

## Vegetation

About 18 percent of the area is alpine and Krummholz vegetation types. The remaining area is forested (82 percent), of which 3 percent is nonproductive (growth capability is less than 20 cubic feet per acre per year) and the balance productive (79 percent).

Forested areas include spruce/fir (66 percent), lodgepole pine (15 percent), aspen (13 percent), Douglas-fir (5 percent) and ponderosa pine (1 percent). Riparian areas are limited, and occur mainly as willow bottomlands and moist subalpine meadow at the headwaters of Kenosha and Rock creeks. There are no known threatened or endangered plants in the area.

## Tentatively Suitable Forest Land

Many locations in the western and southwestern portions of the area have been logged previously, including some recent clearcutting (prior to RARE II process).

### Forest Land Classification

Total Area	20.7 (thousand acres)
Tentatively Suitable Forest Land	16.4
Tentatively suitable for for conventional logging (slopes less than 45%)	11.6
Tentatively suitable on steep slopes (over 40%)	4.8
Unsuitable Forest Land	0.6
Nonforested Land	3.7

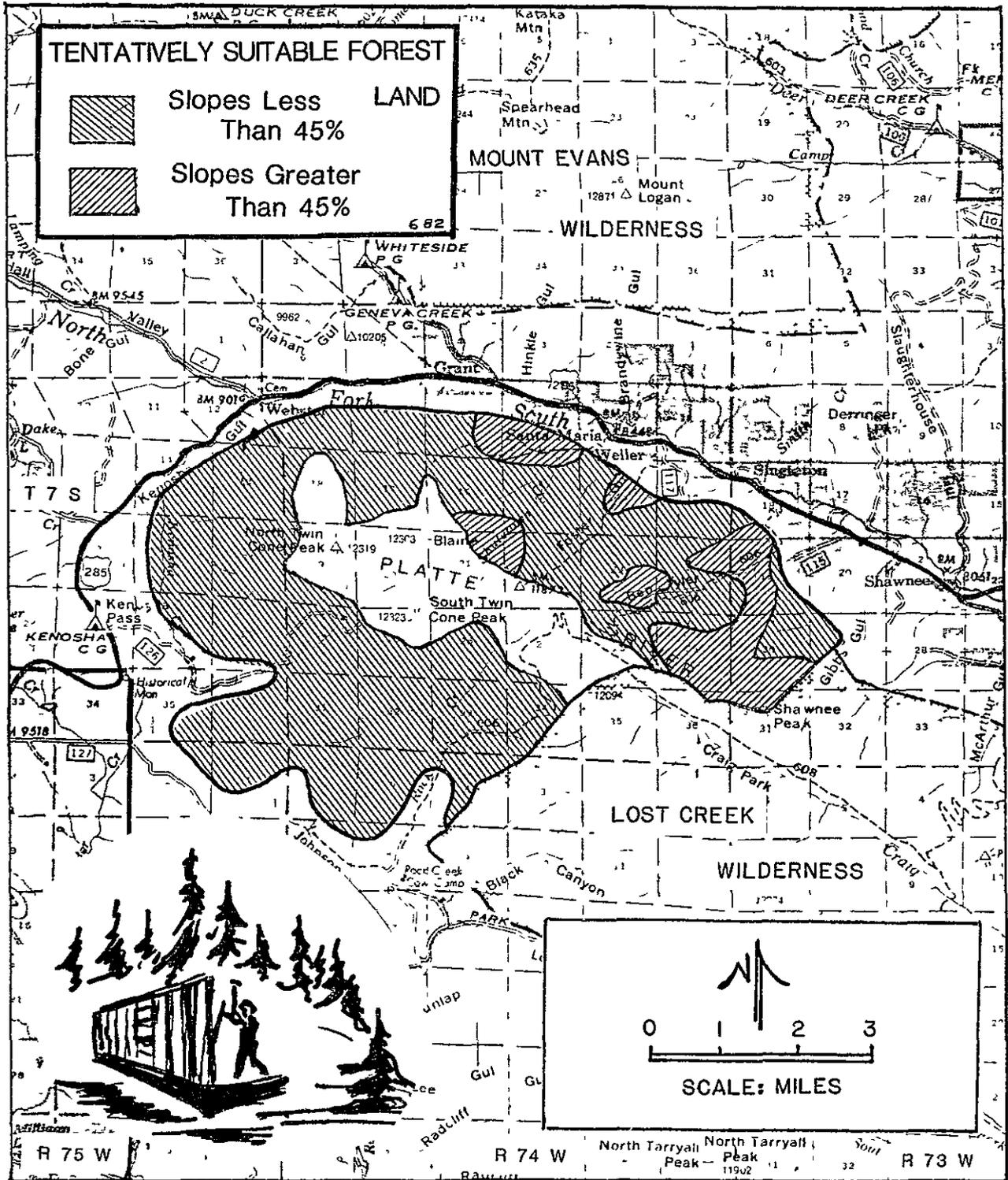
The current annual allowable sale quantity is about 1,409 thousand board feet. The long-term sustained yield capacity is 701 thousand cubic feet (MCF) or 2,448 thousand board feet (MBF) per year. For those slopes less than 40 percent, the long-term sustained yield capacity is 489 MCF or 1,763 MBF annually. Growing-stock volume of forests in the area is about 67 million board feet.

Timber volumes and tentatively suitable lands within the area are not needed to meet timber output objectives identified by the preferred alternative.

Because of the area's proximity to the Denver metropolitan area and Colorado Springs, it is a potentially important source of fuelwood (Figure 8). Fuelwood supplies are already limited in some Front Range markets and demand is expected to continue increasing.

# LOST CREEK FURTHER PLANNING AREA PIKE NATIONAL FOREST

Figure 8



## Climate

The climate of the Lost Creek Further Planning Area is characterized by cool to warm summers and cold winters. Average annual precipitation varies from about 19 inches at the lower elevations to about 26 at the higher elevations.

## Air Quality

The Further Planning Area is classified as a Class II area under section 162(b) of the Clean Air Act as amended August 1977. Current air quality meets these standards.

## Water

Rock Creek and Kenosha Creek are the only significant streams originating in the Further Planning Area. Neither stream supports fish habitat. Kenosha Creek flows into the North Fork of the South Platte River while Rock Creek flows into Tarryall Creek and then into the South Platte River.

Water production from the Further Planning Area is estimated to be about 8,970 acre-feet per year. Vegetation treatment through timber harvest in spruce-fir and lodgepole pine stands could increase the yield to about 9,770 acre-feet per year, an increase of 800 acre-feet per year.

## Wildlife and Fish

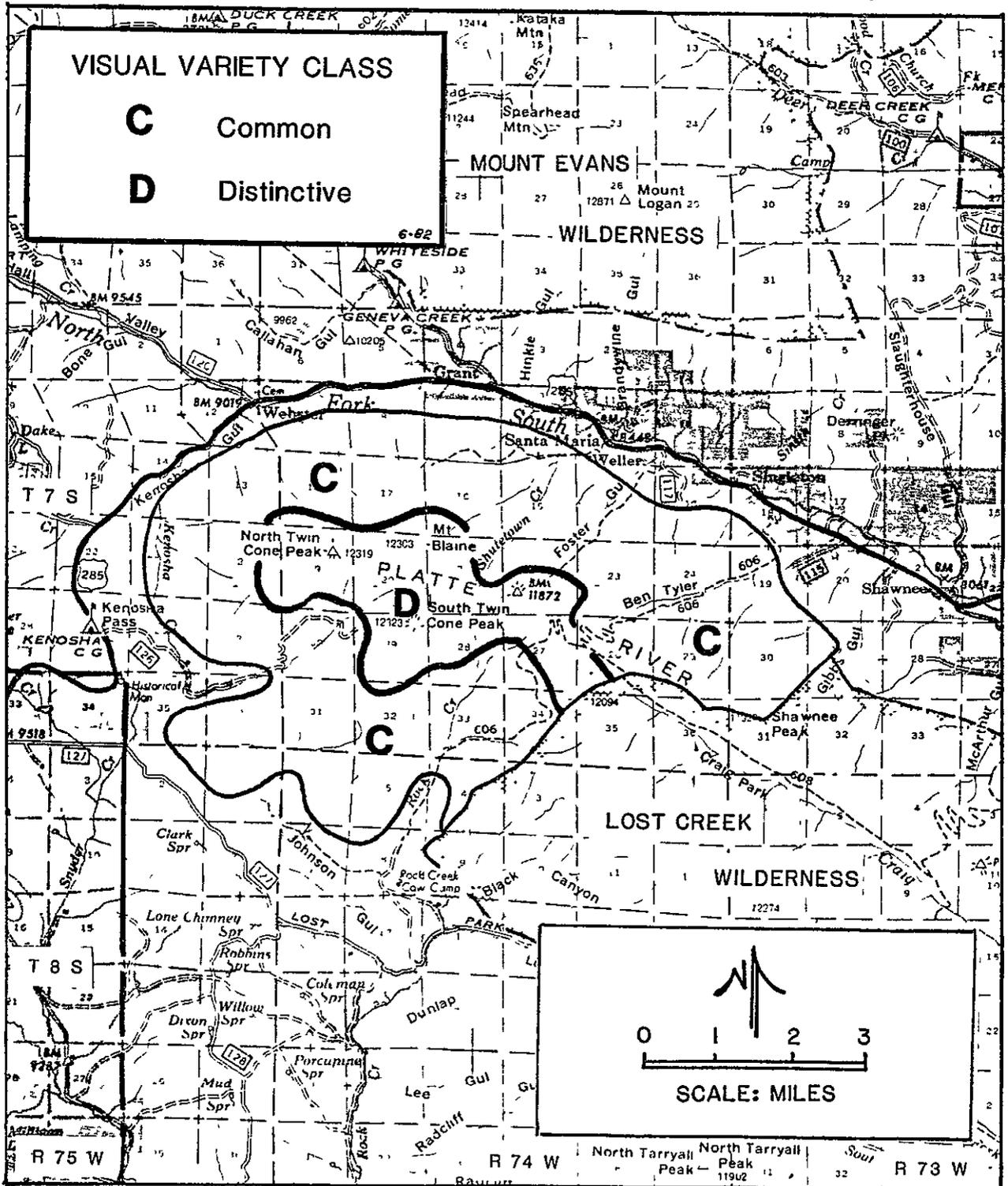
The major wildlife species in this area are deer, elk and bighorn sheep. Approximately 970 acres is deer winter range and the headwaters of Rock Creek is a bighorn sheep lambing area. There is not sufficient water to provide fish habitat in the area.

## Visual Resource

The Lost Creek Further Planning Area contains a variety of landscapes generally typical of the locale. There are no unique or unusual features in the area. Evidences of past uses by man are apparent in much of the area where timber harvest and accompanying roads are noticeable, especially in the recently harvested (prior to 1977) area on the southwest side. The inventoried visual variety class is common in most of the area with the alpine area classed as distinctive. (Figure 9)

# LOST CREEK FURTHER PLANNING AREA PIKE NATIONAL FOREST

Figure 9



## Recreation

The Lost Creek Further Planning Area presently is not heavily used for recreation. Major activities are hiking, horseback riding and some hunting. There is some four-wheel drive and motorcycle use on the old logging roads on the southwest side. The lack of significant attraction generally limits overall use of the area. There are no potential developed sites and opportunity for undeveloped dispersed campsites is limited.

The Ben Tyler Trail, approximately 11 miles long, crosses the area and receives most of the hiking and horseback use.

The area receives an estimated eleven thousand recreation visitor days (MRVD) of use per year. Hiking accounts for about 3 MRVD and horseback riding about 1 MRVD. Motorized use is estimated at less than 1 MRVD. Hunting use is estimated at about 1 MRVD per year. The remaining use is spread widely over numerous activities including nature study, gathering forest products and cross-country skiing.

The Recreation Opportunity Spectrum (ROS) classification shows 15,432 acres of semiprimitive nonmotorized area and 5,291 acres of roaded natural. Estimated capacities for these areas total about 5,240 persons at one time or 138 MRVDs use per year. Under semiprimitive wilderness management, the area would by comparison provide for about 1,004 persons at one time (PAOT) or 60 MRVDs use per year. (Figure 10)

## Land Status

All lands are National Forest System lands. Mineral rights are owned by the State on 3,840 acres.

## Transportation

Access to the area is possible by way of U.S. Highway 285 to the north and west sides of the area. Forest Road 126 provides access into an old logging area on the southwest side. It currently provides access to the summit of South Twin Cone Peak. Trail access is provided by the Ben Tyler Trail which traverses the area and connects with the Craig Park Trail into the existing Lost Creek Wilderness.

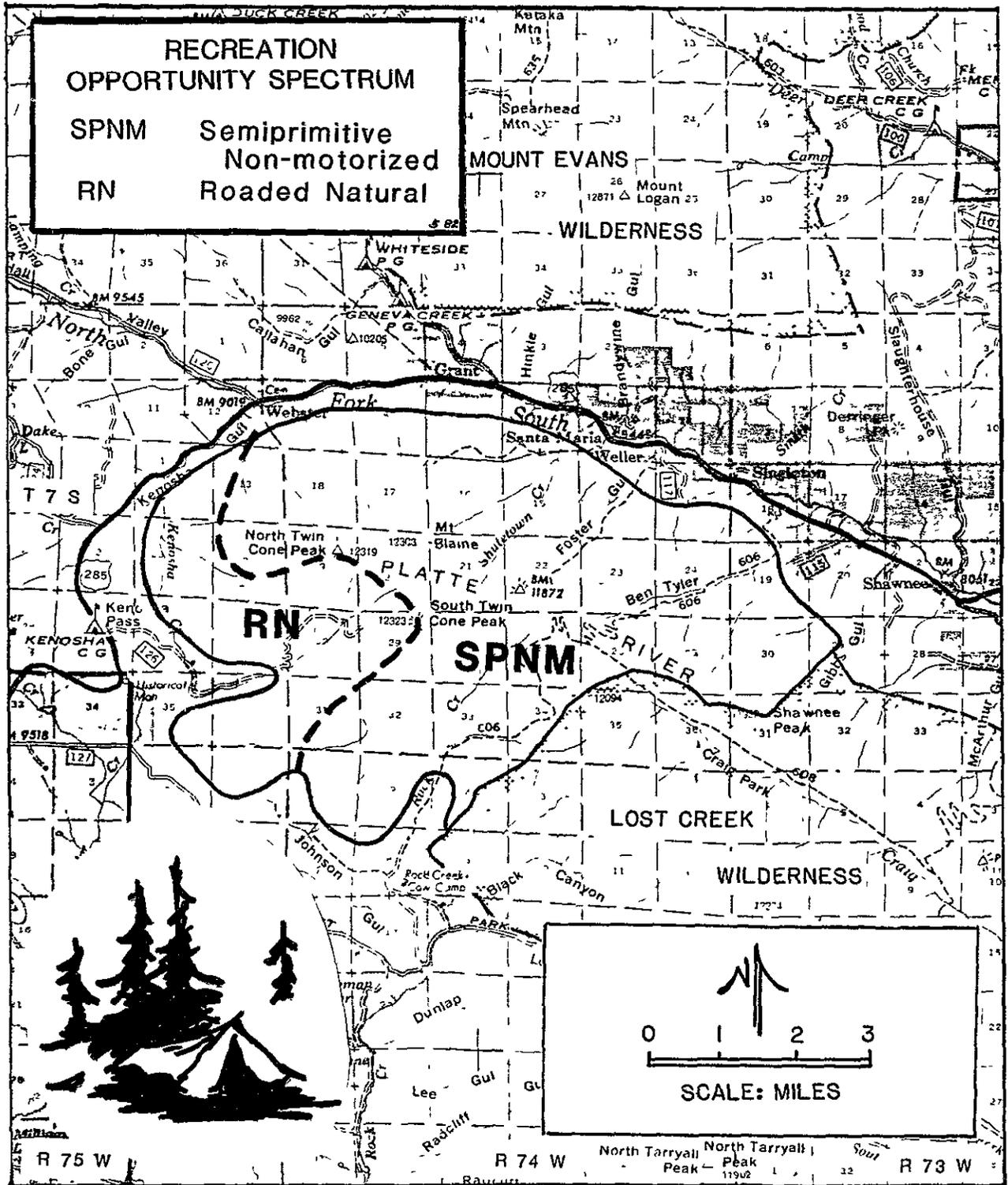
## Range

Grazing use is limited within the area. Only about 200 animal unit months (AUMs) of capacity are available in the area. There is no estimated opportunity to provide additional capacity. The Colorado Wilderness Act of 1980 provided for continuation of grazing where already established prior to designation, thus, wilderness status would not affect the current use in the Lost Creek Further Planning Area. (Figure 11)

# LOST CREEK FURTHER PLANNING AREA

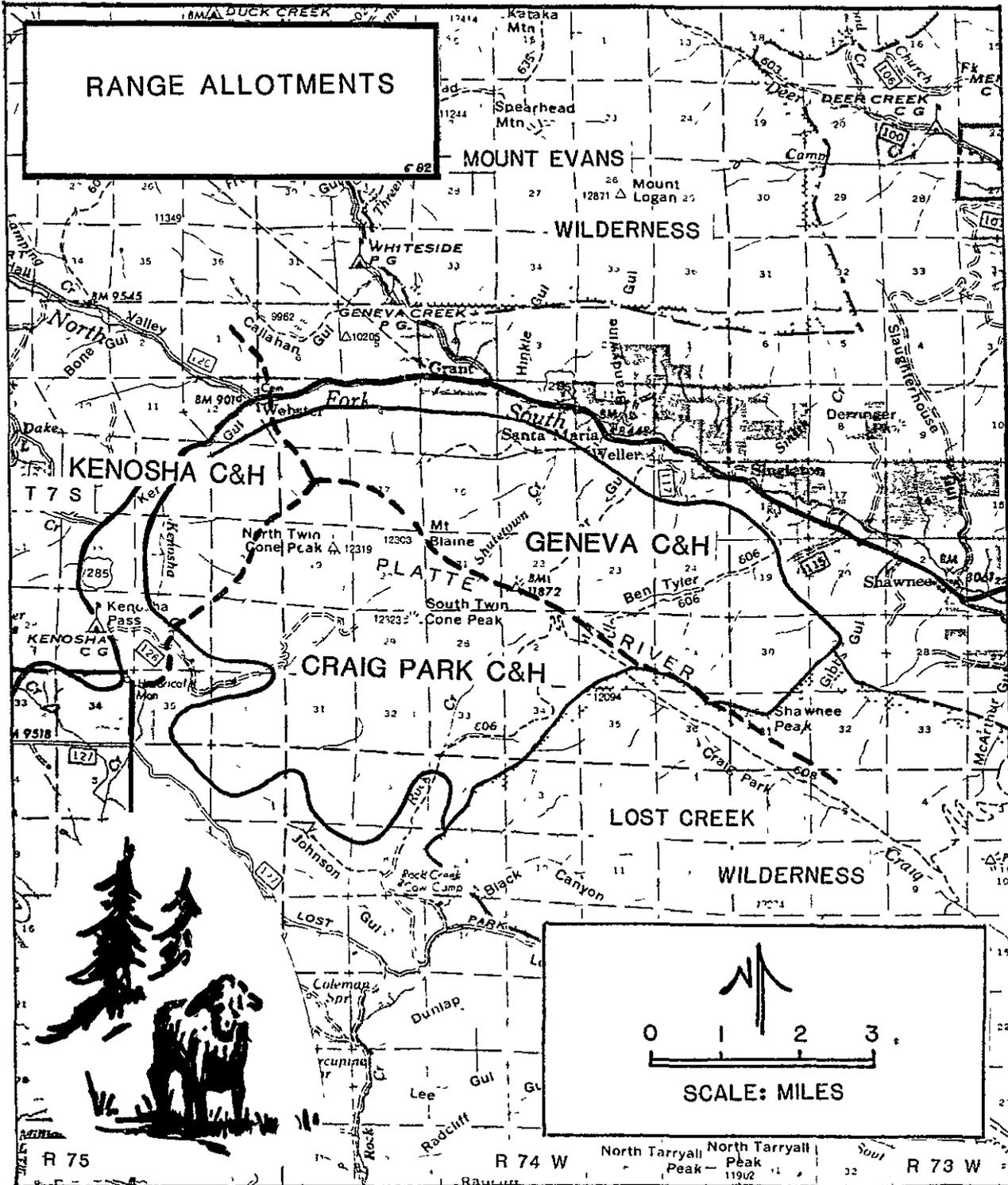
PIKE NATIONAL FOREST

Figure 10



# LOST CREEK FURTHER PLANNING AREA PIKE NATIONAL FOREST

Figure 11



## SOCIAL SETTING

The Lost Creek Further Planning Area is located in Park County, Colorado. Park County is identified as the South Park Human Resource Unit in the Forest Land Management Plan (see Social Setting, Chapter III, FEIS; and Chapter II, Forest Plan). Several small rural communities are widely scattered through the County. Fairplay, the County seat and largest of the communities, has a population of about 420 persons. Park County has a population of about 4,200.

The major occupations include government services, ranching and farming, services and retail trade, construction, and to a small extent mining.

The County includes 1,383,700 acres of which 645,472 are National Forest System lands, 75,380 Bureau of Land Management, and 57,735 State owned. This amounts to 56 percent of the County in government ownership. National Forest Service System land includes about 126,000 acres in the existing Lost Creek and Mount Evans Wildernesses. The 20,723 acre Lost Creek Further Planning Area amounts to about 1.5 percent of the entire County area.

Communities depend on the Forest for summer and winter recreation activities. The Further Planning Area provides a small part of this opportunity. More importantly, the Forest provides an important source of fuelwood to local residents and especially to the nearby Denver metropolitan and Colorado Springs areas. The Further Planning Area is a source of fuel. Tourist trade is important to Park County, although the Lost Creek Further Planning Area would not be expected to influence this activity to any large extent whether wilderness or nonwilderness.

## ECONOMIC SETTING

Park County is a rapidly growing County and has not experienced the economic decline that has recently been the case with other Counties in southeast Colorado. Summer residential development has remained high with increasing numbers of yearlong residences, particularly in the Bailey area. Industry, however, is declining as is agricultural development.

## CHAPTER IV

### ENVIRONMENTAL CONSEQUENCES

#### PHYSICAL AND BIOLOGICAL EFFECTS

##### Wilderness

The Suitable for Wilderness alternative would add 20,723 acres to the National Wilderness Preservation System (NWPS) which have relatively low wilderness attributes. It would provide the opportunity to enhance the Lost Creek Wilderness's characteristics of solitude and the ability to provide outstanding opportunities for primitive and unconfined recreation. The Suitable alternative could also reduce future recreational use pressure on the Lost Creek and Mt. Evans Wildernesses. Natural ecological forces would, over time, reduce but not eliminate the impact of the cut-over areas and the tree plantation.

The Unsuitable for Wilderness (No action) and the Unsuitable for Wilderness-Resource Development have similar effects on the wilderness resource. Opportunities for solitude would be minimal. Both Unsuitable alternatives would eliminate additional opportunities to meet the growing demand for primitive and unconfined recreation opportunities and would probably accelerate the date when a visitor use restrictions (permit system) would be needed in the Lost Creek and Mt. Evans Wildernesses. Additionally, both Unsuitable alternatives would allow necessary management activities and vegetation treatment to take place, causing further "imprints of man" upon the FPA.

The Partially Suitable with Boundary adjustment alternative would add approximately 10,561 acres of the eastern portion of the FPA to the Lost Creek Wilderness. Approximately 10,162 acres would be unsuitable for inclusion in the NWPS and would be managed for nonwilderness purposes (semi-primitive recreation, wood fiber production and wildlife habitat). The proposed 10,561 acre addition to the Lost Creek Wilderness contains minimal evidence of past human activity, and is natural in appearance. The State-owned mineral rights and most of the past mining activity, as well as past timber harvest are in the western portion of the FPA. In combination with the existing Lost Creek Wilderness, opportunities for solitude and primitive and unconfined recreation would be increased from the current situation. The Partially Suitable alternative would reduce the visitor pressure on the nearby wildernesses in the long-term.

##### Recreation

The Unsuitable (No Action) and Unsuitable Resource Development alternatives would continue management of the current ROS classes; semi-primitive nonmotorized and roaded natural. Under these categories, the capacity would be 5560 PAOT's or 127,500 recreation visitor days per year. The current use of about 11,000 RVD's per year includes a small amount of motorized use. The motorized use would be eliminated under wilderness designation.

Under the Suitable alternative the area would be managed under a semi-primitive classification with a capacity of about 1036 PAOT's, or 62,000 recreation visitor days per year.

Under the Partially Suitable Alternative recreation use would be about 30,400 RVD's a year and the PAOT capacity would be approximately 2365 on the "suitable" portion. On the unsuitable portion of the FPA the use would be approximately 25,000 RVD's and the capacity would be approximately 1870 PAOTs.

Under both Unsuitable Alternatives the opportunities for a wilderness-type recreation experience would be foregone. The FPA could accommodate a larger number of visitors, however, than could be accommodated under the Suitable or Partially Suitable alternatives.

Under the Suitable and Partially Suitable alternatives it is assumed that visitors will congregate in the Ben Typer Gulch and Rock Creek Drainage (the eastern portion, adjacent to the Lost Creek Wilderness) because of the more primitive setting. Additionally, the sights and sounds of Highway 285 which runs along the north boundary impact the opportunity for solitude many visitors are seeking.

#### Minerals

The differences in alternatives would have effects on mineral exploration and potential for leasing. Table II-3 shown earlier in this report presents those differences. Differences are primarily in access and area suitable for surface development. The suitable alternative would preclude leasing on 20,723 acres. Designation as wilderness would withdraw the area from mineral entry and leasing except for valid existing claims prior to midnight, December 31, 1983.

Under the unsuitable alternative, the mining laws and laws pertaining to mineral leasing will apply unless otherwise determined by Congress. Surface management would be as prescribed in the Forest Plan. Table IV-1 illustrates the area subject to mineral leasing availability recommendations under suitable and unsuitable alternatives. Recommendations with appropriate stipulations are shown in the Forest Land and Resource Management Plan.

TABLE IV-1

#### MINERAL LEASING AREA

<u>Category</u>	<u>Alternative 1</u> Suitable	<u>Alternative 2</u> Unsuitable	<u>Alternative 3</u> Resource Development	<u>Alternative 4</u> Partially Suitable
Geophysical investigations	17,256	20,723	20,723	10,561
Leasable	-0-	20,723	20,723	-0-
No leasing (Will be withdrawn)	20,723	-0-	-0-	-0-

### Tentatively Suitable Forest Land

Selection of the unsuitable alternative results in all forested lands being available for timber production, insect and disease control and manipulation to improve water yields and wildlife habitat. The long-term sustained yield capacity is about 701 MCF or 2.4 MMBF annually. On slopes less than 45 percent, the long-term sustained yield capacity is about 507MCF or 1.8 MMBF per year (see Table II-3).

Approximately 11,657 acres on slopes less than 45 percent and another 4,768 acres on steep slopes (over 45 percent) would be available for vegetation management.

The suitable alternative would preclude vegetation manipulation for timber, fuelwood, water yield or wildlife habitat purposes.

### Air Quality

There is no evidence to indicate that any of the alternatives would have major effects on the area's air quality, Class II designation, or air quality protection requirements.

### Water

Water quality generally would not be affected under any alternative, except for possible short-term localized effects as a direct result of timber harvest activities. Mitigation measures would keep sediment levels within acceptable limits.

Water yield however can be increased by tree stand management in spruce/fir or lodgepole pine stands at over 9,000 foot elevations. An increase in yield of up to 800 acre-feet per year could be realized from the area under the unsuitable alternative.

### Wildlife

Improvement of wildlife winter habitat and habitat diversity can be accomplished by vegetation treatment practices. Approximately 970 acres are deer winter range which could benefit from vegetation treatment practices. Diversity could be improved on areas where timber harvest activities are carried out. This would include the 11,600 acres of tentatively suitable forest land on slopes under 45 percent where timber harvest is accomplished. Eventually, the entire 16,400 acres of tentatively suitable, including slopes over 45 percent, might be treated.

### Visual Resource

Current visual quality objective is partial retention on 13,055 acres, (63 percent), retention on 4,559 acres (22 percent), and modification on 3,109 acres (15 percent). The suitable alternative would provide for management for Retention VQ0. Under the unsuitable alternative, visual quality would generally remain as it currently is.

### Transportation

The Suitable alternative would preclude the use of about 19 miles of old logging roads, including about three miles of Forest System Road 126, for management purposes. Currently, only Road 126 is open for motorized use for recreation. Under the Unsuitable-No Action alternative the situation would not change significantly except for seasonal closures to protect resources or reduce impacts on wildlife.

Under all alternatives, road access may eventually be needed if an economically viable discovery is made on the 3,840 acres of State-owned mineral rights. Impacts of access and the mining operation would be addressed in appropriate environmental documents before the Forest issued any special use document.

### Range

The livestock grazing situation would not change in the short-term under any of the alternatives. The ecological condition of the forage throughout the FPA is in satisfactory or better condition. Under the Suitable or Partially Suitable alternatives the opportunity for treating forage by mechanized means would be foregone if the FPA (or a portion of it) was designated wilderness.

### SOCIAL EFFECTS

None of the alternatives would result in significant effects on the local communities or the Human Resource Unit.

### COST EFFICIENCY ANALYSIS

An economic efficiency analysis was carried out to determine an incremental net present value of wilderness designation and the unsuitable alternative.

TABLE IV-2

ECONOMIC EFFICIENCY ANALYSIS OF LOST CREEK  
FURTHER PLANNING AREA

(All values are in millions of real 1978 dollars,  
discounted at 4 percent and 7 1/8 percent.)

<u>Resource Outputs</u>	<u>Suitable</u>	<u>Suitable With Boundary Modification</u>	<u>Unsuitable</u>	<u>Current Management</u>
Timber (MMBF)	0	0.9	1.8	0
Water Yield (MAF)	9.0	9.4	9.8	9.0
Rec. Wild. (MRVD)	60.0	30.0	0	0
Rec. Disp. (MRVD)	0	64.0	128.0	128.0
Rec. Dev. (MRVD)	0	0	0	0
Range (MAUM)	0	0	0	0
<u>Discounted Benefits 4% (MM\$)</u>				
Timber	0	0.4	0.9	0
Water Incr.	0	0.2	0.3	0
Rec. - Wild.	10.4	5.2	0	0
Rec. - Nonwild.	0	7.0	13.9	13.9
Range	0	0	0	0
TOTAL	10.4	12.8	15.1	13.9
<u>Discounted Costs 4% (MM\$)</u>				
Oper. and Maint.	0.5	1.6	2.7	2.0
Gen. Administration	0.1	0.3	0.5	0.4
Capital Invest.	0	0	0	0
TOTAL (PVC)	0.6	1.9	3.2	2.4
<u>Economic Measures 4%</u>				
Total Discounted Benefits (PVB)	10.4	12.8	15.1	13.9
Total Discounted Costs (PVC)	0.6	1.9	2.7	2.4
Present Net Value	9.8	10.9	12.4	11.5
Benefit/Cost Ratio	17.3	6.7	5.6	5.8
<u>Discounted Benefits 7-1/8% (MM\$)</u>				
Timber	0	0.3	0.5	0
Water Incr.	0	0.1	0.2	0
Rec. - Wild.	6.6	3.3	0	0
Rec. - Nonwild.	0	4.4	8.8	8.8
Range	0	0	0	0
TOTAL	6.6	8.1	9.5	8.8
<u>Discounted Costs 7-1/8% (MM\$)</u>				
Oper. and Maint.	0.3	1.0	1.7	1.2
Gen. Administration	0.1	0.2	0.3	0.2
Capital Invest.	0	0	0	0
TOTAL (PVC)	0.4	1.2	2.0	1.4

Table IV-2 Continued

<u>Resource Outputs</u>	<u>Suitable</u>	<u>Suitable With Boundary Modification</u>	<u>Unsuitable</u>	<u>Current Management</u>
<u>Economic Measures 7-1/8%</u>				
Total Discounted				
Benefits (PVB)	6.6	8.1	9.5	8.8
Total Discounted				
Costs (PVC)	0.4	1.2	2.0	1.4
Present Net Value	6.2	6.9	7.5	7.4
Benefit/Cost Ratio	16.5	6.8	4.8	6.3

As displayed in Table IV-2, resource values were assigned to timber, water, range and recreation outputs. Wildlife benefits are included in the recreation visitor day outputs. Mineral outputs were not valued in the analysis because only their probability of existence was estimated. Quantities of various mineral resources were not estimated due to the lack of detailed information.

The economic efficiency analysis was based on a planning horizon of 50 years. Benefits and costs were estimated for five ten year periods from 1980 to 2030 and discounted back to the present using a 4% and a 7-1/8% discount rate. Values are lower using the 7-1/8% discount rate because more emphasis is placed on immediate use of resources rather than future uses.

Resource values used in the analysis were:

<u>Resource</u>	<u>Units</u>	<u>Value/Unit (\$)</u>
Timber	MCF	78.00
Water	Acre-Foot	19.70
Recreation (Wilderness)	RVD	8.00
Recreation (Nonwilderness)	RVD	5.00
Range	AUM	10.50

#### WILDERNESS SUITABILITY ANALYSIS

The Wilderness Act of 1964 established standards to be met by areas in the National Wilderness Preservation System. Forest Service policy requires that an area's wilderness capability, availability, and need be established before determining whether the area is suitable or unsuitable for inclusion in the system. Following is the required analysis of the Lost Creek FPA's ability to meet these criteria and to respond to public issues.

## Capability

Wilderness capability is analyzed without regard to either the need for more wilderness or the availability of the area for wilderness. It is determined by the degree to which an area possesses the basic characteristics necessary for wilderness as well as the degree to which an area can be managed for wilderness.

The Wilderness Attribute Rating System (WARS) was developed in RARE II to indicate the degree to which an area possesses wilderness attributes. The system involves a rating for each of several attributes described in the 1964 Wilderness Act, which are then totaled to arrive at a composite WARS rating. The attributes for which an area is rated are: influence on natural integrity; apparent naturalness; solitude opportunity; primitive recreation opportunity; supplementary wilderness attributes; and scenic value. These attributes were discussed in detail in Chapter III of this report. The wilderness attributes of Lost Creek FPA were reviewed during this planning effort and, primarily because the FPA is now smaller than the RARE II allocation, the WARS rating was reduced from 14 to 13. Ratings in RARE II could range from 4 to 28, thus, a rating of 13 or 14 is considered low for Colorado areas. Detailed worksheets are on file in the Pike and San Isabel National Forests' Supervisor's in Pueblo, Colorado.

The second element of wilderness capability is "manageability." the most uncertain aspect of which involves conflicts which might result from future development of mineral resources in the area. The following factors relate directly to manageability of the area for wilderness:

- Ability to manage the area as an enduring resource of wilderness and to protect and manage its natural character. Recreation, grazing and most other resource uses could easily be managed on Lost Creek FPA while maintaining and protecting the existing wilderness characteristics. However, the area contains 19 miles of old logging roads, cut over areas including about 600 acres of recent logging (just prior to 1977), a radio repeater site, a tree plantation, and 3,840 acres of State-owned mineral rights. As a result of public comment a new alternative, Partially Suitable with Boundary Adjustment, was developed. In the new alternative about 11,000 acres of the FPA would be suitable for wilderness and the remaining 9,723 acres which contain the significant "imprints of man" discussed above would be unsuitable for wilderness.

Surface disturbance relating to mineral development of valid existing rights could be controlled under Forest Service Surface Protection Regulations (36 CFR 228) and the Management Direction in the Forest Plan (Chapter III, Plan), but some impacts must be expected. Impacts from exploration are minimal, but if a major economic discovery was made, impacts on the wilderness characteristics of an area could be severe. A road system necessary to gain access to development sites would be the greatest impact.

- Size and shape of the area. Lost Creek FPA contains 20,723 acres of National Forest System Land. The State of Colorado owns mineral rights on 3,840 acres within the FPA boundary. The current FPA boundary is on easily recognized topographic features. In the Partially Suitable alternative the boundary was placed to follow easily recognizable topographic features.
- Location relative to external influences. The north side of the area is bounded by Highway 285, a major highway and the sights and sounds of the traffic are evident throughout much of the FPA. The same route is a commonly used corridor for small aircraft. In the Partially Suitable alternative the adjusted boundary runs north-south and is set well back from the highway. However the north side of the area would be adjacent to the highway, and visitors would still be impacted by the traffic and airplane noise.
- Boundaries. The boundaries in both the Suitable and the Partially Suitable alternatives can be logically located to utilize easily recognized topographic features. They can be sufficiently described to be posted on the ground and they can be located to avoid conflict with existing or potential public uses.

#### Availability

Value comparison. Availability of an area for wilderness designation is determined, in part, by comparing the value of the wilderness resource with the value of the nonwilderness resources foregone on that same area. The value of tangible and intangible wilderness resources should be greater than the values foregone if the suitable alternative is to be recommended. The highest and best use of an area with respect to wilderness designation is difficult to assess in such terms because of the difficulty of attaching precise values to the intangible benefits derived.

The area contains approximately 16,425 acres of land suitable for timber production, from which an estimated 67 MMBF could be harvested annually. All of this would be foregone under the Suitable alternative. However, this amount would not be needed to meet the timber production goals in the Pike and San Isabel National Forests Plan. Under the Partially Suitable alternative the suitable timberland would be in the portion of the FPA which would be unsuitable for wilderness.

No attempt was made to place a dollar value on the mineral potential of the FPA. The Suitable and Partially Suitable alternatives would impose additional environmental constraints on development activities of valid existing rights which would result in increased costs to developers. There is the possibility that a major discovery could be foregone under the Suitable or Partially Suitable alternatives if the area is withdrawn upon designation.

Recreation constitutes a major use of the FPA under the Suitable and Partially Suitable alternatives. By its very nature, however, wilderness recreation results in a much lower capacity than non-wilderness recreation. Motorized use is minimal in the area, so a wilderness designation for all or part of the FPA would have little to no effect on hunting and fishing activities.

Existing constraints and encumbrances. The State of Colorado owns the mineral rights on 3,840 acres of land in the north central portion of the FPA. There are no patented mining claims in the area.

Effects of wilderness designation and management on adjacent lands. Wilderness designation would have little effect on management of adjacent lands. The Lost Creek Wilderness abuts approximately one-third of the FPA to the south and east and Highway 285 is to the north and west.

#### Need

The following factors were considered in determining the need for the Lost Creek FPA as designated wilderness:

Location, size, and type of other wildernesses in the general vicinity and their distance from the Lost Creek FPA. There are 770,000 acres of designated wilderness within 50 air miles of this area. Lost Creek Wilderness which adjoins the FPA contains 106,000. Mt. Evans Wilderness is within three miles of the FPA and contains 73,000. The FPA, Lost Creek and Mt. Evans Wildernesses have similar topography and vegetation.

Present visitor pressure, trends in use, and patterns of use. Although public comment on the Pike and San Isabel National Forests Plan and DEIS indicated that there is a need for more designated wilderness close to the Front Range population, current use of the area does not indicate a high demand of the FPA for recreation purposes. Use trends indicate that wilderness users prefer to spend a longer period of time in one area rather than travel to several wildernesses. The lack of outstanding features or bodies of water in the Lost Creek FPA may account for low use of the area.

Ability to provide outstanding opportunities for primitive and unconfined type of recreation. The Lost Creek FPA has moderate potential to provide this type of recreation opportunity with or without the boundary adjustment, this attribute is not in short supply in the surrounding wildernesses.

Ability of biotic species to compete with people and projects. No threatened or endangered plant or animal species are known to exist in the FPA.

The ecosystem is not unique to the locale and is represented in the adjoining Lost Creek and Mt. Evans Wildernesses. Management direction in the Forest Plan provides for protection and perpetuation of existing ecosystems.

Need to provide sanctuary for species that are dependent on a wilderness environment. No species have been identified which are dependent on a wilderness environment for their survival.

Need to provide for preservation of unique landform types or ecosystems. There are no unique or unusual landform types or ecosystems in the Lost Creek FPA. Those present are well represented in the adjoining and nearby wildernesses, as well as in the non-wilderness lands of the surrounding area.

#### SHORT-TERM USES OF MAN'S ENVIRONMENT VERSUS THE MAINTENANCE AND ENHANCEMENT OF LONG-TERM PRODUCTIVITY

There would be no major direct effect on the long-term productivity of renewable resources by either the suitable or unsuitable alternative. Mitigation of effects of resource management activities is provided in the Forestwide and Management Area Direction of the Forest Plan. Short-term uses of timber would maintain or enhance the longterm productivity of timber, wildlife habitat and diversity, water yield and integrated pest control programs through maintenance of a healthy forest cover.

#### IRREVERSIBLE AND IRRETRIEVABLE COMMITMENT OF RESOURCES

None of the alternatives directly propose any irreversible or irretrievable commitment of resources. Mineral extraction, however, might be more likely under a nonwilderness alternative, although it is not precluded entirely under wilderness. Proper mitigation would tend to restore the production of renewable resources after mining is completed.

The loss of wilderness character would potentially be an irreversible commitment of the wilderness resource.

Loss of timber production and revenues from sales or potential mineral leases would be an irretrievable loss under the suitable alternative.

#### PROBABLE ADVERSE EFFECTS THAT CANNOT BE AVOIDED

##### Suitable and Partially Suitable Alternatives

- There would be a probable increase in the cost of mineral development.
- There would be a loss in overall recreation use capacity. Motorized use opportunity on existing roads would also be lost.

- There would be a loss in available wood fiber supply.
- There would be a loss of potential for wildlife habitat improvement.

Unsuitable Alternatives

There would be a potential loss of wilderness capability of the area in the event of substantial mineral development or other road supported resource management activities in the area.

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# **APPENDIX D**

## APPENDIX D

### RESOURCE ALLOCATION MODEL AND CONSTRAINT ANALYSIS

The resource allocation and scheduling model used in developing the proposed Pike and San Isabel National Forests Land and Resource Management Plan is called FORPLAN. FORPLAN is a linear program that allocates portions of the Forest landbase to various management prescriptions through time. Each specific prescription that is selected and scheduled for application is tracked for time of implementation, costs and outputs. The linear program predicts resource capability.

Major parts of the model include:

Scheduled Outputs - Scheduled outputs are outputs (goods and services) whose level varies over time as a result of the application of prescriptions. Scheduled outputs in the Pike and San Isabel National Forest FORPLAN model are livestock production (animal unit months), water yield increase (acre-feet), dispersed recreation (recreation visitor days), and timber (cubic feet). These scheduled outputs were chosen because they provide a direct and/or indirect measure of one or more of the issues and concerns.

Analysis Areas - Analysis areas are areas of the landbase where responses to management are similar. Analysis area delineators used in this planning effort were forest or grasslands, recreation opportunity spectrum class, vegetative type, site productivity, slope class, vegetative size, and special sites such as campgrounds or legally classified areas. Two hundred and three analysis areas were represented in the model.

Management Prescriptions - Management Prescriptions are combinations of management practices designed to emphasize the production of various scheduled outputs. Management prescriptions were expressed mathematically in terms of outputs and costs. Over 500 prescriptions were tested in the model.

Objective Function - An objective function is a statement of what is to be optimized in the linear program. Within the model, scheduled outputs, benefits and costs can be maximized or minimized. The objective function most often used was to maximize present net value for five periods. Benchmark analyses were run with the objective function being to maximize each resource (scheduled output) for five periods.

Each analysis area/management prescription combination required the Forest Interdisciplinary Team to calculate a production and cost coefficient for each scheduled output by time period. There were over 1500 analysis area/management prescription combinations available in the model. All resources were modeled for 50 years except timber which was modeled for 240 years (2 rotations).

Timber yield tables were developed using RMYLD (Rocky Mountain Yield) and GROW, both of which are computerized growth and yield simulation

models. RMYLD was used to develop yield tables for regenerated stands of ponderosa pine, lodgepole pine, spruce/fir and aspen. It was also used to develop yield tables for existing seedling/sapling stands of spruce/fir, lodgepole pine, ponderosa pine and aspen. GROW was used to develop yield tables for all existing stands with a sawtimber, pole-timber or understocked size classification. GROW was also used to prepare yield tables for all existing and regenerated stands of Douglas-fir and white fir. The growth and mortality coefficients used in GROW were developed following a recent (1980) forest inventory. They were based on remeasurement of 100 fixed-radius plots (1/5-acre each) and completion of a Stage I/II inventory of 740 sample stands (7,151 variable-radius plots were measured).

Before constructing yield tables, growth simulation results were modified by:

1. Reducing gross volumes to net volumes to account for defect;
2. Reducing net volumes further to account for nonstockable areas due to rock outcrops, bedrock, bog, etc.

Regulation 36 CFR 219.16(a)(2)(111) states that rotation length will be based on culmination of mean annual increment. Culmination of mean annual increment for current management intensities and utilization standards was calculated using merchantable cubic feet per acre per year as a unit of measure. The ROCKY MOUNTAIN YIELD simulation model was the basis for calculation. The culmination of mean annual increment for ponderosa pine, lodgepole pine and Douglas-fir was found to be 110 years, 120 years for spruce/fir, and 80 years for aspen.

The model contains over 4,000 lines of data. Information on how the coefficients were developed and integrated into the model, or any other information concerning the use of FORPLAN in the Pike and San Isabel National Forests planning effort, is available for review at the Forest Supervisor's Office in Pueblo, Colorado.

#### CONSTRAINT ANALYSIS

During the formulation of alternatives considered in detail, certain objectives/constraints were placed on resource output levels, costs, and levels of management intensities. These objectives/constraints were used to ensure protection of the environment, specify the mix, timing and amount of scheduled outputs, and generally ensure the goals of the specific alternative were being achieved. Outputs produced above projected demand levels were not valued. The constraints used in this planning effort are listed in Tables D-1 and D-2.

TABLE D-1

Constraints Common to All Alternatives

<u>Alternative</u>	<u>Output</u>	<u>Type of Constraint</u>	<u>Constraint</u>	<u>Units</u>	<u>Applicable Time Period</u>	<u>Constraint limiting on PNV</u>	<u>Rationale</u>
All	Timber	Harvest flow	Non-declining yield	MMCF/decade	1-24	Yes	To ensure a continued supply of timber volume for local dependent industries throughout the planning horizon.
	Timber	Inventory	Ending inventory	MMCF/decade	24	Yes	To ensure that total inventory volume left at the conclusion of the planning horizon will equal or exceed the volume that would occur in a regulated forest managed in accordance with the prescriptions selected for regenerated timber.
	Timber	'Less than or equal to'	Sustained yield	MMCF/decade	24	Yes	To ensure that harvest for any decade do not exceed a level which could be sustained indefinitely.

TABLE D-2

Constraints Specific to All Alternatives

<u>Alternative</u>	<u>Output</u>	<u>Type of Constraint</u>	<u>Constraint</u>	<u>Units/Decade</u>	<u>Applicable Time Period</u>	<u>Constraint limiting on PNV</u>	<u>Rationale</u>
A	Grassland Forage	'Greater than or equal to'	185	MAUM/YR	5	Yes	To maintain 100% of demand.
	Forest Forage	'Greater than or equal to'	42	MAUM/YR	1	Yes	To maintain 100% of current demand and increase by 5 to 10% each decade.
			46	MAUM/YR	2	Yes	
			52	MAUM/YR	4	Yes	
			55	MAUM/YR	5	Yes	

Roundwood Rotation Constraints

D-4	A	Timber	'Less than or equal to'	15	MMCF	1	Yes	To hold shortened rotations to within 15% of current timber demand.
				16	MMCF	2	Yes	
				17	MMCF	3	Yes	
				19	MMCF	4	Yes	
				21	MMCF	5	Yes	
		Spruce/fir	'Greater than or equal to'	1	MMCF	2	Yes	To ensure a realistic species mix within the shortened rotation prescription.
		Ponderosa Pine	'Greater than or equal to'	2	MMCF	1	Yes	
				2	MMCF	3	Yes	
				2	MMCF	5	Yes	

TABLE D-2 (Continued)

## Constraints Specific to All Alternatives

<u>Alternative</u>	<u>Output</u>	<u>Type of Constraint</u>	<u>Constraint</u>	<u>Units/Decade</u>	<u>Applicable Time Period</u>	<u>Constraint limiting on PNW</u>	<u>Rationale</u>
A	Douglas-fir	'Less than or equal to'	4	MMCF	2	Yes	To ensure a realistic mixture of species within the shortened rotation prescription. " " "
			3	MMCF	1	Yes	
	Lodgepole pine	'Greater than or equal to'	3	MMCF	2	Yes	
			3	MMCF	4	Yes	
			3	MMCF	5	Yes	
			5	MMCF	1	Yes	
			5	MMCF	2	Yes	
			5	MMCF	3	Yes	
	Aspen	'Greater than or equal to'	5	MMCF	4	Yes	
			5	MMCF	5	Yes	
5			MMCF	4	Yes		
5			MMCF	5	Yes		
<u>VEGETATION TYPE CONSTRAINTS</u>							
A	Douglas-fir	'Greater than or equal to'	36	MACRE	1	Yes	To ensure management emphasis shift to Douglas-fir for insect and disease, wildlife habitat, forest diversity and visual purposes.
			36	MACRE	2	Yes	
			36	MACRE	3	Yes	
			36	MACRE	4	Yes	
			36	MACRE	5	Yes	
	Lodgepole pine	'Less than or equal to'	15	MACRE	1	Yes	To ensure treatment of other species.
			15	MACRE	2	Yes	
		'Greater than or equal to'	3.5	MACRE	3	Yes	
			3.5	MACRE	4	Yes	

TABLE D-2 (Continued)  
 Constraints Specific to Each Alternative

<u>Alter- native</u>	<u>Output</u>	<u>Type of Constraint</u>	<u>Constraint</u>	<u>Units/ Decade</u>	<u>Applicable Time Period</u>	<u>Constraint limiting on PNW</u>	<u>Rationale</u>	
<u>HARVEST METHOD CONSTRAINTS</u>								
A	Spruce/fir clearcut	'Greater than or equal to'	3.75	MACRES	2	Yes	To ensure treatments to increase water yield and improve wild- life habitat in spruce/fir.	
			3.75	MACRES	3	Yes		
			3.75	MACRES	4	Yes		
			3.75	MACRES	5	Yes		
	Spruce/fir shelterwood	'Greater than or equal to'	3.75	MACRES	1	Yes		To ensure treatment of those stands where shelterwood is needed for spruce regeneration.
			3.75	MACRES	2	Yes		
			3.75	MACRES	3	Yes		
			3.75	MACRES	4	Yes		
D-6	Spruce/fir selection	'Less than or equal to'	6	MACRES	1	Yes	To hold selection harvest within implementable levels.	
			6	MACRES	4	Yes		
			6	MACRES	5	Yes		
	Ponderosa pine shelterwood	'Greater than or equal to'	20	MACRES	2	Yes		To ensure regeneration of ponderosa pine, and to improve wildlife habitat.
			20	MACRES	3	Yes		
			20	MACRES	4	Yes		
Ponderosa pine selection	'Less than or or equal to'	4	MACRES	1	Yes	To hold selection harvest within implementable levels.		
		4	MACRES	2	Yes			
		4	MACRES	3	Yes			
Douglas-fir clearcut	'Greater than or equal to'	3	MACRES	1	Yes	To increase water yield and improve wildlife habitat in Douglas-fir.		
		3	MACRES	2	Yes			
		3	MACRES	3	Yes			
		3	MACRES	5	Yes			
Douglas-fir clearcut	'Less than or equal to'	6	MACRES	4	Yes	To hold clearcut harvest within implementable levels and to ensure regeneration.		

TABLE D-2 (Continued)

Constraints Specific to Each Alternative

Alter- native	Output	Type of Constraint	Constraint	Units/ Decade	Applicable Time Period	Constraint Limiting on PNV	Rationale
A	Douglas-fir selection	'Less than or equal to'	6	MACRES	1	Yes	To hold selection harvest within implementable levels.
			6	MACRES	3	Yes	
			6	MACRES	4	Yes	
			6	MACRES	5	Yes	
B	Crassland	'Greater than or equal to'	165	MAUM/YR	1	Yes	To maintain 100% of current demand and increase by 5% per decade.
			172	MAUM/YR	2	Yes	
			177	MAUM/YR	3	Yes	
			185	MAUM/YR	5	Yes	
	Forest	'Greater than or equal to'	43	MAUM/YR	2	Yes	
			45	MAUM/YR	3	Yes	
			50	MAUM/YR	5	Yes	
			50	MAUM/YR	5	Yes	
B	Spruce/fir	'Greater than or equal to'	10	MACRES	1	Yes	To portray current management.
			10	MACRES	2	Yes	
			10	MACRES	3	Yes	
			10	MACRES	4	Yes	
			10	MACRES	5	Yes	
			10	MACRES	10	Yes	
			10	MACRES	10	Yes	
			10	MACRES	10	Yes	
VEGETATION TYPE CONSTRAINTS							

B

D-7

B

A

TABLE D-2 (Continued)  
 Constraints Specific to Each Alternative

Alter- native	Output	Type of Constraint	Constraint	Units/ Decade	Applicable Time Period	Constraint limiting on PNV	Rationale
B	Ponderosa pine	'Greater than or equal to'	30	MACRES	2	Yes	To portray current management.
			30	MACRES	3	Yes	
			30	MACRES	4	Yes	
			30	MACRES	5	Yes	
	Douglas-fir	'Greater than or equal to'	15	MACRES	1	Yes	To portray current management.
			15	MACRES	2	Yes	
			15	MACRES	3	Yes	
			15	MACRES	4	Yes	
			15	MACRES	5	Yes	
	Lodgepole pine	'Greater than or equal to'	4	MACRES	3	Yes	To portray current management.
			4	MACRES	4	Yes	
			4	MACRES	5	Yes	
	Aspen	'Greater than or equal to'	5	MACRES	1	Yes	To portray current management.
			5	MACRES	2	Yes	
			5	MACRES	3	Yes	
			5	MACRES	4	Yes	
5			MACRES	5	Yes		

B HARVEST METHOD CONSTRAINTS

Spruce/fir clearcut	'Greater than or equal to'	3	MACRES	5	Yes	To maintain spruce/fir clearcutting within current levels.
		5	MACRES	1	Yes	
	'Less than or equal to'	5	MACRES	3	Yes	

D-8

TABLE D-2 (Continued)

Constraints Specific to Each Alternative

<u>Alter- native</u>	<u>Output</u>	<u>Type of Constraint</u>	<u>Constraint</u>	<u>Units/ Decade</u>	<u>Applicable Time Period</u>	<u>Constraint limiting on PNV</u>	<u>Rationale</u>
B	Spruce/fir shelterwood	'Greater than or equal to'	5	MACRES	1	Yes	To ensure spruce/fir shelterwood harvesting with current levels.
			5	MACRES	2	Yes	
			5	MACRES	3	Yes	
			5	MACRES	4	Yes	
		'Less than or equal to'	7	MACRES	5	Yes	
C D-9	Timber	'Less than or equal to'	97	MMCF	1	Yes	To ensure timber harvest- ing between 100% and 110% of RPA goals.
			107	MMCF	5	Yes	
	Grassland forage	'Greater than or equal to'	162	MAUM/YR	1	Yes	To ensure forage pro- duction is maintained at RPA specified levels.
			172	MAUM/YR	2	Yes	
			178	MAUM/YR	3	Yes	
	Forest forage	'Greater than or equal to'	43	MAUM/YR	2	Yes	
			45	MAUM/YR	3	Yes	
			45	MAUM/YR	4	Yes	
			45	MAUM/YR	5	Yes	

ROUNDWOOD ROTATION CONSTRAINTS

C	Timber	'Less than or equal to'	15	MMCF	1	Yes	To hold shortened rotation prescription to within 15% of current timber demand.
			16	MMCF	2	Yes	
			21	MMCF	5	Yes	

TABLE D-2 (Continued)

Constraints Specific to Each Alternative

<u>Alter- native</u>	<u>Output</u>	<u>Type of Constraint</u>	<u>Constraint</u>	<u>Units/ Decade</u>	<u>Applicable Time Period</u>	<u>Constraint limiting on PNV</u>	<u>Rationale</u>
C	Lodgepole pine	'Greater than or equal to'	2	MMCF	2	Yes	To ensure a realistic species mix within the shortened rotation prescription.
			2	MMCF	3	Yes	
			2	MMCF	4	Yes	
			2	MMCF	5	Yes	
	Aspen	'Greater than or equal to'	2	MMCF	1	Yes	
			2	MMCF	2	Yes	
			2	MMCF	3	Yes	
			2	MMCF	5	Yes	
D-10	<u>VEGETATION TYPE CONSTRAINTS</u>						
C	Douglas-fir	'Greater than or equal to'	16	MACRES	2	Yes	To ensure management emphasis for insect and disease, wildlife habitat, forest diversity and visual purposes.
			16	MACRES	3	Yes	
			16	MACRES	4	Yes	
			16	MACRES	5	Yes	
<u>HARVEST TYPE CONSTRAINTS</u>							
C	Spruce/fir clearcut	'Greater than or equal to'	3.75	MACRES	3	Yes	Increase water yield and maintain a realistic mix of harvest methods in spruce-fir.
			3.75	MACRES	4	Yes	
			3.75	MACRES	5	Yes	
	Spruce/fir shelterwood	'Greater than or equal to'	3.75	MACRES	1	Yes	
			3.75	MACRES	2	Yes	
			3.75	MACRES	3	Yes	
			3.75	MACRES	4	Yes	

TABLE D-2 (Continued)

Constraints Specific to All Alternatives

<u>Alternative</u>	<u>Output</u>	<u>Type of Constraint</u>	<u>Constraint</u>	<u>Units/Decade</u>	<u>Applicable Time Period</u>	<u>Constraint limiting on PNV</u>	<u>Rationale</u>
C	Douglas-fir selection	'Less than or equal to'	6	MACRES	2	Yes	Hold Douglas-fir selection harvest within implementable levels.
			6	MACRES	3	Yes	
			6	MACRES	4	Yes	
			6	MACRES	5	Yes	
	Douglas-fir clearcut	'Greater than or equal to'	3	MACRES	1	Yes	To improve wildlife habitat in Douglas-fir.
			3	MACRES	2	Yes	
			3	MACRES	3	Yes	
			3	MACRES	4	Yes	
			3	MACRES	5	Yes	
	D	Grassland forage	'Greater than or equal to'	165	MAUM/YR	1	Yes
175				MAUM/YR	2	Yes	
180				MAUM/YR	3	Yes	
185				MAUM/YR	4	Yes	
Forest forage		'Greater than or equal to'	48	MAUM/YR	2	Yes	Produce forage at 110% of current demand.

ROUNDWOOD ROTATION CONSTRAINTS

D	Timber	'Less than or equal to'	22	MMCF	1	Yes	Hold shortened rotations at 15% of timber volume.
			24	MMCF	2	Yes	
			27	MMCF	3	Yes	
			31	MMCF	4		
			34	MMCF	5		

TABLE D-2 (Continued)  
 Constraints Specific to Each Alternative

<u>Alter- native</u>	<u>Output</u>	<u>Type of Constraint</u>	<u>Constraint</u>	<u>Units/ Decade</u>	<u>Applicable Time Period</u>	<u>Constraint limiting on PNV</u>	<u>Rationale</u>
D	Spruce/fir	'Greater than or equal to'	2	MMCF	1	Yes	To ensure a reasonable mix of species treated.
			2	MMCF	2	Yes	
			2	MMCF	5	Yes	
	Ponderosa pine	'Greater than or equal to'	2	MMCF	1	Yes	To ensure a reasonable mix of species treated.
			2	MMCF	3	Yes	
			2	MMCF	5	Yes	
	Douglas-fir	'Less than or equal to'	7	MMCF	2	Yes	To ensure a reasonable mix of species treated.
			8	MMCF	3	Yes	
			9	MMCF	4	Yes	
			10	MMCF	5	Yes	
	Lodgepole pine	'Greater than or equal to'	5	MMCF	1	Yes	To ensure a reasonable mix of species treated.
			5	MMCF	4	Yes	
Aspen	'Greater than or equal to'	7	MMCF	2	Yes	To ensure a reasonable mix of species treated.	
		7	MMCF	3	Yes		
		7	MMCF	5	Yes		

TABLE D-2 (Continued)

Constraints Specific to Each Alternative

<u>Alter- native</u>	<u>Output</u>	<u>Type of Constraint</u>	<u>Constraint</u>	<u>Units/ Decade</u>	<u>Applicable Time Period</u>	<u>Constraint limiting on PNV</u>	<u>Rationale</u>
<u>VEGETATION TYPE CONSTRAINTS</u>							
D	Spruce/fir	'Greater than or equal to'	30	MACRES	3	Yes	To meet the goals of the high commodity output.
			34	MACRES	4	Yes	
			38	MACRES	5	Yes	
	Lodgepole pine	'Greater than or equal to'	17	MACRES	1	Yes	
			20	MACRES	2	Yes	
			24	MACRES	3	Yes	
			28	MACRES	4	Yes	
			32	MACRES	5	Yes	
	Aspen	'Greater than or equal to'	11	MACRES	2	Yes	
			12	MACRES	3	Yes	
			13	MACRES	4	Yes	
			14	MACRES	5	Yes	

TABLE D-2 (Continued)

Constraints Specific to Each Alternative

<u>Alter- native</u>	<u>Output</u>	<u>Type of Constraint</u>	<u>Constraint</u>	<u>Units/ Decade</u>	<u>Applicable Time Period</u>	<u>Constraint limiting on PNV</u>	<u>Rationale</u>
D	<u>HARVEST TYPE CONSTRAINTS</u>						
	Selection	'Less than or equal to'	10	MACRES	1	Yes	Hold selection harvest within implementable levels.
			13	MACRES	2	Yes	

TABLE D-2 (Continued)

Constraints Specific to Each Alternative

<u>Alter- native</u>	<u>Output</u>	<u>Type of Constraint</u>	<u>Constraint</u>	<u>Units/ Decade</u>	<u>Applicable Time Period</u>	<u>Constraint limiting on PNV</u>	<u>Rationale</u>
E	Cost	'Less than or equal to'	39.6	MM \$	1	Yes	To hold the budget below 75% of current management.
			43.6	MM \$	2	Yes	
			47.7	MM \$	3	Yes	
	Grassland forage	'Greater than or equal to'	66	MAUM/YR	1	Yes	To maintain at least 40% of current management forage production.
			69	MAUM/YR	2	Yes	
			71	MAUM/YR	3	Yes	
			72	MAUM/YR	4	Yes	
			74	MAUM/YR	5	Yes	
	Forest forage	'Greater than or equal to'	17	MAUM/YR	2	Yes	

# **APPENDIX E**

APPENDIX E  
BENCHMARK ANALYSIS

Appendix E displays the results of benchmark analysis, which are described in Chapter II of the EIS. There are 11 benchmarks.

- Benchmark 1 - (Minimum Level)
- Benchmark 2 - (Maximum Present Net Value Based on Established Market Prices)
- Benchmark 3 - (Maximum Present Net Value Including Assigned Values)
- Benchmark 4 - (Maximum Timber Level)
- Benchmark 5 - (Maximum Range Level)
- Benchmark 6 - (Maximum Dispersed Recreation Level)
- Benchmark 7 - (Maximum Developed Recreation Level)
- Benchmark 8 - (Maximum Winter Sports Level)
- Benchmark 9 - (Maximum Wilderness Level)
- Benchmark 10 - (Maximum Wildlife Habitat Improvement Level)
- Benchmark 11 - (Maximum Water Yield Level)

The first five benchmarks were analyzed in some detail for use in future RPA plans. The last six were developed more for the maximum value they represented than for an approximation of an integrated program. Table 1 shows the cost efficiency for the first three benchmarks. Table 2 shows the average annual output for the first decade and the 50 year period for the first five benchmarks. Table 3 shows the maximum output level for the last six benchmarks.

TABLE 1

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 Benchmark Cost Efficiency Analysis (First Decade)
 

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Cost Efficiency (in millions of First Quarter 1978 dollars)	Benchmarks		
	1	2	3
4% Discount Rate			
Present Net Value, Incremental	874.5	84.0	223.2
Benefit-Cost Ratio, Incremental	47.8	2.0	2.4
Discounted Benefits, Incremental	893.2	167.5	379.9
Discounted Cost, Incremental	18.7	83.5	156.7
7-1/8% Discount Rate			
Present Net Value, Incremental	541.2	46.1	124.3
Benefit-Cost Ratio, Incremental	49.9	1.9	2.3
Discounted Benefits, Incremental	552.3	95.3	221.3
Discounted Costs, Incremental	11.1	49.1	97.0

TABLE 2a

## Benchmark Level Analysis

Resource	Unit of Measure	First Decade Resource Outputs - Average Annual				
		1	2	Benchmarks 3	4	5
TIMBER	Millions of Cubic Feet	0	7.9	6.7	35.9	9.2
RANGE	Thousand Animal Unit Months	0	216.0	218.0	219.0	240.0
RECREATION Developed	Thousand Visitor Days	0	3,530	3,530	630	630
Dispersed-- Excluding Wilderness	Thousand Visitor Days	4,492	4,860	8,194	5,482	7,948
Downhill Skiing	Thousand Visitor Days	0	300	300	300	300
WILDERNESS Use Capacity	Thousand Visitor Days	251	251	251	251	251
WILDLIFE Habitat Improvement	Acres	0	0	14,800	0	8,000
WATER YIELD	Thousand Acre-Feet	1,227	1,278	1,277	1,282	1,281

TABLE 2b

## Benchmark Level Analysis

Resource	Unit of Measure	50-Year Planning Period Resource Outputs - Average Annual				
		1	2	Benchmarks 3	4	5
TIMBER	Millions of Cubic Feet	0	8.8	8.6	42 1	15 0
RANGE	Thousand Animal Unit Months	0	228.0	222 0	215 0	259.0
RECREATION Developed	Thousand Visitor Days	0	4,396	4,393	1,238	1,238
Dispersed-- Excluding Wilderness	Thousand Visitor Days	5,276	5,372	8,981	4,908	8,411
Downhill Skiing	Thousand Visitor Days	0	864	864	864	864
WILDERNESS Capacity	Thousand Visitor Days	251	685	685	685	685
WILDLIFE Habitat Improvement	Acres	0	2,076	16,900	0	9,000
WATER YIELD	Thousand Acre-Feet	1,227	2,557*	1,307*	4,077*	1,295*

\*Estimated

TABLE 3

## Maximum Outputs for Benchmarks 6-11

Benchmark	Resource	Unit of Measure	Average Annual Output
Benchmark 6	Dispersed Nonmotorized Recreation Capacity	Recreation Visitor Days	876,000
	Dispersed Motorized Recreation Capacity	Recreation Visitor Days	1,892,000
	Dispersed Recreation Along Developed Roads Capacity	Recreation Visitor Days	6,100,000
Benchmark 7	Developed Recreation	Recreation Visitor Days	3,814,000
Benchmark 8	Winter Sports Capacity	Recreation Visitor Days	1,150,000
Benchmark 9	Wilderness Area	Acres	685,000
Benchmark 10	Wildlife Habitat Improvement	Acres	10,000
Benchmark 11	Water Yield	Acre-Feet	4,000,000

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# **APPENDIX F**

APPENDIX F  
WILD AND SCENIC RIVER ELIGIBILITY REPORT  
FOR  
BADGER CREEK, THE CIMARRON RIVER AND  
A SECTION OF THE SOUTH PLATTE RIVER

This appendix includes three Wild and Scenic River eligibility studies. They are Badger Creek, the Cimarron River, and the South Platte River from Eleven-Mile Dam to Cheesman Reservoir

Badger Creek is located in Fremont and Park Counties, Colorado; the section of the Cimarron River studied is within the Cimarron National Grasslands and extends from the Kansas-Oklahoma line in Comanche County; Kansas to the Colorado-Kansas line; the section of the South Platte River studied extends from Eleven-Mile Canyon Dam downstream to the head of Cheesman Reservoir and is within Park and Teller Counties, Colorado.

BADGER CREEK ELIGIBILITY REPORT

Location. Badger Creek is located in Fremont and Park Counties, Colorado on the San Isabel National Forest. The headwaters originate in South Park, flowing to the south where it enters the Arkansas River, approximately two miles west of Howard, Colorado.

River Study Area Boundaries. The segment identified for study includes Badger Creek from its source to the confluence with the Arkansas River, a distance of about 25 miles. The upper portion of Badger Creek is located on private and scattered BLM lands. It then enters National Forest lands through which it flows for about 8 miles until it again passes through lands administered by the BLM for about 5 miles to the confluence with the Arkansas. It flows through 3 tracts of private land for a distance of about 3 miles. This description will focus upon the segment of Badger Creek through National Forest lands from the north boundary of Section 25, T.51N, R.75W., to the Forest boundary in Section 34, T 50N., R 75W. However, much of the description will also be applicable to the subsegment of Badger Creek, south of the National Forest between the National Forest and the Arkansas River.

General Setting Badger Creek is a well defined canyon in the lower reaches becoming more open with rolling terrain in the upper reaches.

Developments and general types of uses in the area include ranching and subdivision development

Past use of the drainage has been for grazing and mining as evidenced by remnants of old mines

Land Ownership and Use. The upper portion of the area is mostly private land with interspersed BLM administered tracts. The central segment of the area is mostly National Forest land with two intermingled private land tracts, and the southern portion of the drainage is BLM administered lands with a private land tract encompassing about one mile of the drainage.

Uses include grazing forest land, wildlife habitat, hunting, fishing, and ranching with some subdivision development of private lands in the upper reaches.

Transportation and Access. The headwaters of Badger Creek is generally crossed and/or paralleled by roads in several places and is readily accessible. The central portion through National Forest lands is generally not accessible by road. The lower portion of the drainage on BLM administered lands is accessible by a four-wheel drive powerline road generally paralleling but at a distance from Badger Creek.

Physical, Biologic and Geologic Features. The Badger Creek drainage is located in a Cenozoic volcanic formation locally known as the Arkansas Hills. This occurs as a low range of north-south oriented hills separating the Arkansas drainage on the west from South Park, a large alluvial deposit on the east. The Arkansas Hills area was not subject to glaciation and the present land form with rolling hills, dissected topography and rocky outcrops is generally the result of wind and water erosion.

The canyon is generally surrounded by rolling hills and with a relatively flat floor through which Badger Creek meanders.

Vegetation is primarily composed of pinyon pine and juniper with small amounts of mountain mahogany and cottonwood at lower elevations. Very little understory is present due to the domination of the pinyon/juniper canopy. At higher elevations in the National Forest portion of the drainage, vegetation is generally ponderosa pine and Douglas-fir with scattered open meadows and grasslands.

Badger Creek is a perennial stream with clear, cold and unpolluted water. All water qualities fall well within tolerance levels for cold water fish. The average flow is 4 to 5 cubic feet per second (cfs), but some thunderstorms may increase this flow to 5,000 cfs. A flood during August 1978 was determined to have a flow of nearly 10,000 cfs. The lower channel is very unstable with mostly annual vegetation, gravelly soils, and little perennial vegetation. The drainage is subject to erosion and has been identified as a nonpoint source of pollution in the water quality management plan for the upper Arkansas area. At the present time a watershed study plan is being developed for the Badger Creek watershed as an interagency effort between federal, state, and private landowners to develop a rehabilitation plan for the entire watershed. This stream has been identified as a critical spawning area for brown trout of the Arkansas River. Interim plans have been made to provide and improve the pool-riffle ratio in Badger Creek to improve

brown trout resting and spawning habitat and stabilize the stream. There will be approximately 100 such temporary pools constructed each fall in a 2½ mile stretch upstream from the Arkansas. These temporary pools will continue to be used until the flow and channel of Badger Creek have been stabilized.

Recreational uses of Badger Creek include fishing and hunting. The creek corridor is used by many species of wildlife. None of them are unique to the corridor, and the area does not provide what could be considered unique habitat.

Social Economic Features Recreation use in the Badger Creek area is generally limited to fishing and hunting use. The scenic and visual resources are those common to the Arkansas Hills and the Arkansas River drainage between Salida and Canon City. There are no resources which are unique with respect to the surrounding area

There are no known cultural resources that have been identified. However, remnants of old mining operations, ranches, prehistoric lithic scatters, campsites, etc., common to the Arkansas Hills and the Arkansas River valley may be present.

Economic uses of the natural resources are primarily focused on grazing, with ranching and subdivision activities on the private lands

## ELIGIBILITY EVALUATION

### BADGER CREEK

The guidelines for evaluating Wild, Scenic and Recreational River Areas proposed for inclusion in the National Wild and Scenic River System under Section 2, Public Law 90-542 list five general criteria that rivers should meet in order to be considered under the provisions of this act. These criteria and the applicability of the Badger Creek corridor are described as follows:

1. Rivers must be in a free flowing natural condition: Badger Creek is a free flowing stream although there may be minor irrigation diversions in the upper segments of the stream.

2. The river must be long enough to provide a meaningful experience, generally at least 25 miles long: Badger Creek is 25 miles long from its source to the confluence with the Arkansas River. However, approximately half of the upper drainage is intermittent and may not contain water during part of the year. Therefore, the effective length of this stream is only about 13 miles

3. There should be sufficient volume of water to permit full enjoyment of water related outdoor recreation activities, generally associated with comparable rivers. The average flow of Badger Creek

is 4 to 5 cubic feet per second although thunderstorms may increase the flow to 5,000 cubic feet per second or more under flash flood conditions. This flow, which normally has a wet stream channel 10 to 15 feet wide and 7 to 8 inches deep, is not a sufficient volume of water to permit the enjoyment of water related outdoor recreation activities associated with comparable rivers. This is particularly evident when compared with rivers designated as components of the National Wild and Scenic Rivers System in the Wild and Scenic Rivers Act of October 2, 1968

4. The river and its environment should be outstandingly remarkable and should be generally pleasing to the eye. The environment of the Badger Creek corridor is generally pleasing to the eye, but it is not outstanding nor remarkable, rather being common to the Arkansas Hills area and the Arkansas River drainage between Salida and Canon City, Colorado.

5. The river should be of high quality water or susceptible to restoration to that condition. Badger Creek has a high sediment loading during periods of high runoff or flash flood conditions, however, it is believed that this can be mitigated by restoration of the Badger Creek Watershed to maintain a higher quality of water.

#### Conclusion

Based upon the lack of a sufficient volume of water and the intermittent nature of approximately half of its length except during the flash flooding conditions, and upon the lack of an outstandingly remarkable river and its environment, it is concluded that Badger Creek is not eligible for inclusion to the Wild and Scenic Rivers System

#### CIMARRON RIVER ELIGIBILITY REPORT

Location. The area of the Cimarron River included in the inventory extends from the Kansas-Oklahoma line in Comanche County, Kansas to the Colorado-Kansas line. This report will only consider that section of the Cimarron within the Cimarron National Grassland. This section is located in Morton County and Stevens County, Kansas in the southwest corner of Kansas

River Study Area Boundaries. This eligibility description will include that portion of the Cimarron River from the Colorado-Kansas border on the east section line of Section 19, T 34S , R.43W., upstream to the point where the river enters the National Grassland at the north section line of Sections 23 and 24, T.32S , R 39W, a distance of approximately 33 miles. The study corridor will encompass an area one-quarter mile from each bank for the length of the stream.

General Setting. The overall terrain is rolling prairie with sandhills on the south side of the river and clayey uplands with a few rocky outcrops on the north side of the river

Developments within the corridor include fences which parallel the river on both sides at a distance of 1/4 to 1/2 mile with some crossfences. There are also a few oil wells located along the river. Current water developments within the flood plain include ponds which have been developed for waterfowl and fishing.

Landownership and Use. This segment of the Cimarron River is in Federal ownership except for about five miles in the northeast corner of the National Grassland from Highway 51 downstream to the Morton County, Stevens County line. Land uses on the Grassland portion of the area include cattle grazing and use by wildlife. The private lands are generally used for farming. There is extensive oil and gas associated development on both sides of the river, mostly outside the corridor.

Transportation. There are four roads which cross the river generally at right angles in a north-south direction. Two of these, Highways 27 and 51, have bridge crossings while the other two are county roads and have only dry weather improved fords.

Physical, Biologic, and Geologic Features Geologically, the high plains area are composed of sedimentary formations ranging from 5,000 to 10,000 feet in depth which contribute to the formation of the sandhills on the south side of the river. There are some rocky outcrops on the north side. The general terrain is rolling prairie land with the Cimarron River occurring in a shallow depression.

Vegetation within the flood plain consists of cottonwood, salt-cedar, and other shrubs and wetland grasses. The vegetation above the flood plain consists of prairie grasses. Water flows above ground in the channel only in conjunction with heavy thunderstorms during the spring and summer or occasionally during periods of heavy snowmelt in the upper reaches of the drainage. There is a shallow water table at a depth of 1 to 5 feet. The river has a flat gradient and a wide channel varying from 50 to 100 yards in width. It is estimated that water flows in the river channel not more than 20 days in a normal year. Ponds have been developed for fishing which also serve as waterfowl habitat. Deer, pheasant, quail, and turkey are found along the river bottom and a small elk herd has been reintroduced into the area. These species are found year-long and generally do not migrate seasonally. A great variety of wildlife species use the cottonwood-dominated flood plain habitat during the spring to fall period. Fish and wildlife recreational use is generally light and much of it is limited to local residents.

Social Economic Features The Cimarron River Picnic Ground, used primarily by local residents, is the only developed recreation site within the corridor. Other uses include hunting along the river bottom and fishing in the developed ponds. There is also some four-wheel drive use in the sandy river channel during dry periods. The Cimarron River provides a valuable scenic and visual resource in that trees and vegetative growth provide a contrast to an otherwise treeless environment. Cultural resources, both prehistoric and historic, are found in this general area and corridor. The Cimarron cut-off route

of the Santa Fe Trail parallels the northside of the Cimarron River. The main station of the Santa Fe Trail in Morton County was Middle Spring, one mile below Point of Rocks, a well known landmark for the early pioneer travelers and also the site of the first settlement in Morton County, Kansas.

The economic uses of the natural resources are related primarily to the grazing of cattle, energy development related to gas and oil, and recreation.

## ELIGIBILITY EVALUATION

### CIMARRON RIVER, CIMARRON NATIONAL GRASSLANDS

The guidelines for evaluating Wild, Scenic and Recreation River Areas proposed for inclusion in the National and Wild Scenic Rivers System under Section 2, Public Law 90-542 list five criteria for determination of whether a river is eligible to be included under the Wild and Scenic Rivers Act. These criteria and their relationship to the Cimarron River are as follows:

1. Rivers must be in a free flowing natural condition. The Cimarron River is in a free flowing condition only when there is water in the channel, which is estimated to be about 20 days per year during the spring and summer seasons following high intensity thunderstorms. Normally, only sections of the river channel will have surface water at one time.

2. The river or river unit must be long enough to provide a meaningful experience: This section of the Cimarron River is approximately 32 miles in length and therefore qualifies under this criteria.

3. There should be sufficient volume of water during normal years to permit, during the recreation season, full enjoyment of water related outdoor recreation activities, generally associated with comparable rivers. The Cimarron River does not contain water except during high intensity storm periods and therefore does not qualify under this criteria, nor is it in any way comparable to the rivers listed in the Wild and Scenic Rivers Act of October 22, 1968.

4. The river and its environment should be outstandingly remarkable and should be generally pleasing. The river corridor provides a contrast to the otherwise treeless prairie but it is not outstandingly remarkable, being typical of prairie rivers.

5. The river should be of high quality water or susceptible to restoration to that condition: The quality of water, particularly the underground flow, is acceptable as evidenced by fish life which is maintained in the ponds which have been excavated in the flood plain. The water generated by high intensity storms has a large quantity of suspended sediments due to the soil conditions.

## Conclusion

Based upon the criteria above, the Cimarron River is determined not to be eligible for consideration as a Wild and Scenic River due to the lack of a sufficient volume of water to permit full enjoyment of water related outdoor recreation activities as envisioned in the Wild and Scenic Rivers Act.

## SOUTH PLATTE RIVER ELEVEN-MILE DAM TO CHEESMAN RESERVOIR ELIGIBILITY REPORT

Location. The section of river included in this study for eligibility extends from Eleven-Mile Canyon Dam downstream to the head of Cheesman Reservoir. The corridor includes National Forest and private lands along approximately 23 miles of stream. The upper portion of the stream is located on the Pike National Forest in Park County (with a small portion in Teller County, Colorado). From the Douglas County - Teller County line to Cheesman Reservoir the river forms a boundary between Douglas and Jefferson Counties, Colorado

River Study Area Boundaries The total area being considered extends from Eleven-Mile Canyon Dam downstream to the head of the pool at Cheesman Lake. The width of the corridor is generally one-quarter mile on each side of the stream which includes the major portion of the South Platte River Canyon

This section of the South Platte contains areas with three different characteristics.

A. The Eleven-Mile Canyon area extends from the Eleven-Mile Canyon Dam downstream to the private land in the vicinity of Lake George, a distance of 8 miles.

B The section of river flowing through predominately private lands in the Lake George area and extends downstream to the mouth of Beaver Creek, a distance of 6 miles.

C. The section of the stream from Beaver Creek downstream to the head of Cheesman Lake, travels a distance of 9 miles.

These segments will be referred to in this report as Segments A, B, and C as shown on map #2. Where descriptive material is pertinent to a specific segment rather than to the entire study corridor, the segment references will be used to distinguish between descriptions.

General Setting The study corridor of the South Platte drainage occurs as a river canyon approximately 700 feet in depth and about 1/2 mile wide. The topography is generally steep on the lower slopes of the canyon becoming more gently sloping on the upper slopes. There are no major national interest events that occurred in the canyon although the upper Eleven-Mile Canyon portion (Segment A) was the location of the Colorado Midland Railroad from Colorado Springs to Leadville and on to the Western Slope of Colorado

The upper portion, Segment A, has developed campgrounds and picnic grounds receiving heavy developed and dispersed recreation use. The central portion of the canyon, Segment B is mostly subdivided private land used as both yearlong and seasonal recreational property. About 1 1/2 miles of undeveloped stream occurs on National Forest land. The lower portion of the canyon, Segment C, is generally undeveloped.

Chessman and Eleven-Mile Reservoirs are large domestic water storage facilities serving the Denver metropolitan area. Water flows through the study area are controlled to meet those domestic water needs. There are no other water developments in the corridor significant to the study area.

Land Ownership and Use. Segment A is National Forest land except for one tract owned by the Boy Scouts of America. The central portion, Segment B, is generally all private land. Segment C is National Forest land except for a short distance immediately above the Chessman Reservoir which is land owned by the Denver Water Board. Segment A is used primarily for dispersed and developed recreation, Segment B is mountain subdivision development and is heavily urbanized. Segment C is used for dispersed recreation, primarily fishing and ORV use. When water flow is restricted to its minimal volumes, rafting, floating or similar activities are not generally possible. Even when flows are adequate, this recreation activity is very light.

Transportation. The river in Segment A is paralleled by a single lane gravelled all-weather road on the old Midland Railroad grade. The river in Segment B is paralleled, crossed, and otherwise heavily influenced by subdivision development roads. U.S. Highway 24 crosses the river at Lake George. The river in Segment C contains only foot and off-road vehicle (ORV) trails to and across the river.

Physical, Biologic, Geologic Features The entire area has been formed from Precambrian granite formations. These rocky outcrops are predominant in the more defined canyon in Segments A and C. The terrain consists of a rocky canyon with interspersed forest cover and scattered meadows. The lower slopes of the canyon generally are very steep while the upper slopes are more gently sloping to the crest of the surrounding ridges. The terrain along the river in Segment B consists of a wide flat canyon bottom which is mostly private and some subdevelopment has occurred. Vegetation throughout the area is generally ponderosa pine and Douglas-fir on the slopes, with willows and interspersed grassy meadows in the canyon bottom.

The water flows are regulated by releases from Eleven-Mile Canyon Reservoir and range from 60 to 80 cubic feet per second to 300 to 350 cubic feet per second. However, during high water periods flows may reach several thousand cubic feet per second. The flood plain on the National Forest portion of this area, Segments A and C, generally consists of a narrow canyon bottom with steep sidewalls.

The entire section of the river provides a good trout fishery and is stocked by the Colorado Division of Wildlife. Wildlife includes species normally associated with this type of environment such as deer and possibly a few mountain lion. The river otter (classified as endangered by the State of Colorado) has been stocked and more stocking is planned in the future.

Social Economic Features The major recreation attractions are scenery and use of the water. The upper canyon area, Segment A, is very heavily used for both dispersed and developed recreation, with water based activities predominant. The lower canyon area, Segment C is used primarily for fishing. The lower terminus of the river is within five miles of the Lost Creek Wilderness. However, the river does not provide direct wilderness access. The primary scenic and visual resource is the flowing river through the canyon area with associated rapids, smooth stretches, riffles, etc. The visual resource of the central portion of the canyon, Segment B, has been heavily modified by subdivision development. There are no identified cultural resources in the corridor other than the Colorado Midland Railroad Grade. However, it is expected that additional cultural resources would be identified by a complete inventory.

The economic uses of natural resources in the area are limited to some past timber harvesting activity. The primary economic use is the domestic water supply by the Denver Water Board.

#### ELIGIBILITY EVALUATION

##### SOUTH PLATTE RIVER

The guidelines for evaluating Wild, Scenic and Recreational River Areas proposed for inclusion in the National Wild and Scenic River System under Section 2, Public Law 90-542 provide five criteria which rivers must meet to be considered for inclusion under the Wild and Scenic Rivers Act. These criteria and the applicability of the South Platte River are as follows:

1. Rivers must be in a free flowing natural condition: The South Platte River from Eleven-Mile Canyon Dam downstream to the head of Cheesman Reservoir is generally free flowing although the amount of flow is controlled by releases from Eleven-Mile Canyon Reservoir.

2. The river must be long enough to provide a meaningful experience: The area of the river under study is approximately 23 miles long and marginally meets this criteria.

3. There should be a sufficient volume of water during normal years to permit, during the recreation season, full enjoyment of water related outdoor recreation activities associated with comparable rivers: There is a sufficient volume of water as illustrated by the attraction and use of the water for a limited range of outdoor recreation activities at the present time.

4. The river and its environment should be outstandingly remarkable and generally pleasing to the eye. It is questionable if the environment of this section of river is truly outstandingly remarkable in comparison to the rivers identified in the original Wild and Scenic Rivers Act. However, this river and the canyon are unique in that these resources are scarce along the Front Range of Colorado. Therefore, it appears that, considering the Front Range situation, the river generally meets this criteria.

5. The river should be of high quality water. The South Platte River is the source of domestic water for the City of Denver, is high quality water, and will be maintained in this condition.

The Wild and Scenic Rivers Act also provides criteria for the classification of Wild, Scenic, and Recreational River Areas as described by the Act. These criteria and the applicability of the three segments of the South Platte River are described as follows:

a. Wild River Areas

1) Free of Impoundments. The entire South Platte River Study Area meets this criteria.

2) Generally inaccessible except by trail: Segments A and B do not meet this criteria due to numerous roads along and crossing the river. Segment C generally meets the criteria, although there are ORV routes to and across the river. However, these uses could be regulated where they are in conflict with the purposes of the Act.

3) Watersheds or shoreline essentially Primitive: Segments A and B do not meet this criteria due to the level of development. Segment C appears to essentially meet the criteria.

4) Waters unpolluted: The entire South Platte River in the study area meets this criteria.

b. Scenic River Areas

1) Free of impoundments. The entire South Platte River Study Area meets this criteria.

2) Are accessible in places by road: This is defined to mean that roads may occasionally bridge the river area but that long stretches of conspicuous and well traveled roads do not closely parallel the riverbank. The river in Segments A and B do not meet this criteria because they are paralleled and crossed by roads. Segment C meets this criteria.

3) Have shorelines or watersheds still largely primitive and shorelines largely undeveloped. Segments A and B do not meet this criteria due to the level of recreation and subdivision development. Segment C meets this criteria.

c Recreational River Areas

1) Are readily accessible by road or railroad Segments A and B meet this criteria with numerous roads.

2) May have some development along their shoreline This means that the lands may be developed for a full range of agricultural uses and could include small communities as well as dispersed or clustered residential developments. Segments A and B meet this criteria.

3) Undergone some impoundment or diversion in the past: The entire South Platte River Study Area meets this criteria.

Based upon the above evaluation it appears that Segment C of the South Platte River Study Area meets the criteria for eligibility as a Wild River. It appears that Segments A and B meet the criteria for eligibility as a Recreational River, but do not meet the criteria for a Scenic or Wild River

A river may have more than one classification for different segments but each classified segment must be long enough to provide a meaningful experience. The length of the segments meeting eligibility requirements for wild and recreational classification (9 and 15 miles respectively) may be marginal in terms of length to provide meaningful experiences.

Conclusion

Based upon the above eligibility evaluation, this section of the South Platte River is found to be eligible for inclusion into the Wild and Scenic River System.

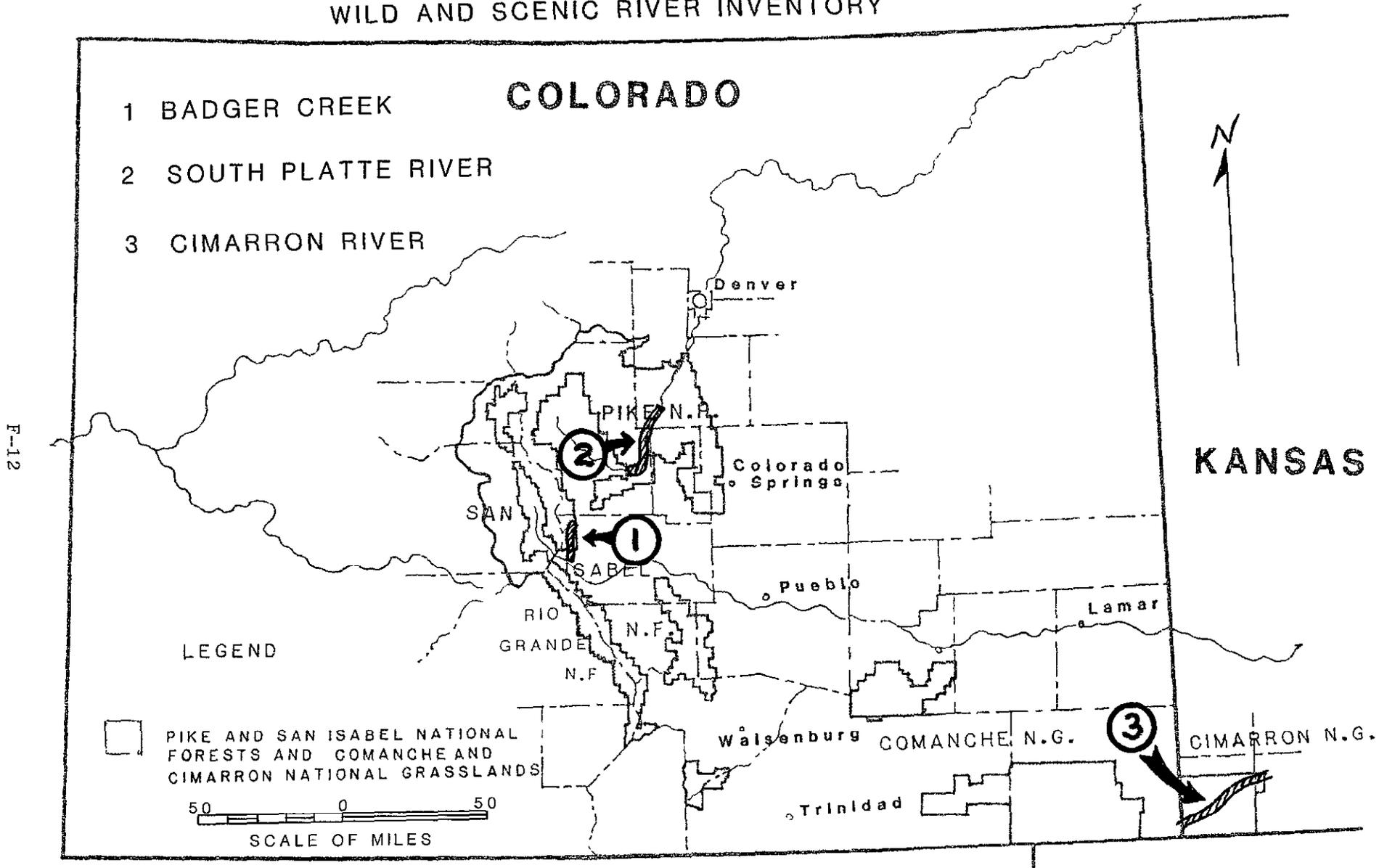
A suitability analysis, followed by a legislative proposal if the segment is determined suitable, will be made on this section of the South Platte River after the Forest Plan has been completed.

Management Pending Suitability Analysis

A Forest-wide prescription to protect the river's characteristics so as not to impair its eligibility will be established in the Management Direction section of the Forest Plan. These standards and guidelines will apply to the corridor boundary, generally one-quarter mile from each bank of the river segment

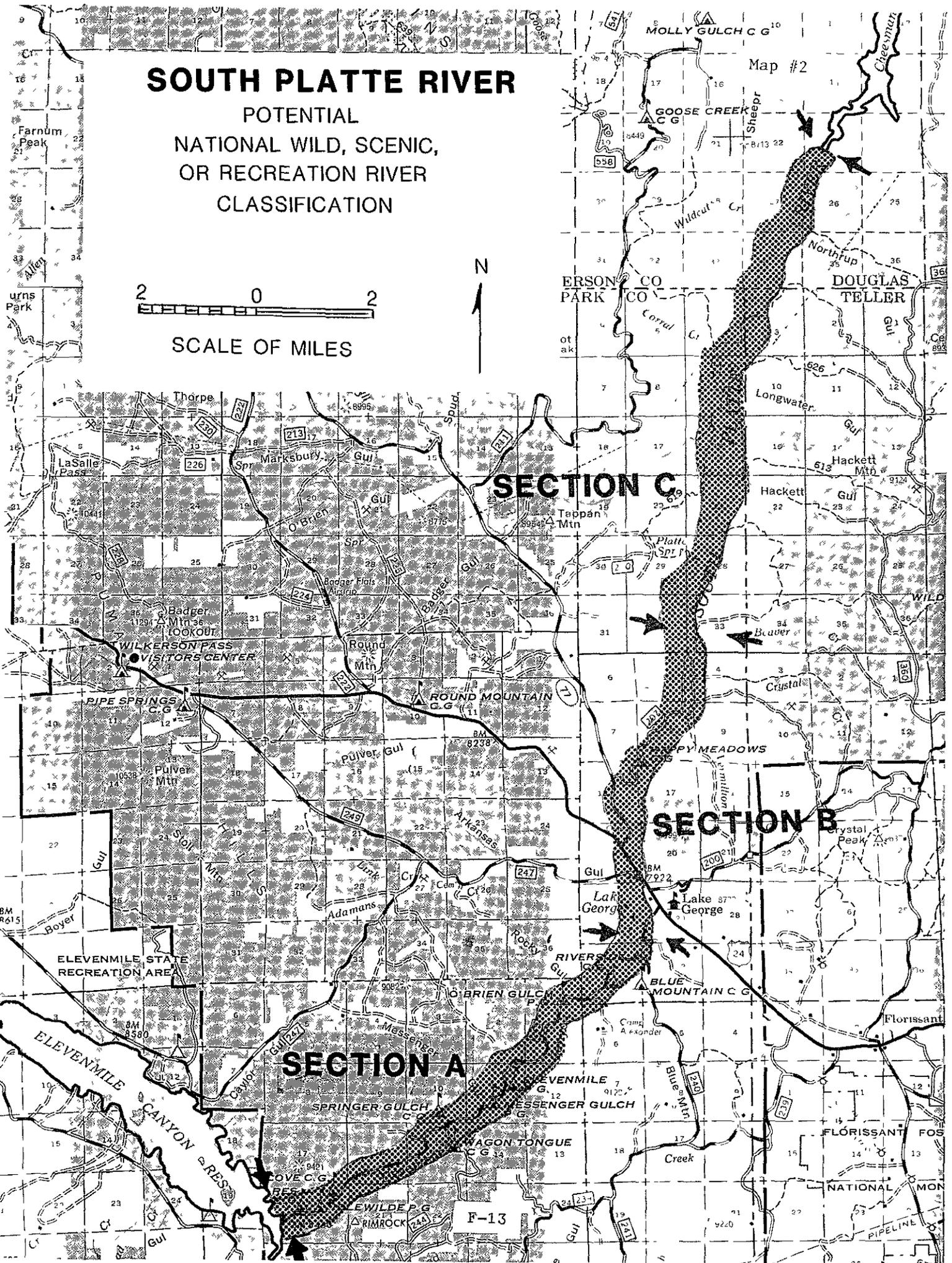
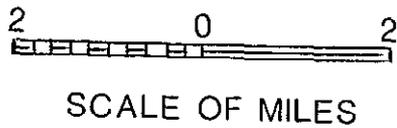
# GENERAL LOCATION MAP

## WILD AND SCENIC RIVER INVENTORY



# SOUTH PLATTE RIVER

POTENTIAL  
NATIONAL WILD, SCENIC,  
OR RECREATION RIVER  
CLASSIFICATION



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# **APPENDIX G**

## APPENDIX G

Management Area Prescription changes following publication of the Proposed Forest Plan and Draft Environmental Impact Statement. These changes are reflected on the Forest Plan Map. Additional supportive information for these prescription allocation changes is contained in the planning record and is available for review at the Forest Supervisor's Office, Pueblo, Colorado.

<u>Ranger District</u>	<u>Area</u>	<u>Prescription Change</u>	<u>Reason</u>
Leadville	Mt Zion	4B to 4D & 5B	Elk winter range/aspen management
Leadville	Missouri Hill	4B to 2B	Recreation use and view
Leadville	Ski Cooper	1B & 2A to 1B-1	Ski Cooper expansion/new prescription
Leadville	Mt Elbert (east side)	5B to 4B	Wildlife and recreation
Leadville	Buffalo Peaks Wilderness Study Area	3A to 8B	Wilderness recommendation
Leadville	Mt Arkansas	6A to 3A	Recreation use
Leadville	Sheephead Gulch	4B to 3A	Recreation use
Leadville	Horseshoe Mtn	6A to 3A (with a 2B corridor along Weston Pass Road)	Recreation use
Leadville	S Fork Lake Creek	9B to 2A	Watershed values/Recreation use (semiprimitive)
Leadville	Twin Lakes	2B, 3A & 5B	Acquired jurisdiction of lands from Bureau of Reclamation
Leadville	Quail Mtn	4B, 2A & 3A to 3A & 1B-2	Recreation use and new prescription
Leadville	Jones Hill	6A to 7D	Fuelwood demand
Leadville	Chubb Creek	7A to 4D	Aspen management
Leadville	Marmot Peak	3A to 9B	Increased water yield
Leadville	Spring Creek	4B to 4D	Aspen management
Leadville	Empire Gulch	2B to 7D	Fuelwood demand
Leadville	Tennessee Creek	9B to 2B & 7D	Fuelwood demand/recreation
Leadville	Winfield Peak	3A to 2A	Semiprimitive recreation
Leadville	Virginia Peak	9B to 2B	Watershed values/recreation
Leadville	Monitor Gulch	5B to 3A	Recreation use
San Carlos	South Huerfano & Slide Mtn	6A to 4B	Wildlife values
San Carlos	Huerfano River	3A & 2A to 4B	Access
San Carlos	Conquistador Ski Area & lands near North Taylor Creek	4D & 1B to 2A & 1B-1	Jurisdiction of lands acquired from Bureau of Land Management & new prescription
San Carlos	Curley Peak & Tanner Peak	2A & 7A to 4B	Wildlife management
San Carlos	Stover Area	7A to 7D	Fuelwood demand
San Carlos	Greenleaf and Middle Brush Creeks (Sangre de Cristo Wilderness Study Area)	3A to 8B	Wilderness recommendation
San Carlos	Brush Creek Lakes	8C to 2A	Wilderness Study Area boundary adjustment
San Carlos	North Peak (Greenhorn Wilderness Study Area)	7A to 8C	Close road/motorized use
San Carlos	Millset Area	3A to 2B	Access
San Carlos	Badito Cone	2B to 5B	Big game winter range
San Carlos	Greenhorn Mtn Wilderness Study Area	8C to 8B	More consistent with capability
San Carlos	Santana Butte	6A to 5B	Big game winter range
San Carlos	Blue Lakes	7A to 9B	Increased water yield
San Carlos	Lake Isabel	6A to 6B	Range improvement need
San Carlos	Little Red Butte	2A to 7D	Fuelwood demand
San Carlos	Gardner Road	6B to 4D	Aspen management
San Carlos	Adobe Creek	5B to 2A	Semiprimitive recreation use

<u>Ranger District</u>	<u>Area</u>	<u>Prescription Change</u>	<u>Reason</u>
San Carlos	North Taylor Creek	2A to 4D	Aspen management
San Carlos	Murray Creek	5B to 4B	Wildlife values
San Carlos	Mount Maxwell	9B to 10E	Municipal watershed
San Carlos	Cuchara Valley	1B to 1B-1	New prescription
San Carlos	Spring Creek	1B to 2B	Roaded recreation use
San Carlos	North Hardscrabble Creek along Highway 96	Extend 2B along road corridor	Uniform management direction
South Park	Little Baldy Mtn	9B to 4B	Wildlife values
South Park	Michigan Creek	1B to 9B	Increased water yield
South Park	Crooked Creek	9B & 6A to 5B	Wildlife values
South Park	Rock Creek	6B to 5B	Wildlife values
South Park	Packer Gulch	5B to 4B	Wildlife values
South Park	Wilkerson Pass	5B to 2B	Recreation use
South Park	Black Mountain	6A to 6B	Range improvement need
South Park	Thirty-nine Mile Mtn	4A to 4B	Wildlife values
South Park	Wagon Tongue Gulch	6A to 6B	Range improvement need
South Park	Blue Mtn	7A to 7D	Fuelwood demand
South Park	Crystal Creek	7A to 2A	Recreation use
South Park	Springer Gulch	7A to 4B	Wildlife values
South Park	Antelope Park	6A to 7D	Fuelwood demand
South Park	Fish Creek	6A to 6B	Range improvement need
South Park	Johnson Gulch	6A & 4B to 3A	Recreation use
South Park	Watrous Gulch Area	6B to 7D	Aspen management/fuelwood demand
South Park	Rishaberger Mtn	6A to 6B	Range improvement need
South Park	Schoolmarm Draw	6A to 6B	Range improvement need
South Park	Turner Gulch	6A to 6B	Range improvement need
South Park	Graveyard Gulch	9D to 5B	Big game winter range
South Park	Deadman Gulch	6A to 6B	Range improvement need
South Park	Lost Park	6A to 6B	Range improvement need
South Park	Lost Creek Further Planning Area (Partial)	8C to 8B	More consistent with capabilities
South Park	Pony Creek	6A to 6B	Range Improvement Stand
South Platte	Lost Creek Further Planning Area (Partial)	8B to 8C	More consistent with capabilities
South Platte	Bruno Gulch	2A to 4B	Elk calving area
South Platte	Kenosha Pass	2A to 4B	Recreation use/wildlife values
South Platte	South Twin Cone Peak	4B to 3A	Recreation use
South Platte	Foster Gulch	2A & 3A to 4B	Elk and deer
South Platte	Bear Creek	5B to 4B	Wildlife values
South Platte	Waterton Canyon	5B to 4B	Bighorn sheep
South Platte	Molly Gulch	2B to 7D	Fuelwood demand
South Platte	Flat Rocks	2B to 7D	Fuelwood demand
South Platte	Burning Bear	1B to 1B-2	New prescription
South Platte	Geneva Basin Ski Area	1B to 1B-1	New prescription
South Platte	Buffalo Creek	9B to 2B	Recreation use
South Platte	Mt Evans Wilderness	8A to 8B (Partial)	Coordination with adjoining National Forest
South Platte	Mt Evans Wilderness	8B to 8C (Partial)	Coordination with adjoining National Forest
South Platte	Mt Evans Wilderness	8C to 8B (Partial)	Coordination with adjoining National Forest
Salida	Hamilton Baldy	7A to 4B	Wildlife values
Salida	Simmons Peak	3A to 2A	Recreation use
Salida	Mount Peck	4B to 9B	Water yield increase
Salida	Fourmile Creek	6B & 5B to 4B	Wildlife and fish values
Salida	Monarch Ski Area	2B to 1B-1 and 1B to 1B-1	Expansion and new prescription
Salida	Starvation Creek	6A & 2B to 4D	Aspen management
Salida	Shirlev	6A to 6B	Range improvement need
Salida	Mt Ouray	2A to 2B	Range improvement need

<u>Ranger District</u>	<u>Area</u>	<u>Prescription Change</u>	<u>Reason</u>
Salida	Aspen Ridge	6B to 4D	Aspen management
Salida	Raspberry Gulch	7A & 9B to 7D	Fuelwood demand
Salida	Browns Creek	3A to 4B	Management needs
Salida	North Fooses Creek	4B to 7D & 9B	Fuelwood demand and water yield increase
Salida	Garfield	2B to 4D	Aspen management
Salida	Echlings Reservoir	2B & 3A to 4D	Aspen management
Pikes Peak	Fremont Experimental Forest	10B to 2A	Declassified
Pikes Peak	Plum Creek	5B to 4B	Wildlife values
Pikes Peak	Rosemont	2B to 4D	Aspen management
Pikes Peak	Stove Mtn	9D to 2A	Recreation use
Pikes Peak	Pikes Peak	9B to 10E	Municipal watershed
Pikes Peak	Raspberry Mtn	2B & 4B to 4D	Aspen management
Pikes Peak	Woodland Park	9B to 4B	Wildlife values
Pikes Peak	Ensign Gulch	2B to 7D	Fuelwood demand
Pikes Peak	Palmer Lake	9B to 10E	Municipal watershed
Pikes Peak	Pikes Peak Ski Area	1B to 1B-1	New prescription
Pikes Peak	West Creek	5B to 7D	Fuelwood demand
Comanche	Timpas Unit	10A to 6B	<i>Proposed Research Natural Area does not meet requirements or qualifications for a Research Natural Area</i>
Comanche	Timpas Unit	6D to 6B	The Regional Uniform Forest Management Prescription is suitable for the National Grasslands
Comanche	Canyons & Prairie Chicken Habitat Areas	6C & 2B to 4B & 10C	Lesser Prairie Chicken habitat and wildlife habitat in the canyon lands
Comanche	Campo proposed RNA	6C to 10A	<i>Area found to be suitable as a Research Natural Area (Proposed Campo Research Natural Area )</i>
Comanche	Rest of District	6D to 6B	The Regional Uniform Forest Management Prescription is suitable for the National Grasslands
Cimarron	Cimarron River	4B to 9A	Riparian area management

# **APPENDIX H**

APPENDIX H

STATUS OF GRAZING ALLOTMENTS ON THE

PIKE AND SAN ISABEL NATIONAL FORESTS

COMANCHE AND CIMARRON NATIONAL GRASSLANDS

National Forest Districts

Leadville District

Stocked  
Arkansas S&G  
Harvard C&H  
Tennessee Pass S&G  
Union C&H

Vacant  
Lake Creek S&G  
Sayers S&G  
South Halfmoon S&G  
Weston Pass S&G

Salida District

Stocked  
Arkansas C&H  
Aspen Ridge C&H  
Bassam C&H  
Bear Creek C&H  
Cameron C&H  
Chalk Creek C&H  
Chubb Park C&H  
Fourmile C&H  
Kerr Gulch C&H  
Little Cochetopa C&H

Vacant  
  
  
  
None

San Carlos District

Stocked  
Antelope C&H  
Beulah C&H  
Breece C&H  
Devil's Hole C&H  
East Peak C&H  
Greaser Creek C&H  
Greenhorn C&H  
Huerfano C&H  
Indian Creek C&H  
Lakes C&H  
Maes Creek C&H  
Newlin C&H  
Ophir C&H  
Red Creek C&H  
Rye C&H  
West Peak C&H  
Williams Creek C&H

Vacant  
  
  
  
  
  
  
  
  
  
  
Muddy C&H  
  
North Fork C&H

Pikes Peak District

<u>Stocked</u>	<u>Vacant</u>
Beaver C&H	
Beaver Ranch C&H	
Bison C&H	
Fourmile C&H	None
Phantom-Montague-Drury C&H	
Rule-Ryan-Limbaugh-Monument C&H	

South Park District

<u>Stocked</u>	<u>Vacant</u>
Badger C&H	Bross S&G
Black Mountain North C&H	Stirrup C&H
Blue Mountain-Wagon Tongue C&H	
Boreas S&G	
Buffalo Meadows C&H	
Craig Park C&H	
Eagle Rock C&H	
Jefferson S&G	
Kenosha C&H	
Long Park C&H	
Lost Park C&H	
McQuaid C&H	
Puma-Parker-Rishaberger C&H	
Sheep Creek C&H	
Silverheels C&H	
Slater Creek C&H	
Thirty-Nine Mile North C&H	
Thirty-Nine Mile South C&H	
Three Mile C&H	

South Platte District

<u>Stocked</u>	<u>Vacant</u>
Buffalo-Craig Meadows C&H	
Deer Creek C&H	
Geneva Basin	None
Wigwam C&H	

National Grassland Districts

Carrizo District (Comanche National Grassland)  
There are 195 C&H allotments - all stocked

Cimarron District  
There are 29 C&H allotments - all stocked

C&H - Cattle and Horse Allotment  
S&G - Sheep and Goat Allotment

# **APPENDIX I**

APPENDIX I

DOWNHILL SKIING SUPPLY AND DEMAND PROJECTIONS AND THE ALLOCATION OF POTENTIAL NEW SKI AREAS

I. SUPPLY AND DEMAND PROJECTIONS

A. The Existing Situation

The following table lists the present capacities of existing ski areas of the Pike and San Isabel National Forests. Also listed is a general estimate of each area's expansion potential.

Area	Present Capacity SAOT 1/	Expansion Potential During Current Planning Cycle SAOT Within Permit Area/Adjoining Area	Expansion Potential Beyond Current Planning Cycle
Monarch	3,000	400	3,000 2/ unlikely
Cooper	2,500	800	1,450 possibly
Pikes Peak	1,250	400	0 unlikely
Geneva Basin	1,200	400	0 unlikely
Cuchara	1,300	650	3,200 unlikely
Conquistador	2,600	900	3,500 unlikely
	<u>11,850</u>	<u>3,550</u>	<u>11,150</u>

1/ According to current Master Development Plans and actual development as of May 84.

2/ An estimated additional 5,400 SAOT of potential capacity is available on the Gunnison National Forest.

The following table lists recreation use at the existing ski areas during the 1983-1984 skiing season.

Area	Skier Visits	RVD
Monarch	140,300	70,150
Cooper	46,100	23,050
Pikes Peak	4,900	2,450
Geneva Basin	24,300	12,150
Cuchara	33,500	16,750
Conquistador	44,200	22,100
	<u>293,300</u>	<u>146,650</u>

B. Analysis of Future Supply Potential

1. Estimated number of skier visits that can be supplied by existing facilities.

All of the existing Pike and San Isabel National Forest ski areas are basically operating as day-skier areas at the present time.

Monarch Ski Area tends to set the upper level utilization standard for the Forests' day-skier areas. Monarch has been in operation for 50 years. It has ample and good snow, an interesting diversity of ski trails, well groomed trails, and well maintained facilities. Its recent marketing efforts have stressed affordable skiing and attempted to attract more visitors during week days. During the 1983-1984 season, the season long utilization rate was 30% of permitted SAOT capacity. The low use week days rate averaged 15% of capacity (90 days), and the high use weekend and holiday rate averaged 50% of capacity (68 days)

Ski Cooper Ski Area increased its mountain capacity during the latter part of 1983 by installing a new triple chair lift and by relocating a surface lift.

Pikes Peak Ski Area is presently in the process of expanding and improving its mountain facilities. It operated on a limited basis during the 1983-1984 season due to uncompleted construction.

Geneva Basin Ski Area changed ownership during the 1983-1984 season and operated on a limited basis.

Cuchara Valley Resort Ski Area was in its second year of operation on the San Isabel National Forest.

Conquistador Ski Area became part of the San Isabel National Forest in 1983, as the result of legislation which transferred public lands from the Bureau of Land Management to the Forest Service. Conquistador expanded its mountain facilities considerably in 1982, but the facilities were first fully operational during the 1983-1984 season.

Based on the assumption that Monarch Ski Area's utilization rate represents an upper level standard for Forest-wide application, existing ski areas should be able to easily accommodate an additional 246,400 skier visits annually.

Ski Area	SAOT Capacity	Operating Season Days	Theoretical Skier Visits Season Capacity	Actual Skier Visits 1983-1984	Utilization Rate%	Unutilized Skier Visits Season Capacity
Monarch	3,000	158	474,000	140,327	30	-
Cooper	2,500	150	375,000	46,100	12	67,500
Pikes Peak	1,250	150	187,500	4,900	3	50,625
Geneva Basin	1,200	150	180,000	24,300	14	28,800
Cuchara	1,300	150	195,000	33,500	17	25,350
Conquistador	2,600	150	390,000	44,200	11	74,100
	11,850		1,801,500	293,300		246,375

Cuchara Valley Resort and Conquistador intend to become destination-skier ski areas. It is assumed that they will attain that goal sometime within the present decade. Several of the principal destination-skier areas in the State have utilization rates of about 60%. It is assumed that Cuchara and Conquistador will experience higher

than Forest standard utilization rates after their conversion to destination-skier areas. It is further assumed that the rates will not match the 60% rate common to the State's principal destination-skier areas prior to the end of 2000. For the purposes of this analysis, a 40% utilization rate is assigned, resulting in a 10% increase in expected utilization. Accordingly, it is estimated that their existing facilities could be accommodating an additional 58,500 skier visits within 5 years.

Ski Area	Theoretical Skier Visits Season Capacity	Anticipated Utilization Rate % Increase	Additional Skier Visits Potential
Cuchara	195,000	10	19,500
Conquistador	390,000	10	39,000
	<u>585,000</u>		<u>58,500</u>

On the basis of this analysis, it is estimated that Pike and San Isabel National Forest ski areas should be able to accommodate a 100% increase in skier visits through better utilization of existing facilities.

Actual 1983-1984 skier visits:	293,300
Unutilized capacity:	246,375
Additional destination capacity:	<u>58,500</u>
Total additional capacity:	304,875

2. Estimated number of skier visits that can be supplied by expanding facilities within the existing permitted areas.

Ski Area	Estimated Expansion Capacity SAOT	Operating Season Days	Theoretical Additional Skier Visits Capacity	Assigned Utilization Rate %	Additional Skier Visits Potential
Monarch	400	160	64,000	30	19,200
Cooper	800	150	120,000	30	36,000
Pikes Peak	400	150	60,000	30	18,000
Geneva Basin	400	150	60,000	30	18,000
Cuchara	650	150	97,500	40	39,000
Conquistador	<u>900</u>	<u>150</u>	<u>135,000</u>	40	<u>54,000</u>
	3,550		536,500		184,200

All of the expansion is expected to occur prior to the end of the year 2000.

3. Estimated number of skier visits that can be supplied by developing facilities on lands adjoining existing permitted areas.

The following table lists the Forest ski areas that are considered to have this type of expansion potential. For the purposes of this analysis, it is assumed that only one half of the total potential will be developed for skiing prior to the end of the year 2000. This

assumption is applied in recognition of the complexities, uncertainties and process associated with major expansion projects. It is also assumed that any major expansion of Monarch Ski Area would be done with the intent of becoming a destination-skier area. Accordingly, a 40% utilization rate is used to calculate Monarch's potential expansion capacity for the initial planning period, which is approximately 1985-2000.

Ski Area	Total Estimated Expansion Capacity	Predicted Expansion SAOT	Operating Season Days	Theoretical Additional Skier Visits Capacity	Assigned Utilization Rate %	Additional Skier Visits Potential
	SAOT	SAOT				
Monarch	3,000	1,500	160	240,000	40	96,000
Cooper	1,450	725	150	108,750	30	32,625
Cuchara	3,200	1,600	150	240,000	40	96,000
Conquistador	3,500	1,750	150	262,500	40	105,000
	11,150	5,575		851,250		329,625

4. Summary of estimated skier visits supply potential available by the end of the year 2000.

Current Use:	293,300
Additional available capacity at existing sites:	304,875
Additional capacity that can be developed within existing permitted areas:	184,200
Additional capacity that can be potentially developed on lands adjoining existing permitted areas by the end of the year 2000:	<u>329,625</u>
TOTAL	1,112,000

C. Analysis of Future Demand

1. Projected growth in skier visits.

According to documents that were prepared in conjunction with the Rocky Mountain Regional Guide, the Colorado Ski Industry is predicting a 10% rate of annual growth through 1990. This rate appears to represent the highest of several projections. For Regional planning purposes, the Rocky Mountain Region used an annual percent growth figure of 7 to 10%. Some doubts have been raised recently concerning the possibility of sustaining the 10% growth rate. On April 8, 1984 a feature story entitled "The Mid-Life Crisis of the Colorado Ski Industry" appeared in the Denver Post magazine. The following statement was made therein

"The industry's rate of growth, which averaged a staggering 19 percent a year in the seventies, has slowed to 3 or 4 percent increases in lift ticket sales each year. Several ski areas are seeing fewer skiers now than they did five years ago."

The news story presented several reasons for the high rate of increase

in the seventies, including a population comprised of a high percentage of youth, the evolution of the destination resort, and the improvement of transportation systems. The present decline in growth rate was described as resulting from a "maturing" of these growth-inducing factors, plus an aggressive bid by Utah and other states to assume a greater part of the skier market.

The predictions and reasons presented in the Denver Post article are assumed to be valid insofar as overall Statewide effect. However, it is probable that a relatively high level of demand for recreational opportunities, including downhill skiing, will be sustained within the Pike and San Isabel National Forest area by the large population increases predicted for the Colorado Springs/Southern Front Range Region. Predictions are being made that the population of Colorado Springs will double (to 500,000) within the next 10 years. The increase is expected to result through the development of Colorado Springs as a center for military space operations and related high technology industries. Predictions have also been made that the population of Douglas County will increase from 25,000 in 1980, to 122,000-369,000 by the year 2000.

The predicted large population growth will significantly increase the demand for skiing opportunities that are accessible to the people. Ski areas within the Pike and San Isabel National Forests and within Summit County will be the most accessible. For these reasons, the high level annual skier visits growth rate of 10% annually is used for estimating demand through the year 2000. This rate is based on the assumption that a statewide decline in the skier visits growth rate will be offset to some degree by a dramatic increase in the local population growth rate.

2. Predicted demand by the end of the year 2000.

Current use (skier visits):	293,000
Predicted year 2000 use:	
(293,000 X 10% compounded 16 years) =	1,346,000

D. Supply/Demand Comparison

A comparison of the results of the supply and demand analysis indicates that demand is expected to exceed supply by 234,000 skier visits prior to the end of the year 2000.

Predicted demand:	1,346,000
Predicted supply potential:	<u>1,112,000</u>
Difference	234,000

Feasible options for balancing supply and demand are considered to be the following:

1. Increase utilization. Utilization at existing sites would need to increase an average of 7% by the end of the year 2000. For example, a 5% increase in the utilization rate of predicted day-skier

areas (to 35%) and destination-skier areas (to 50%) would approximately balance supply and demand.

2. Accelerate expansion on lands adjoining existing permitted areas. A more optimistic prediction of the ability of existing ski areas to expand would serve to balance supply and demand. An additional 35% (85% of total) of the potentially available capacity would have to be developed. Accelerated expansion would require active and deliberate encouragement from the Forest Service and state and local government.

3. Combination of increased utilization and accelerated expansion.

4. Develop additional ski areas. The development of an additional 4,000 SAOT of capacity would approximately balance supply and demand.

E. Supply and demand projections for the period 2001-2030.

1. Demand

So many uncertainties are associated with making demand predictions for a period of fifteen years, that the task of making predictions for an additional thirty years becomes very intimidating. However, the present planning system requires estimates for five decades, until the year 2030. Accordingly, estimates are supplied; but our confidence in those estimates, and the assumptions that they are based on, is certainly not unshakeable.

a. Assumptions:

(1) The industry and Regional predicted short-term skiing growth rate will not be sustained over the long period. A 10 percent annual growth rate for just about anything is a tremendous growth rate. The proposition that the Colorado ski industry is changing from a fast growing young industry to a mature industry seems valid. This maturing is probably characteristic of most direct participation recreation industries ranging from bowling to river rafting.

(2) The predicted short term large southern Front Range population growth rate will decrease during the period 2001-2030. This is expected to occur because of environmental limitations; including water supply limitations and air pollution limitations. Perhaps there will also be a limitation relating to the amount of military and scientific space operations the country can afford.

b. Projections

<u>Decade</u>	<u>Annual Rate</u>	<u>Demand by the end of Decade (Skier visits)</u>
2001-2010	5%	2,192,000
2011-2020	3%	2,946,000
2021-2030	3%	3,959,000

2. Supply assumptions and projections.

Third Decade 2001-2010

The supply and demand comparison of Section D and the demand projections of this section indicate that demand will exceed the supply potential of the Forests' existing ski areas after the year 2000. The Forests' ability to supply additional skiing opportunities after the year 2000 appears to depend on the yet to be determined prospects of developing two potential new ski areas, Burning Bear and Quail Mountain. Assuming that events and circumstances prove that it will be appropriate and feasible to develop those sites, the Forest would have the capacity to supply an estimated 2,876,000 skier visits annually by the end of the year 2010.

	<u>Skier visits</u>
Supply potential at the end of the year 2000:	1,112,000
Remaining existing sites expansion potential:	330,000
Burning Bear:	810,000
Quail Mountain:	<u>624,000</u>
TOTAL	2,876,000

Fourth Decade 2011-2020

The additional capacity that would theoretically have been developed in the third decade would come close to serving fourth decade demand. It seems reasonable to assume that supply could accommodate demand through increased utilization, which might result in somewhat crowded conditions at the more popular ski areas.

	<u>Skier visits</u>
Demand at the end of the decade:	2,946,000
Supply at the beginning and end of the decade:	<u>2,876,000</u>
Difference	70,000

Fifth decade 2021-2030

Demand is predicted to exceed supply by 1,083,000 skier visits at the end of the decade. With possibly one exception, no additional sources of supply are considered to exist within the Forest. A possibility may exist for expanding Ski Cooper onto the north slopes of Mt. Zion. A rough estimate of the potential capacity and supply is 2,500 SAOT and 187,000 skier visits.

The Forest supply/demand situation would be indirectly affected if Monarch Ski Area were to expand across the Forest boundary onto the Gunnison National Forest. It is likely that a large proportion of the skiers will come from the southern front range urban centers adjacent to the Pike and San Isabel National Forests. The estimated potential expansion capacity and supply is 5,400 SAOT and 486,000 skier visits.

If Ski Cooper's expansion possibilities materialize, and if Monarch's expansion potential is allowed to accrue to the benefit of the Pike and San Isabel, the Forests' end of decade supply deficiency would be reduced to 410,000 skier visits.

## II. CONSIDERATIONS INVOLVED IN THE ALLOCATION OF POTENTIAL NEW SKI AREAS

### A. Criterion and guidelines

The principal guidelines applicable to this area of consideration are set forth in the Rocky Mountain Regional Guide pages 3-5 through 3-12. The expected outcome of Forest Plans is essentially three things:

1. A validation of inventoried winter sports sites ratings;
2. a determination of the availability of the sites for ski area development; and
3. a schedule for the expansion of existing sites and for the development of new sites.

The rating process involves an assessment of the capability (potential) of the site to serve as a ski area. Capability depends upon the physical characteristics of the site such as size, capacity, climate, slope, soils, geology, location, and configuration. Capability as applied in this assessment is defined in planning regulations (36 CFR 219.3).

Availability considerations involve an assessment of the potential demand for the site and an assessment of the appropriateness of committing the site to ski area development (suitability). Matters considered in assessing appropriateness are economic and environmental consequences and the alternative uses foregone. Suitability as applied in this assessment is also defined in planning regulations (36 CFR 219.3).

### B. Potential new ski areas previously rated good.

Burning Bear, Michigan Creek and Quail Mountain are identified in the Rocky Mountain Regional Guide (Table 3-3) as inventoried potential winter sports sites. All three are rated in the Guide as good--Priority 2.

### BURNING BEAR

The Burning Bear site is located approximately five miles south of the existing Geneva Basin Ski Area and is within Park County.

### Site Capability

The good site rating stems from an inventory performed in March 1970. The site has a potential vertical rise of 1,600 feet, a range of slopes that appear more than adequate with respect to beginner and intermediate skier capabilities and less than optimum with respect to expert skier capabilities. Slope orientation is favorable. Observations of snow depth were made during the winter of 1969-1970 and a snow pack study was conducted during the winters of 1970-1971 and 1971-1972. Approximate average recorded snow depths during those years were as follows:

<u>1969-1970</u>	<u>1970-1971</u>	<u>1971-1972</u>
3-4 feet	1-2 feet	3 feet

The snow pack study was intended to extend for a period of five years, but ended inconclusively after two years. No mention was made during the course of the observations and study of any serious adverse wind conditions. The site encompasses approximately 2,600 acres and is estimated to have a maximum design capacity of 9,000 SAOT. There appears to be sufficient land for developing the basic base area facilities. The nearest private land for possible development of lodging and related resort facilities is located approximately one mile east of the base area. The development of lodging and resort facilities on National Forest lands in the adjacent Geneva Park area appears possible from the standpoint of terrain and landform. If destination-skier ski area development opportunities are assumed to exist, the site could potentially provide an estimated 810,000 skier visits annually.

### Site Suitability

The site may be generally described as natural appearing uniformly dense forest. The principal resource use is dispersed nonmotorized recreation. The eastern portion of the site is exposed to an area that provides motorized recreation opportunities in a predominantly natural appearing setting. The application of ski area development and management practices to the site would not appear to result in unacceptable or unmitigable impacts on other resources, uses, or activities in place or committed during the planning period. However, this determination was made without benefit of on-site investigation and deliberate and careful scoping, public involvement, or evaluations.

### Site Availability

Committing land to downhill skiing use is very close to an irretrievable action and ski area development is normally attended with significant environmental impacts. Accordingly, decisions involving the commitment of land for the development of new ski areas should be fully supported by the facts and based on a thorough understanding of the effects. Existing information about the Burning Bear site is not adequate for making conclusive determinations of the capability or suitability of the site for ski area development. However, the existing information tends

to be more supportive than nonsupportive of the proposition that the site is capable and suitable for ski area development. Moreover, there is a special factor that should be taken into consideration. The Burning Bear site is located relatively near to the existing Geneva Basin Ski Area. The possibility may exist for the two to compliment each other by collectively providing a better variety of skiing terrain and attracting and accommodating day and destination-skiers

Supply and demand projections from Part I indicate that supply cannot keep pace with demand after the year 2000 without the development of new areas. If most of the assumptions and predictions concerning the Burning Bear site are substantially correct, Burning Bear could contribute toward meeting skiing demand in an important and significant way.

For these reasons, it is concluded that a special management prescription should be applied to the site which would maintain existing essential land characteristics and would preserve, on a tentative basis, opportunity for future downhill skiing. The prescription should also direct that capability and suitability will be verified through detailed studies prior to, or in conjunction with, development concept planning.

#### MICHIGAN CREEK

The Michigan Creek site is located approximately eight miles northwest of Jefferson, Colorado and is within Park County.

#### Site Capability

The "good" rating stems from an inventory of the site's physical characteristics that was conducted in January 1970. The rating was applied prior to the development and expansion of the major destination ski areas in nearby Summit County. The site has a maximum vertical rise of 900 feet. Approximately half of the skiable terrain would be classified as beginner skill level. Most of the remainder would be classified as low intermediate skill level. Only a very small portion would be classified higher than intermediate. A major drainage separates the skiable terrain. A substantial amount of road improvement would be required for access. Approximately 160 acres of private lands are located adjacent to the base area. Field trips were conducted during the winter seasons of 1968-1969, 1969-1970, and 1970-1971 to evaluate snow depth and conditions. Those observations indicate that snow cover would be adequate. The site is estimated to have a maximum design capacity of 2,950 SAOT. It is relatively isolated from local community centers and support services. In terms of current standards and conditions the site is considered small and incapable of attracting the skiers of higher than intermediate skiing abilities and the destination skiers. It is unlikely that the site would be operated more than 140 days annually or operate with a utilization rate higher than 20%. Accordingly, the site would not be expected to be capable of providing more than 83,000 skier visits annually.

### Site Suitability

A local standard Forest Development System road extends across the lower portion of the site. Timber was harvested from a large portion of the site during the late 1960's and early 1970's. The principal resource use at the present time is dispersed motorized recreation. The application of ski area development and management practices to the site would not appear to result in unacceptable or unmitigable impacts on other resources, uses, or activities in place or committed during the planning period. However, this determination was made without benefit of on-site investigation and deliberate and careful scoping, public involvement or evaluation.

### Site Availability

It is concluded that the 1970 rating of "good" is no longer an accurate portrayal of the site's physical characteristics as they relate to ability to attract and satisfy skiers. The site is considered incapable of competing with existing ski areas in the same market area at the present time. Moreover, supply and demand projections indicate that new ski areas will probably not be needed on the Forest to meet demand by the end of the year 2000. In any event, the site's capabilities are such that it would not make a significant or suitable contribution toward meeting demand in either the short term or the long term. For these reasons, it should be eliminated from the inventory.

### QUAIL MOUNTAIN

The Quail Mountain site is located near Twin Lakes, Colorado and is within Lake and Chaffee Counties.

### Site Capability

The Quail Mountain site incorporates two separate but adjacent inventoried winter sports sites, consisting of the Flume Creek site and the Twin Lakes #2 site.

The Flume Creek site includes the upper three-fourths of the Flume Creek drainage basin. A preliminary feasibility study was conducted in July 1966 in response to a ski area development proposal. The development proposal contemplated that the base area would be located on the north edge of the site and that access would need to be developed across private lands adjacent to the site and to the south side of Twin Lakes. (The private lands were subsequently acquired by the Bureau of Reclamation and transferred in 1983 to the Forest Service for administration.) The study concluded that the Flume Creek site was unsatisfactory for development for the following reasons:

1. Insufficient vertical rise and size for development as a major ski area;
2. poor to fair ski trail slope orientation;
3. limited opportunity to provide connecting access between the lift terminal and the base area; and
4. the development of road access to the site would be difficult and expensive.

The study was conducted in July and did not consider or address snowfall and other climatic conditions.

The Twin Lakes #2 site adjoins the east side of the Flume Creek site and extends eastward to the limits of the National Forest ownership. An inventory of physical characteristics of the site was performed in August 1976. The appraisers concluded that the site should be rejected. The principal reasons given for rejecting the site were incompatibility with elk habitat and with visual resource management objectives.

In May 1982, the two sites were reinventoried as if they were one. The reinventory was conducted through a desk review of the previous studies and inventories, and resulted in a qualified composite rating of "good" capability for ski area development. The rating was qualified on the basis that it was dependent on verification of favorable wind, slope protection, avalanche, geologic hazard, and soil erodability conditions.

None of the studies and inventories were conducted during winter. The area is generally considered to receive less than abundant snowfall for downhill skiing. However, no studies for determining whether snow cover would be adequate, adequate within supplemental snowmaking, or not adequate have been completed.

The Quail Mountain site has a potential vertical rise of more than 2,000 feet and a favorable range of slopes for beginner through expert skiing. Maximum design capacity has been estimated to be 8,000 SAOT. The most favorable location for base area facilities would be on adjacent undeveloped private land. The private land could probably accommodate a full range of base area and related resort facilities. The characteristics mentioned in this paragraph indicate opportunity for developing a destination-skier ski area that could potentially provide 624,000 skier visits annually.

The principal unknown physical factors that are critical to a final determination of the Quail Mountain site's capability are snowfall and other climatic factors. In addition, avalanche, geologic hazard and soil erodability conditions have not been studied.

#### Site Suitability

Distribution of the Draft Forest Plan and EIS was effective in generating many comments concerning the Quail Mountain site.

Many comments and petitions were received in support of developing the site for downhill skiing. The principal reasons given in support relate to predicted economic benefits. Many commentators expressed the viewpoint that a Quail Mountain Ski Area is essential for stimulating the development of an all seasons recreation resort complex, which would in turn increase recreation and tourism, and expand, stabilize, and diversify the local economy. Some stated that development of a destination skier ski area at Quail Mountain would tend to compliment rather than compete with the two existing ski areas (Monarch and Ski Cooper) in the Upper Arkansas Valley. Others argued that the Quail

Mountain site is well situated for providing the rapidly growing Front Range population centers with conveniently accessible skiing opportunities.

Many comments and petitions were also received in opposition to developing the Quail Mountain site for downhill skiing. Ski area development was opposed principally because of alleged adverse effects on elk and on the landscape.

#### Effects on Elk

The Lake Creek drainage basin, which includes the Quail Mountain site and Twin Lakes, is home range for a distinct elk population. Relatively small portions of the home range provide food and cover for the elk during severe winter weather. The number of elk that the home range can support is limited to the number that these smaller areas can support during the winter. Two areas of elk "winter range" are located along the northern base of Quail Mountain, one on the southwest side of upper Twin Lake and one on the southeast side of lower Twin Lake. Both areas are identified in the Forest Plan as Big Game (Elk) Winter Range Management Areas. The boundaries of the Management Areas were delineated after consultation with field personnel of the Colorado Division of Wildlife. None of the lands now or previously inventoried as potential winter sports sites are located within the Winter Range Management Areas. However, the Management Area on the southeast side of lower Twin Lake is located adjacent to the Quail Mountain winter sports site and to private lands which could probably be developed for base area and related purposes. Management requirements would preclude any development of base facilities or access roads within the boundaries of the Big Game Winter Range Management Areas. Consequently, Forest planning actions have indirectly placed some limitations on the potential scope and intensity of ski area development and thereby reduced to some degree the possibilities of displacing elk from critical habitat. However, issues have been raised concerning other possible effects. The issues are:

1. Would the development of skiing facilities on the Quail Mountain site adversely affect other important elk habitat requirements?
2. Would the development of base area facilities and the associated activities of people displace elk from the Big Game Winter Range Management Areas?
3. Would the development of base area, resort, and other ancillary facilities disrupt seasonal migration between the Lake Creek drainage area and the Cache Creek and Clear Creek drainage areas to the south?

Insufficient information exists for analyzing these issues and determining effects.

## Effects on the Landscape

The inventoried potential winter sports site is located in the northeast quadrant of Quail Mountain. The lands in this quadrant are mainly viewed from the Twin Lakes area and from a 20 mile section of U.S. Highway 24 extending from Balltown north up the Arkansas Valley to near Tennessee Pass.

Quail Mountain is within close distance (foreground and middleground) viewing zones from the Twin Lakes area. Within close distance zones, detail, texture, color, and contrast are readily discernible. The most visually sensitive portion of the mountain is the lower portion along the south shore of Twin Lakes. It is close, steep and generally viewed at an angle that is near perpendicular to the observer's normal line of sight. The Quail Mountain inventoried winter sports site is located just above this zone. The land within the site is not as steep and tends to be viewed from below at oblique angles.

Quail Mountain is within background viewing zones from U S. Highway 24. Within this zone details are least apparent. Color distinctions are reduced and replaced with blues and grays. Texture differences are usually not discernible. Landscape patterns are recognized mainly on the basis of size, shape and contrast.

Except for the presence of a narrow horizontal line created by an old irrigation ditch, the north-facing slopes of Quail Mountain are natural appearing. The overall appearance is very aesthetically pleasing. The outstanding visual quality of the surrounding mountains is the fortune of the Twin Lakes area. Private lands along the south shore of Twin Lakes were acquired for public purposes principally to insure that the scenic values would be retained. This is thoroughly documented in a report by Cermak (See Appendix). In recognition of the importance of the scenic values and in consideration of the uses and activities that would be compatible with the maintenance of those values, the lands along the south shore (excluding areas of critical elk winter range) have been identified in the Forest Plan as a management area for emphasizing visually subordinate semiprimitive nonmotorized recreation opportunities such as hiking, horseback riding, cross-country skiing, and perhaps bicycling.

As in the case of the adjacent Big Game Winter Range Management Areas, the management requirements for the Semiprimitive Nonmotorized Recreation Management Area would preclude any development of ski area base or mountain facilities or access roads therein. And, in similar fashion, this Forest planning action may indirectly place some limitations on the potential scope and intensity of ski area development.

Preliminary observations indicate that ski area development could occur within the limits of the inventoried winter sports site and on adjacent private lands without causing visually unacceptable conditions. However, this tentative appraisal should be verified through detailed visual analysis. Base facilities on private lands would be generally hidden from observers in the Twin Lakes area by an intervening lateral moraine.

Ski area mountain facilities such as lifts and trails would be located within middleground and background distance zones. In consideration of the distances, terrain and vegetation patterns within the site, it appears that the facilities could be made compatible with the natural surroundings through careful and sensitive project design.

#### Other Considerations

The Forest planning process was also instrumental in raising public issues and management concerns regarding the nature and intensity of recreational development at Twin Lakes. Some commentators indicated that ski area and resort development at the Quail Mountain site should be closely integrated with resort oriented recreational development at Twin Lakes. It has been argued that integrated development would be a logical extension of the master plan for the recreation management and development of Twin Lakes that was prepared in 1968 by the Forest in connection with the Fryngpan-Arkansas Project.

The integrated development concept is invalid for at least two reasons:

1. The intervening lands will be managed under the Forest Plan for elk winter range and semiprimitive nonmotorized recreation purposes for reasons previously discussed; and

2. Much of the direction in the 1968 master plan is no longer adequate or appropriate.

Management Direction needs to be revised for the following reasons:

1. Significant changes have occurred during the past 16 years. Twin Lakes was not enlarged to the extent contemplated; plans for providing recreational developments at the Mt. Elbert Reservoir were cancelled because of large fluctuations in the water level and because of potential interference with Bureau of Reclamation operations. Interlaken historic structures were restored in place and occupy the site of a proposed campground. The objective for management of the Interlaken Historic District is to only provide low key interpretative information about the structures. The result of these actions is considerably less physical carrying capacity.

2. Whatever the causes or the reasons, the 1968 planning approach tended to be directed at answering the question, "How much recreation use capacity can be developed?" rather than "How much should be developed?" The plan is weak in identifying and analyzing existing and potential recreation opportunities, settings, and experience levels. For example, the high use-high density development concept for Twin Lakes appears to be one that is typically used for developing large warm bodies of water in eastern states. Twin Lakes is a relatively small to medium sized lake, one that can be crossed and recrossed with a power boat in a matter of minutes. It is located at an elevation of 9,200 feet and the summer recreational season is relatively short. The water is very cold all the time, which severely limits the type and amount of water-based recreation activities that the lake can provide. It also limits fish production capacity. Twin Lakes fishing is more quality

than quantity. It appears that previous planning failed to recognize some important practical limitations.

3. The scale and type of development proposed by the 1968 plan would significantly change the physical and social recreational settings. If the plan were fully implemented, the number of structures, vehicles, lights, noises, and interactions between visitors would significantly increase and change the settings from rural to urban. This would result in substituting one combination of recreation opportunities for another. Persons seeking opportunities to recreate in natural environments would probably tend to avoid the area. The area would become more attractive to those who seek convenience sites, considerable affiliation with people, and organized activities. Accessible scenic, relatively undeveloped lakes are a scarce natural resource. Outdoor recreational resources are valuable in proportion to the opportunities that they provide for doing and seeing things which differ from, and contrast with, normal workaday life. Converting the Twin Lakes area into another familiar and commonplace high-visitor-density modified-environment reservoir area would diminish its outdoor recreation, scenic and other amenity values.

4. The 1968 plan presumed a need for developing resorts, restaurants, stores and other lodging and service facilities on National Forest lands along the north side of Twin Lakes. This assortment of facilities is characteristic of the highly developed urban side of the recreation opportunity spectrum and is uncharacteristic of the present recreational setting. This assortment is not needed to support the kind of outdoor recreation opportunities that Twin Lakes presently provides or is capable of providing. If this determination is incorrect, it is reasonable to expect that the need will be more appropriately met through the improvement of existing private-owned facilities and development of new facilities on what appears to be an ample amount of private land in the same general locality.

In consideration of these factors, Twin Lakes and the lands on the north side of Twin Lakes have been identified in the Forest Plan as a management area for emphasizing rural and roaded natural recreation opportunities. The applicable management direction allows a moderately wide range of recreation activities. The direction also allows a level of facilities and support services development that is consistent and compatible with the intended management emphasis. This level has been reached in terms of scope (number and kinds of sites) and intensity (acres committed to sites and capacity). Future management actions should focus on improving the quality and durability of existing sites and facilities. For example, roads should be hard surfaced to reduce dust and annual maintenance costs. Future management actions must also focus on insuring that all areas disturbed by Fryingpan-Arkansas project construction activities are successfully and attractively stabilized and revegetated.

#### Site Availability

Committing public land to downhill skiing development is very close to an irretrievable action, and such action is normally attended with

significant and complex effects on the physical and social environment. Accordingly, decisions involving the commitment of land and its resources for ski area development should be fully supported by the facts and based on a thorough understanding of the effects. Existing information about the Quail Mountain site is not adequate for making conclusive determinations of the capability or suitability of the site for ski area development. The information does not even indicate a strong likelihood, one way or the other. However, in fairness to the many who have expressed the belief that development is feasible and would produce substantial economic benefits, and in light of the deficit supply projections that were discussed in Part I, it is concluded that the matter should be left open for further consideration. For these reasons, a special management prescription should be applied to the site to maintain essential land characteristics and to preserve on a tentative basis, opportunity for future ski area development. The prescription should include a requirement that capability and suitability must be verified through detailed studies prior to, or in conjunction with, development concept planning.

One determination can be made. There is no suitable site on National Forest lands for developing base area facilities.

#### C. Potential new ski areas previously rated marginal.

Anderson Bowl and West Bowl are identified in the Rocky Mountain Regional Guide (Table 3-5) as inventoried potential winter sports sites. Both are rated in the Guide as marginal--priority 4. The center of the Anderson Bowl site is located approximately one mile east of the existing Pikes Peak Ski Area. The center of the West Bowl site is located approximately three miles southwest of the Pikes Peak Ski Area. Both sites are within Teller County.

#### Site Capability

The marginal site ratings stem from inventories performed in March 1970. The principal limiting site conditions include marginal snow depth, inadequate slope protection, and high winds. Field reconnaissance trips were made to evaluate snow conditions during the 1968-1969 and 1969-1970 skiing seasons. A snow pack study was conducted at both sites during the following winter (1970-1971). Average snow depth recorded at Anderson Bowl for the November through February period was six inches. Average snow depth recorded at West Bowl for the same period was less than three inches. Adverse wind effects were observed throughout the period.

The Anderson Bowl site is estimated to have a potential vertical rise of 1,200 feet. However, the bowl has a narrow configuration and is estimated to have a maximum design capacity of only 1,500 SAOT. Three miles of road would need to be constructed to provide access to the site from the Pikes Peak Highway.

The West Bowl site is estimated to have a potential vertical rise of

1,700 feet and a maximum design capacity of 4,000 SAOT. The terrain is generally steep, and horizontally and vertically irregular. Approximately 80% of the potential skiing routes would be classified as advanced skier ability level and 20% would be classified as intermediate skier ability level. Consequently, the terrain gradient mixture is very much out of balance with the normal range of skier abilities. The inventoried design concept proposes two base area sites. One would be located on a 320 acre tract of private land and the other would be located on National Forest land. The base area site on private land would serve the intermediate ability level terrain (20% of the mountain capacity), and base area site on the Forest would serve the advanced ability level terrain (80% of the mountain capacity). There does not appear to be any good opportunities for interconnecting the two sites with ski trails. The terrain appears excessively steep and irregular for effective use of snow grooming vehicles. In addition to improving the quality of skiing, grooming is essential for managing and conserving scarce quantities of snow.

The subsequent snow pack study recordings and the other factors discussed herein indicate that the initial 1970 "marginal" ratings for these two sites were overly optimistic, and that the appropriate rating for both sites is "unacceptable"

#### Site Suitability

Anderson Bowl is located within the local municipal water supply watershed of the City of Colorado Springs. A longstanding written agreement on measures to protect the watershed has been executed by the U.S. Department of Agriculture and the City. West Bowl is located within an area that is essential range for the Pikes Peak bighorn sheep herd. The herd consists of approximately 180 animals and is recognized as one of the major bighorn sheep herds in the State of Colorado.

#### Site Availability

Anderson Bowl and West Bowl should be omitted from further consideration as potential ski areas for reasons of poor physical capability and competition with water and wildlife resource management opportunities and objectives. Moreover, from the supply/demand standpoint the sites appear incapable of attracting skiers and making significant contributions in either the short term or long term. Based on experience to date with the existing Pikes Peak Ski Area, the feasibility of establishing and operating a ski area, at what is probably the best site on Pikes Peak, remains to be proven.

#### D Scheduling Considerations

The only scheduling system that seems appropriate for application to the Pike and San Isabel National Forests is the four-level priority system set forth in the Rocky Mountain Regional Guide. Further prioritization, such as a proposed order for expansion and new development, does not appear practical or necessary and would be subject to revision almost

immediately. The existing and potential sites are spread throughout a very large portion of the State. Something could be done at each existing site in the way of completing or expanding facilities which would result in operational improvements, optimizing recreational experiences, or improving marketing capability.

UNITED STATES DEPARTMENT OF AGRICULTURE  
FOREST SERVICE  
910 Highway 50 West  
Pueblo, Colorado  
81008

2740

December 10, 1971

Mr. Robert Evans, Project Manager  
Fryingpan-Arkansas Project  
P. O. Box 515  
Pueblo, Colorado 81002

OFFICIAL FILE COPY		
Fryingpan-Arkansas Project Office		
DEC 13 1971		
To	Surname	Date
400	R J B	12/15
420	Billings	12/13
421		



Dear Mr. Evans:

This letter states our reasoning and justification for requesting acquisition of the land south of Twin Lakes for public purposes.

According to surveys quoted in the Colorado Outdoor Recreation Plan, 51% of out-of-state visitors come to Colorado because of its scenery. The 1968 Profile of the Tourist Market, by the Denver Research Institute, showed that visitors listed the mountains, sightseeing, scenery, fishing and boating as the things they most wanted to see and do. The desires of Coloradans for outdoor activity were similar according to this report.

The Twin Lakes recreation complex combines these most important visitor activities in one area. The backdrop of the Sawatch Range, the highest range in the 48 states; Twin Lakes, one of the larger mountain lakes in the state; and the undisturbed timbered slopes south of the Lakes, will form one of the most attractive and one of the heavier used recreation areas in Colorado.

The area's unusually scenic terrain was recognized last winter when several miles of Colorado Route 82 over Independence Pass was declared a Scenic Highway by the Colorado Legislature. Twin Lakes is 20 miles east of Independence Pass and the highway passes through the recreation area. There are seven 14,000 foot peaks within a few miles of Twin Lakes, including Mt. Elbert, Colorado's highest mountain.

The whole framework at the Lakes is one of great scenic beauty. To indicate how much this scene is appreciated, our traffic

counters and sampling show that our interpretive site and trail at Independence Pass received 322,000 visits during June, July, August and September of this year. Over 11,000 people from 50 states and 37 foreign countries actually wrote comments in the trail register. The comments were almost entirely about the scenery and its preservation.

The largest visitor center in this part of the state, which is also the key interpretive site for the Fryngpan-Arkansas Project, will be located on the top floor of the Mt. Elbert Powerhouse facing the south shore of the reservoir. Tens of thousands of visitors will view the Lake, the south shore and the high peaks of the Sawatch Range through large windows and interpretive devices. The design of the visitor center considered our proposals that the south shore of Twin Lakes would remain essentially undisturbed and undeveloped.

These few facts indicate the value the public places upon a natural scene. This is the scene which Twin Lakes now occupies and which the enlarged reservoir should continue to occupy. Our plans call for no development of the south side except for trails, limited boat access camping and the preservation of historic Interlaken.

This area of green timber is in contrast to the moraine north of the Lake, and the north shore of the Lake which are mostly covered with sagebrush and scattered pine. The primary development area is planned for the north and east sides of the reservoir. Only a small area on the south shore would be suitable for public development such as campgrounds, resorts, etc. Most of the terrain is too steep for development other than for summer homes. Our proposal is to leave most of the south shore in a natural state except as noted above. An integral part of the recreation experience at Twin Lakes should be the opportunity to get away from the developed areas and into open spaces and trees. Thus, the recreation area would provide a wider range of activities to the user by leaving the south shore roadless and essentially undeveloped.

The south shore also provides wildlife habitat and a chance for visitors to see wildlife in their natural state.

Unless this area is acquired, there seems to be little doubt that it will be developed commercially. There is no guarantee that a private developer will protect the scenic qualities of the area, or that the public would be allowed to use the land at all.

Furthermore, any development other than the few facilities we propose would be at odds with our judgment that the south side of the area should remain undeveloped and protected for its scenic aspect. Retaining recreation land in an undeveloped state would be compatible with public, rather than private ownership.

We recognize there is a place for private development at public reservoirs. However, this must be under controls which insure the public is served and the environment is protected. The best way to achieve this, in our opinion, is through public ownership of the land and our Special Use Permit procedure.

There is also ample opportunity outside the immediate reservoir recreation area for development of recreation camping and residence facilities on private land. There will remain several hundred acres of developable private land within the Twin Lakes Basin, but outside the take-line. This land is already being subdivided and sold for recreation homesites. In the upper Arkansas Valley, private land is an important source of camping space. This allows use of the public land as a primary attraction unencumbered by much intensive development and makes it available to larger numbers of people who use the private lands as a sort of bedroom.

To summarize:

We believe the south shore of Twin Lakes should be acquired because:

1. This area has great unspoiled scenic value and scenery is a key recreation resource in Colorado.

2. This area is fully exposed to all users of the Lake and visitor center, a fact taken into account in the decision to maintain it in an unspoiled state.

3. This area would serve a basic function as undeveloped area needed near high density recreation developments such as we anticipate Twin Lakes Recreation Area will be.

4. The area has value as wildlife habitat and as a wildlife viewing area for visitors to Twin Lakes.

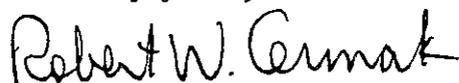
5. Retention in private ownership will probably result in development and development will defeat our basic plans for the area.

6. Under private ownership, there is no guarantee of full public use of a reservoir area developed at public expense. Private development of recreation facilities on public land is provided for under existing regulations and there is ample opportunity for recreation development on private lands outside the immediate reservoir area.

7. Development would deny use by wildlife of the area part of the year and probably alter their patterns of use permanently.

I think it would be tragic, indeed, if we did not protect the scenic quality of the south shore through public ownership after all the effort that has gone into protecting environmental qualities on the north shore as an integral part of Bureau and Forest Service developments. If you need more information or supportive data, please let me know.

Sincerely yours,



ROBERT W. CERMAK  
Forest Supervisor

# **APPENDIX J**

APPENDIX J  
Management Area Prescriptions 8A and 8D

This appendix displays management requirements for Prescriptions 8A and 8D. These prescriptions are not contained in the Forest Plan. The Pike and San Isabel National Forests have not allocated these two prescriptions on lands within the Forest boundaries; however, they are displayed on the Forest Plan Map for lands administered by other adjacent National Forests.

PRESCRIPTION FOR MANAGEMENT AREA 8A

(Provides for pristine wilderness opportunities )

MANAGEMENT PRESCRIPTION SUMMARY

General Direction and Goals

Management emphasis is for the protection and perpetuation of essentially pristine bio-physical conditions and a high degree of solitude for both wildlife and humans with no perceptible evidence of past human use

All resource management activities are integrated in such a way that evidence of current human use, including permitted and recreation livestock, is not noticeable the following season, or so that natural biological processes are not adversely or artificially changed over time by human use

B MANAGEMENT REQUIREMENTS

MANAGEMENT ACTIVITIES	GENERAL DIRECTION	STANDARDS & GUIDELINES
Visual Resource Management (A04)	1 Design and implement management activities to maintain a pristine ecosystem (0218 )	a The Adopted Visual Quality Objective (VQO) is Preservation (6132 )
Dispersed Recreation Management (A14 and 15)	<p>1 Provide opportunities for primitive and unconfined recreation featuring solitude and to travel cross-country in an environment where success or failure is directly dependent on ability, knowledge and initiative (0223 )</p> <p>2 Emphasize recreation opportunities on the most primitive end of the recreation opportunity spectrum Manage use to provide very infrequent contact with other groups or individuals (0224 )</p>	<p>a Maximum use and capacity levels are</p> <ul style="list-style-type: none"> <li>- Trail and camp encounters during peak use days are less than 2 other parties per day</li> <li>- Trail and area-wide use capacity               <ul style="list-style-type: none"> <li>(1) Open lands, meadow and alpine 0 001 to 0 002 PADT per acre</li> <li>(2) Forested lands and shrub lands 0 003 to 0 007 PADT per acre</li> </ul> </li> <li>- Reduce the above use levels where unacceptable changes to the biophysical resources are likely to occur (6128 )</li> </ul>
	3 Limit specially permitted parties to not more than one per 2500 acres (0226 )	

7-3

MANAGEMENT  
ACTIVITIES

GENERAL  
DIRECTION

STANDARDS &  
GUIDELINES

CONTINUATION OF  
Dispersed  
Recreation  
Management  
(A14 and 15)

- 4 Prohibit open fires in alpine, krummholz, meadow areas and within riparian areas when
- a Use of dead and down wood for fuel is likely to violate diversity requirements, soil nutrient and erosion protection, or
- b Visual resource objectives for the area likely could not be met  
(0199 )
- 5 Manage site use and occupancy to maintain sites in Frissell condition class 2 or better, except for designated sites which may be class 3  
(0630 )

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

- 1 Manage outfitter-guide operations in the same manner as other visitors. Permit camping only in sites specified in outfitter-guide permits. Keep outfitter-guide activities harmonious with activities of non-guided visitors. Include outfitter-guide operations in calculations of level-of-use capacities  
(0208 )

Wildlife and  
Fish Resource  
Management  
(C01)

- 1 Manage human activity so that wildlife and plant species population dynamics and distribution occurs naturally. Prohibit fish stocking except for reintroduction of indigenous species or where stocking has been previously authorized and practiced  
(0220 )

Range Resource  
Management  
(D02)

- 1 Manage livestock and herbivorous wildlife forage use in accordance with FSM 2320 3 (36 CFR 293 7)  
(01B2 )

- a Follow established utilization standards for areas, within grazing allotments  
(6130 )
- b Limit utilization of forage to not more than 30 percent of current annual growth outside established allotments  
(6342 )
- c Limit trampling of forage to not more than 40 percent of current annual herbaceous vegetation growth, outside established allotments

J-4

MANAGEMENT  
ACTIVITIES

GENERAL  
DIRECTION

STANDARDS &  
GUIDELINES

CONTINUATION OF  
Range Resource  
Management  
(D02)

(6344 )

Special Use  
Management (Non  
-Recreation)  
(J01)

1 Permit only those uses authorized by wilderness  
legislation, which cannot be reasonably met on non-  
Wilderness lands  
(0211 )

Soil Resource  
Management  
(KA1)

1 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 )

a Follow procedures  
specified in Agricultural  
Handbook 537 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 1 (a)(3)  
(xvii)  
(6159 )

b Provide Frissell condition  
classes 1 and 2 campsites only  
(6133 )

Trail  
Construction and  
Reconstruction  
(L22)

1 Do not construct or reconstruct trails  
(0228 )

FAND  
Construction  
Reconstruction  
and Maintenance  
(L24 AND 25)

1 Prohibit man-made structures and facilities  
(0219 )

J-5

MANAGEMENT PRESCRIPTION 8D

(Provides for limited areas of high-density day-use )

MANAGEMENT PRESCRIPTION SUMMARY

Management emphasis is to provide for the protection and perpetuation of essentially natural bio-physical conditions 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 uses 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.

B MANAGEMENT REQUIREMENTS

MANAGEMENT  
ACTIVITIES

GENERAL  
DIRECTION

STANDARDS &  
GUIDELINES

Visual Resource  
Management  
(A04)

1 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 )

Dispersed  
Recreation  
Management  
(A14 and 15)

1 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 )

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

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

c Prohibit recreation livestock  
except for through travel  
(6362 )

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

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

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

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  
(PAOT/Acre)

Open Lands  
Alpine, Krummholz

04

J-7

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 )

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

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

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

Wildlife and  
Fish Resource  
Management  
(C01)

1 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 )

Range Resource  
Management  
(D02)

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

MANAGEMENT  
ACTIVITIES

GENERAL  
DIRECTION

STANDARDS &  
GUIDELINES

CONTINUATION OF  
Range Resource  
Management  
(D02)

2 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 )

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

3 Prohibit overnight use of recreational stock  
(0247 )

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

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

Special Use  
Management (Non-  
Recreation)  
(J01)

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

2 Permit only those uses authorized by wilderness legislation, which cannot be reasonably met on non-Wilderness lands  
(0211 )

Soil Resource  
Management  
(KA1)

1 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 )

a Follow procedures specified in Agricultural Handbook 537 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 1 (a)(3)  
(xvii)  
(6159 )

2 Manage designated campsites to Frissell condition class 3  
(0242 )

MANAGEMENT  
ACTIVITIES

GENERAL  
DIRECTION

STANDARDS &  
GUIDELINES

Transportation  
System  
Management  
(L01 & 20)

1 Locate and design required access roads within the management area for authorized activities to minimize the biophysical and visual impact, and to facilitate restoration  
(0213 )

a Roads will not be authorized

- 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 affect threatened and endangered plant and animal species  
(6165 )

2 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 VGO  
(0254 )

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

b Schedule trail maintenance in accordance with Regional Acceptable Work Standards (FSM 1310 R2 ID No 1 7/22/82 )  
(6131 )

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

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

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

J-10

CONTINUATION OF  
Transportation  
System  
Management  
(LO1 & 20)

4 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 )

5 Use corduroy and/or puncheon treads across bogs where no safe and feasible bypass opportunity exists  
(0215 )

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

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

MANAGEMENT  
ACTIVITIES

GENERAL  
DIRECTION

STANDARDS &  
GUIDELINES

CONTINUATION OF  
Transportation  
System  
Management  
(L01 & 20)

7 Use signs of unstained wood with routed letters  
and mounted on unstained posts  
(0249 )

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

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

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

1 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 )

# **APPENDIX K**

## APPENDIX K

### PRESENT NET VALUE TRADE-OFF ANALYSIS

The desired result of the Forest Planning Process is the maximization of Net Public Benefits (NPB) resulting from the management of the Forest. NPB is the overall value to the Nation of all benefits less all associated inputs and costs, regardless of whether or not they can be quantitatively valued. In comparing Forest Plan alternatives, the most direct index of NPB is Present Net Value (PNV). PNV is the difference between the discounted value (benefits of all outputs to which monetary values or established market prices are assigned) and the total discounted monetary cost associated with producing Forest outputs. The PNV's of all alternatives considered in detail were calculated as described in Chapters II and IV. These PNV's represent the monetarily quantifiable components of the NPB's of each of the alternatives. The discussion which follows will examine both the quantifiable and nonquantifiable aspects of the Forest Plan alternatives from an economic perspective.

Tables I-1 and I-2, display the variations among alternatives in terms of PNV, discounted benefits (PNV) and discounted cost (PVC) at both a 4 percent and 7-1/8 percent discount rate. As previously mentioned, PNV is not a comprehensive measure of NPB, because it compares total monetary costs against only that portion of total benefits which can be valued. PNV is, therefore, somewhat biased against alternatives which incur cost in order to produce non-priced benefits such as Alternatives A, B, and C.

#### FACTORS WHICH REDUCE PNV

##### Direct Costs

The implication of direct expenditures are frequently consequences of production decisions. For example, a decision to produce a high level of timber may lead to increased costs for road construction, reductions in fire, insect and disease protection costs, and either increases or decreases in wildlife management costs. In addition, recreation use may increase or shift among areas within the Forest. Although many benefits and costs are indirectly linked, only a brief discussion of major differences across alternatives is presented here.

The direct expenditures that account for the largest variations in costs among alternatives but that make little or no contribution to total discounted priced benefits are those focused on improving the quality of the recreation experience, those associated with an active lands program, those associated with improvement of wildlife habitat, and those focused on protecting and enhancing the resource production potential of the Forest.

### Quality of Recreation

Certain expenditures enhance the quality of recreation experiences. Based on observations of payments in the private sector, it is believed that the prices recreationists are willing to pay for higher quality National Forest experiences is higher than for lower quality experiences. It is also possible that more recreationists would be attracted to the Forest. However, it can be argued that the number of National Forest recreationists is more a function of population, gasoline prices, and the like than of management activities. Because of a lack of empirical studies, no change in the number of recreationists, as measured by RVD's, is assumed as expenditures change.

### Lands Programs

The lands program varies across alternatives and in all cases involves expenditures that return little in the way of benefits that can be valued in an economic analysis. Land exchange and purchase contribute to the efficient management of the Forest through improved access. Cases of trespass provide public benefits in the prevention of inappropriate use of National Forest System land.

### Trail Construction

The Forest-wide average cost of trail construction is about \$9,000 per mile. Non-priced public benefits which occur as a result of trail construction include increased resource protection, increased safety, and an increase in the quality of the recreation experience. None of these benefits are present in PNV calculations, yet their cost is

### Management Intensity of Wilderness

The level of management in Wilderness influences the number of patrols, the amount of public information available, and other services provided to enhance the recreation experience of current and future Wilderness visitors. Providing a quality of Wilderness experience is not reflected in PNV, yet it is an important aspect of Wilderness management.

### Enhancement and Protection of Resource Base

Numerous expenditures are made primarily to rehabilitate, protect, and enhance the production base of the Forest. These expenditures are for the most part indirectly reflected in PNV through the future production of priced outputs. For example, current enhancement of soil conditions may be implied in predictions of future timber production based on standard timber yield tables. On the other hand, rehabilitation expenditures now are required to compensate for past activities. While the benefits of resource protection and enhancement are needed, only their costs are reflected in PNV.

Big Game Winter Range Carrying Capacity - Carrying capacity varies by alternative. Greater capacities would reduce the current conflicts encountered when big game summering on the National Forests move to other ownerships for the winter. This public benefit is not recognized

in PNV although costs of management are included. In contrast, the number of hunters attracted by larger big game herds are counted as RVD's and are included as priced benefits in the PNV calculation.

Wildlife Habitat Diversity - Diversity depends both upon the acreage and pattern of timber harvesting or other vegetation treatment which varies across alternatives. As a consequence, management costs also vary across alternatives. Although diversity is recognized in the NFMA Regulations as a public benefit, varying levels of diversity were not assigned economic values, and only their costs are reflected in PNV.

#### Fish Structures

The number of fish structures constructed varies across alternatives. Such structures are necessary both to mitigate damage and to protect and enhance habitat. No increase in the value per fishing RVD is claimed, and many public benefits associated with the structures are not reflected in difference in PNV across alternatives.

#### Ski Areas

Ski areas are unique in that they provide a high level of benefits at a low cost to the Forest Service. This over-exaggerates their value because many of the costs of development are not included. The Forest Service works closely with developers and with State and County governments to insure that the net public benefit from ski area development is positive.

### OPPORTUNITY COSTS

The alternatives were constructed to respond to the full range of issues, concerns, and opportunities with varying emphases. Sets of analytical constraints reflecting those emphases were applied to the FORPLAN computer model (Appendix D). Since the analytical objective function was always to maximize PNV, the set of constraints that least interfered with the maximization led to the highest PNV. Achieving the goals of Alternative C led to the least total constraints on the objective function and the least reduction in PNV. The constraints applied to all other alternatives led to greater trade-off costs between PNV and the achievement of goals based on issues and concerns.

Benchmark #3 was not constructed in this manner. Because it was intended to define the maximum PNV achievable, it was developed only to ensure the land and resources that were valued could produce the estimated levels of output. In contrast to all of the alternatives, its timber production pattern was not required to conform to the design requirements built into other alternatives. There is no assurance that Benchmark #3 would address any of the issues and concerns developed in the planning process other than the valued resource outputs and cost efficiency.

These analytical constraints, which reflect real-world conditions, or which are necessary to address issues, concerns, and opportunities, lead to opportunity costs that must be incurred.

## DIRECT COMPARISONS

Benchmark #3 differs in significant ways from all of the alternatives. It only includes programs (costs and benefits) that contribute to present net value. It does not include costs of producing non-priced benefits. Programs such as lands adjustment, soil inventory, and environmental protection add significant costs to the alternatives, but they do not lead to increases in priced outputs. Tables K-1 and K-2 summarize the PNV trade-off analysis.

TABLE K-1 Present Net Value Trade-off Analysis - Summary All Periods 1/ (Millions of First Quarter 1978 Dollars, 4% Discount Rate)

	Benchmarks			Alternatives			
	#2	#3	C	A	B	D	E
Discounted Cost (PVC)	83 5	156 7	174 9	172 6	167 6	185 4	102 3
Discounted Benefits (PVB)	167 5	379 9	377 0	362 2	322 6	298 1	165 3
Present Net Value	84 0	223 2	202 1	189 6	155 0	112 7	63 0
difference in PNV (from BM#3)	-139 2		-21 1	-33 6	-68 2	-110 5	-160 2
difference in PNB (from BM#3)	-212 4		-2 9	-17 7	-57 3	-81 8	-214 6
difference in PVC (from BM#3)	-73 2		18 2	15 9	10 9	28 7	-54 4
Contributions Made to Total Discounted Benefits by Resource, Incremental							
Timber	14 3	12 5	13 9	13 1	13 8	11 1	10 9
Range	51 6	50 5	48 9	50 6	49 5	51 9	20 8
Developed Recreation	64 7	64 7	64 7	64 7	54 8	54 8	39 3
Dispersed Recreation	0	152 9	152 9	152 9	126 0	126 0	56 1
Winter Sports	36 9	36 9	36 9	36 9	36 9	36 9	22.1
Wilderness	0	55 6	55 6	40 1	40 1	15 3	15.3
Wildlife (Recreation Related Activities)	0	6 6	3 6	3 6	1 2	1 2	0 4
Water	0	0 2	0 5	0 3	0 3	0 9	0 4

1/ All Benefits and Costs are incremental from Benchmark #1

TABLE K-2 Present Net Value Trade-off Analysis - Summary All Periods <sup>1/</sup> (Millions of First Quarter 1978 Dollars, 7-1/8% Discount Rate)

	#2	Benchmarks #3	C	A	B	Alternatives D	E
Discounted Cost (PVC)	49 2	97 0	105 1	103 6	100 8	112 5	62 7
Discounted Benefits (PVB)	95 3	221 3	218 6	210 0	188 6	173 6	99 8
Present Net Value	46 1	124 3	113 5	106 4	87 8	61 1	37 1
difference in PNV (from BM#3)	-78 2		-10 8	-17 9	-36 5	-63 2	-87 2
difference in PNB (from BM#3)	-126 0		-2 7	-11 3	-32 7	-47 7	-121 5
difference in PVC (from BM#3)	-47 8		8 1	6 6	3 8	15 5	-34 3
Contributions Made to Total							
Discounted Benefits by							
Resource, Incremental							
Timber	8 9	7 9	8 5	8 0	8 5	6 9	6 9
Range	32 4	31 8	30 5	31 6	31 1	32 2	12 6
Developed Recreation	35 5	35 5	35 5	35 5	31 1	31 1	24 6
Dispersed Recreation	0	90 4	90 4	75 1	75 1	75 1	34 2
Winter Sports	18 5	18 5	18 5	18 5	18 5	18 5	12 5
Wilderness	0	32 7	32 7	23 5	23 5	8 6	8 6
Wildlife (Recreation Related Activities)	0	4 4	2 3	2 3	0 6	0 6	0 2
Water	0	0 1	0 2	0 2	0 2	0 6	0 2

<sup>1/</sup> All Benefits and Costs are incremental from Benchmark #1