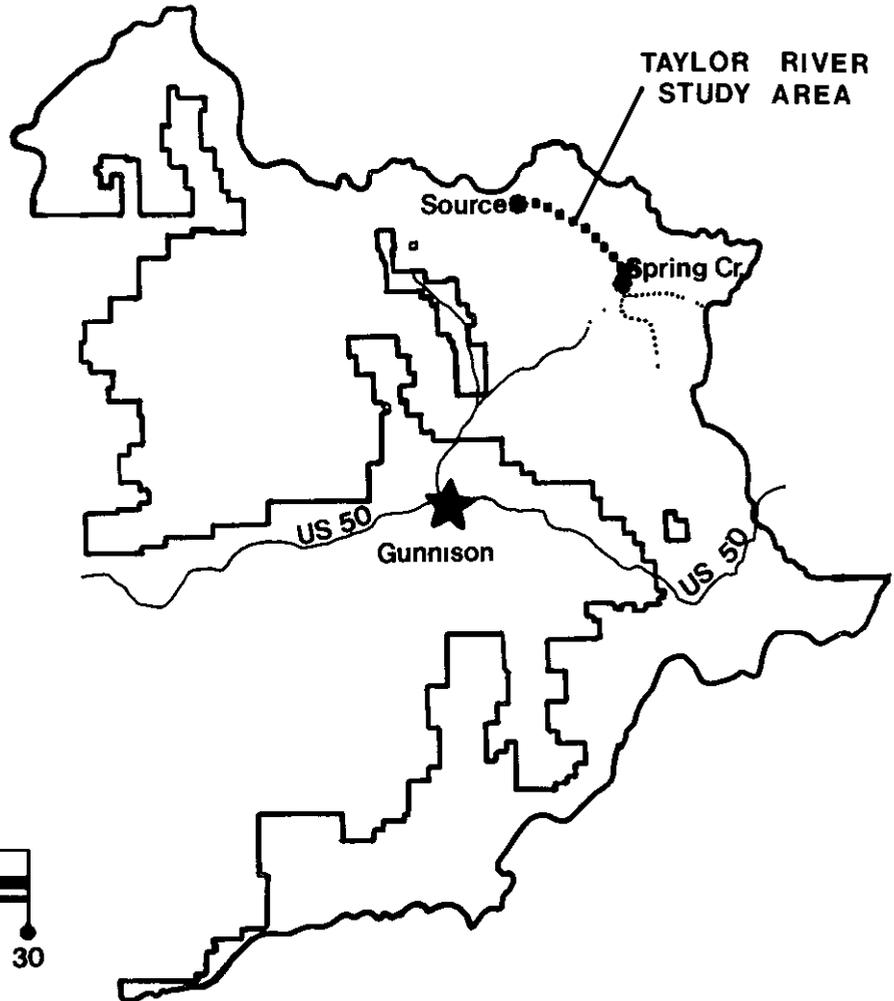
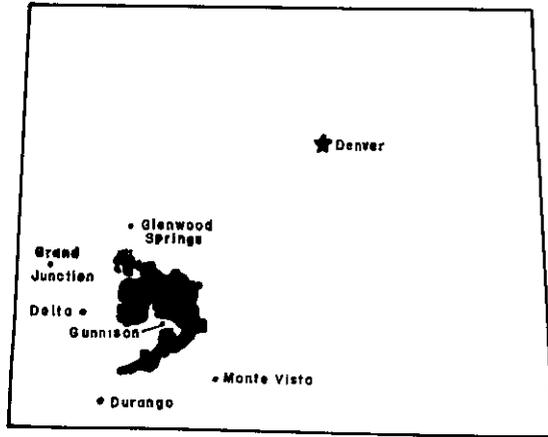
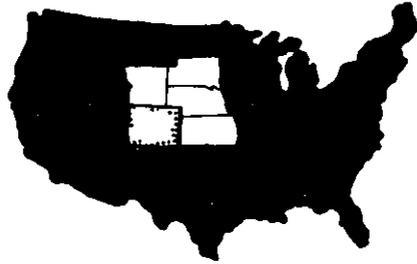
Physical Setting

Figure G-4 is a vicinity map displaying the Taylor River study area.

The headwaters of the Taylor River begin in Eyre Basin, located 15 miles northwest of Taylor Park Reservoir. The river was divided into three segments. Segment "A" of the river starts in the Eyre Basin and ends at its

FIGURE G-4.

TAYLOR RIVER VICINITY MAP



confluence with Bowman Creek. Segment "B" terminates at the confluence of Trail Creek. Segment "C" terminates at Illinois Creek. The length of the river study area is 18 1/3 miles. The three study segments are displayed in Figure G-5.

Taylor River flows south from above timberline (11,600 ft. elevation) on a fairly constant grade of between 8 and 15%. It flows through Taylor Park.

#### Social and Economic Setting

Settlement - Taylor Park was first explored in search of gold and silver in the late 1800's. A wagon road was constructed in the early 1900's that essentially followed the Taylor River through the park. This wagon road connected Taylor Park with the communities of Ashcroft and Aspen on the other side of the Elk Mountains.

The area is used by tourists for camping, picnicking, sightseeing, hunting, and fishing. Livestock grazing occurs under permit to twelve ranchers. There are no attractions of national interest within the study area.

Land Use - There are two campgrounds; 1 current uranium operating plan that has had an active drilling program; 2 small reservoirs; 1 Forest Service guard station; and one cow camp within the river corridor.

The river's primary uses within the study area are sightseeing and fishing for the recreationist, and water for livestock. The river has one irrigation diversion near private land on Pieplant Creek.

#### Economic Use

No site-specific study has been done on the social-economic features of the study area. No resident population live in the upper Taylor River above Taylor Park Reservoir. Previous discussion illustrates that the study area is used mainly for recreation and livestock grazing during the summer months. The area contributes to the overall recreation and agriculture economy of the Taylor River Basin and Gunnison County. The extent of these impacts without specific data can only be surmised.

#### PAST AND CURRENT MANAGEMENT

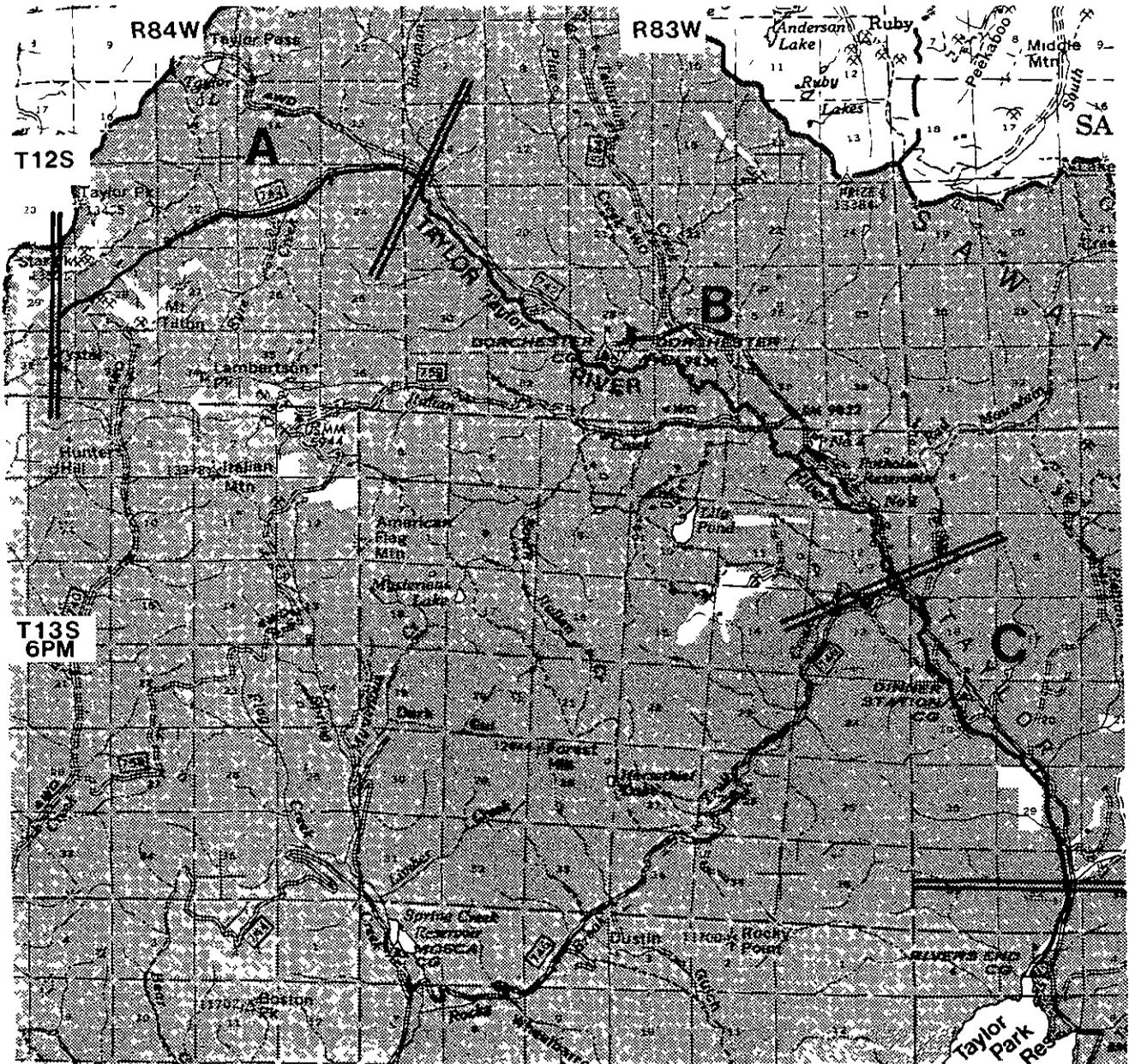
##### Recreation

The upper segment of the Taylor River, segment "A" is somewhat remote with dispersed camping, fishing and hunting as the main attractions. Total use for these activities is approximately 1,000 RVD's annually.

Segment "B" is the broad and scenic Taylor Park. The river runs adjacent to one developed campground and the remains of the historic Dorchester townsite. Fishing, hunting, and camping comprise the major activities in this segment. It is estimated that 10,000 RVD's occur in this area; 3,400 RVD's in developed camping, 5,000 R.V.D.'s occur in dispersed camping, and the remainder in hunting. No private land or livestock grazing exists in either segment "A" or "B".

FIGURE G-5.

TAYLOR RIVER STUDY SEGMENTS



Segment "C", as it approaches the Taylor Park Reservoir, gets more use because of its proximity to the reservoir. Dinner Station Campground sits on the river and continues to be one of the more popular campgrounds of the surrounding area. Nine thousand-seven hundred RVD's were recorded for the 1980 season. Approximately the same number of dispersed campers use the area. Fishing accounts for 6,000 RVD's on segment "C" of the river. The river runs within one mile of the Red Mountain Summer Home Group and this area accounts for 700 RVD's. Winter activities; including snowmobiling and cross-country skiing; account for approximately 500 RVD's.

Cultural Resources - Presently there is no survey data for this area, but comparing it to the East River, it is similar in terrain and remoteness. Therefore, the estimated site density would be very low and cultural resources would not be significant along the river.

Visual Resources - The Taylor River study corridor and its visual surroundings are inventoried as variety class B (common) with identified visual quality objectives of retention and partial retention. The study corridor contains landform, vegetative, and waterform characteristics which are common to the general area. They are not unusual or distinctive in comparison to the character subtype.

#### Fish and Wildlife

There are no threatened - endangered species in the vicinity of the study river.

The Taylor River is stocked with rainbow and cutthroat trout. Ninety percent of the fishing pressure above the Taylor Park Reservoir is at the Pot Holes.

In 1980 and 1982, a fisheries improvement project was completed that consisted of placing and moving large rocks in the river to create pools in approximately one mile of segment "C". Certain segments of the river banks were fenced to reduce streambank erosion.

#### Water

On the average, about 1.0 acre foot of runoff per acre is produced annually on the watershed. This is low in comparison to other areas with similar average elevation in the same vicinity. The two main factors that contribute to this are the geology of Taylor Park and climatic.

In general, the stream channel conditions of the Taylor River and some of the principal tributaries are poor. Heavy grazing has altered the riparian ecosystem and eliminated streambank vegetation. High flows have damaged and cut back streambanks to the point that the stream is, in many places, wider and shallower than it would have been under undisturbed conditions. Fisheries habitat has deteriorated as a result. Though range conditions have improved in Taylor Park, the channel and habitat damage that has occurred will continue to be a management problem. Fisheries are maintained through heavy stocking.

The Taylor River, from its headwaters to its confluence with Illinois Creek is undammed, unregulated, and essentially undiverted. Water quality is good, though affected by past grazing practices.

Major tributaries to the Taylor River include Illinois Creek, Italian Creek, Pieplant Creek, Red Mountain Creek, Trail Creek, Tellurium Creek, Bowman Creek, Pine Creek, and Eyre Creek.

Geology

Topography of the upper Taylor River area is typical of the glaciated mountainous regions of central Colorado. Elevations range from 9,400 feet at the confluence with Illinois Creek to over 11,600 feet at the headwaters. The Sawatch Range is part of the Continental Divide and forms the east and north-east boundary of the watershed. Valleys are steep and U-shaped from glaciation. The tributary streams have high gradients and narrow floodplains. Taylor Park is a long, open grassland basin enclosed on the north and east by glacial moraines, and on the west by steep mountain slopes. The geological material occupying the park consists mainly of glacial outwash that forms benches and terraces on several levels. More recent fluvial material is found immediately adjacent to the Taylor River and its tributaries. Valley bottoms are typically poorly drained.

The headwater areas of the upper Taylor River are composed almost exclusively of granitic rocks. Since the rock is resistant to weathering, rock outcrops and precipitous slopes are common. The drainage system is well developed on these steep mountain slopes.

The glacial moraine and outwash materials are also primarily granitic in origin. The moraines are rolling. Glacial outwash occurs as gently sloping terraces. Because of the high permeability of the glacial deposits, the drainage system is not well developed. Streams that flow from the resistant granitic materials into the glacial deposits below have cut relatively straight parallel channels.

Lands

Table G-3 displays the percentage of private and National Forest System land by segment.

TABLE G-3.

LAND PERCENTAGE BY SEGMENT

Segment	Percentage	Type of Land*
A	100%	NFS Rangeland and Forest land
B	100%	NFS Rangeland
C	98%	NFS Rangeland
	2%	Private Rangeland

\* NFS = National Forest System.

RECOMMENDATION

Table G-4 displays a summary of Taylor River resource qualities.

TABLE G-4.

ELIGIBILITY SUMMARY OF TAYLOR RIVER

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Resource Qualities	Outstanding and Remarkable Value
Scenic	No
Recreation	No
Geologic	No
Fish and Wildlife	No
Historic	No
Cultural	No
Similar Values	No

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Based on the available information, the Taylor River is not eligible for further consideration for inclusion in the Wild and Scenic River System.

APPENDIX H  
GOALS COMMON TO ALL ALTERNATIVES  
CONSIDERED IN DETAIL

## GOALS COMMON TO ALL ALTERNATIVES CONSIDERED IN DETAIL

Management goals describe the desired future conditions of the Forest. The following goals are common to all alternatives considered in detail. These goals are in addition to the goals of each alternative presented in Chapter II.

### RECREATION

Meet demand for downhill skiing.

Meet demand for dispersed recreation outside wilderness.

Preserve and manage significant cultural resources and ensure that these resources remain available for research and education uses.

### WILDERNESS

Emphasize primitive wilderness opportunities.

Implement indirect methods for controlling wilderness use.

### FISH AND WILDLIFE

Increase National Forest System winter range carrying capacity for elk and deer.

Improve wildlife habitat diversity.

Improve fisheries habitat.

Increase vertical and horizontal diversity.

### RANGE

Increase investments in structural and non-structural range improvements on range with high potential for improvement.

### TIMBER

Accomplish the current reforestation needs.

### WATER

Manage surface uses to maintain water quality above Federal, State, and local standards.

Protect the water quality in streams, lakes, riparian areas, and other water bodies.

## MINERALS

Encourage environmentally sound energy and minerals development.

Coordinate mineral extraction with surface resource management.

Integrate mineral exploration and development within the National Forest System with the use and protection of other resource values.

Emphasize oil, gas, and mineral exploration and development outside wilderness areas.

Mitigate adverse environmental effects on National Forest System land.

## HUMAN AND COMMUNITY DEVELOPMENT

Provide the opportunity for economic growth of industries and communities dependent upon Forest outputs.

## PROTECTION

Provide a cost-efficient fire management program.

Manage protection activities for air quality compatible with Federal and State laws.

Prevent and control insect and disease infestations.

## LANDS

Increase opportunities for exchange and transfer of National Forest System land.

Acquire rights-of-way needed to support management of National Forest System resources.

Post and mark the Forest boundary.

## SOILS

Conserve soil resource.

Maintain long-term land productivity.

## FACILITIES

Improve cost-effectiveness and efficiency of road management.

Provide a efficient and environmentally sound transportation system.

Coordinate transportation facilities to meet the needs of the Forest.

Implement an effective travel management program.

Update existing facilities and structures to meet State and Federal standards.

Replace facilities and structures that are deficient from a structural, functional, mechanical, electrical, or energy efficient standpoint.

**APPENDIX I**  
**OUTPUTS FOR WILDERNESS**

## OUTPUTS FOR WILDERNESS

Because of the need for uniform management direction in wildernesses which are on more than one Forest, this Final EIS discloses management alternatives and their potential impacts on an entire wilderness. This is done for the wilderness areas displayed in Table I-1.

TABLE I-1.

WILDERNESS AREAS COVERED IN THIS FINAL EIS  
(Acres)

Name	Net N.F. Acres
Big Blue Wilderness	98,235
La Garita Wilderness (includes 24,164 acres administered by the Rio Grande N.F.)	103,986
Mount Sneffels Wilderness	16,200
Raggeds Wilderness (includes 16,578 acres administered by the White River N.F.)	59,105
West Elk Wilderness	176,092
<u>GRAND TOTAL</u>	<u>453,618</u>

The overall effects of alternatives relating to these wildernesses are discussed in Chapter IV of this Final EIS. The one exception is the economic efficiency analysis which will be covered in the specific EIS for the individual Forests. This incorporates the total costs and benefits (including wilderness management) within each Forest's alternative analysis. The purpose of this appendix is to show more detailed information by individual Forest for each wilderness than is portrayed in Chapter IV. This is done in five tables.

- Table I-2 displays the estimated wilderness management area direction.
- Table I-3 displays the economic analysis for Fossil Ridge Wilderness Study Area and Cannibal Plateau Further Planning Area.
- Table I-4 displays land recommended available for mineral leasing in designated wilderness areas.
- Table I-5 summarizes the environmental consequences of each alternative for Fossil Ridge Wilderness Study Area and Cannibal Plateau Further Planning Area.
- Table I-6 displays the land use allocations for each alternative for Fossil Ridge Wilderness Study Area and Cannibal Plateau Further Planning Area.

TABLE I-2.

**WILDERNESS MANAGEMENT AREA DIRECTION AND FOREST  
(Acres)**

Wilderness/ Forest/Management Area Direction	Alternative								
	1	2	3	4	5	6	7	8	9
<b>LA GARITA</b>									
Rio Grande N.F.									
High density	0	400	400	0	400	400	400	400	400
Semi-primitive	18,914	18,514	18,514	17,166	18,514	18,514	18,514	18,514	18,514
Primitive	5,250	5,250	5,250	6,998	5,250	5,250	5,250	5,250	5,250
Pristine	0	0	0	0	0	0	0	0	0
TOTAL = 24,164 acres									
<b>Gunnison N.F.</b>									
High density	0	9,140	9,140	0	9,140	7,615	6,785	9,140	9,140
Semi-primitive	50,128	40,988	40,988	9,898	40,988	36,327	37,277	40,988	40,988
Primitive	15,230	15,230	15,230	38,706	15,230	21,416	21,296	15,230	15,230
Pristine	14,464	14,464	14,464	31,218	14,464	14,464	14,464	14,464	14,464
TOTAL = 79,822 acres									
<b>RAGGEDS</b>									
White River N.F.									
High density	0	0	0	332	0	332	332	0	0
Semi-primitive	3,979	3,979	3,979	3,647	3,979	4,808	3,647	3,979	3,979
Primitive	5,471	5,471	5,471	5,471	5,471	4,310	5,471	5,471	5,471
Pristine	7,128	7,128	7,128	7,128	7,128	7,128	7,128	7,128	7,128
TOTAL = 16,578 acres									
<b>Gunnison N.F.</b>									
High density	0	0	0	4,785	0	4,785	4,785	0	0
Semi-primitive	2,722	2,722	2,722	6,804	2,722	6,804	6,804	2,722	2,722
Primitive	15,033	15,033	15,033	6,804	15,033	13,927	6,804	15,033	15,033
Pristine	24,772	24,772	24,772	24,134	24,772	17,011	24,134	24,772	24,772
TOTAL = 42,527 acres									
<b>BIG BLUE</b>									
Uncompahgre N.F.									
High density	0	0	0	4,540	0	6,454	4,540	0	0
Semi-primitive	79,777	75,651	75,651	3,873	75,651	2,584	3,873	75,651	75,651
Primitive	18,458	22,584	22,584	58,865	22,584	69,835	58,865	22,584	22,584
Pristine	0	0	0	30,957	0	19,362	30,957	0	0
TOTAL = 98,235 acres									
<b>MOUNT SNEPPELS</b>									
Uncompahgre N.F.									
High density	0	2,550	2,550	1,395	2,550	1,395	1,395	2,550	2,550
Semi-primitive	2,550	13,650	13,650	9,027	13,650	9,027	9,027	13,650	13,650
Primitive	13,650	0	0	0	0	0	0	0	0
Pristine	0	0	0	5,778	0	5,778	5,778	0	0
TOTAL = 16,200 acres									
<b>WEST ELK</b>									
Gunnison N.F.									
High density	0	0	0	5,102	0	15,937	5,102	0	0
Semi-primitive	13,612	10,196	10,196	7,673	10,196	14,950	7,673	10,196	10,196
Primitive	105,092	108,508	108,508	74,059	108,508	118,404	74,059	108,508	108,508
Pristine	57,388	57,388	57,388	89,258	57,388	26,801	89,258	57,388	57,388
TOTAL = 176,092 acres									

TABLE I-2. (Cont.)

Wilderness/ Forest/Management Area Direction	Alternative								
	1	2	3	4	5	6	7	8	9
<b>FOSSIL RIDGE WILDERNESS</b>									
<b>STUDY AREA</b>									
Gunnison N.F.									
High density	0	0	0	2,085	0	1,920	2,085	0	0
Semi-primitive	0	0	0	13,327	0	8,476	13,327	0	0
Primitive	0	0	0	15,698	0	16,037	15,698	0	0
Pristine	0	0	0	16,290	0	7,967	16,290	0	0
<b>TOTAL</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>47,400</b>	<b>0</b>	<b>34,400</b>	<b>47,400</b>	<b>0</b>	<b>0</b>
<b>CANNIBAL PLATEAU FURTHER</b>									
<b>PLANNING AREA</b>									
Gunnison N.F.									
High density	0	0	0	1,036	0	0	1,036	0	0
Semi-primitive	4,596	0	0	15,871	0	4,596	15,871	4,596	0
Primitive	7,280	0	0	13,464	0	7,280	13,464	7,280	0
Pristine	1,723	0	0	1,619	0	1,723	1,619	1,723	0
<b>TOTAL</b>	<b>13,599</b>	<b>0</b>	<b>0</b>	<b>31,990</b>	<b>0</b>	<b>13,599</b>	<b>31,990</b>	<b>13,599</b>	<b>0</b>

TABLE I-3.

ECONOMIC EFFICIENCY ANALYSIS  
FOSSIL RIDGE WILDERNESS STUDY AREA  
(4% Discount Rate)

	ALTERNATIVES				OUTPUTS ACCRUED		
	A UNSUITABLE (NO ACTION)	B PARTIAL SUITABLE	C SUITABLE	D UNSUITABLE (PROPOSED ACTION)	B-A PARTIAL SUITABLE ALTERNATIVE	C-A SUITABLE ALTERNATIVE	D-A UNSUITABLE ALTERNATIVE
<b>I. Resource Outputs</b>							
Timber (MMBF/Yr)	0	0	0	.242	0	0	.242
Water (MAF/Yr)	50	50	50	51	0	0	1
Recreation							
Wilderness (MRVD/Yr)	0	2.21	2.21	0	2.21	2.21	0
Dispersed Non- Wilderness (MRVD/Yr)	2.345	.135	0	2.345	0	0	0
Range (AUM/Yr)	697	697	697	697	0	0	0
<b>II. Present Value Benefits(M\$)</b>							
Timber	0	0	0	193.9			
Water	5370.5	5370.5	5370.5	5477.9			
Recreation							
Wilderness	0	556.6	556.6	0			
Dispersed Non- Wilderness	222.2	12.7	0	222.2			
Range	156.9	156.9	156.9	156.9			
<u>Total</u>	<u>5749.6</u>	<u>6096.7</u>	<u>6084.0</u>	<u>6050.9</u>			
Benefits Accrued- Partial Suitable (B-A)		347.1					
Benefits Accrued- Suitable (C-A)			334.4				
Benefits Accrued- Unsuitable (D-A)				301.3			
<b>III. Present Value Costs (M\$)</b>							
Operation & Maintenance	103.3	211.0	251.0	304.7			
Capital Investment	0	0	0	219.7			
General Administration	20.7	42.2	50.2	60.9			
<u>Total</u>	<u>124.0</u>	<u>253.2</u>	<u>301.2</u>	<u>585.3</u>			
Incremental Disc. Costs*							
Unsuitable Minus No Action (D-A)				461.3			
Suitable Minus No Action (C-A)			177.2				
Partial Suitable Minus No Action (B-A)		129.2					
<b>IV. Incremental Efficiency Analysis*</b>							
Present Value Benefits		347.1	334.4	301.3			
Present Value Costs		129.2	177.2	461.3			
Present Net Value		217.9	157.2	-160.0			
Benefit-Cost Ratio		2.69	1.89	.65			

\* All values are incremental to Alternative A

TABLE I-3. (Cont.)

ECONOMIC EFFICIENCY ANALYSIS  
FOSSIL RIDGE WILDERNESS STUDY AREA  
(7 1/8% Discount Rate)

	ALTERNATIVES				OUTPUTS ACCRUED		
	A UNSUITABLE (NO ACTION)	B PARTIAL SUITABLE	C SUITABLE	D UNSUITABLE (PROPOSED ACTION)	B-A PARTIAL SUITABLE ALTERNATIVE	C-A SUITABLE ALTERNATIVE	D-A UNSUITABLE ALTERNATIVE
I. Resource Outputs							
Timber (MMBF/Yr)	0	0	0	.242	0	0	.242
Water (MAF/Yr)	50	50	50	51	0	0	1
Recreation							
Wilderness (MRVD/Yr)	0	2.21	2.21	0	2.21	2.21	0
Dispersed Non- Wilderness (MRVD/Yr)	2.345	.135	0	2.345	0	0	0
Range (AUM/Yr)	697	697	697	697	0	0	0
II. Present Value Benefit(M\$)							
Timber	0	0	0	103.8			
Water	3396.4	3396.4	3396.4	3464.3			
Recreation							
Wilderness	0	322.7	322.7	0			
Dispersed Non- Wilderness	129.6	7.5	0	129.6			
Range	99.2	99.2	99.2	99.2			
<u>Total</u>	<u>3625.2</u>	<u>3625.8</u>	<u>3618.3</u>	<u>3796.9</u>			
Benefits Accrued-							
Partial Suitable (B-A)		200.6					
Benefits Accrued- Suitable (C-A)			193.1				
Benefits Accrued- Unsuitable (D-A)				171.7			
III. Present Value Costs (M\$)							
Operation & Maintenance	65.4	133.5	158.7	168.4			
Capital Investment	0	0	0	130.9			
General Administration	13.1	26.7	21.7	33.7			
<u>Total</u>	<u>78.5</u>	<u>160.2</u>	<u>180.4</u>	<u>333.0</u>			
Incremental Disc. Costs							
Unsuitable Minus No Action (D-A)				254.5			
Suitable Minus No Action (C-A)			111.9				
Partial Suitable Minus No Action (B-A)		81.7					
IV. Incremental Efficiency Analysis*							
Present Value Benefits		200.6	193.1	171.7			
Present Value Costs		81.7	111.9	254.5			
Present Net Value		118.9	81.2	-82.8			
Benefit-Cost Ratio		2.46	1.73	.67			

\* All values are incremental to Alternative A

TABLE I-3. (Cont.)

ECONOMIC EFFICIENCY ANALYSIS  
CANNIBAL PLATEAU FURTHER PLANNING AREA  
(4% Discount Rate)

	ALTERNATIVES				OUTPUTS ACCRUED		
	A UNSUITABLE (NO ACTION)	B PARTIAL SUITABLE (PROPOSED ACTION)	C SUITABLE	D UNSUITABLE	B-A PARTIAL SUITABLE ALTERNATIVE	C-A SUITABLE ALTERNATIVE	D-A UNSUITABLE ALTERNATIVE
<b>I. Resource Outputs</b>							
Timber (MMBF/Yr)	0	0	0	1.4	0	0	1.4
Water (MAF/Yr)	42	42	42	43	0	0	1
Recreation							
Wilderness (MRVD/Yr)	0	.6	1.25	0	.6	1.75	0
Dispersed Non- Wilderness (MRVD/Yr)	1.75	1.15	0	1.75	0	0	0
Range (AUM/Yr)	4922	4922	4922	4922	0	0	0
<b>II. Present Value Benefit(M\$)</b>							
Timber	0	0	0	1108.0			
Water	4511.3	4511.3	4511.3	4618.7			
Recreation							
Wilderness	0	151.2	315.5	0			
Dispersed Non- Wilderness	166.5	109.0	0	166.5			
Range	1108.1	1108.1	1108.1	1108.1			
<u>Total</u>	<u>5785.9</u>	<u>5879.6</u>	<u>5934.9</u>	<u>7001.3</u>			
Benefits Accrued- Partial Suitable (B-A)		93.7					
Benefits Accrued- Suitable (C-A)			149.0				
Benefits Accrued- Unsuitable (D-A)				1215.4			
<b>III. Present Value Costs (M\$)</b>							
Operation & Maintenance	176.3	218.0	274.2	1226.2			
Capital Investment	0	0	0	475.7			
General Administration	35.3	43.6	54.8	245.2			
<u>Total</u>	<u>211.6</u>	<u>261.6</u>	<u>329.0</u>	<u>1947.1</u>			
Incremental Disc. Costs							
Unsuitable Minus No Action D-A				1735.5			
Suitable Minus No Action C-A			117.4				
Partial Suitable Minus No Action B-A		50.0					
<b>IV. Incremental Efficiency Analysis*</b>							
Present Value Benefits		93.7	149.0	1215.4			
Present Value Costs		50.0	117.4	1735.5			
Present Net Value		43.7	31.6	-520.1			
Benefit-Cost Ratio		1.87	1.27	.70			

\* All values are incremental to Alternative A.

TABLE I-3. (Cont.)

ECONOMIC EFFICIENCY ANALYSIS  
 CANNIBAL PLATEAU FURTHER PLANNING AREA  
 (7 1/8% Discount Rate)

	ALTERNATIVES				OUTPUTS ACCRUED		
	A UNSUITABLE (NO ACTION)	B PARTIAL SUITABLE (PROPOSED ACTION)	C SUITABLE	D UNSUITABLE	B-A PARTIAL SUITABLE ALTERNATIVE	C-A SUITABLE ALTERNATIVE	D-A UNSUITABLE ALTERNATIVE
I. Resource Outputs							
Timber (MMBF/Yr)	0	0	0	1.4	0	0	1.4
Water (MAF/Yr)	42	42	42	43	0	0	1
Recreation							
Wilderness (MRVD/Yr)	0	.6	1.2	0	.6	1.25	0
Dispersed Non- Wilderness (MRVD/Yr)	1.75	1.15	0	1.75	0	0	0
Range (AUM/Yr)	4922	4922	4922	4922	0	0	0
II. Present Value Benefit(M\$)							
Timber	0	0	0	558.4			
Water	2853.0	2853.0	2853.0	2920.9			
Recreation							
Wilderness	0	87.7	182.5	0			
Dispersed Non- Wilderness	98.9	63.6	0	98.9			
Range	700.8	700.8	700.8	700.8			
<u>Total</u>	<u>3652.7</u>	<u>3705.1</u>	<u>3736.3</u>	<u>4279.0</u>			
Benefits Accrued- Partial Suitable (B-A)		52.4					
Benefits Accrued- Suitable (C-A)			83.6				
Benefits Accrued- Unsuitable (D-A)				626.3			
III. Present Value Costs (M\$)							
Operation & Maintenance	111.5	137.9	173.4	634.2			
Capital Investment	0	0	0	273.1			
General Administration	22.3	27.6	34.7	126.8			
<u>Total</u>	<u>133.8</u>	<u>165.5</u>	<u>208.1</u>	<u>1034.1</u>			
Incremental Disc. Costs							
Unsuitable Minus No Action D-A				900.3			
Suitable Minus No Action C-A			74.3				
Partial Suitable Minus No Action B-A		31.7					
IV. Incremental Efficiency Analysis*							
Present Value Benefits		52.4	83.6	626.3			
Present Value Costs		31.7	74.3	900.3			
Present Net Value		20.7	9.3	-274.0			
Benefit-Cost Ratio		1.65	1.13	.70			

\* All values are incremental to Alternative A.

TABLE I-4.

LAND AVAILABLE FOR MINERAL LEASING WITHIN DESIGNATED WILDERNESS AREAS  
(Alternatives 1, 3, 4, 5, 6, 7, 8, 9)\*\*

Wilderness and Forest	Recommend Unavailable for Lease		Recommend Available for Lease with Surface Occupancy		Recommend Available for Lease without Surface Occupancy		Total Net Acres
	Acres	Percent*	Acres	Percent*	Acres	Percent*	
<b>BIG BLUE</b>							
Uncompahgre N.F.	75,235	76	21,490	22	1,510	2	98,235
<b>LA GARITA</b>							
Rio Grande N.F.	4,320	18	5,509	23	14,335	59	24,164
Gunnison N.F.	21,161	26	32,464	41	26,197	33	79,822
<b>TOTAL</b>	<b>25,481</b>	<b>24</b>	<b>37,973</b>	<b>36</b>	<b>40,532</b>	<b>40</b>	<b>103,986</b>
<b>MOUNT SNEFFELS</b>							
Uncompahgre N.F.	10,708	66	0	0	5,492	34	16,200
<b>RAGGEDS</b>							
White River N.F.	13,392	81	0	0	3,186	19	16,578
Gunnison N.F.	35,116	83	880	2	6,531	15	42,527
<b>TOTAL</b>	<b>48,508</b>	<b>82</b>	<b>880</b>	<b>1</b>	<b>9,717</b>	<b>17</b>	<b>59,105</b>
<b>WEST ELK</b>							
Gunnison N.F.	123,581	70	10,425	6	42,086	24	176,092
<b>TOTALS</b>							
Rio Grande N.F.	4,320	18	5,509	23	14,335	59	24,164
White River N.F.	13,392	81	0	0	3,186	19	16,578
Grand Mesa, Uncompahgre and Gunnison N.F.	265,801	64	65,259	16	81,816	20	412,876
<b>GRAND TOTAL</b>	<b>283,513</b>	<b>62</b>	<b>70,768</b>	<b>16</b>	<b>99,337</b>	<b>22</b>	<b>453,618</b>

\* Percentages added horizontally equal 100%.

\*\*Alternative 2 recommends 453,618 acres (100%) unavailable for mineral leasing.

TABLE I-5.

SUMMARY OF ENVIRONMENTAL CONSEQUENCES  
(Fossil Ridge Wilderness Study Area)

Resource	Alternative			
	A <u>UNSUITABLE</u> (NO ACTION)	B <u>PARTIAL SUITABLE</u>	C <u>SUITABLE</u>	D <u>UNSUITABLE</u> (PROPOSED ACTION)
<u>Wilderness</u>				
Potential Loss Wilderness Character	None	Increased	None	Increased
Natural Integrity	No Change	No Change	No Change	Decreased
Apparent Naturalness	No Change	No Change	No Change	Decreased
Solitude	No Change	Decreased	No Change	Decreased
Primitive Recreation Opportunity	No Change	No Change	No Change	Decreased
Supplement Attributes	No Change	No Change	No Change	Decreased
Scenic Value	No Change	No Change	No Change	Decreased
Acres added to Wilderness	-0-	34,300	47,400	-0-
<u>Recreation Opportunities</u> (PAOT*)				
Roaded Natural	189	-0-	-0-	189
Semi-Primitive Motorized**	376	82	-0-	433
Non-Motorized	156	95	135	135
High Density	-0-	149	162	-0-
Primitive	-0-	107	88	-0-
Pristine	-0-	20	38	-0-
Annual Recreation Use at Capacity (RVD*)	33,556	22,586	21,557	34,774
Value of Rec. Use/ Year at Capacity (RPA Values)	\$100,668	\$153,585	\$172,616	\$104,322
Area open to motorized vehicle use (trail miles)	45 miles currently used.	7 miles currently used.	-0-	45 miles currently used.
<u>Water</u>				
Acre Feet Water Yield	50,000	50,000	50,000	51,000
Pollution Risk Caused by Surface Disturbing Activities	Increased	Some Increase	Unchanged	Increased

TABLE I-5. (Cont.)

SUMMARY OF ENVIRONMENTAL CONSEQUENCES  
(Fossil Ridge Wilderness Study Area)

Resource	Alternative			
	A <u>UNSUITABLE</u> (NO ACTION)	B <u>PARTIAL SUITABLE</u>	C <u>SUITABLE</u>	D <u>UNSUITABLE</u> (PROPOSED ACTION)
<u>Water (Continued)</u>				
Pollution Risk Caused by recreation and other use.	Increased	Increased	Increased	Increased
Development Likelihood Of Water Storage Facilities	Low	Low	Low	Low
Feasibility of Planned or Proposed Water Developments.	Not feasible at this time.	Not feasible at this time.	Not feasible at this time.	Not feasible at this time.
<u>Timber</u>				
Acres Tentative Suitable Timberland	0	0	0	5,847
Suitable Timberland Acres	0	0	0	3,415
Volume Scheduled for Harvest Through Year 2030	0	0	0	17.811 MMBF
Present Value Timber (50-years @ 4% discount)M\$	0	0	0	193.9
Long-Term Sustained Yield Capacity	0	0	0	.242 MMBF/Yr
<u>Land Ownership</u>				
Future Mineral Patents	No Change	No Change on 13,100 acres.  Decreased Possi- bility on 34,300 acres.	Decreased Possibility	No Change
<u>Minerals</u>				
Chance of Significant Mineral Resource Development Foregone	Low	Low on 13,100 acres; High on 34,300 acres.	High	Low
Cost of Exploration	No change	Increased	Increased	No Change
Chance of Conflict with Wilderness Values	Low	Low on 13,100 acres; High on 34,300 acres.	High	Low

\* PAOT = Persons-At-One-Time

RVDs = Recreation Visitor Days

MMBF = Million Board Feet

M\$ = Thousand Dollars

\*\* Roads outside the WSA affect the recreation experience inside the WSA.

TABLE I-5.

SUMMARY OF ENVIRONMENTAL CONSEQUENCES  
(Cannibal Plateau Further Planning Area)

Resource	Alternative			
	A UNSUITABLE (No Action)	B PARTIAL SUITABLE (Proposed Action)	C SUITABLE	D UNSUITABLE
<u>Wilderness</u>				
Potential Loss	None	Increased	None	Increased
Wilderness Character				
Natural Integrity	No Change	No Change	No Change	Decreased
Apparent Naturalness	No Change	No Change	No Change	Decreased
Solitude	No Change	Decreased	No Change	Decreased
Primitive Recreation				
Opportunity	No Change	No Change	No Change	Decreased
Supplement Attributes	No Change	No Change	No Change	Decreased
Scenic Value	No Change	No Change	No Change	Decreased
Acres added to Wilderness	-0-	13,599	31,990	-0-
<u>Recreation Opportunities (PAOT*)</u>				
Roaded Natural	-0-	-0-	-0-	99
Semi-Primitive				
Motorized**	516	188	-0-	492
Non-Motorized	23	71	226	-0-
High Density	-0-	-0-	119	-0-
Primitive	-0-	54	60	-0-
Pristine	-0-	6	5	-0-
Annual Recreation Use at Capacity (RVD*)	44,404	25,378	21,211	51,818
Value of Rec. Use/ Year at capacity (RPA Values)	\$133,212	\$128,244	\$169,688	155,454
Area Open to Motorized Vehicle Use	31,990	18,391	-0-	31,990

TABLE I-5. (Cont.)

SUMMARY OF ENVIRONMENTAL CONSEQUENCES  
(Cannibal Plateau Further Planning Area)

Resource	Alternative			
	A UNSUITABLE (No Action)	B PARTIAL SUITABLE (Proposed Action)	C SUITABLE	D UNSUITABLE
<u>Water</u>				
Pollution Risk Caused by Surface Disturbing Activities	Increased	Some Increase	Unchanged	Increased
Pollution Risk Caused by Recreation and Other Use	Increased	Increased	Increased	Increased
Development Likelihood Of Water Storage Facilities	Low	Low	Low	Low
<u>Timber</u>				
Acres Tentative Suitable Timberland	0	0	0	11,147
Suitable Timberland Acres	0	0	0	11,147
Volume Scheduled For Harvest Through Year 2030 MMBF	0	0	0	109.9
Present Value Timber (50-years @ 4% discount)M\$	0	0	0	1,108.0
Long-Term Sustained Yield Capacity MMBF/Yr	0	0	0	1.4
<u>Land Ownership</u>				
Future Mineral Patents	No Change	Decreased Possibility	Decreased Possibility	No Change
Special Uses - Motorized Access	Yes, with re- source restric- tions	Yes on 18,391 acres; No on 13,599 acres.	No	Yes, with re- source restric- tions.
<u>Minerals</u>				
Chance of Significant Mineral Resource Development Foregone	Low	Low	Low	Low
Cost of Exploration	No Change	Increased	Increased	No Change
Chance of Conflict with Wilderness Values	Low	Low	High	Low

\* PAOT = Persons-At-One-Time  
RVDs = Recreation Visitor Days  
M\$ = Thousand Dollars  
MMBF = Million Board Feet

\*\* Roads outside the FPA affect the recreation experience inside the WSA.

TABLE I-6.

ACREAGE ALLOCATION BY MANAGEMENT AREA PRESCRIPTION  
FOR EACH ALTERNATIVE  
(Fossil Ridge Wilderness Study Area)

Mgmt. Area Prescription	Emphasis	Alternatives*			
		A No Action Unsuitable (2 and 9)	B Partial Suitable (6)	C Suitable (4 and 7)	D Unsuitable (1,3,5,& 8)
2A	Semi-Primitive motorized recreation opportunities. Range management will reduce conflicts between recreation and livestock.	21,687	8,900	0	21,369
2B	Roaded natural and rural recreation opportunities. Major travel routes. Maintained or improved visual quality. Range management will reduce conflicts between recreation and livestock. Timber harvest.	1,315	0	0	1,315
3A	Semi-primitive non-motorized recreation opportunities. User density is controlled by access.	24,398	0	0	21,116
6B	Livestock grazing. Maintain forage composition. Vegetation treatment in mountain grass, meadow, and shrub; oakbrush; and aspen types. All slopes.	0	4,200	0	1,500
7A	Intensive timber management. Clearcut harvest in aspen, spruce-fir, and lodgepole pine types. Slopes less than 40%.	0	0	0	200
7C	Intensive timber management. Clearcut harvest in lodgepole pine type. Group Selection harvest in spruce-fir type. Slopes greater than 40%.	0	0	0	300
7E	Intensive timber management. Shelterwood harvest in spruce-fir and ponderosa pine types. Clearcut lodgepole pine. Slopes less than 40%.	0	0	0	1,600
8A	Pristine wilderness setting. Very high levels of solitude. High opportunity for challenge, risk, and self-reliance. No trails present.	0	7,867	16,290	0
8B	Primitive wilderness setting. High level of solitude. High opportunity for challenge, risk, and self-reliance.	0	16,037	15,698	0
8C	Semi-primitive wilderness setting. Moderate level of solitude. Moderate opportunity for challenge, risk, and self-reliance.	0	8,476	13,327	0
8D	High density wilderness setting. Heavy day use. Low level of solitude. Low opportunity for challenge, risk, and self-reliance.	0	1,920	2,085	0
<u>Total</u>		<u>47,400</u>	<u>47,400</u>	<u>47,400</u>	<u>47,400</u>

\* The numbers in the parentheses identify the alternative considered in detail in the Final Environmental Impact Statement for the Grand Mesa, Uncompahgre, and Gunnison National Forests Land and Resource Management Plan in which the Fossil Ridge Wilderness Study Area alternatives are included.

TABLE I-6. (Cont.)

ACREAGE ALLOCATION BY MANAGEMENT AREA PRESCRIPTION  
FOR EACH ALTERNATIVE  
(Cannibal Plateau Further Planning Area)

Mgmt. Area Prescription	Emphasis	Alternatives*			
		A No Action Unsuitable (2 and 9)	B Partial Suitable (1,6,& 8)	C Suitable (4 and 7)	D Unsuitable (3, & 5,)
2A	Semi-Primitive motorized recreation opportunities. Range management will reduce conflicts between recreation and livestock.	30,203	12,108	0	3,467
2B	Roaded natural and rural recreation opportunities. Major travel routes. Maintained or improved visual quality. Range management will reduce conflicts between recreation and livestock. Timber harvest.	0	0	0	489
5A	Big game winter range in non-forest areas. Travel management prevents unacceptable stress. Livestock grazing managed to favor wildlife habitat.	1,487	0	0	1,487
5B	Big game winter range in forest areas. Travel management prevents unacceptable stress. Vegetation treatment will enhance plant and animal diversity. Livestock grazing managed to favor wildlife habitat.	0	0	0	946
6B	Livestock grazing, Maintain forage composition. Vegetation treatment in mountain grass, meadow, and shrub; oakbrush; and aspen types. All slopes.	0	5,983	0	15,589
7E	Intensive timber management. Shelterwood harvest in spruce-fir and ponderosa pine types. Clearcut lodgepole pine. Slopes less than 40%.	0	0	0	9,712
8A	Pristine wilderness setting. Very high levels of solitude. High opportunity for challenge, risk, and self-reliance. No trails present.	0	1,723	1,619	0
8B	Primitive wilderness setting. High level of solitude. High opportunity for challenge, risk, and self-reliance.	0	7,280	13,464	0
8C	Semi-primitive wilderness setting. Moderate level of solitude. Moderate opportunity for challenge, risk, and self-reliance.	0	4,596	15,871	0
8D	High density wilderness setting. Heavy day use. Low level of solitude. Low opportunity for challenge, risk, and self-reliance.	0	0	1,036	0
10C	Special Interest Areas. Cultural Areas. National Natural Landmarks.	300	300	0	300
<u>Total</u>		<u>31,990</u>	<u>31,990</u>	<u>31,990</u>	<u>31,990</u>

\* The numbers in the parentheses identify the alternative considered in detail in the Final Environmental Impact Statement for the Grand Mesa, Uncompahgre, and Gunnison National Forests Land and Resource Management Plan in which the Cannibal Plateau Further Planning Area alternatives are included.

**APPENDIX J**  
**OUTPUTS, ACTIVITIES, COSTS, AND BENEFITS SUMMARY**

OUTPUTS, ACTIVITIES, COSTS, AND BENEFITS SUMMARY

Tables J-1 and J-2 summarize the resource output analysis by alternative.

TABLE J-1.

RESOURCE OUTPUT ANALYSIS BY ALTERNATIVE  
(Summary First Decade, Average Annual Output)

Output	Unit of Measure**	Current Year	Alternative								
			1 Proposed	2 No Action	3 RPA	4	5	6	7	8	9
<b>RECREATION</b>											
Developed Recreation Use (Inc VIS)	MRVD	578	656	656	656	656	656	656	656	656	637
Downhill Skiing Use	MRVD	222	315.5	315.5	315.5	315.5	315.5	315.5	315.5	315.5	315.5
Dispersed Rec. Use (Inc Wildlife & Fish)	MRVD	1399	1,587	1,587	1,587	1,587	1,587	1,587	1,587	1,587	1,587
Off-Road Motorized Use	MRVD	168	190.5	190.5	190.5	190.5	190.5	190.5	190.5	190.5	190.5
Trail Construction/ Reconstruction	Miles	0	50	15	11	100	15	50	15	15	0
<b>WILDERNESS</b>											
Wilderness Management	M Acres	501.8	515.4	501.8	501.8	581.2	501.8	549.7	581.2	515.4	501.8
Wilderness Use	MRVD	164	185	185	185	185	185	185	185	185	185
<b>FISH &amp; WILDLIFE</b>											
Wildlife Habitat Improvement (Aspen and Burning)	Acres	4,000	5,500	5,500	5,500	6,330	4,000	6,330	4,830	4,830	2,650
Threatened and/or Endangered Species Habitat Mgt	Acres	19,104	19,104	19,104	19,104	19,104	19,104	19,104	19,104	19,104	19,104
Winter Range Carrying Capacity Deer & Elk	M Animals	82.7	87.3	87.6	88.1	86.2	87.8	86.5	86.3	87.4	86.0
Wildlife Structures	Numbers	35	10	35	35	10	30	10	40	10	0
<b>RANGE</b>											
Grazing Use (Livestock)	MAUM	320.0	327.9	326.7	330.0	314.9	334.9	314.9	334.6	328.3	315.0
<b>TIMBER</b>											
Programmed Sales Offered	MMBF	28.8	35.0	28.0	40.8	13.5	35.0	13.5	30.0	35.0	22.0
Reforestation	M Acres	638	408	270	422	227	402	225	368	408	262
Timber Stand Improvement	M Acres	1.5	75	625	75	585	1,000	585	900	1,000	1,528
<b>WATER</b>											
Avg Annual Yield	4 Ac Ft	2,869.0	2,880	2,877	2,881	2,876	2,880	2,876	2,880	2,883	2,876
<b>MINERALS</b>											
Mineral Leases and Permits	# Op. Plans	90	114	135	114	120	135	120	135	135	50
<b>SOILS</b>											
Soil & Water Res Imp (Imp Watershed Condition)	Acres	80	74	150	74	100	150	100	100	150	0
Annual Soil Survey	Acres	0	198,750	198,750	198,750	198,750	198,750	198,750	198,750	198,750	0
<b>FACILITIES</b>											
Road Const/Reconst	Miles	8.1	5.7	4.9	5.7	1.1	5.8	1.1	4.7	4.4	3.6
Arterial Roads	Miles	1.4	4.5	3.8	4.5	0.9	4.5	0.9	3.7	3.4	2.8
Collector Roads	Miles	1.4	4.5	3.8	4.5	0.9	4.5	0.9	3.7	3.4	2.8
<b>PROTECTION</b>											
Fuelbreaks & Treatment	M Acres	1.5	1.85	2.75	1.85	2.25	3.25	2.25	2.75	3.25	0.20
Insect & Disease Survey	M Acres	1.0	4.5	4.5	4.5	7.0	4.5	7.0	7.5	4.5	0.0
<b>LANDS</b>											
Land Purchase & Acquis	Acres	0	0	0	0	0	0	0	0	0	0
Land Exchange Offer	Acres	440	560	560	560	560	560	560	560	560	560
ROW Acquisition	Cases	11	13	13	13	9	13	9	7	13	9
Occupancy Trespass	Cases	5	18	18	18	18	18	18	18	18	18
Landline Location	Miles	31	23	20	28	18	23	20	20	23	18
<b>HUMAN AND COMMUNITY DEVELOPMENT *</b>											
Human Resource Program	Enrollee Years	19.28	19.28	19.28	19.28	19.28	19.28	19.28	19.28	19.28	19.28
Job Corps	Enrollee Years	0	0	0	0	0	0	0	0	0	0
YCC	Enrollee Years	0	0	0	0	0	0	0	0	0	0

\* Human Resource Programs are not included after 1985.

\*\*MRVD = Thousand Recreation Visitor Days  
M Acres = Thousand Acres  
M Animals = Thousand Animals  
MAUM = Thousand Animal Unit Months  
ROW = Right-of-Way

MMBF = Million Board Feet  
4 Ac Ft = Thousand Acre Feet  
# Op. Plans = Number of Operating Plans  
VIS = Visitor Information Service  
YCC = Youth Conservation Corp

TABLE J-2.

RESOURCE OUTPUT ANALYSIS BY ALTERNATIVE  
(Summary All Decades, Average Annual Output)

Output	Unit of Measure**	Current Year	Alternative								
			1 Proposed	2 No Action	3 RPA	4	5	6	7	8	9
<b>RECREATION</b>											
Developed Recreation Use (Inc. VIS)	MRVD	578	847.2	726.4	968.0	968.0	726.4	847.2	726.4	847.2	653.0
Downhill Skiing Use	MRVD	222	689.1	689.1	689.1	689.1	689.1	689.1	689.1	689.1	689.1
Dispersed Rec Use (Inc Wildlife & Fish)	MRVD	1399	2339.2	2339.2	2339.2	2339.2	2339.2	2339.2	2339.2	2339.2	2339.2
Off-Road Motorized Use	MRVD	168	280.9	280.9	280.9	280.9	280.9	280.9	280.9	280.9	280.9
Trail Construction/Reconstruction	Miles	0	49.0	15.0	42.4	49.0	15.0	49.0	15.0	15.0	0
<b>WILDERNESS</b>											
Wilderness Management	M Acres	501.8	515.4	501.8	501.8	581.2	501.8	549.7	581.2	515.4	501.8
Wilderness Use	MRVD	164	277.0	277.0	277.0	277.0	277.0	277.0	277.0	277.0	277.0
<b>FISH &amp; WILDLIFE</b>											
Wildlife Habitat Improvement (Aspen and Burning)	Acres	4,000	6,098	5,900	6,098	7,450	4,598	7,450	4,830	5,310	2,730
Threatened and/or Endangered Species Habitat Mgt	Acres	19,104	19,104	19,104	19,104	19,104	19,104	19,104	19,104	19,104	19,104
Winter Range Carrying Capacity Deer & Elk	M Animals	82.7	87.1	87.5	88.0	86.2	87.6	86.4	86.2	87.2	85.9
Wildlife Structures	Numbers	35	10	33	35	10	30	10	44.4	10	0
<b>RANGE</b>											
Grazing Use (Livestock)	MAUM	320.0	334.2	332.0	338.1	310.9	346.8	310.9	346.8	335.0	315.0
<b>TIMBER</b>											
Programmed Sales Offered	MMBF	28.8	36.9	31.9	44.8	15.6	36.5	14.8	31.6	35.5	22.3
Reforestation	M Acres	.638	.375	.289	.463	.218	.362	.229	.326	.365	.236
Timber Stand Improvement	M Acres	1.5	.530	.625	.530	.585	1.0	.585	.900	1.000	1.528
<b>WATER</b>											
Avg Annual Yield	M Ac ft	2,869.0	2,886.4	2,881.0	2,886.6	2,880.8	2,884.0	2,881.2	2,884.4	2,890.0	2,879.8
<b>MINERALS</b>											
Mineral Leases and Permits	# Op. Plans	90	154.4	147.0	154.4	128.0	147.0	128.0	147.0	147.0	50.0
<b>SOILS</b>											
Soil & Water Res. Imp. (Imp. Watershed Condition)	Acres	80	66.0	64.0	66.0	52.0	104.0	52.0	57.0	104.0	0
Annual Soil Survey	Acres	0	61,000	61,000	61,000	61,000	61,000	61,000	61,000	61,000	0
<b>FACILITIES</b>											
Road Const/Reconst. Arterial Roads	Miles	8.1	2.49	2.38	3.47	.52	2.37	.52	2.09	1.82	1.57
Collector Roads	Miles	1.4	1.94	1.85	2.69	.40	2.00	.40	1.60	1.41	1.22
<b>PROTECTION</b>											
Fuelbreaks & Treatment	M Acres	1.5	1.7	2.9	1.7	2.4	3.4	2.4	2.9	3.4	.2
Insect & Disease Survey	M Acres	1.0	4.1	4.1	4.1	7.8	3.3	7.8	4.7	4.1	0
<b>LANDS</b>											
Land Purchase & Acquis	Acres	0	0	0	0	0	0	0	0	0	0
Land Exchange Offer	Acres	440	304.0	304.0	304.0	304.0	304.0	304.0	304.0	304.0	304.0
ROW Acquisition	Cases	11	8.5	8.5	8.5	7.3	8.5	7.3	6.9	8.5	7.3
Occupancy Trespass	Cases	5	14.1	14.1	14.1	21.9	14.1	21.9	14.1	14.1	21.9
Landline Location	Miles	31	20.5	20.0	25.5	15.5	20.5	20.0	20.0	20.5	15.5
<b>HUMAN AND COMMUNITY DEVELOPMENT *</b>											
Human Resource Program	Enrollee Years	19.28	19.28	19.28	19.28	19.28	19.28	19.28	19.28	19.28	19.28
Job Corps	Enrollee Years	0	0	0	0	0	0	0	0	0	0
YCC	Enrollee Years	0	0	0	0	0	0	0	0	0	0

\* Human Resource Programs are not included after 1985

\*\*MRVD = Thousand Recreation Visitor Days  
M Acres = Thousand Acres  
M Animals = Thousand Animals  
MAUM = Thousand Animal Unit Months  
YCC = Youth Conservation Corp

MMBF = Million Board Feet  
M Ac Ft = Thousand Acre Feet  
# Op. Plans = Number of Operating Plans  
VIS = Visitor Information Service

APPENDIX K  
INDEX TO FOSSIL RIDGE WILDERNESS STUDY AREA

INDEX TO FOSSIL RIDGE WILDERNESS STUDY AREA

Table K-1 indexes the Fossil Ridge Wilderness Study Area.

TABLE K-1.

FOSSIL RIDGE WILDERNESS STUDY AREA

TOPIC	REFERENCE
<u>LOCATION</u>	
A. Location Description	Chapter III, Pg.III-36
B. Vicinity Map	Chapter III, Pg.III-36
C. Wilderness Study Area Map	Chapter II, Pg.III-63
D. Partial Suitable Area Map	Chapter II, Pg.III-64
<u>HISTORY</u>	
A. Review and Recommendation Process	Chapter I, Pg.I-3
B. Previous Wilderness Study History and Result	Chapter III, Pg.III-37
C. Current Management	Chapter III, Pg.III-38
D. Status of Pending Legislation	None
<u>WILDERNESS SUITABILITY OR UNSUITABILITY</u>	
A. Capability	Chapter IV, Pg.IV-27
B. Availability	Chapter IV, Pg.IV-29
1. Economics	Appendix I
C. Need	Chapter IV, Pg.IV-31
D. Environmental Consequences	Chapter IV, Each Resource
1. Mineral Leasing	Chapter IV, Pg.IV-86
2. Summary of Environmental Consequences	Appendix I
3. Management Area Prescriptions by Alternatives	Appendix I
E. Alternatives Considered in Detail	Chapter II, Pg.II-61

APPENDIX L  
INDEX TO CANNIBAL PLATEAU FURTHER PLANNING AREA

INDEX TO CANNIBAL PLATEAU FURTHER PLANNING AREA

Table L-1 indexes the Cannibal Plateau Further Planning Area.

TABLE L-1.

CANNIBAL PLATEAU FURTHER PLANNING AREA

TOPIC	REFERENCE
<u>LOCATION</u>	
A. Location Description	Chapter III, Pg.III-37
B. Vicinity Map	Chapter III, Pg.III-36
C. Further Planning Area Map	Chapter II, Pg.II-67
D. Partial Suitable Area Map	Chapter II, Pg.II-68
<u>HISTORY</u>	
A. Review and Recommendation Process	Chapter I, Pg.I-4
B. Previous Study History and Results	Chapter III, Pg.III-58
C. Current Management	Chapter III, Pg.III-58
D. Status of Pending Legislation	None
<u>WILDERNESS SUITABILITY OR UNSUITABILITY</u>	
A. Capability	Chapter IV, Pg.IV-36
B. Availability	Chapter IV, Pg.IV-38
1. Economics	Appendix I
C. Need	Chapter IV, Pg.IV-40
D. Environmental Consequences	Chapter IV, Each Resource
1. Mineral Leasing	Chapter IV, Pg.IV-86
2. Summary of Environmental Consequences	Appendix I
3. Management Area Prescriptions by Alternatives	Appendix I
E. Alternatives Considered in Detail	Chapter II, Pg.II-65

Appendix M

**DEPARTURE FROM BASE SALE SCHEDULE**

## DEPARTURE FROM BASE SALE SCHEDULE

The Draft EIS stated that an additional analysis would be conducted to determine the need for Departure from the Base Sale Schedule should the market for timber improve significantly. As noted in Chapters II and VI, Continental Lumber Company has indicated they feel the market is improving. This Appendix discloses the analysis associated with an accelerated timber harvest schedule based on departure compared to the Proposed Action.

A Departure from Base Sale Schedule (BSS) is a timber harvest schedule which deviates from the principle of nondeclining flow (NDEF) by exhibiting a planned decrease in the timber sale and harvest schedule at any time in the future. A departure can be characterized as a temporary increase, usually in the beginning decade(s) of the planning period, over the BSS that would otherwise be established, without impairing the future attainment of the Forest's long-term sustained yield capacity.

Departure from BSS for the proposed action was analysed to display the consequences of an accelerated Timber Harvest Schedule, other objectives and emphasis are the same as the Proposed Action on nondeclining even flow.

This Departure from BSS has the same land use allocations as the Proposed Action. Land use allocations are displayed in the Final EIS Table II-22.

The Proposed Action and Departure from BSS have the same set of objectives. Departure from BSS adds the following objectives:

- Improve timber sizeclass, age and spatial distribution.
- Capture current mortality losses and reduce future mortality loss.
- Accelerate regeneration schedule.
- Accelerate the schedule for improving suitable timberland growing condition.
- Reduce old growth timber volume on suitable timberland.
- Increase timber growth rate on suitable timberland.
- Respond to a local issue requesting the timber harvest schedule be accelerated.
- Display the consequence of Departure from BSS.
- Enhance other resources through an improved forest condition.

The Proposed Action and Departure from BSS have the same basic constraint set. Table M-1 displays additional constraints applied to departure.

TABLE M-1

CONSTRAINTS  
(Departure from BSS)

Output	Type of Constraint*	Con- straint	Units**	Decade
TIMBER	GE	110.0	MMCF/Decade	1-2,
Total Volume		55.0	MMBF/Yr	14,
		95.0	MMCF/Decade	13
		47.5	MMBF/Yr	
	LE	110.0	MMCF/Decade	4&5
		55.0	MMBF/Year	
Long Run Sustained Yield				
Capacity	EQ	209.8	MMCF/Decade	24.
		104.9	MMBF/Yr	24
Timber Harvest Constraint				
		25% departure		2-14
		NonDeclining		15-24
		Even Flow		

\* LE = Less Than or Equal to  
 GE = Greater Than or Equal to  
 EQ = Equal to

\*\*MMCF/Decade = Million Cubic Feet/Decade  
 MMBF/Yr = Million Board Feet/Year

The total timber volume constraint responds to a local issue requesting the timber harvest schedule be accelerated to 55 MMBF/Yr in the early planning decades. The long run sustained yield capacity volume is set equal to the Proposed Action.

The less than or equal to constraints in decades 4 and 5 and the greater than or equal to constraints in decades 13 and 14 are designed to produce even timber harvest flow in those decades.

The timber harvest constraint is 25% departure in decades 2-14 and non-declining even flow in decades 15-24. The departure will let the timber harvest schedule respond to the local issue. The nondeclining even flow will help the departure achieve the long run sustained yield capacity by the 25th decade.

All land use allocations are the same for the Proposed Action and Departure from BSS.

### Expected Future Condition.

Recreation - Departure from BSS will have no direct impact on developed recreation capacity. The Forest will not meet all of the increased demand for developed recreation opportunities. This provides the private sector the opportunity to supply developed recreation opportunities to meet demand. The Forest will meet 100% of demand during the first decade. This will reduce to 96%, 89%, 82% and 79% during decades 2-5. Approximately 45% of the sites will be operated at the full service management level. In the later decades more people will use undeveloped sites because demand will exceed supply for developed recreation.

Dispersed recreation will be directly affected by Departure from BSS.

More roads will be constructed during the 50 year planning horizon. This will mean fewer non-motorized recreation settings. This may be a temporary condition because roads will be closed after some management activity is completed. Fewer non-motorized settings will mean higher density use in those settings that are retained. All settings will be managed within the density standards displayed in the Forest Direction and demand for non-motorized recreation will be met. The increased road mileage will disperse some motorized recreationists. This means recreation user density will decrease. This may be offset by increased timber management activity.

Fish and Wildlife - Departure will have some impacts on wildlife. Silvicultural activity will continue to improve overall habitat conditions. Wildlife habitat diversity will increase faster than under other alternatives. The Forest will be brought under regulation sooner. This will mean better age class distribution and increased edge. Seedling and sapling stands are the current habitat diversity limiting factor. Accelerated harvest will provide more acres of these conditions sooner than under other alternatives.

Negative wildlife habitat impacts will be mitigated by the standards and guidelines displayed in the Forest Direction and Management Area Prescriptions.

Old growth conditions will be provided on large undeveloped tracts distributed across the forest.

Timber - Departure will accelerate the Proposed Action timber harvest schedule. Timber will be harvested from the same suitable timberland base. The accelerated harvest schedule will bring the suitable timber resource under management sooner. This will result in a more balanced age class distribution being achieved sooner. This will lead to a healthier forest. Old growth timber is vulnerable to infestation problems. Departure will accelerate old growth harvest. This will result in healthier more vigorous stands. These stands will be more resistant to disease and other natural catastrophies than current stands.

Accelerated timber harvest will reduce the need for other artificial pest management control efforts. Currently 17% of the Forest is in old growth condition. Eleven percent of the old growth is on suitable timberland. All suitable timberland old growth volume is scheduled for harvest.

Management costs will be higher. Shelterwood volumes will contribute 65 percent more timber. Since shelterwood areas are scheduled for re-entry every 20 years most roads will require maintenance level III or higher to ensure their usefulness for the next entry.

Water - Water yield will increase under departure management. This will occur directly from the timber harvest increase. Clear cutting small areas contributes the most to increased water yields. Clear cutting is scheduled for 748 acres/year Decade 1 in the Proposed Action, and 979 acres/year Decade 1 on departure. No additional timber harvest over the Proposed Action is scheduled for critical watersheds, so threshold limits will not be affected.

Facilities - Accelerated timber harvest will require the same number of facilities over the 240 year plan. Construction and reconstruction will be accelerated in the earlier decades to support the additional timber activity.

Road construction or reconstruction will occur on 90 miles of arterial, 70 miles of collector and 339 miles of local roads during the first 10 years.

Departure accelerates the suitable timber land treatment schedule. In the Proposed Action 71,458 acres are treated annually in the first ten years compared to 119,621 acres treated on departure. The 50 year comparison is 164,959 acres treated in the Proposed Action and 249,246 acres treated on departure.

Table M-2 compares the timber harvest schedule for the Proposed Action and Departure from BSS.

TABLE M-2.

COMPARISON PROPOSED ACTION AND DEPARTURE FROM BASE SALE SCHEDULE

TIMBER HARVEST SCHEDULE	Total Suitable Timberland Acres	Suitable Timberland Steep Slopes Acres	Land Use Allocation By Prescription Suitable Acres					Total Suitable Timberland Entered After 50 Years
			2B	4D	7A	7C	7E	
Proposed Action	476,251	3,221	88,696	47,944	13,092	3,221	323,298	164,959
Departure From Base Sale Schedule	476,251	3,221	88,696	47,944	13,096	3,221	323,294	249,246

TIMBER HARVEST SCHEDULE	Total Timber Volume By Decade MMBF					Species Volume Scheduled for Harvest by Decade														
	1	2	3	4	5	Spruce Fir MMBF					Lodgepole Pine					Aspen				
Proposed Action	35.0	35.0	35.0	38.3	41.1	28	26	26	27	28	3.5	5.5	5.5	7.8	9.6	3.5	3.5	3.5	3.5	3.5
Departure From Base Sale Schedule	55.0	55.0	56.9	55.0	55.0	42.8	39.1	42.0	35.5	32.0	8.7	12.4	11.4	16.0	19.5	3.5	3.5	3.5	3.5	3.5

TIMBER HARVEST SCHEDULE	Total Clear Cut Acres/Decade					Species Clear Cut Acres/Decade														
	1	2	3	4	5	Spruce Fir					Lodgepole Pine					Aspen				
Proposed Action	7480	7470	3960	3250	2180	535	1000	116	776	0	1629	1931	0	0	0	5316	4539	3844	2474	2180
Departure From Base Sale Schedule	9785	6397	3938	2439	2178	0	1036	0	0	0	2927	637	0	0	0	658	4697	3938	2439	2178

M-6

TABLE M-2. (Cont.)

TIMBER HARVEST SCHEDULE	Clear Cut Acres/Decade on Steep Slopes					Total Clear Cut Volume/Decade MMBF					Total Shelterwood Treated Acres/Decade by Cutting Prep Cut				
	1	2	3	4	5	1	2	3	4	5	1	2	3	4	5
Proposed Action	599	0	0	0	0	4.5	6.3	3.5	3.9	3.5	63,979	52,811	4,692	14,126	5,011
Departure From Base Sale Schedule	599	0	0	0	0	5.9	5.1	3.5	3.5	3.5	109,836	96,385	0	12,894	5,394

TIMBER HARVEST SCHEDULE	Regeneration Cut Acre/Decade					Overwood Removal Acre/Decade					Shelterwood Volume MMBF/Decade				
	1	2	3	4	5	1	2	3	4	5	1	2	3	4	5
Proposed Action	0	0	63,979	52,811	4692	0	0	0	0	63,979	30.2	28.5	31.4	38.7	37.2
Departure From Base Sale Schedule	0	0	109,836	96,385	0	0	0	0	0	109,836	49.1	50.0	52.9	51.5	51.5

TIMBER HARVEST SCHEDULE	Treated Area /Decade					Total Volume Harvested Over 240 Years MMBF	LRSYC
	1	2	3	4	5		
Proposed Action	71,458	60,281	72,627	71,570	76,253	1.62	104.5
Departure From Base Sale Schedule	119,621	102,782	115,544	111,718	117,408	1.62	104.5

M-7

Conclusions:

Using existing data it appears to be possible to accelerate the timber harvest schedule in the early planning decades without effecting the long-term sustained-yield of the Proposed Action. Accelerating the timber harvest schedule in the first 5 decades will require reducing timber outputs in some future decades.

Should Continental Lumber Company, or any timber processor, make actual investment commitments at specific locations within the Forest's market area, demand estimates will be reanalyzed. Commitments will include, land and facility purchase for a mill or processing unit.

APPENDIX N

MANAGEMENT PRESCRIPTIONS USED IN ALTERNATIVES BUT  
NOT USED IN THE PROPOSED ACTION.

MANAGEMENT PRESCRIPTION USED IN ALTERNATIVES  
BUT NOT USED IN PROPOSED ACTION

This appendix displays Management Area Prescription 8D. Prescription 8D was allocated to wilderness areas in alternatives 2-9, but not the proposed action. It is included here for reference. The complete set of management area prescriptions are located in Chapter III of the Plan.

MANAGEMENT PRESCRIPTION 8D  
(Provides for limited areas of high-density day-use)

Management emphasis is to provide for the protection and perpetuation of essentially natural bio-physical condition inside wilderness boundaries which are adjacent to and accessed from urban or rural developments or heavily used developed recreation sites. Human use is characterized by large numbers of day-users traveling relatively short distances into the wilderness.

Management activities are integrated so that the bio-physical wilderness resources are protected from unacceptable change, and day-users are made aware of the purposes of wilderness management. Management is directed towards providing a generally natural appearing setting. A trail system directs the user within the area and leads the overnight user through to other management areas. Opportunities to make official visitor contacts are frequent. There are no developed sites within the wilderness. Facilities such as bridges necessary for user safety or bio-physical resource protection may be present.

MANAGEMENT  
ACTIVITIES

GENERAL  
DIRECTION

STANDARDS &  
GUIDELINES

Visual Resource  
Management  
(A04)

01 Manage for maximum retention of the natural landscape  
Design and locate management activities to meet the Visual  
Quality Objective of Preservation in all areas except where  
specific surface occupancy is authorized by Wilderness  
legislation In these areas, the Visual Quality  
Objective is Retention  
(0173 ) ( 8D )

Dispersed  
Recreation  
Management  
(A14 and 15)

01 Provide semi-primitive recreation opportunities  
requiring a predominately unmodified natural setting  
with a low degree of challenge and risk and travel on  
system trails  
(0245 ) ( 8D )

a Designated sites will be  
spaced only as required for  
reasonable screening between  
sites or at least 100 feet  
apart  
(6358 ) ( 8D )

b Close and restore sites in  
Frissell condition class 5  
Designated sites may occur in  
Frissell condition class 1  
through 4  
(6360 ) ( 8D )

c Prohibit recreation livestock  
except for through travel  
(6362 ) ( 8D )

d Require self-contained stoves  
Prohibit open campfires  
(6364 ) ( 8D )

02 Manage for day-use and through-travel  
and to prevent unacceptable changes to the  
biophysical resources  
(0243 ) ( 8D )

03 Allow overnight camping only at designated sites  
where conflict with day-use can be avoided  
(0630 ) ( 8D )

a Maximum use and capacity levels  
is reached when trail and camp  
encounters during peak-use days  
are more than 20 other parties  
per day

AREAWIDE CAPACITY  
(PADT/Acre)

Open Lands

Alpine, Krummholz

04

MANAGEMENT  
ACTIVITIES

GENERAL  
DIRECTION

STANDARDS &  
GUIDELINES

CONTINUATION OF  
Dispersed  
Recreation  
Management  
(A14 and 15)

Rock, Mtn Grass 08  
Forest and Shrub Lands  
Ponderosa pine, Douglas-  
fir, Riparian areas,  
White Pine 5  
Spruce/fir, Lodgepole  
pine, aspen 8  
(6125 ) ( 8D )

b Reduce the above use level  
coefficients as necessary to re-  
flect usable acres, patterns of  
use, and general attractiveness  
of the specific management area  
type as described in the RQS  
Users Guide, Chapter 25  
Reduce the above use levels  
where unacceptable changes to the  
biophysical resources will occur  
(6356 ) ( 8D )

Recreation  
Management  
(Private and  
Other Public  
Sector)  
(A16)

O1 Permit only through-travel for outfitter-guide  
operations during the summer-use season  
(0248 ) ( 8D )

Wildlife and  
Fish Resource  
Management  
(C01)

O1 Protect habitat requirements over human use, even on  
a short-term basis Priorities are  
a State and Federal classified threatened  
or endangered species needs;  
b Permitted livestock where allowed by Wilderness  
legislation; and  
c Recreation livestock  
(0178 ) ( 8D )

Range Resource  
Management  
(D02)

O1 Prohibit grazing and trailing of permitted  
livestock except where no feasible alternative access  
to an allotment is available  
(0241 ) ( 8D )

N-5

MANAGEMENT  
ACTIVITIES

GENERAL  
DIRECTION

STANDARDS &  
GUIDELINES

CONTINUATION OF  
Range Resource  
Management  
(D02)

02 Manage meadows and lakeshores in "good" range condition  
Limited areas of "fair" are permissible in areas of user  
concentrations. However, "fair" areas must be exhibiting  
an upward trend  
(0235 ) ( BD )

a Base range condition on the  
standards in Range Analysis  
Handbook (FSH 2209 21)  
(6156 ) ( BD )

03 Prohibit overnight use of recreational stock  
(0247 ) ( BD )

04 Maintain trailside vegetation in at least a "fair or  
better" condition based upon natural productivity of the  
area  
(0234 ) ( BD )

a Base range condition on the  
standards in Range Analysis  
Handbook (FSH 2209 21)  
(6156 ) ( BD )

Special Use  
Management (Non-  
Recreation)  
(J01)

01 Manage surface occupancy activities authorized prior  
to wilderness designation to reduce impact on wilderness  
values consistent with the intent of the occupancy  
authorization  
(0210 ) ( BD )

Soil Resource  
Management  
(KA1)

01 Restore soil disturbances caused by human use (past  
mining, grazing, trail construction and use, camping, etc )  
to soil loss tolerance levels commensurate with the  
natural ecological processes for the treatment area  
(0184 ) ( BD )

a Follow procedures  
specified in Agricultural  
Handbook 337 for Utilizing the  
Universal Soil Loss Equation  
(Cautions contained in WD 2550  
letter dated 5/28/82 should be  
noted ) The guidance for K and  
T factors are in the National  
Soils Handbook 407 i (a)(3)  
(xvii)  
(6159 ) ( BD )

Transportation  
System  
Management  
(LO1 & 20)

01. Locate and design required access roads within the  
management area for authorized activities to minimize the  
biophysical and visual impact, and to facilitate restora-  
tion  
(0213 ) ( BD )

a Roads will not be author-  
ized

- On slopes steeper than 60%;
- In areas of high erosion hazard;
- In areas of high geologic hazard;
- In areas of low visual absorption capacity that are unlikely for successful restoration;
- In areas which would adversely effect threatened

MANAGEMENT  
ACTIVITIES

GENERAL  
DIRECTION

STANDARDS &  
GUIDELINES

CONTINUATION OF  
Transportation  
System  
Management  
(LO1 & 20)

and endangered plant and animal  
species  
(6165 ) ( 8D )

02 Convert roads not needed for authorized activities  
to trails, or if they are not needed as part of the  
transportation system, restore them to the established VGD  
(0284 ) ( 8D )

a Maintain trails in accordance  
with standards in the Trail Hand-  
book (FSH 7709 12)  
(6129 ) ( 8D )

b Schedule trail maintenance in  
accordance with Regional Accept-  
able Work Standards (FSM  
1310 R2 ID No 1 7/22/82 )  
(6131 ) ( 8D )

03 Construct or reconstruct trails only when needed to  
meet objectives of the wilderness transportation system  
(0255 ) ( 8D )

a Follow standards specified in  
FSH 7709 12, FSM 2323 11c and  
2323 61d w/R-2 Supplement  
(6134 ) ( 8D )

b Trail density may exceed two  
miles per square mile Trails  
are constructed and maintained  
for high levels of use as  
specified below  
(6163 ) ( 8D )

N-7

MANAGEMENT  
ACTIVITIES

GENERAL  
DIRECTION

STANDARDS &  
GUIDELINES

CONTINUATION OF  
Transportation  
System  
Management  
(LO1 & 20)

04 Construct bridges to only the standard necessary to accommodate the specified class of user Construct bridges only where no safe opportunity exists to cross a stream or gorge during periods of normal stream flow

A safety hazard is a physical condition of a trail which may cause injury, is unusual or unexpected, and not readily identifiable by the trail user It is not a condition which is easily identifiable and normally encountered for the type or location of the trail involved The following examples illustrate this distinction

A hazard is a rotten bridge decking or handrail A stream crossing where no bridge is provided and the user would expect this on the type and location of the trail is not a hazard

A hazard is a stable-appearing loose rock in a constructed treadway where all other rocks are stable A trail treadway made up of rocks in a near-natural position, many of which are loose, is not a hazard

A hazard is a perennial bog-hole on a horse trail. An intermittent bog-hole which will dry up by early summer or within a few days following a rain storm is not a hazard

A hazard is a section of trail treadway supported by rotten cribbing A section of trail where the treadway is obviously slippery is not a hazard

A hazard is a marked ford with holes deeper than the normal channel A deep ford with a consistent stream bed is not a hazard  
(0214 ) ( 8D )

05 Use corduroy and/or puncheon treads across bogs where no safe and feasible bypass opportunity exists.  
(0215 ) ( 8D )

06 Close or sign system trails when not maintained to the safe standard for the specified use  
(0216 ) ( 8D )

a Maintain trails in accordance with standards in the Trail Handbook (FSH 7709 12)  
(6129 ) ( 8D )

MANAGEMENT  
ACTIVITIES

GENERAL  
DIRECTION

STANDARDS &  
GUIDELINES

CONTINUATION OF:  
Transportation  
System  
Management  
(L01 & 20)

07 Use signs of unstained wood with routed letters  
and mounted on unstained posts  
(0249 ) ( 8D )

a Follow standards specified in  
FSH 7109 11a and 11b  
(6158 ) ( 8D )

08 Provide signs at trail terminals and trail junctions  
only Include only trail identification and identification  
of terminal points  
(0250 ) ( 8D )

FA&O  
Construction  
Reconstruction  
and Maintenance  
(L24 AND 25)

01 Prohibit construction of new administrative fac-  
ilities or structures In the event a substantial  
portion of the existing administrative facility and/  
or structure is destroyed, it will not be replaced  
(0207 ) ( 8D )