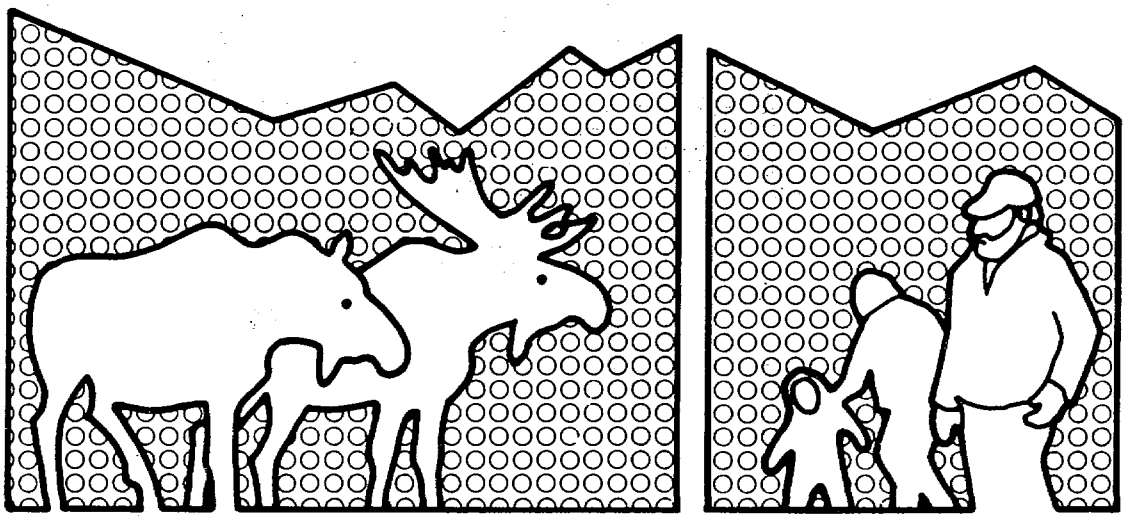
MATANUSKA VALLEY MOOSE RANGE



MANAGEMENT PLAN

October 1986

PREPARED BY:

Alaska Department of Natural Resources

Alaska Department of Fish and Game

IN COOPERATION WITH:

Matanuska-Susitna Borough

Alaska Department of Transportation and Public Facilities

Alaska Department of NATURAL RESOURCES

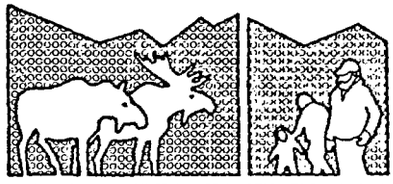
STATE OF ALASKA

BILL SHEFFIELD, GOVERNOR

DEPARTMENT OF NATURAL RESOURCES
DIVISION OF LAND AND WATER MANAGEMENT
SOUTHCENTRAL REGION

3601 C STREET
BOX 7 005
ANCHORAGE, ALASKA 99510-7005
PHONE: (907) 561-2020

MATANUSKA VALLEY
MOOSE RANGE



MANAGEMENT PLAN

October 1986

Dear Moose Range Participants:

The Mantanuska Valley Moose Range Management Plan has been signed by the Commissioners of the Departments of Natural Resources and Fish and Game. This document is the guiding policy for management of the Range. We are pleased with the joint agency effort on this project. We feel that the management plan meets the legislative mandate for multiple use and the major concerns of the public. The plan allows for maintenance, improvement and enhancement of wildlife habitat, mineral development, timber harvest, grazing and outdoor recreational use of the Range.

We would like to encourage you to use the plan. The plan can be helpful to people involved in resource development efforts, conservation efforts and multiple-use management efforts. If you have any recommendations on how this plan could be improved, or made easier to use, we would like to hear from you.

Due to the current budget situation we have been able to print only 100 copies of the document. Copies of the plan will be available at the main library in Anchorage, and the Palmer, Sutton, Fairbanks and Juneau libraries. Individual copies of the plan are available for $10.00 per copy. The plans are located at the Public Information Office, Southcentral Region Office, Division of Land and Water Management, Box 7005, Frontier Building, Room 1034, Anchorage, AK 99501-7005. Phone: (907)762-2202.

Sincerely,

Meg Hayes

Margaret J. Hayes,
Regional Manager and

Tom Hawkins

Tom Hawkins, Director
Division of Land and Water Management

MATANUSKA VALLEY MOOSE RANGE MANAGEMENT PLAN

October 1986

Prepared by:

Alaska Department of Natural Resources; Division of Land and Water Management
Southcentral Region Office; Frontier Building; 3601 C Street; P.O. Box 7005
Anchorage, Alaska 99587; Phone: (907) 762-2249
and
Alaska Department of Fish and Game; Habitat Division; 333 Raspberry Road
Anchorage, Alaska 99518

In cooperation with:

Matanuska-Susitna Borough
Alaska Department of Transportation and Public Facilities

* *

DNR, Division of Land and Water Management
Central Office
Tom Hawkins, Division Director
Southcentral Region Office
Margaret J. Hayes, Regional Manager
Patrick C. Beckley, Planning Section Chief
Helen Nienhueser, Planning Supervisor

Alaska Department of Fish and Game
Central Office
Norm Cohen, Division Director
Southcentral Region Office
Carl Yanagawa, Regional Supervisor
Al Carson, Regional Planner

STATE OF ALASKA

BILL SHEFFIELD, GOVERNOR

DEPARTMENT OF NATURAL RESOURCES

P.O. BOX 7005
ANCHORAGE, ALASKA 99510-7005
PHONE: (907) 561-2020

OFFICE OF THE COMMISSIONER

PLAN ADOPTION

The Department of Natural Resources and the Department of Fish and Game have cooperatively prepared the Matanuska Valley Moose Range Management Plan. The Department Commissioners find that this plan meets the requirements of the following Alaska Statutes and Titles:

AS 38.04.065 (Land use planning and classification),
AS 38.04.910 (Definitions),
AS 16.20.340-.360 (Act creating the Matanuska Valley Moose Range), and
11 AAC 55.010-030 (Land planning and classification).

This plan establishes policies that will guide land uses which both DNR and ADF&G must either permit or review. Both DNR and ADF&G adopt this plan and will use it as guidance when implementing agency authorities under Titles 16 (Fish and Game), 38 (Public Land) and 41 (Public Resources) of the Alaska Statutes. DNR and ADF&G will continue to cooperatively manage the Matanuska Valley Moose Range.

Esther C. Wunnicke
Esther C. Wunnicke, Commissioner
Department of Natural Resources

August 27, 1986
Date

Don W. Collinsworth
Don W. Collinsworth, Commissioner
Department of Fish and Game

10. 2. 86
Date

PLANNING TEAM
LEAD AGENCY MEMBERS

DEPARTMENT OF NATURAL RESOURCES

Division of Land and Water Management

Southcentral Region Office
Planning Section
Lisa R. Holzapfel, Project Manager
Dan MacFarlane, Project Assistant

Water Section
Gary Prokosch

Matanuska-Susitna Area
Linda Medieros

Central Office
Resource Allocations Section
Rob Walkinshaw

Division of Forestry

Southcentral Region Office
Mat-Su Area
Bill Beebe

Division of Agriculture
Jake Shaw

Division of Mining
Jerry Gallagher

Division of Parks and Outdoor Recreation

State Office
Nat Goodhue
Cheryl Green

Mat-Su District
Dale Bingham
Robert Watkins

DEPARTMENT OF FISH AND GAME

Dimitri Bader, Habitat Division
Jack Didrickson, Game Division

DEPARTMENT OF TRANSPORTATION AND PUBLIC FACITILITES

Roger Maggard

MATANUSKA-SUSITNA BOROUGH

Michelle Stearns
Jim Lee

COOPERATING AGENCIES

USDA Soil Conservation Service
University of Alaska
Ag. Experiment Station

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Resource Allocations Section
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Dale Sterling, Historian
Jim Culbertson, Land Management

**Alaska Department of Fish and Game
Christopher Estes, Sport Fish Research Biologist
Larry Engel, Sportfish Area Biologist
Roger Post, Habitat Biologist
Karen Oakley, Habitat Biologist
Randall Zarnke, Game Biologist

**DNR, Division of Geological and Geophysical Surveys
Resource Analysis Section
Doug Jones, Section Chief
Enzo Becia, Air Photo Interpretation
M. Scott Christy, George Dickison, Liv Froholm-Kulstad, Jean Tam, Merlin Wibbenmeyer
Engineering Geology Section
Randall Updike, Kerwin Krause, Stan Carrick, Mary Mauer, Catherine Ulery, John Reeder
Karen Clautice, Fairbanks Geology Section
History and Archaeology Section
Doug Reger

**DNR, Division of Forestry
Dave DeHart, Maintenance of Snowmachines and Three-Wheelers

**DNR, Division of Parks and Outdoor Recreation
History and Archaeology Section
Diana Rigg

**Matanuska-Susitna Borough
Pat Ownes

**University of Alaska, Agricultural Experiment Station
Dot Helm
Bill Mitchell

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Connie Van Horn, Mining Claim Research

**Soil Conservation Service
Mark Brannon

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Volunteer research assistance

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CHAPTER 1

INTRODUCTION

I. INTRODUCTION

PURPOSE OF THE PLAN

The Matanuska Valley Moose Range (Moose Range or Range) is an area rich in natural resource values. The lands within the Range support abundant fish and wildlife populations, contain marketable timber products and high-valued coal reserves and provide a variety of outdoor recreational and cultural opportunities. The area also has abundant water resources and can provide for limited grazing opportunities.

The use of natural resources often leads to resource use conflicts. In the Moose Range such issues involve the maintenance of wildlife habitat, heritage, water, recreational and scenic values while allowing utilization of forest products, mineral and grazing resources. A comprehensive management plan will play an essential role in the orderly use and protection of these resources.

The development and utilization of the natural resources within the Matanuska Valley Moose Range could also have dramatic effects on the local economy: creation of more jobs; expansion of support services; and possible improvements in schools, health and public services. Adverse effects of resource-related growth and development could result in increased local population; crowded schools and services; increased traffic on highways; as well as changes in air, water and scenic qualities; public overuse of the resources; and possible changes in rural lifestyles. By using a carefully developed plan for managing all of the resources, it is expected that many of the negative effects will be greatly reduced.

In response to the increasing need to utilize yet protect the areas' resources, the Alaska State Legislature in 1984 passed the act which created the Matanuska Valley Moose Range. AS 16.20.350(b) requires that the Department of Natural Resources (DNR) shall develop and adopt a management plan for the Matanuska Valley Moose Range that shall reflect the concurrence of the Department of Fish and Game (ADF&G). Both DNR and ADF&G will adopt and comply with this management plan.

The Moose Range was established to maintain, improve and enhance moose populations and habitat and other wildlife resources of the area, and to perpetuate public multiple use of the area, including fishing, grazing, forest management, hunting, trapping, mineral and coal entry and development, and other forms of public use of public land not incompatible with the purposes stated. (See Appendix I for the complete version of the legislation). The purpose of the plan is to determine how these various uses will coexist. The plan provides guidelines which lay-out how a given use will occur so that its impact on other resources is minimized. Where two or more uses cannot occur on the same parcel without detrimental effects, the plan separates these uses. Through these methods, the plan resolves resource-use conflicts, and provides for the orderly use and protection of the Moose Range's varied natural resources.

The plan is intended to direct the use of state lands for the next twenty years. This document is meant to be flexible enough to meet future land use needs. Procedures for revision are included in Appendix IV, on page 225, to provide flexibility for unforeseen land use needs. As elsewhere on state land, DNR will manage the surface and subsurface resources and ADF&G will manage the fish and wildlife. (The plan does not specify how private or Matauska-Susitna Borough lands are to be managed.)

ORGANIZATION OF THE PLAN

The plan is organized in five main chapters. The first chapter provides the reader with the general purpose and organization of the management plan, and an overall description of the management area.

The second chapter provides a description and evaluation of the resources within the Matanuska Valley Moose Range. Resource maps are provided to clarify the location of the key resource values.

The third chapter describes the rangewide land management policies that will apply to the Moose Range. In the fourth chapter, the management intent and subunit specific land management policies are described for the three management subunits.

Implementation of the management plan is covered in the fifth chapter. This section describes the priorities for actions the agencies need to take to manage the Moose Range. Where possible, the estimated costs for the key actions are shown.

The Appendicies are located at the end of the document. The appendicies include the enabling legislation, list of acronyms, definitions, revision procedures, the summary of public involvement, water resource information, geology related maps, summary of applicable state laws and a bibliography.

DESCRIPTION OF THE MATANUSKA VALLEY MOOSE RANGE

LOCATION

The Matanuska Valley Moose Range in Southcentral Alaska is a legislatively-designated area that is nestled in the southern foothills of the Talkeetna Mountains east of the Little Susitna River and north of the Glenn Highway. One of the Glenn Highway signs designating the Moose Range is located twelve miles northeast of Palmer, at Mile Post (MP) 59. The Range continues through portions of the drainages of Moose, Eska, Granite, Young, California and Boulder Creeks, as well as the drainages of the Kings and Chickaloon Rivers. A second boundary sign for the Moose Range is located at MP 80 of the Glenn Highway. Two rural communities lie within the area. They are Sutton and Chickaloon (see Map 1, page 11).

LAND OWNERSHIP

There are approximately 132,500 acres of land within the Matanuska Valley Moose Range. Although the Moose Range is located in the Matanuska-Susitna Borough, the land within the Range is owned by the state, the borough, private citizens and Native groups. The policies in this plan apply only to state land. A breakdown as to the numbers of acres owned, tentatively approved and selected by these groups is shown in Figure 1 on page 5.

The state has management authority for approximately 76% of the land in the Moose Range (the state has patent to 42% and tentative approval to 34%). The Matanuska-Susitna Borough has patent and tentative approval to almost 1% of the land. Private individuals have patent to 8% of the land, while Native corporations have patent to 4%. The land status of 16% of the area has not yet been determined, with 11% of the land selected by both the state and Native corporations, and 5% of the land tentatively approved to the state but selected by Native groups. With only 4,483 acres of over-selected lands and rights to over 69,000 acres, it is likely the Chickaloon Moose Creek Native Association, Inc. will receive ownership of a majority of the lands they have selected.

MENTAL HEALTH LANDS

In July 1956, Congress passed Alaska's Mental Health Enabling Act (MHEA). The Act is quoted as follows:

> Sec. 202 (e) "All lands granted to the Territory of Alaska under this section, together with the income therefrom and the proceeds from any dispositions thereof, shall be administered by the Territory of Alaska as a public trust and such proceeds and income shall first be applied to meet the necessary expenses of the mental health program of Alaska..."

Approximately 34,595 acres of land now within the Moose Range were selected for this trust under the Mental Health Enabling Act (see Map 1, page 11 and

Figure 2, page 6). In 1978, the legislature redesignated mental health trust lands as general grant lands and provided an alternative funding mechanism for mental health programs. However, the appropriations authorized in this legislation were never made. In 1982, mental health advocates sued the state (Weiss v. Alaska) to return these lands to their former trust status and to gain monetary compensation for the trust.

In October 1985, the Alaska Supreme Court invalidated the 1978 act and returned mental health lands to the trust and ordered compensation for lands which had been alienated. However, the Supreme Court did not resolve the issue of the disposition of lands which had been legislatively designated. The case was remanded to the Superior Court for eventual clarification of these and other issues.

The state believes that mental health land within legislative designations did not return to the trust, but instead is a part of the state's liability. As a consequence, this plan identifies the highest and best uses for all lands within the legislatively designated boundaries of the Moose Range. In the event that the lands within the Moose Range are returned to trust status, then the policies and guidelines of this plan may not be applicable to those trust lands.

The plan contains the Department of Natural Resources' (DNR) recommendations for managing the mental health lands. The final decision on management of mental health lands will be dependent upon the final decision made by the Mental Health Commission and the Supreme Court.

SPECIAL USE DISTRICTS

Portions of the Matanuska-Susitna Borough Moose Creek Reserve Special Use District and Talkeetna Mountain Special Use District lie within the Matnauska Valley Moose Range. Many uses in both districts require the issuance of a permit by the Planning Commission after a public hearing.

The Purpose of the Moose Creek Reserve Special Use District is to assure the continuing presence of moose in the district and surrounding areas, to subordinate uses of the public lands within the district to the purposes of the management program of the Alaska Department of Fish and Game for this district, and to otherwise preserve and develop moose habitat in the Lower Matanuska River Valley area. The purpose of the Talkeetna Mountain Special Use District is to permit the multiple use of land within the district. It is further the purpose to conserve the unspoiled beauty of the mountains and the alpine region, to be consistent with the historic and continual use as a mining district as well as a water resource district; and to aid wildlife habitat while permitting resource development, recreation, grazing and related activities where appropriate. (Map 5a, page 33 shows the present district boundaries.)

Figure 1: LAND OWNERSHIP
(as of 1/1/85)

OWNER		ACRES		PERCENTAGE
State (Patent)		55,525		42
(T.A.)*		45,440		34
(Select)*		14,740		11
	TOTAL	115,705		87
Borough (Patent)		1,040		.8
(T.A.)*		40	(less than)	.1
	TOTAL	1,080		.8
Private				
Non-Native (Patent)		10,850		8
Native (Patent)		4,910		4
(Select)*		21,760		16
	TOTAL	37,520		28

Total Acres in the MVMR are approximately 132,500

*Non-patented borough and native lands overlay state patented, T.A. or selected lands. Since these lands are counted more than once, the total acreage exceeds 100%.
-14,720 acres of native selections are on state selected lands
- 7,040 acres of native selections are on state T.A. lands
- all borough selections are on state T.A. lands

The management plan will apply to land for which the state has patent or tentative approval

Lands the management plan will not directly affect

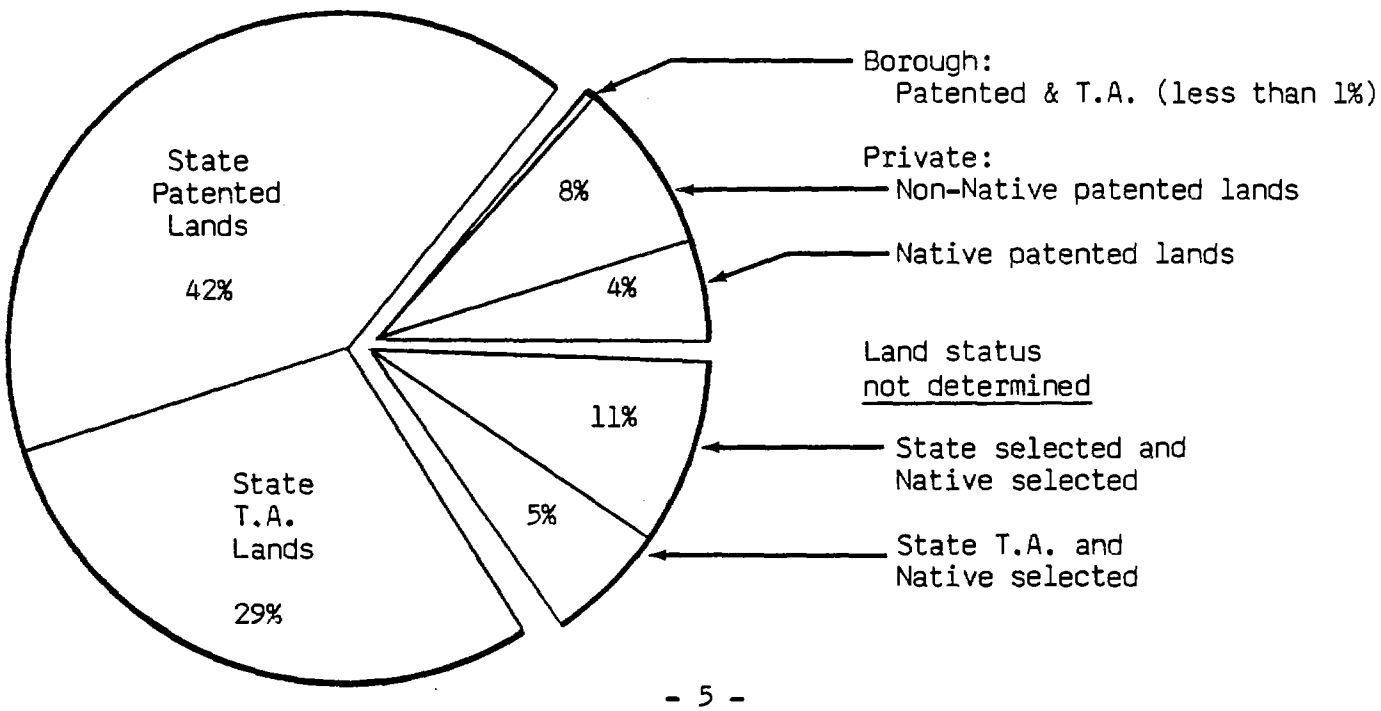


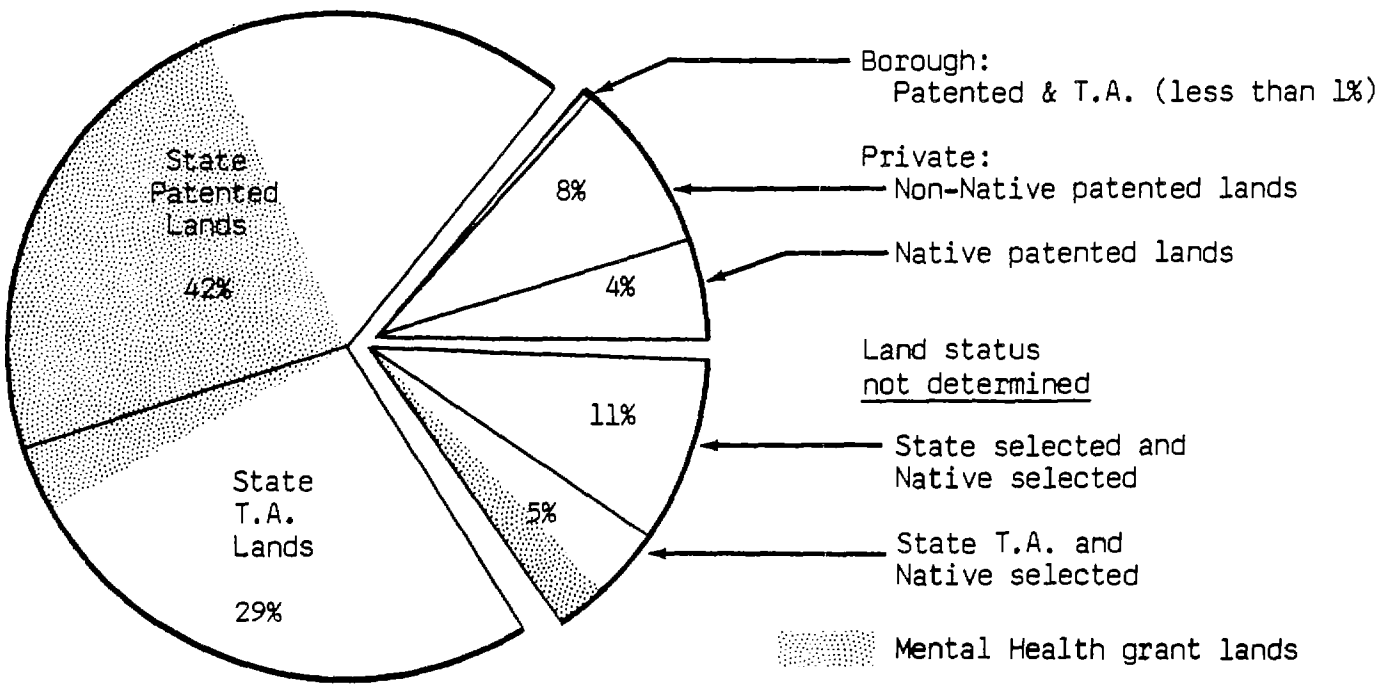
Figure 2: MENTAL HEALTH LANDS

Total Mental Health Acres within the Moose Range	34,615 acres
Patent	30,455 acres
T.A.	4,160 acres
Native Selected	3,500 acres
Coal Lease	3,410 acres
Grazing Lease	210 acres

NOTE: Although outside of the Moose Range, mental health grant lands lie north of the Glenn Highway and adjacent to the Moose Range in portions of Sec. 33 & 34, T20N, R5E and Sec. 3, T19N, R5E. (These are identified in the Susitna Area Plan as potential settlement lands.)

Additional areas now private, that were originally Mental Health grant lands include:

Private	1,149 acres
Native	2,511 acres



CLIMATE

The diversity of climate in the Moose Range has a direct effect on the potential growing season and habitat enhancement efforts for native vegetation. The Matanuska Valley Moose Range lies within a transitional zone between coastal and interior climates. The average summer temperatures are 40 to 69°F and average winter temperatures are -3 to 39°F. These averages do vary with temperatures becoming more extreme as one moves north and east into the Moose Range. Extreme temperatures recorded for this area are -42 to 90°F.

The yearly average precipitation is 14 inches, including an average 69 inches of snowfall. The heaviest periods of rainfall are in late summer and early fall. The Talkeetna Mountains to the north and Chugach Mountains and Matanuska River to the south have a great influence upon climate. These mountains generally create conditions which produce precipitation on the windward slopes.

Some of the most predominant climatic features of the area are the strong winds channeled out of the Matanuska River Valley canyons. The winds are generally seasonal and most pronounced from November through March.

Daylight hours within the Moose Range reflect the state's northern latitudes, with 19 hours of daylight in the summer and only 5 hours of daylight in mid-winter.

POPULATION

In 1985, the Department of Community and Regional Affairs certified the Matanuska-Susitna Borough population to be 41,093. Seven thousand, four hundred seven residents live in the three incorporated cities within the borough, 3,666 for the City of Wasilla, 3,016 for the City of Palmer and 725 residents for the City of Houston. Exact figures for the communities of Sutton and Chickaloon are not available. The fire service area of Sutton for 1985 has 667 residents.

Although the Municipality of Anchorage is located two hours driving time from the Moose Range, Anchorage residents use the area's resources. According to the Municipality of Anchorage figures the 1985 population for the municipality was 248,263.

TRANSPORTATION AND CIRCULATION

Most of the southern boundary of the Moose Range is accessible by road and within a short drive of the majority of the state's population. The main transportation corridor accessing the Matanuska Valley Moose Range is the Glenn Highway from MP 57 to MP 80. Additional subdivision and upgraded homestead, mining and railroad spur roads also provide access into the Range. A few of these roads are maintained by the Matanuska-Susitna Borough.

Map 1 on page 11 shows the major access routes. Some trails which were used historically are now surrounded by private lands and are closed to the public. Upgrading, improvement and possible realignment of the Glenn Highway

is planned and local citizens of the Sutton and Chickaloon communities are concerned about effects on their lifestyles. The Alaska Department of Transportation and Public Facilities (DOT/PF) has identified a corridor along this section of the Glenn Highway in which the highway developments will occur. The corridor is displayed on Map 2, page 13.

LOCAL AND REGIONAL ECONOMY

The Sutton and Chickaloon communities are presently supported economically by service-related businesses, private guiding enterprises and a few government positions. The Matanuska-Susitna Borough economy began to rise as a whole in 1981 due to the influence of state loan funds being made available for home purchase and business loans. In the borough, government-based positions account for 30% of the employment, followed by the services and trade sectors. Approximately 37% of the borough residents are employed outside of the Matanuska-Susitna Borough. Some Sutton and Chickaloon residents commute to Palmer, Wasilla and Anchorage for work.

As mentioned in the introduction, the development, utilization or preservation of natural resources within the area could have significant effects on the local economy. Time will tell as to the nature and extent of these impacts, but regardless, economic growth does mean changes will occur.

DECISIONS MADE THROUGH THE PLAN

This plan is signed by the Commissioners of Natural Resources and Fish and Game and is state policy for management of the Matanuska Valley Moose Range. The Matanuska Valley Moose Range Management Plan determines how DNR and ADF&G will manage state-owned resources for the next twenty years. The plan does not specify how private or Matnauksa-Susitna lands will be managed. The plan identifies the types and locations of resource development that should occur on the land. This is done in the following manner. The plan lists the rangewide management guidelines which direct all land management decisions. Then the Moose Range is divided into three management subunits for which a statement of the management intent is provided. Next, site-specific management guidelines are described for each management subunit. In the implementation chapter, specific agency responsibilities are described. These responsibilities are necessary for cooperative, multiple-use management of the Moose Range. Map 10, the Land Use Plan, summarizes these key resource decisions on page 199.

Continued, cooperative management efforts by DNR and ADF&G will include expanding specific timber harvest areas, habitat enhancement areas and reviewing mining operation plans. The detailed, site-by-site location of logging roads, timber cut designs, etc. will be designed by the Area Forester and his/her staff with ADF&G while continuing to develop the forest management schedules for 1991 - 2005. The Division of Mining and Geology will be responsible for approving the mining operation plans through their established procedures including ADF&G review. The details of these follow-up efforts are described in the Implementation Chapter.

PLANNING PROCESS

The Department of Natural Resources develops plans at three levels: Statewide, Area and Management. The Statewide Natural Resources Plan develops the Department's long-term goals and objectives for resource management. Area plans are developed to determine the resource uses that will occur on public lands. Management plans are developed to coordinate the site-specific resource development actions. The overall goals, objectives and policies which are developed in the Statewide and Area plans provide guidance to the Management Plans.

The DNR, Division of Land and Water Management developed the Susitna Area Plan in 1985 to designate specific land uses for the entire Susitna basin. The policies and guidelines developed in Susitna Area Plan apply to most of the Matanuska Valley Moose Range. The Matanuska Valley Moose Range Management Plan is consistent with the Susitna Area Plan and provides more detailed management guidance by deciding where and how the resource uses will occur in the Range. A small portion of the west end of the Moose Range falls under the Willow Sub-basin Area Plan. The policies and guidelines developed in Willow Sub-basin Area Plan also apply to that portion of the Moose Range. This draft is consistent with the Willow Sub-basin Area Plan.

According to the Alaska Coastal Management Program, Biophysical Boundaries for Alaska's Coastal Zone, the Moose Range is outside of the direct interaction zone, direct influence zone, and the indirect influence zone. Therefore, the Range is outside of the interim coastal zone boundaries.

The major steps used in developing the Matanuska Valley Moose Range Management Plan are as follows:

1. Public issues are identified.
   In April 1985, public meetings were held in Sutton, Anchorage and Palmer to learn about local knowledge of the Range, local problems, land use preferences, and concerns about uses of state lands. Approximately eighty people attended these meetings.

2. Information is gathered and analyzed.
   Information about natural resources, existing land uses, land ownership, economic and social characteristics was gathered, mapped and analyzed. A summary of this information is located in Chapter Two - Resource Description and Evaluation. This step was completed in September 1985.

3. Management alternatives are prepared.
   Alternative plans for use of the resources in the Moose Range were developed. These alternative plans were based on legislative intent, existing state policies, public comments and resource characteristics.

4. Public review of alternatives.
   In November 1985, public comments and preferences on the alternatives were obtained at public meetings. Approximately eighty people reviewed these alternatives at Sutton, Anchorage and Palmer.

5. Draft Plan for State Lands is Prepared.
Using public and agency comments, land uses were determined and the draft management plan was developed. Public review of the draft management plan took place in May 1986.

6. Public Draft Plan is Reviewed.
Public hearings were held to receive comments on the draft management plan in late May of 1986. Meetings were held in Sutton, Anchorage and Palmer. Approximately sixty people attended the meetings.

7. Final plan is prepared.
The final plan recommending management actions and management guidelines was developed in June and July of 1986 and is based on agency and public comments.

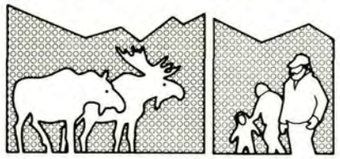
8. Plan is adopted and implemented.
The Commissioners of the DNR and ADF&G approved and adopted the final plan in August 1986. All uses of the state's land and resources in the Matanuska Valley Moose Range over the next twenty years must be consistent with the plan or its ammendments.

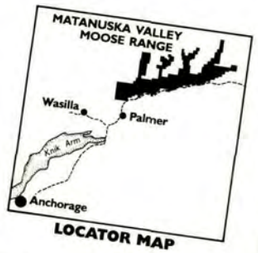
IMPLEMENTATION AND REVISION PROCEDURES

The implementation actions for the management plan are addressed in Chapter Five of this document. The plan may be revised, based upon the established DNR procedures, which are described in Appendix IV on page 225.

MAP 1: LOCATION AND LAND OWNERSHIP

MATANUSKA VALLEY
MOOSE RANGE
MANAGEMENT PLAN





LOCATOR MAP

MOOSE CREEK DRAINAGE

GRANITE CREEK DRAINAGE

KINGS RIVER DRAINAGE

CHICKALOON RIVER DRAINAGE

BOULDER CREEK DRAINAGE

MOOSE RANGE BOUNDARY

R. 1 E. | R. 2 E. | R. 3 E. | R. 4 E. | R. 5 E. | R. 6 E. | R. 7 E.

T. 22 N.
T. 21 N.
T. 20 N.
T. 19 N.
T. 18 N.

Little Susitna River
Moose Creek
Granite Creek
Young Creek
Kings River
Chickaloon River
Boulder Creek
Eska Creek
Matanuska River

GRANITE PEAK △
CASTLE MOUNTAIN △

JONESVILLE ROAD
MURPHY RD.
BUFFALO MINE ROAD
SOAPSTONE RD.
FISHHOOK-WILLOW ROAD
GLENN HIGHWAY
PERMANENTE ROAD
CHICKALOON RIVER ROAD

Sutton
Chickaloon
Palmer

MP 6.7 SUNVALLEY DRIVE
MP 52.8 SOAPSTONE ROAD
MP 53.1 BUFFALO MINE ROAD
MP 54.5 MOOSE CREEK STATE RECREATION SITE
MP 56.7 MOOSE RANGE BOUNDARY SIGN
MP 61 SUTTON AND JONESVILLE ROAD
MP 66.7 KINGS RIVER AND CHICKALOON — KNIK — NELCHINA TRAIL ACCESS
MP 71.8 PERMANENTE ROAD
MP 73 IDA LAKE/FISH LAKE ACCESS ROAD
MP76.0 KING MOUNTAIN STATE REC. SITE
MP 76.2 KING MOUNTAIN LODGE
MP 77.5 CHICKALOON RIVER ROAD
MP 80.8 MOOSE RANGE BOUNDARY SIGN
MP85.3 LONG LAKE STATE RECREATION SITE
MP 89.2 PURINTON CREEK TRAIL

0 1 2 3 miles

LEGEND

LAND OWNERSHIP

- **State** (patent or tentative approval)
- **Matanuska-Susitna Borough**
- **Private**
  - Non-Native
  - Native

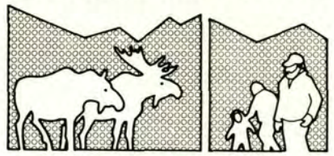
LAND SELECTIONS

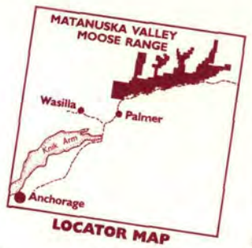
- **State and Native**
- **Native**
- **MENTAL HEALTH GRANT LAND SELECTIONS** (state patent or tentative approval)

- **Moose Range boundary**
- **road**
- **community**
- MP **milepost**

MAP 2: GLENN HWY. REALIGNMENT CORRIDOR / MATERIAL SOURCES

MATANUSKA VALLEY
MOOSE RANGE
MANAGEMENT PLAN





LOCATOR MAP

MOOSE CREEK DRAINAGE

GRANITE CREEK DRAINAGE

KINGS RIVER DRAINAGE

CHICKALOON RIVER DRAINAGE

BOULDER CREEK DRAINAGE

MOOSE RANGE BOUNDARY

GRANITE PEAK

CASTLE MOUNTAIN

JONESVILLE ROAD

MURPHY RD.

BUFFALO MINE ROAD

SOAPSTONE RD.

FISHHOOK-WILLOW ROAD

GLENN HIGHWAY

PERMANENTE ROAD

CHICKALOON RIVER ROAD

Chickaloon

Sutton

Palmer

Little Susitna River

Moose Creek

Granite Creek

Young Creek

Kings River

Eska Creek

Chickaloon River

Boulder Creek

Matanuska River

R. 1 E. | R. 2 E.

R. 2 E. | R. 3 E.

R. 3 E. | R. 4 E.

R. 4 E. | R. 5 E.

R. 5 E. | R. 6 E.

R. 6 E. | R. 7 E.

T. 22 N.

T. 21 N.

T. 20 N.

T. 19 N.

T. 18 N.

MP 6.7 SUNVALLEY DRIVE

MP 52.8 SOAPSTONE ROAD

MP 53.1 BUFFALO MINE ROAD

MP 54.5 MOOSE CREEK STATE RECREATION SITE

MP 56.7 MOOSE RANGE BOUNDARY SIGN

MP 61 SUTTON AND JONESVILLE ROAD

MP 66.7 KINGS RIVER AND CHICKALOON — KNIK — NELCHINA TRAIL ACCESS

MP 71.8 PERMANENTE ROAD

MP 73 IDA LAKE/FISH LAKE ACCESS ROAD

MP76.0 KING MOUNTAIN STATE REC. SITE

MP 76.2 KING MOUNTAIN LODGE

MP 77.5 CHICKALOON RIVER ROAD

MP 80.8 MOOSE RANGE BOUNDARY SIGN

MP85.3 LONG LAKE STATE RECREATION SITE

PURINTON CREEK TRAIL

0 1 2 3 miles

LEGEND

DOT/PF REALIGNMENT CORRIDOR STUDY AREA

HIGHWAY ROUTE WITH PROPOSED ALTERNATIVES
(represents approximately 1,000 foot alignment study width)

- **Preliminary Alignment**
- **Alternatives**

LAND STATUS

- **Private** (native & non-native) **& Borough Owned Land**
- **Selected Land** (State and/or Native)
- **State Land** (patent or tentative approval)

MATERIAL SITES

- **Active DOT/PF Interest**
- **No Active DOT/Interest**
- **Potential Material Sites**

map compiled by DOT/PF (6-85)

CHAPTER 2

RESOURCE DESCRIPTION AND EVALUATION

2. RESOURCE DESCRIPTION AND EVALUATION

The following resource descriptions and evaluations were developed by the corresponding Division members on the planning team. While reading this chapter, the reader should reference the relevant resource maps and figures which generally follow each individual resource section. Additional supplementary information is available in the Southcentral Regional Office files, DNR, DLWM, SCRO, Frontier Building, Room #1080, 3601 C Street, Anchorage, Alaska 99510.

The purpose of this chapter is to provide the necessary background to help the reader understand the basis of the decisions made in the plan about future land uses and management policies.

Please note, the Division of Mining (DOM) and the Division of Geological and Geophysical Surveys (DGGS) were two separate Divisions within the Department of Natural Resources when the plan was developed in 1985-86. In July 1986, the two Divisions were merged into one -- the Division of Mining and Geology (DOMG). The implementation actions for mining and geology-related functions in Chapter Five will now be performed by DOMG.

The heritage resource analysis function was within the Division of Geological and Geophysical Surveys (DGGS) when the plan was developed in 1985-86. This function was transferred to the Division of Parks and Outdoor Recreation in July 1986. The implementation actions for heritage resource related functions in Chapter Five will now be performed by DOPOR.

FISH AND WILDLIFE

RESOURCE DESCRIPTION

The Matanuska Valley Moose Range supports a variety and abundance of fish and wildlife (see Map 3, page 23 and Tables 1 and 2, pages 18 and 19). Generally speaking, approximately 134 species of birds (See Checklist of Birds -- Palmer Area by M. T. Bronson), 14 species of fish and 28 species of mammals are inhabitants or migrants in the Moose Range. The diversity and abundance of fish and wildlife reflect the variety and productivity of available habitats that provide food, cover, water and reproductive areas for these species. Moose Range habitats include river floodplains, riparian areas, deciduous, coniferous and mixed forests and woodlands, shrublands, grasslands, forb communities, muskegs, rivers, streams, lakes, wetlands and a variety of tundra plant communities.

Moose, the most abundant large ungulate (hoofed) species found within the Moose Range, are year-round residents. The highest moose densities occur where habitat disturbance resulting from landslides, forest fires, clearing, flooding or timber cutting has created paper birch, willow and aspen vegetation in an early seral growth stage. Disturbed vegetative habitats produce larger volumes of palatable moose forage, which in turn result in greater seasonal growth and better physical condition of moose. Eventually the area will support a much larger moose population as a result of the habitat enhancement program.

In a 1981 ADF&G (post-hunting season) aerial survey, 508 moose were seen in portions of the Moose Range. Based on this information and other moose density estimates from Susitna basin studies, the Moose Range moose population is estimated to be less than 1,000 moose. The 1986 aerial survey projects the moose population to be between 426 and 986. ADF&G used the 1986 aerial survey data to determine the preliminary high density mose wintering areas shown on Map 3, page 23.

There is a general distribution of brown and black bear throughout the area, with high brown and black bear occurances in the eastern third of the Range, some brown bear occurrences in upper drainages and some black bear occurrences in the southcentral section of the Range. The Range supports a general distribution of Dall sheep, with a known important lambing area on Puddingstone Hill. Wolves are known to be in the middle and upper reaches of some drainages.

Other wildlife species which inhabit the Moose Range include wolverine, mountain goat, caribou, coyote, land otter, fox, marten, beaver, mink, weasel, lynx, hare, red squirrel, porcupine, three species of ptarmigan and spruce grouse. See Table 1, page 18, for the wildlife inventory. In addition, several important raptors such as the peregrine falcon, gyrfalcon, and bald and golden eagle nest, hunt and/or migrate through the area. Peregrine falcons and bald eagles are protected under existing Federal Laws, which apply within the Moose Range.

Migrant and resident fish found within the Moose Range include chinook, coho, and chum salmon, rainbow trout, Dolly Varden, arctic grayling, round whitefish, burbot, three-spine stickleback, nine-spine stickleback, and the longnose sucker. The important sport fishing species include chinook, coho and chum salmon, rainbow trout, Dolly Varden, and arctic grayling. See Table 2, page 19 for species occurring in specific waters within the Range. More information about fish and wildlife species can be derived through the use of the ADF&G Fish and Wildlife Resources Element for the Susitna Area Planning Study and A Guide to Wildlife Viewing in Alaska in conjunction with Map 4, page 27, on vegetation.

Table 1: WILDLIFE INVENTORY

SPECIES	SURVEYS		HARVEST		EFFORT IN DAYS		# HUNTERS
	Unit 14A	Unit 13	West 14A	East 13	West 14A	East 13	
Moose	706± 280 (1986)	N/A	104-130 Range from surveys 1981 to 1984	12-25 Range from surveys 1981 to 1984	2500-3000 Range from surveys 1981 to 1984	100+ est.	334 * (1981)
Sheep	30 counted in range 20 adjacent	30 counted in range 600 adjacent	N/A	N/A	374 (1981)	262 (1981)	108 (1981)
Goat	1 counted in range 15 adjacent	2 counted in range 15 adjacent	N/A	N/A	N/A	N/A	N/A
Caribou	No surveys. Present, not abundant	30-15 est. (1981)	N/A	9 (1981)	N/A	18 (1981)	9 (1981)
Brown Bear	No Surveys Present, not abundant (No techniques available)		yes N/A	yes N/A	yes N/A	yes N/A	yes N/A
Black Bear	No Surveys Present and common (No techniques available)		yes N/A	yes N/A	yes N/A	yes N/A	yes N/A
Small Game	No Surveys Present and common (No techniques available)		yes N/A	yes N/A	yes N/A	yes N/A	yes N/A
Furbearers	No Surveys Present and common (No techniques available)		yes N/A	yes N/A	yes N/A	yes N/A	yes N/A

N/A = Numbers Not Available

* = Tickets Returned

Compiled by ADF&G 12-85

Table 2: FISH INVENTORY

WATERBODY	ANADROMOUS FISH (Escapment)			RESIDENT FISH			Effort
	Chinook	Coho	Chums	Dolly Varden	Rainbow	Grayling	(Angler Days)
Wasilla Creek	200-300	500-4000	--	P	P	--	4500-6260 est.
Moose Creek	400-600	100	?	P	P	--	500-1000 est.
Eska Creek	?	P	P N/A	P	?	?	500± est.
Granite Creek	P N/A	P N/A	P N/A	P	?	?	?
Boulder Creek	?	?	P N/A	?	P	P	?
Kings River	P N/A	?	P N/A	P	P	?	500± est.
Chickaloon River	?	P N/A	P N/A	P	P	P	?
Slipper Lake	--	--	--	--	P	?	
Fish Lake	--	--	--	--	P	--	?
Wishbone Lake	--	--	--	--	P	--	?
Seventeen Mile Lake	--	--	--	--	?	P	?
Chain Lakes	--	--	--	--	P	?	?

N/A = Numbers Not Available ? = Presence Undetermined P = Present -- = Not Present

Compiled by ADF&G 12-85 through personal communications with Larry Engel, and ADF&G Regional Guides.

RESOURCE EVALUATION

The Matanuska Valley Moose Range is readily accessible from the Glenn Highway, spur roads and a number of trails which are found in the vicinity of Moose Creek, Sutton, Jonesville, Kings River, Chickaloon River and Purinton Creek. Because of relatively good access, high moose densities and close proximity to Anchorage and Palmer/Wasilla hunters, the Moose Range is a very popular moose hunting area. An analysis of returned hunter harvest tickets indicates that approximately 334 hunters spent 1,579 user-days to harvest 105 moose from the Moose Range in 1981. Extrapolation of these numbers to account for hunters who did not return their harvest tickets indicates up to 878 hunters spent up to 4153 user-days, harvesting up to 276 moose. This effort occurred from the Moose Creek drainage to Young Creek. Sixty-three percent of the moose hunters were from the Anchorage area, 34% were from the Palmer/Wasilla area, and 3% were from other areas. This illustrates the high demand and importance of this land for providing public hunting opportunities near these population centers.

The economic value associated with moose hunting in the Susitna basin for 1981 includes an estimated net expenditure of $208,000 by hunters for recreational equipment, lodging, etc., and $1,034,000 as the replacement protein food value for moose meat (Appendix B, Chapter I, Table 31, Fish & Wildlife Resources Element for the Susitna Area Planning Study, 1984).

Sport fishing for all species, except chinook (king) salmon, is permitted in the Range, and the fish populations support considerable recreational use. ADF&G estimates 500 to 1,000 user-days on Moose Creek in 1982 (see Table 2, page 19). Wasilla Creek, a popular fishing stream, originates in the Moose Range. Estimated user-days on Wasilla Creek are from the portion lying outside of the Moose Range. No sport fishing data are available for Eska Creek, Granite Creek, Boulder Creek, Kings River or the Chickaloon River. However, ADF&G estimates that total sport fishing effort on these creeks, other than Moose Creek, ranges between 500 to 1,000 user-days annually (personal communication with D. Watzjold). Fish harvested are predominantly Dolly Varden, but arctic grayling, whitefish, coho and chum salmon are occasionally caught.

Although some sport fishing for Dolly Varden occurs on each of the above streams within the confines of the Moose Range, a majority of the sport fishing effort occurs just outside of the Moose Range boundary near each stream's confluence with the Matanuska River. Year-round sport fishing for rainbow trout occurs on Seventeen Mile and Wishbone Lakes (personal communication with L. Engel.).

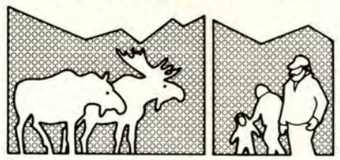
The distance traveled to these streams and lakes, and the number of recreational users represent an important local economic interest and deep rooted public concern for the resource. The economic analysis conducted on the Willow Creek sport fishery in 1980 by ADF&G concluded that the public's "willingness to sell" one pink salmon fishing day amounted to $140.00. (Appendix A, Fish & Wildlife Resources Element for the Susitna Area Planning

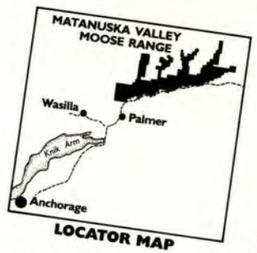
Study, 1984). The Willow Creek Study shows that fishing for chinook or rainbow trout has a higher recreational value than for pink salmon or Dolly Varden. Applying the fishing-day value derived for pink salmon times the number of fishing days annually to all species harvested in the streams originating in the Matanuska Valley Moose Range indicates the following: the value of the anglers' willingness to sell their sport fishing opportunities originating in the Moose Range varies between $492,000 and $983,000 annually.

Public use is expected to increase within the Moose Range as the human population increases and access to adjoining private lands is restricted. Whether the use is by hunters, trappers, wildlife viewers, firewood cutters, persons fishing, snowmachiners, and/or hikers, there will be times when certain uses will need to be restricted to protect sensitive habitats for fish and wildlife resources. Within the Moose Range, such habitat includes: moose winter range, moose breeding areas, Dall sheep lambing areas, riparian lake and stream habitats, stream banks and waterfowl nesting areas.

MAP 3: FISH AND WILDLIFE RESOURCES

MATANUSKA VALLEY
MOOSE RANGE
MANAGEMENT PLAN





MOOSE CREEK DRAINAGE

GRANITE CREEK DRAINAGE

KINGS RIVER DRAINAGE

CHICKALOON RIVER DRAINAGE

BOULDER CREEK DRAINAGE

MOOSE RANGE BOUNDARY

GRANITE PEAK

CASTLE MOUNTAIN

JONESVILLE ROAD

MURPHY RD.

BUFFALO MINE ROAD

SOAPSTONE RD.

FISHHOOK-WILLOW ROAD

GLENN HIGHWAY

CHICKALOON RIVER ROAD

PERMANENTE ROAD

Little Susitna River
Moose Creek
Granite Creek
Young Creek
Kings River
Esko Creek
Chickaloon River
Boulder Creek
Matanuska River

Sutton
Chickaloon
Palmer

R. 1 E. | R. 2 E. | R. 3 E. | R. 4 E. | R. 5 E. | R. 6 E. | R. 7 E.

T. 22 N.
T. 21 N.
T. 20 N.
T. 19 N.
T. 18 N.

MP 6.7 SUNVALLEY DRIVE
MP 52.8 SOAPSTONE ROAD
MP 53.1 BUFFALO MINE ROAD
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MP 56.7 MOOSE RANGE BOUNDARY SIGN
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MP 71.8 PERMANENTE ROAD
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MP 76.2 KING MOUNTAIN LODGE
MP 77.5 CHICKALOON RIVER ROAD
MP 80.8 MOOSE RANGE BOUNDARY SIGN
MP85.3 LONG LAKE STATE RECREATION SITE
MP 89.2 PURINTON CREEK TRAIL

0 1 2 3 miles

LAND STATUS

- **Private** (native & non-native) **& Borough Owned Land**
- **Selected Land** (State and/or Native)
- **State Land** (patent or tentative approval)

LEGEND (within Moose Range)

MOOSE

- (G) **General Distribution**
- (R) **Rutting Distribution**
- (W) **Winter Distribution**
- (wr) **Winter Range**
- **Moose Harvested (1981-1984)** (No data available east of Chickaloon River)
- **Mineral Lick Areas**
- **Preliminary High Density Moose Wintering Areas (1986)**

- **GENERAL DALL SHEEP DISTRIBUTION**
- **GENERAL CARIBOU DISTRIBUTION**
- **ANADROMOUS AND/OR STOCKED FISH**

map compiled by ADF&G (8-85)

FORESTRY

RESOURCE DESCRIPTION

The forest resource potential in the Matanuska Valley Moose Range has not been completely assessed. The limited data available, including the Susitna Basin Study, and reconnaissance of commercial and personal-use sale areas covers only that portion of the range west of the Buffalo Mine Road. In addition to this, there is some data that describes the forest lands owned or selected by the Chickaloon Moose Creek Native Association along the Kings, Chickaloon, and Matanuska Rivers. Aerial photography analysis of vegetation types has been completed, but on-the-ground field analysis has not yet been performed. This data indicates that there are areas within the Range that can be managed for forest products. These areas can be subdivided into three zones, which are described below and are also shown on Map 4, page 27.

Zone 1: High potential - These areas are below 1000 feet in elevation. These areas are covered by a mixed forest of paper birch, quaking aspen and white spruce. The spruce volumes will average around 500-1,000 board feet per acre, sometimes running as high as 1,500 board feet per acre. The birch averages about 8 to 10 cords per acre, with highs approaching 15 cords. The aspen will average around 2 to 3 cords per acre, with some almost-pure stands containing as high as 10 to 15 cords per acre. There may be stands of black cottonwood along some of the larger drainages. In rare cases these may reach as high as 20,000 gross board feet per acre. Averages will be much lower, usually around 5,000-10,000 board feet per acre.

Zone 2: Moderate potential - These areas are usually located between 1,000 and 1,500 feet in elevation. They are typically covered by a mixed forest but may contain areas of almost-pure stands of aspen, birch, spruce or cottonwood. The volumes are generally less than similar stands growing in Zone 1. This is a result of poorer form usually encountered at these elevations. Mixed stands will usually be located nearer the lower elevations, with almost-pure stands occurring at near 1,500 feet. Volumes range around 300 to 500 board feet of spruce per acre, 5 to 8 cords of birch per acre, and 2 to 3 cords of aspen per acre, in the mixed stands. The pure stands will usually run at 800 to 1000 board feet per acre for spruce, 10 to 12 cords per acre for birch, and 10 to 12 cords per acre for aspen.

Zone 3: Low potential - These stands are located above 1,500 feet in elevation. They are broken into "fingers" with open grasslands or shrublands between the stands. The forested areas consist primarily of pure stands of white spruce, cottonwood, aspen and sometimes birch. They will be bordered by willow or alder, which in turn is generally bordered by alpine tundra or grass.

Expected volumes will be considerably less than similar stands in the other forested zones within the Moose Range. These stands will be less dense, resulting in a grass understory.

RESOURCE EVALUATION

Growth rates in Zone 1 are very good, with potential growth being excellent relative to Zones 2 and 3. Regeneration can usually be accomplished easily with scarification. Form is generally good with many straight stems and light branching.

Growth is poor to moderate in Zone 2, with a moderate-to-high potential for improvement. Regeneration may be difficult, due to the competition from grass on most sites in this zone. Intensive silvicultural practices and/or planting may be required to properly regenerate, especially at the higher elevations. Timber quality may be lower than Zone 1 as a result of climatic conditions and more open stand features.

Regeneration in Zone 3 may be difficult to very difficult. More often than not, intensive silvicultural practices will be required, usually followed by planting to ensure a proper stand. Growth rates will be slow. Diameter growth will be high relative to growth in height, causing the trees to appear very conical, resulting in poor form and less volume per tree than that found at lower elevations. Trees may often be "wolf" trees with many large branches, reducing the timber quality.

The current market situation, coupled with the present knowledge of regeneration requirements, allows Zone 1 and the lower portions of Zone 2 to be managed for timber products at this time. A significant change in the market situation, such as the development of a chip market, combined with improved access and regeneration techniques, may allow some operation up to about 2,000 feet, especially in the eastern portion of the Moose Range. Higher elevations are likely to remain inoperable due to climatic conditions which have precluded natural aforestation.

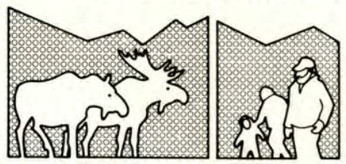
The forest resource, although providing valuable moose habitat, can provide more valuable habitat than it is providing at present. Forest management will clearly augment the availability of forage for browse species. For example, as a mature stand is harvested the plants that quickly regenerate are preferred for browse. Subsequently, moose populations may increase.

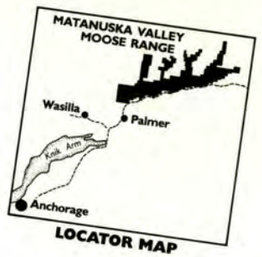
The locations of timber harvest/habitat enhancement are limited as a result of determining factors such as environmental considerations (water quality, potential soil erosion, critical wildlife habitat, etc.), access and market demand. Areas that have been determined suitable for harvest are identified in the five-year timber harvest/habitat enhancement schedule in Chapter Four, on pages 151-161, 174-178, and 189-190. Timber sales will be offered in these areas for both commercial and personal uses. More detailed studies or changes in the determining factors may increase or decrease the acreages, exact locations of the sites and the date of offering.

Resource development, like opening of material sites, road construction and mineral development, may create additional areas in which timber harvest will be encouraged in order to utilize the resource prior to the primary development.

MAP 4: FOREST AND GRAZING RESOURCES

MATANUSKA VALLEY
MOOSE RANGE
MANAGEMENT PLAN





LOCATOR MAP

MOOSE CREEK DRAINAGE

GRANITE CREEK DRAINAGE

KINGS RIVER DRAINAGE

CHICKALOON RIVER DRAINAGE

BOULDER CREEK DRAINAGE

MOOSE RANGE BOUNDARY

R. 2 E. | R. 3 E. | R. 4 E. | R. 5 E. | R. 6 E. | R. 7 E.

T. 22 N.
T. 21 N.
T. 20 N.
T. 19 N.
T. 18 N.

Little Susitna River
Moose Creek
Granite Creek
Young Creek
Kings River
Boulder Creek
Matanuska River

GRANITE PEAK
CASTLE MOUNTAIN

1500'
1000'

MURPHY RD.
BUFFALO MINE ROAD
JONESVILLE ROAD
SOAPSTONE RD.
FISHHOOK-WILLOW ROAD
GLENN HIGHWAY
CHICKALOON RIVER ROAD
PERMANENTE ROAD

Sutton
Chickaloon
Palmer

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MP85.3 LONG LAKE STATE RECREATION SITE
MP 89.2 PURINTON CREEK TRAIL

0 1 2 3 miles

LEGEND

FORESTRY -vegetation dominated by:

- Aspen, Balsam Poplar or Black Cottonwood
- White Birch less than 11" DBH
- White Birch greater than 11" DBH
- White Spruce less than 9" DBH
- White Spruce greater than 9" DBH

FORESTRY ZONES

- Less Than 1000' Elevation
- 1000' to 1500' Elevation
- Greater Than 1500' Elevation

GRAZING -vegetation dominated by:

- Grasses and Forbs

OTHER -vegetation dominated by:

- Shrubs, Lichens, Wetlands, Bare Areas (no-vegetation), etc.

map compiled by DGGS (5-85)

SUBSURFACE RESOURCES

RESOURCE DESCRIPTION

A portion of the Matanuska Coal Field lies within the Matanuska Valley Moose Range. The coal field, as delineated by the Alaska Division of Geologic and Geophysical Surveys, lies in a band approximately 42 miles long and 6 miles wide on the north side of the Matanuska River. This band of coal also extends outside of the Moose Range, south of the Matanuska River and east of the Moose Range boundary. The coal field is specifically described as Townships 19 through 21 North, Ranges 2 through 8 East, Seward Meridian.

The State Division of Geological and Geophysical Surveys has determined that approximately 75,000 acres of the Matanuska Coal Field within the Moose Range has moderate-to-high potential for coal development. That is slightly more than half of the total of 132,500 acres in the Moose Range. The land was consequently designated "competitive" for leasing purposes. Currently, there are ten existing state coal leases, encompassing approximately 8,383 acres, in the Matanuska Valley Moose Range. Commercial development of the field is expected (see Map 5a and 5b, pages 33 and 35).

In the Moose Range, it is estimated that at least 100 million tons of coal are present, of which 32.5 to 60 million tons are potentially able to be mined. The coal deposits are located in the 3,000 foot thick Chickaloon Formation, a Paleocene sequence composed of claystones, siltstones, sandstones, and conglomerates. There are up to 30 coal beds within the upper half of the formation ranging from several inches to more than 10 feet thick.

The Chickaloon Formation is overlain by the Wishbone and Tsadaka Formations, up to 1,800 and 450 feet thick, respectively. The Chickaloon Formation is exposed on the limbs of a syncline whose axis runs along the center of Wishbone Hill.

Limestone and haydite sources are also known to be present in the Range. (Haydite is used to make strong, yet lightweight, concrete.) Map 5a on page 33 shows the location of these resources. Both are expected to be of a marketable type and amount. Placer deposits do exist, though in limited amounts. There are limited oil and gas resources in the Range.

RESOURCE EVALUATION

The coal in the Moose Range is among the highest quality found in Alaska. This coal compares favorably with that found in the Lower 48. The Matanuska coal field is among the smallest in Alaska, and by itself could not sustain long-term, large-scale production for export. However, because of the high coal quality, history of production, and access to transportation facilities, the Matanuska Valley may help lead the way into the Pacific Rim export market.

There are a variety of scenarios that could occur regarding the Matanuska coal in the Moose Range. Evaluation is difficult because it is impossible to predict the exact future of coal development due to coal's direct dependence on the marketplace. To focus on one individual development would be misleading. Because of the quality and quantity of coal resources, it is necessary to visualize the Matanuska Valley Moose Range encompassing a variety of coal development at different levels in the future.

Under favorable conditions, a coal lease within the Moose Range can be brought into production in six to ten years. Coal from recently acquired leases may be on the market as soon as 1992. By then the market for Alaskan coal may be much stronger.

Local power is one potential use of Matanuska coal. Several firms have been actively exploring and mapping coal deposits on existing leases and have been preparing development outlines. Other firms, foreign and domestic, have advised the Division of Mining that they are interested in Alaskan coal in general and the Matanuska Valley in particular.

Private development of the Wishbone Hill coal is estimated to have a 3-year construction period employing an average of 300, with a peak of 500 personnel. The mining operation would hire approximately 100 and, if a power plant is constructed, the total employment would be even greater.

Renewed coal mining within the Moose Range will produce a revenue boost to the local and regional economy. If coal development occurs on existing and new leases, revenues from lease rentals, bonuses, production royalties, corporate income taxes, and mining license taxes will accrue to the state. The federal government will also receive a 35-cent-per-ton fee on any surface coal production for reclamation purposes. The state may use 50% of this fee for reclaiming abandoned mines, for experimental mining practices and construction of related infrastructure. The state and local governments may also levy a tax on the property value of a coal operation.

The state may hold additional coal lease sales in the Matanuska Coal Field during the next several years. By offering coal, the state is giving the private sector the opportunity to evaluate the coal resource with regard to the market. With a long-term lease, mining firms will be able to confidently invest in the planning, permitting, exploration and development necessary to support appropriate economic decisions.

Geologic factors in the Moose Range which might limit the coal's marketability are: 1) a discontinuity of coal beds because of lenticularity (pinch and swell), numerous faults (some with large displacement), and intrusions of igneous rock in the coal-bearing strata; 2) existing impurities (ash); and 3) the steep angle of dip of some coal beds.

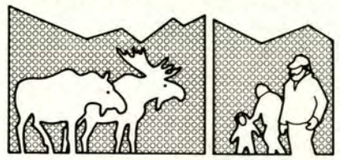
Historically, coal production ceased in the Matanuska Valley not because the resource was exhausted or difficult to mine, but because the market evaporated; diesel engines replaced steam locomotives, and the power plants at Fort Richardson and Elmendorf Air Force Base converted from coal to natural gas. The local market for residential heating has not been large enough to sustain significant coal production in the Matanuska region since 1968.

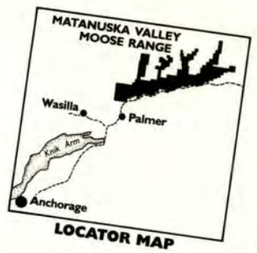
Analysis of the Moose Range also shows limestone and haydite as two other known subsurface resources that may have potential for development. The locations of these resources are shown on Map 5a, page 33. Analysis shows the potential for placer development to be low. Overall, not enough is known about the mineral potential within the Range.

The DNR, Division of Geological and Geophysical Surveys determined the oil and gas potential to be non-existant in areas north of the Castle Mountain fault and low potential to the south. It is unlikely marketable oil and gas resources will be located within the Moose Range.

MAP 5a: SUBSURFACE RESOURCES & LEGAL DESIGNATIONS

MATANUSKA VALLEY
MOOSE RANGE
MANAGEMENT PLAN





LOCATOR MAP

MOOSE CREEK DRAINAGE

GRANITE CREEK DRAINAGE

KINGS RIVER DRAINAGE

CHICKALOON RIVER DRAINAGE

BOULDER CREEK DRAINAGE

R. 1 E. R. 2 E. R. 3 E. R. 4 E. R. 5 E. R. 6 E. R. 7 E.

T. 22 N.
T. 21 N.
T. 20 N.
T. 19 N.
T. 18 N.

MOOSE RANGE BOUNDARY

Little Susitna River
Moose Creek
Granite Creek
Young Creek
GRANITE PEAK
CASTLE MOUNTAIN
Kings River
Chickaloon River
Boulder Creek
Matanuska River
Eska Creek

No Oil & Gas Potential
Low Oil & Gas Potential

TMSUD

JONESVILLE ROAD
MURPHY RD.
BUFFALO MINE ROAD
SOAPSTONE RD.
FISHHOOK-WILLOW ROAD
GLENN HIGHWAY
PERMANENTE ROAD
CHICKALOON RIVER ROAD

Sutton
Chickaloon
Palmer

MP 6.7 SUNVALLEY DRIVE
MP 52.8 SOAPSTONE ROAD
MP 53.1 BUFFALO MINE ROAD
MP 54.5 MOOSE CREEK STATE RECREATION SITE
MP 56.7 MOOSE RANGE BOUNDARY SIGN
MP 61 SUTTON AND JONESVILLE ROAD
MP 66.7 KINGS RIVER AND CHICKALOON—KNIK—NELCHINA TRAIL ACCESS
MP 71.8 PERMANENTE ROAD
MP 73 IDA LAKE/FISH LAKE ACCESS ROAD
MP76.0 KING MOUNTAIN STATE REC. SITE
MP 76.2 KING MOUNTAIN LODGE
MP 77.5 CHICKALOON RIVER ROAD
MP 80.8 MOOSE RANGE BOUNDARY SIGN
MP85.3 LONG LAKE STATE RECREATION SITE
MP 89.2 PURINTON CREEK TRAIL

0 1 2 3 miles

LEGEND

SUBSURFACE RESOURCES

- State Coal Patent Lands (Surface is Private or Borough)
- Haydite Shale Deposits
- Limestone Deposits
- Potential Sites for Coal Power Plant
- Oil & Gas Potential
- Coal Deposits
  - High Value
  - Moderate Value
  - Low Value

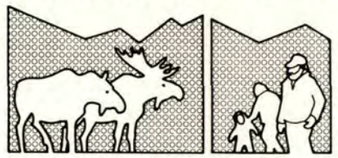
LEGAL DESIGNATIONS

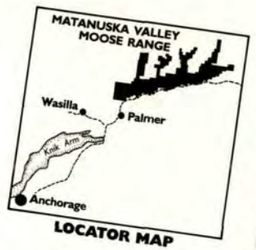
- Moose Creek Reserve Special Use District
- Talkeetna Mountains Special Use District (TMSUD)
- Competitive Coal Lands
- Coal Leases
- Mining Claims
- Mineral Leasehold Order #2

map compiled by DOM (8-85)

MAP 5b: 1984 COAL LEASE TRACTS

MATANUSKA VALLEY
MOOSE RANGE
MANAGEMENT PLAN





MOOSE CREEK DRAINAGE

GRANITE CREEK DRAINAGE

KINGS RIVER DRAINAGE

CHICKALOON RIVER DRAINAGE

BOULDER CREEK DRAINAGE

R. 2 E. | R. 3 E.

R. 3 E. | R. 4 E.

R. 4 E. | R. 5 E.

R. 5 E. | R. 6 E.

R. 6 E. | R. 7 E.

R. 1 E. | R. 2 E.

T. 22 N.
T. 21 N.
T. 20 N.
T. 19 N.
T. 18 N.

MOOSE RANGE BOUNDARY

Little Susitna River

Moose Creek

Granite Creek

Young Creek

Kings River

Chickaloon River

Boulder Creek

Matanuska River

Eska Creek

GRANITE PEAK

CASTLE MOUNTAIN

JONESVILLE ROAD

MURPHY RD.

BUFFALO MINE ROAD

SOAPSTONE RD.

PERMANENTE ROAD

CHICKALOON RIVER ROAD

FISHHOOK-WILLOW ROAD

GLENN HIGHWAY

1 2 3 4 5 6 7 8 9

Sutton

Chickaloon

Palmer

MP 6.7 SUNVALLEY DRIVE

MP 52.8 SOAPSTONE ROAD

MP 53.1 BUFFALO MINE ROAD

MP 54.5 MOOSE CREEK STATE RECREATION SITE

MP 56.7 MOOSE RANGE BOUNDARY SIGN

MP 61 SUTTON AND JONESVILLE ROAD

MP 66.7 KINGS RIVER AND CHICKALOON – KNIK – NELCHINA TRAIL ACCESS

MP 71.8 PERMANENTE ROAD

MP 73 IDA LAKE/FISH LAKE ACCESS ROAD

MP76.0 KING MOUNTAIN STATE REC. SITE

MP 76.2 KING MOUNTAIN LODGE

MP 77.5 CHICKALOON RIVER ROAD

MP 80.8 MOOSE RANGE BOUNDARY SIGN

MP85.3 LONG LAKE STATE RECREATION SITE

MP 89.2 PURINTON CREEK TRAIL

0 1 2 3 miles

LAND STATUS

- **Private** (native & non-native) **& Borough Owned Land**
- **Selected Land** (State and/or Native)
- **State Land** (patent or tentative approval)

LEGEND

1984 COAL LEASE TRACTS

- **1984 Coal Lease Tracts**
- **1984 Tracts That Sold (4, 5, & 7)**
- **Existing Leases (in 1984)**

RECREATION

RESOURCE DESCRIPTION

The lands now designated as the Moose Range have been used by the public for dispersed recreational activities for years. The recreational land base of the area is extensive, including several large river valleys and small streams traversing diverse vegetation, geological and wildlife habitat types. The outstanding mountain scenery and scenic views of Castle Mountain and Granite Peak are some of the many valuable recreational resources (see Map 6, page 39).

The abundance of wildlife in the Moose Range make the area popular for hunting of moose, black and brown bear, Dall sheep, varying hare, grouse, and ptarmigan; trapping of a variety of furbearers; and wildlife viewing. Fishing for salmon, Dolly Varden and rainbow trout is popular in the streams. Dolly Varden, grayling and/or rainbow trout are also caught in Seventeen Mile, Wishbone, Fish and Chain Lakes.

Hiking, horseback riding, cross-country skiing and snowmachining extend into the most remote areas of the Moose Range. Two, three and four-wheel driving and off-road vehicle use are common on Permanente Road, Buffalo Mine Road, old mining roads near Sutton and along Boulder Creek. Whitewater kayaking and rafting is popular on the Chickaloon River. Kings River and Moose Creek both have potential for expert level kayaking. Fossil hunting and rock collecting are popular along Moose Creek, the north side of Wishbone Hill, Chickaloon River and Boulder Creek. Recreational gold panning and dog mushing also occur in the Moose Range along the Chickaloon River.

These dispersed activities generally occur along the existing complex network of trails within the Moose Range. The most popular trails are the Permanente Road, the Chickaloon-Knik-Nelchina Trail, the Chickaloon River Trail, the Boulder Creek Trail and the Young Creek trails. Several old mining roads between Moose Creek and Seventeen Mile Lake are used frequently. For more information about trails see the Transportation and Access section in Chapter Two on page 50.

RESOURCE EVALUATION

People participate in dispersed recreational opportunities on public lands which are readily accessible. Presently, recreational use of the Moose Range is low-to-moderate due to the lack of access, the lack of information available describing a legal public access and the existing trail conditions. In some cases, historic trails, such as the Chickaloon-Knik-Nelchina Trail, are underneath subdivision roads and public access is blocked by private landowners. Currently, no user fees are being imposed by private landowners.

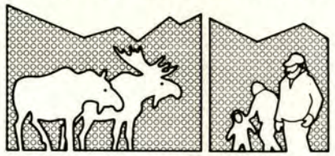
RECREATION

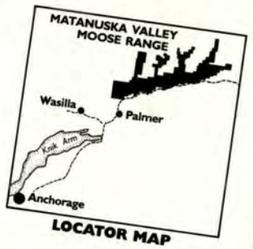
Overall the public use of the area is infrequent, with small groups using the Range for recreation on a limited basis. The public involved in the planning process feels that public recreational use should be allowed to continue as long as it does not adversely effect state efforts to maintain, improve and enhance wildlife populations, particularily moose. The public prefers to keep the area like it is, providing opportunities for rugged, natural backcountry experiences. Peak use of the Range occurs during the fall hunting season.

The state tourism industry can also be supported by maintenance of the scenic view of the Moose Range from the adjacent Glenn Highway. The traveling public is drawn to the Chickaloon Area for the scenic splendor of Castle Mountain and towards Sutton for views of Granite Peak. Views of the Chugach Range to the south are also spectacular. Overall, the rugged mountain scenery along this portion of the Glenn Highway is some of the finest the state has to offer (see Map 6, page 39).

MAP 6: OUTDOOR RECREATION RESOURCES

MATANUSKA VALLEY
MOOSE RANGE
MANAGEMENT PLAN





LOCATOR MAP

MOOSE CREEK DRAINAGE

GRANITE CREEK DRAINAGE

KINGS RIVER DRAINAGE

CHICKALOON RIVER DRAINAGE

BOULDER CREEK DRAINAGE

R. 2 E. | R. 3 E. | R. 4 E. | R. 5 E. | R. 6 E. | R. 7 E.

T. 22 N.
T. 21 N.
T. 20 N.
T. 19 N.
T. 18 N.

MOOSE RANGE BOUNDARY

Little Susitna River
Moose Creek
Granite Creek
Young Creek
Kings River
Chickaloon River
Boulder Creek
Eska Creek
Matanuska River

GRANITE PEAK △
CASTLE MOUNTAIN △

fossils
local

JONESVILLE ROAD
MURPHY RD.
BUFFALO MINE ROAD
SOAPSTONE RD.
PERMANENTE ROAD
CHICKALOON RIVER ROAD
FISHHOOK-WILLOW ROAD
GLENN HIGHWAY

Sutton
Chickaloon
Palmer

MP 6.7 SUNVALLEY DRIVE
MP 52.8 SOAPSTONE ROAD
MP 53.1 BUFFALO MINE ROAD
MP 54.5 MOOSE CREEK STATE RECREATION SITE
MP 56.7 MOOSE RANGE BOUNDARY SIGN
MP 61 SUTTON AND JONESVILLE ROAD
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MP 71.8 PERMANENTE ROAD
MP 73 IDA LAKE/FISH LAKE ACCESS ROAD
MP76.0 KING MOUNTAIN STATE REC. SITE
MP 76.2 KING MOUNTAIN LODGE
MP 77.5 CHICKALOON RIVER ROAD
MP 80.8 MOOSE RANGE BOUNDARY SIGN
MP85.3 LONG LAKE STATE RECREATION SITE
MP 89.2 PURINTON CREEK TRAIL

0 1 2 3 miles

LAND STATUS

- **Private** (native & non-native) **& Borough Owned Land**
- **Selected Land** (State and/or Native)
- **State Land** (patent or tentative approval)

LEGEND

OUTDOOR RECREATION RESOURCES

- **Roads (two-wheel drive)**
- **ATV Trails (existing use)**
- **Foot Trails (existing use)**

SCENIC VALUES

- **Viewshed**
- **Scenic Turnout**
- **Potential Scenic Turnout**

GEOLOGIC VALUES

- **Fossils**
- **Geologic Interpretation Site**

FISHING
CAMPING
PICNICKING
SWIMMING

Note: Dispersed motorized and non-motorized outdoor recreation occurs on public lands throughout the entire Moose Range.

map compiled by DOPOR (9-85)

HERITAGE RESOURCES

Numerous historic abandoned mines exist within the Moose Range. The Buffalo and Eska mines are eligible for the National Register of Historic Places. The Alaska Heritage Resources Survey has identified eleven cultural resources within the Moose Range. These include Native grave sites, bridges and mines. The trails traversing the Range have been used historically for many years, specifically and most importantly, the Chickaloon River Trail, the Chickaloon-Knik-Nelchina Trail, the Boulder Creek Trail, the Old 98 Trail and several old mining roads. There are several known heritage sites on private property within the Moose Range.

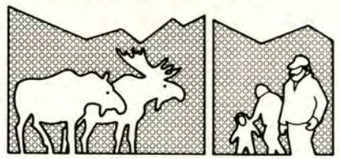
There are other unrecorded resources in the area which are equally important. Contacts made with statewide historians, local citizens and agencies produced very little additional site specific information. To date a complete survey of the Moose Range has not yet been undertaken.

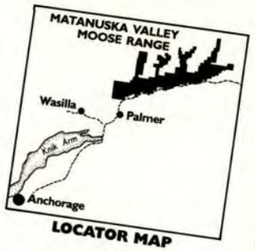
The Moose Range contains cultural resources in many old coal mines, homestead sites, trails and other native sites. These are available for evaluation and may show a need for preservation and identification on the National Register of Historic Places (see Map 7, page 43).

The local Alpine Historical Society in the Sutton-Chickaloon communities is actively involved with researching the mining history of the area. The group is currently developing a mining era museum on a six-acre site in Sutton. This museum, when open to the public, will provide interpretive information about the local mining history.

MAP 7: HERITAGE RESOURCE VALUES

MATANUSKA VALLEY
MOOSE RANGE
MANAGEMENT PLAN





LOCATOR MAP

MOOSE CREEK DRAINAGE

GRANITE CREEK DRAINAGE

KINGS RIVER DRAINAGE

CHICKALOON RIVER DRAINAGE

BOULDER CREEK DRAINAGE

MOOSE RANGE BOUNDARY

GRANITE △ PEAK

CASTLE MOUNTAIN

Little Susitna River

Moose Creek

Granite Creek

Young Creek

Kings River

Eska Creek

Chickaloon River

Boulder Creek

Matanuska River

JONESVILLE ROAD

MURPHY RD.

BUFFALO MINE ROAD

SOAPSTONE RD.

FISHHOOK-WILLOW ROAD

GLENN HIGHWAY

PERMANENTE ROAD

CHICKALOON RIVER ROAD

Palmer

Sutton

Chickaloon

R. 1 E. | R. 2 E.

R. 2 E. | R. 3 E.

R. 3 E. | R. 4 E.

R. 4 E. | R. 5 E.

R. 5 E. | R. 6 E.

R. 6 E. | R. 7 E.

T. 22 N.

T. 21 N.

T. 20 N.

T. 19 N.

T. 18 N.

MP 6.7 SUNVALLEY DRIVE

MP 52.8 SOAPSTONE ROAD

MP 53.1 BUFFALO MINE ROAD

MP 54.5 MOOSE CREEK STATE RECREATION SITE

MP 56.7 MOOSE RANGE BOUNDARY SIGN

MP 61 SUTTON AND JONESVILLE ROAD

MP 66.7 KINGS RIVER AND CHICKALOON—KNIK—NELCHINA TRAIL ACCESS

MP 71.8 PERMANENTE ROAD

MP 73 IDA LAKE/FISH LAKE ACCESS ROAD

MP76.0 KING MOUNTAIN STATE REC. SITE

MP 76.2 KING MOUNTAIN LODGE

MP 77.5 CHICKALOON RIVER ROAD

MP 80.8 MOOSE RANGE BOUNDARY SIGN

MP85.3 LONG LAKE STATE RECREATION SITE

MP 89.2 PURINTON CREEK TRAIL

0 1 2 3 miles

LAND STATUS

Private (native & non-native) **& Borough Owned Land**

Selected Land (State and/or Native)

State Land (patent or tentative approval)

LEGEND

KNOWN CULTURAL VALUES

POTENTIAL CULTURAL VALUES

High Potential

Moderate Potential

TRAILS WITH HISTORIC VALUE

map compiled by DGGS (6-85)

WATER

RESOURCE DESCRIPTION

Almost all surface water runoff within the Matanuska Valley Moose Range drains into the Matanuska River; the exception is upper Wasilla Creek which flows directly into the Knik Arm via the Palmer Slough. Four major tributaries to the Matanuska River pass through the Moose Range. These include the Kings and Chickaloon Rivers and Moose and Granite Creeks. These streams generally flow south through narrow valleys or gorges and have cut canyons into bedrock over the last 10,000 years (see Map 8, page 47).

The headwaters of the Kings and Chickaloon Rivers and Granite Creek originate outside of the Matanuska Valley Moose Range boundary. The headwaters of Moose Creek are located within the Moose Range boundary. All four of the major tributaries have glaciers in their headwaters and most of their annual discharge occurs during the spring and early summer. A large portion of the basin's annual runoff occurs in late spring and early summer months--May and June. Stream discharge decreases during winter because of cold temperatures and ice formation. The minimum discharge occurs during the late winter and sometimes the late summer.

There are several smaller creeks which are direct tributaries of the Matanuska River. These include, but are not limited to, Eska and Little Granite Creeks. Gloryhole and Knob Creeks are tributaries of Eska Creek. Tributaries of the three major streams include Premier Creek, Iron Creek and Buffalo Creek (Moose Creek), Young Creek (Kings River), Boulder, Sawmill, California and Doone Creeks (Chickaloon River). There are numerous unnamed tributaries of all four major streams.

To date, none of the major streams (Moose and Granite Creeks and Chickaloon and Kings Rivers) have continuous flow records. Miscellaneous flow measurements have been recorded by the Division of Geological and Geophysical Survey (DGGS) during April of 1984 (see Appendix VI on page 231). The variety of units and abbreviations used for measuring water use and flow are also defined in Appendix VI.

Eska Creek near Sutton has had miscellaneous discharge measurements taken since 1961 (see Appendix VI on page 231). The peak discharge recorded was on August 10, 1961, at 680 cfs. The minimum record discharge was taken on May 19, 1966, at 7.70 cfs. No discharge measurements are available for the winter months, i.e., October-April.

Miscellaneous water quality samples have been taken on all major streams and Eska Creek between the years 1948 and 1958. The most recent sample was taken on Moose Creek in 1984 for temperature, pH, dissolved oxygen and conductivity by DGGS.

There are numerous lakes within the Moose Range, many of which are unnamed, although they probably have local names. Some of the larger lakes include Wishbone, Seventeen Mile, Slipper, Ruby (Rose), Fish and Drill lakes. All of these lakes are located within three miles of the southern boundary in the Moose Range and seem to be accessible by existing roads or trails. Most of these lakes are surrounded by private lands. Wishbone and Slipper Lakes are surrounded by state lands, and Seventeen Mile Lake has state, borough and private lands adjacent to it.

There is very little groundwater information in any area of the Moose Range east of Granite Creek and only 26 recorded well logs for the area west of Granite Creek, most of which are located around Sutton, within a seven square mile area. These well logs are very sketchy at best and give very little indication of water availability. A display of existing well log information prior to December, 1985 is in Appendix VI on page 231.

These wells range in depth from 21 to 178 feet and show yields of between 1 and 117 gallons per minute. Bedrock was encountered between 2 and 54 feet below the surface. (See Appendix VI on page 231 for more information.)

Also in Appendix VI is a chart showing a number of water rights the state has on file for the Moose Range by township, range and case file number.

Flood hazard is discussed in the Engineering Geology section and areas within the Moose Range with flood hazard are shown on Map 8, page 47.

RESOURCE EVALUATION

Water is a crucial determinant in resource planning and management. Without adequate water supplies, human development becomes impossible, or, at the very least, expensive.

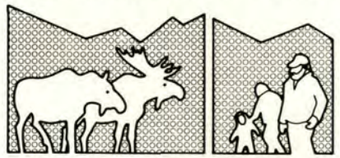
Water has both consumptive and non-consumptive uses. Consumptive uses are recognized for domestic, industrial and commercial activities, while non-consumptive uses include those for fish and wildlife, recreation, mineral development, navigation and transportation.

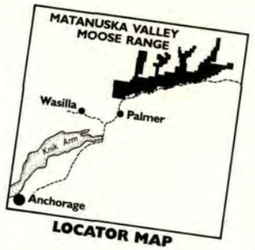
The significance of glaciers in a drainage basin is that they contribute to the water quality problems. Active glaciers produce a heavy sediment load which, without treatment, results in almost undrinkable water. Removal of the sediment is expensive. The water is, however, adequate for use in placer mining, irrigation, recreation, fish and wildlife and other specific purposes.

The hydrology data available at this time is insufficient. Without adequate attention to the quality and supply of this resource, future needs may not be met and development may be difficult.

MAP 8: HYDROLOGY

MATANUSKA VALLEY MOOSE RANGE MANAGEMENT PLAN





LOCATOR MAP

MOOSE CREEK DRAINAGE

GRANITE CREEK DRAINAGE

KINGS RIVER DRAINAGE

CHICKALOON RIVER DRAINAGE

BOULDER CREEK DRAINAGE

MOOSE RANGE BOUNDARY

R. 1 E. | R. 2 E. | R. 3 E. | R. 4 E. | R. 5 E. | R. 6 E. | R. 7 E.

T. 22 N.
T. 21 N.
T. 20 N.
T. 19 N.
T. 18 N.

Little Susitna River
Moose Creek
Granite Creek
Young Creek
Kings River
Chickaloon River
Boulder Creek
Matanuska River
Esko Creek

GRANITE PEAK
CASTLE MOUNTAIN
Chain Lakes
Rush Lake
Bonnie Lake
Long Lake
Fish Lake
Drill Lake
Ruby L.
Thirty Mile Lake
Wishbone Lake
Coyote Lake
Sipper Lake
Seventeen Mile Lake

Chickaloon
Sutton
Palmer

JONESVILLE ROAD
MURPHY RD.
BUFFALO MINE ROAD
SOAPSTONE RD.
FISHHOOK-WILLOW ROAD
GLENN HIGHWAY
PERMANENTE ROAD
CHICKALOON RIVER ROAD

MP 6.7 SUNVALLEY DRIVE
MP 52.8 SOAPSTONE ROAD
MP 53.1 BUFFALO MINE ROAD
MP 54.5 MOOSE CREEK STATE RECREATION SITE
MP 56.7 MOOSE RANGE BOUNDARY SIGN
MP 61 SUTTON AND JONESVILLE ROAD
MP 66.7 KINGS RIVER AND CHICKALOON—KNIK—NELCHINA TRAIL ACCESS
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MP76.0 KING MOUNTAIN STATE REC. SITE
MP 76.2 KING MOUNTAIN LODGE
MP 77.5 CHICKALOON RIVER ROAD
MP 80.8 MOOSE RANGE BOUNDARY SIGN
MP85.3 LONG LAKE STATE RECREATION SITE
MP 89.2 PURINTON CREEK TRAIL

N

0 1 2 3
miles

LAND STATUS

- **Private** (native & non-native) **& Borough Owned Land**
- **Selected Land** (State and/or Native)
- **State Land** (patent or tentative approval)

LEGEND

- STREAMS AND RIVERS
- WATERSHED DIVIDES
- LAKES
- POTENTIAL FLOOD HAZARD AREAS
- MISCELLANEOUS STREAM FLOW AND WATER QUALITY MEASUREMENTS
- SNOW SURVEY SITE
- EXISTING WATER RIGHTS (4-85)
- EXISTING WELL LOG DATA

map compiled by DGGS & DLWM (6-85)

GRAZING

RESOURCE DESCRIPTION

The grazing resource within the Moose Range is dominated by bluejoint grass in several vegetation types. Moderate to high potential grasslands occur above forests near the 1,500 to 2,000 foot elevation in the western portion of the Moose Range. Wetland areas in the Moose Range also contain potential grazing resources, yet have been ranked as having low grazing potential because of possible impacts on the wetland areas through grazing activities (see Map 4 on page 27).

Open Forest (25-60% tree cover) and woodland (10-25% tree cover) birch - spruce forests contain bluejoint and/or shrub understories depending on site histories, conditions, and tree cover. Shrub understories appear to occur on more riparian sites while grass understories occur at higher elevations. Other plant species present in varying amounts include fireweed, cow parsnip, ferns, grasses, sedges, rushes, willow, bunchberry, rose, highbush cranberry, lowbush cranberry, alder, white spruce, paper birch, and aspen. Forbs such as fireweed and ferns are utilized by domestic grazing animals.

Grazing lands with high potential appear to be located mainly in the river valleys and southern-facing slopes and generally lie within the 1,000-2,500 foot elevation level.

Presently, 7,300 acres in the Moose Creek drainage on southern slopes of the Talkeetna Mountains near the western boundary of the Moose Range are under grazing lease or permit.

The Susitna Area Plan noted general areas within the Moose Range as having some potential for grazing. These areas are open to grazing permits and leases under the DNR Department Order 112, Susitna Area Plan regional guidelines and Moose Range guidelines. Field reconnaissance of the Range has shown grazing potential to be limited. (See Map 4 on page 27 for lands with grazing potential.) The existing lease areas near Moose Creek have the highest known potential. Map 10, page 199, shows the location of existing grazing leases and proposed new lease/permit sites.

RESOURCE EVALUATION

From available data, it appears there may be 35,000-45,000 acres of grazing land with potential for grazing lying within the Moose Range; 25,000-35,000 acres occur on state land and 8,000-10,000 acres occur on Native-selected land. Presently, 20-25% of the state grazing lands are being utilized under lease or permit.

Forage analysis indicates that between 7 and 13 acres are needed to support one head of livestock for a four month summer grazing season in this area. The state grazing land may have the potential to provide supplementary summer grazing for approximately 2000 to 5000 head of livestock. Unfortunately, much of the unleased potential grazing lands are located on unstable slopes, in inaccessible locations and in disjointed parcels. The most suitable large acreages of grazing land are already leased or permitted to individuals.

TRANSPORTATION AND ACCESS

RESOURCE DESCRIPTION

On-the-ground access to public lands is a major factor in determining applicable management options. At present, most access is available from the Glenn Highway through strips of private land that abut the highway (see Maps 1 and 6, pages 11 and 32). More specifically, access to the Moose Range is gained via a number of roads and trails, which include: 1) Sun Valley Drive and Wendt Road; 2) Boyd Road; 3) Soapstone Road; 4) Buffalo Mine Road; 5) Mile 58 Road; 6) an unnamed road that leaves the Glenn Highway at Mile 59.9; 7) Jonesville Mine Road; 8) Permanente Road; 9) Fish Lake Subdivision; 10) Castle Mountain Mine Road; 11) Chickaloon River Road; 12) the historic Chickaloon-Knik-Nelchina Trail; 13) Young Creek Trail; 14) Purinton Creek Trail; 15) the historic Chickaloon River Trail; and 16) Boulder Creek Trail (see Map 6 on page 39). Many of the access trails and roads being used by the public are historic mining roads which were constructed during coal exploration in the mid-1900's. The legal status of the rights-of-way of many of these roads or trails is unclear and needs additional research to be verified.

The location of the Glenn Highway is critical to Moose Range access. DOT/PF is in the reconnaissance phase of evaluating the reconstruction of the Glenn Highway adjacent to the Moose Range. Several preliminary alignment alternatives have been identified by the DOT&PF for further study (see Map 2 on page 13). When this highway is reconstructed, portions of it may be realigned. There is a possibility that potential realignment alternatives could affect the southern edge of the Moose Range. The reconnaissance, environmental impact analysis, and design of this project are not expected to be completed in the near future.

The location and design of this highway reconstruction must be approved by the Federal Highway Administration (FHWA) before the project can be developed. Once the FHWA approval has been obtained, the right-of-way acquisition, utility relocation, and construction phases of the project will be carried out when funding is available. Potential scenic turnouts, which will be considered for inclusion when the highway is reconstructed, are identified on Map 6 on page 39. Maintenance or provision of public access to trailheads and public facilities will be addressed during highway reconstruction, when the exact location of the highway realignment is known.

RESOURCE EVALUATION

The state's current position is that there is legal public access to the Moose Range on the following roads or trails: 1) Wendt Road; 2) Boyd Road; 3) Soapstone Road; 4) Buffalo Mine Road and its spur roads; 5) Mile 58 Road; 6) an unnamed road that leaves the Glenn Highway at mile 59.9; 7) Jonesville Mine Road and its spur roads; 8) the Chickaloon-Knik-Nelchina Trail ; 9) Permanente Road; 10) Fish Lake Road; 11) Chickaloon River Road and its spur roads; 12) the Boulder Creek Trail; and 13) the Purinton Creek Trail (a portion of the Chickaloon-Knik-Nelchina Trail).

Trails which traverse through or along private lands include: 1) The partial Arkose Ridge Trail; 2) Upper Moose Creek Road; 3) Premier Mine Road (east of Moose Creek); 4) Mile 58 Road; 5) Seventeen Mile Lake Road; 6) the Chickaloon-Knik-Nelchina Trail; 7) Permanente Road; 8) Chickaloon River Trail; and 9) Purinton Creek Trail (a portion of the Chickaloon-Knik-Nelchina trail). In most cases, private land owners believe that public access does not exist across their property. In many cases, validity determination of public access across private lands requires detailed historical documentation of use, the state's ability to assert public right-of-way and possibly a court decision. For the trails listed above, the state has only begun to research historical documentation and to determine validity.

Consequently the clearest legal access into the Moose Range is found on subdivision roads or roads of long-standing public use. These include Wendt Road, Boyd Road, Soapstone Road, Buffalo Mine Road, an unnamed road that leaves the Glenn Highway at mile 59.9, Jonesville Mine Road, Permanente Road, Fish Lake Road and the Chickaloon River Road.

Table 3: EVALUATION OF ACCESS

The chart below describes the main accesses:

Assertion Priority	Access Trail/Road	Beginning Point	Physical Capability In Dry Areas	Legal Status ** Clear Public Access	Comments
	Arkose Ridge Trail	MP 8.4 Fishhook Road	Undeveloped Trail	No known R/W	• Begin on private land. Only portions of the trail are existing.
	Wendt Road (off Sun Valley Drive)	MP 6.7 Fishhook Road	2-Wheel Drive	Section Line Easement Road	• Public road and section line access - roads in Moose Range are Division of Forestry(DOF) roads.
	Boyd Road	MP 5.8 Fishhook Road	2-Wheel Drive	Section Line ** Easement Road	• This also accesses DOF logging roads.
	MEA R/W off Soapstone Road	MP 52.8 Glenn Highway	4-Wheel Drive	ADL #202787	• This trail follows a power-line to Sutton.
4	*Buffalo Mine Road	MP 53.1 Glenn Highway	2-Wheel Drive	ADL #57529 **	• There are a number of trails that branch off from this Rd.
	Murphy Road	MP 3.3 B. Mine Road	2-Wheel Drive	ADL #56187 **	• Some DOF roads begin here.
	Upper Moose Crk.	MP 5 Buffalo Mine Road	4-Wheel Drive	ADL #56975 **	• Continuation of B. Mine Road-which crosses private land
	Premier Mine Rd. (Baxter Mine Rd.) (and mining roads east to Jones-ville Rd.)	MP 3.6 B. Mine Road	2-Wheel Drive	ADL #52715	• Part may be transferred to CIRI; it is the state's intent to maintain public access. Until determined, present use of road may constitute trespass.
	Mile 58 Road	MP 58 Glenn Highway	2-Wheel Drive	ADL #18704 (partial coverage)	• This is the road to the correctional center and Seventeen Mile Lake.
	Unnamed Road	MP 59.9 Glenn Highway	2-Wheel Drive	Undetermined	• This is an old mining road that goes up to the Jonesville Mine.

Note: See actual case files for status on ADL's

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Table 3: EVALUATION OF ACCESS (continued)

Assertion Priority	Access Trail/Road	Begining Point	Physical Capability In Dry Areas	Legal Status ** Clear Public Access	Comments
	*Jonesville Mine Rd	MP 61 Glenn Highway	2-Wheel Drive	Alaska Railroad R/W **	
	Seventeen Mile Lake Road	MP 1.7 Jonesville	2-Wheel Drive	ADL #52715	• Parts of the R/W were transferred to CIRI.
6	Old Mining Roads (east of Eska Creek)	MP 2.2 Jonesville	4-Wheel Drive	Unknown	Possible RS2477, it is the state's intent to maintain public access.
1	Chickaloon-Knik-Nelchina Trail	MP 66.7 Glenn Highway	Undeveloped 18.5 miles. 2-wheel Drive 2.5 miles.	ADL #52374	• Portions of trail are covered by roads and do not have public rights-of-way.
5	Access Road to Little Granite Creek Bench	MP 64.3 Glenn Highway	2-Wheel Drive	Undetermined	• Possible RS2477 and Potential to upgrade to Borough standards.
2	Permanente Road	MP 71.8 Glenn Highway	4-Wheel Drive	ADL #03131, section line 17B reservations	• This is a well-used ORV trail/road built to explore limestone potential. Parts of R/W were transferred to CIRI and/or CMCNA for admin.
	Fish Lake Road	MP 73 Glenn Highway	2-Wheel Drive	Public subdivision road**	• C-K-N Trail Rd. continues to the east from the road.
	*Chickaloon R. Road	MP 77.5 Glenn Highway	2-Wheel Drive	Alaska Railroad R/W **	
1	C-K-N Trail	MP 1 Chickaloon Road	Undeveloped (to east)	ADL #52374	• C-K-N Trail intersects and continues to the east.
1	Castle Mountain Mine Road	MP 1.5 Chickaloon Road	4-Wheel Drive	ADL #52374	
3	Chickaloon River Trail	MP 1.3 Chickaloon River Rd	Undeveloped	17B reservation RS2477	• Trail crosses through 1 mile of private lands before entering public lands.
	Bonnie Lake Road	MP 83 Glenn Highway	2-Wheel Drive	ADL #27166 **	• Access to state park facility and private homes.
1	Purinton Crk. Trail (a portion of the C-K-N Trail)	MP 89.2 Glenn Highway	2-Wheel Drive	ADL #52374	• Possible RS2477 on private lands (approximately .25 miles at beginning).

* Major Access Routes

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MATERIALS

RESOURCE DESCRIPTION

The Matanuska River and its tributaries contain an abundance of construction materials. Recent glacial and fluvial activity also created many upland landforms composed primarily of construction materials. The materials deposited by water are generally well-sorted beds with particle size ranging from sands and gravels to rocks and cobbles. The glacial deposits are often undifferentiated with particles of all sizes, often including fines (silt and clay particles) found together. Combinations and variations of the above conditions are also common in the geologically active lands of the Moose Range.

Several material deposits are found along all the drainages with large deposits located in the upper drainages of Kings and Chickaloon Rivers and Boulder Creek. Lower Granite Creek also has a large deposit located on private lands. Other private lands along Murphy Road, west of Sutton and near Drill Lake all contain deposits of construction materials. (See Map 11, page 239, for potential construction materials.)

Adjacent to the Moose Range, DOT/PF has several existing material sites located along the Glenn Highway. The Matanuska River floodplain is comprised primarily of construction materials.

RESOURCE EVALUATION

Construction materials are abundant in and adjacent to the Moose Range. A DGGS study indicated 8% or 11,000 acres of the Moose Range as having high potential for materials. An additional 25,000 acres (20%) are rated as having good potential. Further studies conducted by DLWM eliminated sites on private land and sites located 2 miles or more from present access. (The legislation precludes the state from planning on private lands within the Range.) This left 11 sites on state or borough land ranging in size from 20 to 640 acres totaling less than 2% of the Moose Range (see Map 2, page 13). These locations are adequate for planning purposes but field investigation prior to leasing (or permitting) is required to pinpoint the location of the material as well as verify the quantity and quality of the material. Field investigation may also reveal undetected limitations (e.g. springs or bedrock).

Anticipated material demands will be for road maintenance and local use only. DOF may require moderate amounts of materials for development of forest harvest access roads. Presently no large construction projects are planned for the near future in the Moose Range.

Realignment of the Glenn Highway may occur within 20 years. If so, this project may demand large quantities of materials from the Moose Range. Other potential uses of large quantities of materials may be a coal-fired power plant, mineral exploration or development or a hydro-electric project.

The following list of "most suitable" sites begins in the west, where the greatest demand is anticipated, and continues to the east and lesser demand expectations.

Site #1. 80 acres located within the NE1/4, Sec. 4, T18N, R2E, S.M.

This site may be readily accessed off Buffalo Mine Road or from the Soapstone subdivision. The area contains ice contact deposits which have been worked by water thereby reducing the silt content. The hilly terrain means most materials would be above the water table. Mining would be relatively easy and there is good visual screening potential.

Site #2. 80 acres located in the N1/2SE1/4, Sec. 20, T19N, R2E, S.M.

This site is accessed off Murphy Road. The landform is an alluvial fan that slopes to the south. This slope and location (elevation 1100'-1200') may make visual screening of the site from the Glenn Highway difficult. This area may provide access for timber harvest/habitat enhancement projects below Arkose Ridge. Local demand may also be supplied from this site.

Site #3. 20 acres located in N1/2S1/2, Sec. 27, T19N, R2E, S.M.

This site is accessed from Premier Mine Road or from Elks Lake. The landform is an esker which indicates the source may be limited in extent. Despite this, the site may prove useful for timber harvest/habitat enhancement or mineral exploration and development roads in the area. Materials for the potential power plant may have to come from other sources. Shallow depth to the water table and difficulty in screening are not expected at this site.

Site #4. 320 acres located in S1/2, Sec. 21, T19N, R3E, S.M.

This is Borough land that is accessed from an unnamed road that leaves the Glenn Highway at Mile 59.9. Water worked ice contact deposits may provide a large quantity of material. Visual screening and mining should be easy in this hilly terrain. With Borough cooperation, this site may supply materials for both local and large project needs.

Site #5. 160 acres, SE1/4, Sec. 8, T19N, R3E, S.M.

Although only 1.5 miles from Jonesville Mine Road, this site would be difficult to access because of wetlands. The 160 acres lie in a much larger alluvial fan. The actual material area may be as large as 600 acres. If developed, it is anticipated that: 1) visual screening would be easy; 2) material quality may vary from good to high and; 3) the water table may be relatively close to the surface.

Site #6. 20 acres located NE1/4, Sec. 9, T19N, R4E, S.M.

This site is located near the Young Creek Trail and would most likely be developed only if this trail were to be upgraded. Visual screening and a shallow depth to the water table are not expected to be problems.

Site #7. 160 acres located in N1/2S1/2 and E1/2NE1/4, Sec. 16, T19N, R4E, S.M.

This area is accessed from Mile 66.7 of the Glenn Highway. The site is within the floodplain of the lower Kings River. A large quantity of material is available here. Although visual screening should be easy, the water table may be shallow. Other factors to consider at this site include the nearby Chickaloon-Knik-Nelchina Trail with a 200' buffer and a possible state campground. This site also has potential for enhancing fish spawning beds in the river. This easily accessed site is anticipated to have high quality material in abundance.

Site #8. 640 acres located in NW1/4, Sec. 11, SE1/4, Sec. 2, W1/2, Sec. 1, T19N, R4E, S.M.

This area is accessed the same as Site #7, but is located about 1.5 miles further upriver. The floodplain site should provide enough materials for almost any project; however, it is expected its primary use would be for timber harvest/habitat enhancement projects or mineral exploration and development projects. Potential restrictions may include the Chickaloon-Knik-Nelchina Trail and groundwater near the surface. The site's low slope and remoteness would make visual screening easy.

Site #9. 40 acres located in the SE1/4NW1/2 and NE1/4SW1/4, Sec. 8, T20N, R5E, S.M.

This area is accessed from the Permanente Road. This site is an old alluvial fan. It is anticipated that the primary use of this site would be for the Permanente Road and any other roads developed off it. No estimates are made on material quantity or quality; however, limitations such as shallow depth to groundwater and visual screening are expected to be minimal.

Site #10. 40 acres NW1/4SE1/4, Sec. 23, T20N R5E, S.M.

This site is accessed off the Castle Mountain Mine Road. The area actually has low potential but scattered pockets may provide enough materials for road maintenance and local needs. Another higher value site (in Sec. 14, T20N, R5E, S.M.) can be found one mile north of this area, but access may prove difficult.

Site #11. 160 acres located in E1/2, Sec. 19, T20N, R6E, S.M.

This site is located in the floodplain of the Chickaloon River. Its primary use would be for trail maintenance on the Chickaloon River Trail or the Chickaloon-Knik-Nelchina Trail. This site may also be advantageous for fishery enhancement. Difficulty in access, visual screening, and shallow depth to the water table reduces this site's visual value.

At present, there is little demand for the material deposits found in the upper drainages of Kings and Chickaloon Rivers and Boulder Creek. Until construction occurs within these drainages, or nearby sources are depleted, this large resource will most likely remain untapped.

The private lands with construction materials generally lie near improved access. Sources of construction materials located on private land cannot be used without compensation to the private landowner. Privately owned material resources should be used whenever possible before using state-owned deposits within the Moose Range.

South of the Glenn Highway lies the Matanuska River floodplain which covers an estimated 3,000 to 6,000 acres. These sites to some extent would be replenished every spring and are easily accessed in many places. These sources may provide large quantities of high-quality materials and should be considered along with sources within the Moose Range.

SOILS

RESOURCE DESCRIPTION

In 1968, the U.S.D.A. Soil Conservation Service published the Matanuska Valley Area Soil Survey. This survey includes approximately 35,000 acres within the Moose Range. Map 9, on page 61 will display this information.

Glaciers, water, and wind are the primary material movers responsible for the present geomorphology and soil complexes found within the Range. The surface soils in the main body of the Moose Range are derived primarily from loess. Generally the thickness and texture of the loess cap decreases in depth and particle size as distance from the Matanuska River flood plains increases, however prevailing wind patterns and microtopography do add variations. The soils in the upper drainages of the Moose Range are less influenced by loess deposition and are subsequently more influenced by local parent materials. The subsurface soils are gravelly terraces and glacial till such as moraines. The terraces are primarily rounded gravel and sands while the glacial till contains a random unsorted mixture of gravel, sand, silt and clay sized particles.

The most common soil series on the Moose Range are Homestead silt loam, Knik silt loam, and Doone silt loam respectively. The Homestead soils dominate the uplands and are, therefore, fine textured and shallow. These characteristics tend to make this soil less productive, more droughty and more susceptible to erosion than the others. The surface soil, although fertile, is too shallow to be productive relative to the Doone and Knik soils. Vegetation on this soil is generally a forest consisting of paper birch, white spruce and quaking aspen. Shrub and forb/grass communities are also common. The subsurface soil is a good source of gravel if the landform is a terrace deposit.

The Doone series generally lies closer to the Matanuska River. These soils tend to have thicker and coarser (minor amounts of sand-sized particles) textured upper horizons. The soil depth and texture characteristics make these soils relatively productive, perhaps the most productive soils within the Moose Range. Water and wind erosion are potential problems on exposed areas. Subsurface soils are good gravel sources but generally are over 30 inches below the surface. Vegetation in undisturbed areas consists of paper birch, white spruce, quaking aspen and some cottonwood.

The Knik silt loam is more common at lower elevations. This soil texture is still silty, but the surface soil is thicker than the Homestead soils. This soil is more productive but is still droughty and susceptible to water erosion. This soil occurs on terrace deposits as well as glacial deposits. Natural vegetation consists primarily of paper birch, white spruce and quaking aspen. The subsurface gravel sources are similar to that of the Homestead series. The overburden is thicker, however.

Most other soils within the Moose Range are found in poorly-drained or riparian areas or receive excessive seepage from the uplands. Coal Creek, Torpedo Lake, Slikok and Salamatof soils are poorly-drained and grade from mineral to organic respectively. Vegetation ranges from white birch, black spruce, and willow to muskeg. The well-drained riparian soils tend to be mixed alluvial soils. These soils occur in frequently flooded areas and consist of medium textured (sandy) to very coarse sediments overlaying loose cobblestones, stones, and/or boulders. Native vegetation consists of grasses, alder, willow, paper birch, white spruce and cottonwood.

RESOURCE EVALUATION

From an engineering or vegetative production standpoint, variations in a soils' physical and chemical properties are primary factors to consider in determining suitable uses for an area. The common soils with the widest range of suitable uses are the Doone, then Knik, then Homestead soils . Other soils present moderate to severe limitations for development of logging or mining roads and other management options.

Approximately 75% of the soils within the Moose Range are not mapped at present. More soils data need to be compiled before the implications with respect to soils can be evaluated for management alternatives. Adequate information in this area may result in more complete and efficient use of areas suitable for development of mining, forestry, recreation and wildlife habitat enhancement, while unsuitable areas are managed accordingly.

The SCS survey was interpreted by DLWM and the soil series were placed into management groups. These management groups are an effort to categorize the soils, from an agricultural orientation according to their applicability to Moose Range management needs (see Map 9 on page 61).

Management Group 1 contains soils found primarily in wetlands. These soils are infertile, lack texture and are waterlogged. These soils should be left in native vegetation.

Management Group 2 soils have a high moisture content resulting from a high water table. These soils have low vegetative productivity and are best left in native vegetation. Despite a low carrying capacity these soils may support light grazing. Vehicle use taking place on these soils can be detrimental and vehicle use should be restricted to seasons when the ground is frozen or unusually dry.

Management Group 3 soils have large seasonal fluctuations in moisture content. When not flooded these soils may actually have such a low moisture supplying capacity that growth is restricted. Although fertility is generally low, some areas are quite fertile. Productivity may be limited by either moisture extreme. Land management options are best applied between June and April.

Management Group 4 soils are characterized by moderate growth productivity. Moisture content is generally adequate but shallow topsoils reduce the fertility.

Management Group 5 soils are the most fertile and have adequate moisture supplying abilities for good vegetative growth. Topsoil depth and textures may require additional engineering considerations.

Management Group 6 soils are both highly productive and present minimal engineering problems. These are the soils with the most management options, as these soils would support plant growth and road development.

Management Group 7 soils are characterized by the absence of topsoil. They are relatively barren areas with varying engineering considerations.

Management Group 8 soils are those found on slopes exceeding 30%. These soils would otherwise fall into Management Group 1-6 classification regarding productivity and engineering considerations. Due to small scale of the survey many small areas with slopes less than 30% are included. These areas if separated may have many management applications.

Approximately 1,300 acres of land have severe limitations. This includes wetlands, terrace escarpments, mine tailings and material sites (management groups 1 and 7).

Soils which have moderate limitations (generally ammendable) such as steep slope, periodic flooding or high moisture content constitute about 16,500 acres (management groups 2, 3 and 8).

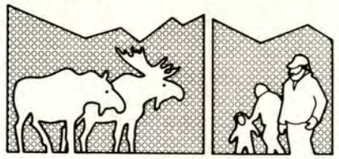
Roughly 8,300 acres of soils have good vegetative growth qualities such as essential nutrients and proper moisture content and moderate to minimal engineering considerations like soil depth or frost heave potential (management group 4).

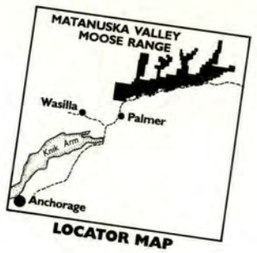
About 4,800 acres were interpreted to have high vegetative growth qualities with moderate engineering limitations (management group 5).

High valued vegetative growth qualities and minimal engineering limitations are found on about 1,300 acres (management group 6).

MAP 9: GENERAL SOIL TYPES

MATANUSKA VALLEY
MOOSE RANGE
MANAGEMENT PLAN





LOCATOR MAP

MOOSE CREEK DRAINAGE

GRANITE CREEK DRAINAGE

KINGS RIVER DRAINAGE

CHICKALOON RIVER DRAINAGE

BOULDER CREEK DRAINAGE

MOOSE RANGE BOUNDARY

R. 1 E. | R. 2 E. | R. 3 E. | R. 4 E. | R. 5 E. | R. 6 E. | R. 7 E.

T. 22 N.
T. 21 N.
T. 20 N.
T. 19 N.
T. 18 N.

Little Susitna River
Moose Creek
Granite Creek
Young Creek
Kings River
Eska Creek
Chickaloon River
Boulder Creek
Matanuska River

GRANITE △ PEAK
CASTLE MOUNTAIN

JONESVILLE ROAD
MURRAY RD.
BUFFALO MINE ROAD
SOAPSTONE RD.
FISHHOOK-WILLOW ROAD
GLENN HIGHWAY
HERMAN CREEK ROAD
CHICKALOON RIVER ROAD
PERMANENTE ROAD

Sutton
Chickaloon
Palmer

MP 6.7
SUNVALLEY DRIVE

MP 52.8
SOAPSTONE ROAD

MP 53.1
BUFFALO MINE ROAD

MP 54.5
MOOSE CREEK STATE RECREATION SITE

MP 56.7
MOOSE RANGE BOUNDARY SIGN

MP 61
SUTTON AND JONESVILLE ROAD

MP 66.7
KINGS RIVER AND CHICKALOON —KNIK— NELCHINA TRAIL ACCESS

MP 71.8
PERMANENTE ROAD

MP 73
IDA LAKE/FISH LAKE ACCESS ROAD

MP76.0
KING MOUNTAIN STATE REC. SITE

MP 76.2
KING MOUNTAIN LODGE

MP 77.5
CHICKALOON RIVER ROAD

MP 80.8
MOOSE RANGE BOUNDARY SIGN

MP85.3
LONG LAKE STATE RECREATION SITE

MP 89.2
PURINTON CREEK TRAIL

N

0 1 2 3
miles

This map is interpreted from the 1968 S.C.S. Soil Survey of the Matanuska Valley Area. Refer to it for more details. The Soil Series have been arranged into management groups roughly by moisture gradient. Also, for management purposes, all soils on a slope exceeding 30% have been placed in one group.

map compiled by
DLWM 10-85

*MANAGEMENT GROUP/ LIMITATIONS		BY SOIL SERIES
1	Severe	Salamatof Peat Slikok Mucky Silt Loam
2	Moderate (shallow water table)	Coal Creek Silt Loam Torpedo Lake Silt Loam Moose River Silt Loam
3	Moderate (periodic flooding)	Mixed Alluvial Lands Chena Silt Loam Susitna Silt or Sandy Loams
4	Moderate	Naptowne Silt Loam Homestead Silt Loam Matanuska Silt Loam
5	Moderate to Minor	Doone Silt Loam Doone and Knik Silt Loam Knik Silt Loam
6	Minor	Anchorage Sandy Loams
7	Severe	Gravel Pits Terrace Escarpments Mine Tailings
8	Moderate to Severe	All Soils on a Slope Exceeding 30%

* refer to text for explanation of management groups

ENGINEERING GEOLOGY

As part of the Management Plan's data gathering effort, the Division of Geologic and Geophysical Surveys compiled a report titled "Engineering Geology of the Matanuska Valley Moose Range Area." This report provided important resource information for use in reaching management decisions within the Range. Engineering geology maps are shown in Appendix VII on pages 237-245.

RESOURCE DESCRIPTION

Engineering geology describes all of the unconsolidated superficial deposits overlying bedrock. These materials are mapped and classified according to genesis, texture, composition, and material lithology. The Matanuska Valley is among the more dynamic regions in Alaska. The bedrock in the Moose Range is primarily young (less than 85 million years old) sedimentary rock of both marine and non-marine origins. Bedrock of igneous origins is also present in various areas of the Moose Range.

Several million years of uplift, folding, erosion and deposition have resulted in a complex geomorphology and a variety of surficial material types. The past 2 million years have seen numerous glacial advances, retreats and resulting stream flow which rearranged the surface materials into glacial formations (e.g. till, moraines), fluvial deposits (e.g. alluvium, terraces) and gravity related formations (e.g. landslides and talus deposits). Even today, natural forces in the form of active faults, gravity, glaciers, rock glaciers, stream action and frost action are changing the geomorphology of the Moose Range. Human actions to a lesser extent are also contributing.

RESOURCE EVALUATION

Engineering geology information can be applied in locating construction materials and engineering constraints. Often road construction or other infrastructure development will be most cost effective and maintenance free when located in areas rated good for material sources. The Moose Range has plenty of sand and gravel available for both large scale construction projects and community needs for many years to come. Construction materials are covered in more detail in the resource description above.

Application of information from the Engineering Constraints Section in the report (listed above) is important for public safety as well as cost effectiveness or development. Four types of constraints were noted in the Moose Range: 1) unstable slopes (landslide, talus slope); 2) unsuitable foundation soils (wetlands, mine tailings); 3) rock glaciers; and 4) fault zones (see Appendix VII on page 237). Unstable slopes are generally found along the Talkeetna Mountain front and along the major drainages. However, these conditions are also found in the Wishbone Hill area, a region with high potential for development. The unsuitable foundation soils are primarily

isolated pockets of poorly drained, nearly level soils. Mine tailings are also unsuitable but are limited in extent. Rock glaciers are commonly found along upper reaches of the major drainages. This is fortunate in that there is low potential for development where they are found.

The major fault on the north side of the Matanuska Valley, the Castle Mountain Fault, traverses the Moose Range from west to east. The fault is shown in Appendix VII on page 243. Being an active fault means there is potential for ground creep or even major movement during an earthquake. The above-mentioned constraints present more of a limitation on infrastructure development than for recreation, although these factors should be weighed when locating trails and other recreation facilities. These constraints are found in a small portion of the Range and can be mitigated by avoidance of the area or, in some cases, proper design.

Other features related more to public safety that should also be addressed are snow avalanche potential and flood hazard. Up to a fourth of the Moose Range has potential for avalanche. Fortunately most of the potential is located in remote areas where human activity and development is unlikely. Nonetheless, winter recreationists and other back-country users should be aware of the danger that exists in the mountainous areas of the Moose Range. Snow avalanche potential is also shown in Appendix VII. Flood potential is a factor to be considered in any development. Many areas with high value construction materials will also have a high potential for flooding. This will not preclude mining the materials but does limit development such as campgrounds. Areas within the Moose Range with flood hazard are delineated in Map 8, page 47.

Engineering Geology information can be used for interpreting geologic features for recreational and educational uses. Rock glaciers, fault-generated landslides and the Castle Mountain Fault are natural features with high interpretive values. These features provide excellent focal points for hikers.

CHAPTER 3

MANAGEMENT PLAN: RANGEWIDE LAND MANAGEMENT POLICIES

3. MANAGEMENT PLAN: RANGEWIDE POLICIES

The following chapter describes the rangewide land management policies that have been developed to manage public lands in the Matanuska Valley Moose Range. These management policies will supplement existing policies from the Susitna Area Plan, state policy and procedure manuals, and state statutes and regulations. Chapter Four contains guidelines that are specific to only a portion of the Moose Range.

To aid the reader, Map 10 on page 199 visually displays the proposed land uses described in Chapters Three, Four and Five. PLEASE NOTE: All of the following guidelines and implementation actions covered in Chapters Three, Four and Five will be dependent upon DNR and ADF&G budget and staff capabilities. This plan addresses the items DNR and ADF&G feel are necessary to manage the Moose Range for multiple use, but these actions will be evaluated with resource management priorities throughout the state before implementation can occur in the Moose Range.

The plan provides for multiple uses of public land, as required by legislation, and the guidelines provide compatibility among these uses. In the long term the land within the Range as a whole will be used for as many uses as possible, without eliminating, or unreasonably limiting other resources.

The objectives of the plan are:

1. To maintain, improve or enhance moose populations and habitat either through forestry practices that also provide for personal and commercial firewood harvesting; or direct habitat manipulation by fire or mechanized means.

2 To maintain, improve or enhance other fish and wildlife populations.

3. To provide opportunities for coal mining and mineral development.

4. To improve and enhance moose populations through reclamation of coal mined lands to productive wildlife habitat, primarily beneficial to moose.

5. To preserve opportunities for materials extraction.

6. To provide for grazing opportunities.

7. To improve legal access on existing public roads and trails.

8. To protect local lifestyles, scenic qualities and reduce trespass and public interference on private lands.

9. To provide for dispersed outdoor recreational opportunities within the Range and camping and picnicking facilities along the roadside.

The Moose Range will be managed for multiple use. This requires a combined, cooperative effort by DNR and ADF&G to allow for timber harvesting, mineral development, grazing, and outdoor recreational pursuits, while perpetuating productive wildlife habitat. For example, an area may be leased for coal mining, and while the land is not actually being developed for coal, the state can harvest the timber from the lease, and the land can be enhanced to create moose browse. Once the mining lessee begins to operate on the land, the actual mining site will be used for mining only, but during the reclamation of the mining site, the lessee will reclaim the land so as to produce wildlife habitat. Surface resources on lands outside of the actual mining development area can still be utilized.

FISH, WILDLIFE AND FORESTRY

Policy on habitat enhancement and forestry is presented in a single section because most habitat enhancement efforts will occur as part of timber harvests, for either personal or commercial use. The guideline portion of this section begins with a combined section on timber harvest/habitat enhancement methods. This is followed by guidelines that deal with habitat enhancement and forestry actions separately.

A. GOALS

1. Maintain, improve and enhance moose habitat and populations and other wildlife resources of the area, and provide opportunities for related public uses, including hunting, trapping, fishing and wildlife viewing;

2. Harvest timber in a manner that maintains or enhances moose habitat and moose populations, while simultaneously making timber available to meet public demands for firewood and, to a lesser extent, for houselogs and sawtimber;

3. Develop and use timber harvest/habitat enhancement methods which will protect scenic values and other environmental values wherever possible.

B. MANAGEMENT STRATEGY

In the Moose Range as a whole, habitat enhancement activities will be given priority over the goals of maximum timber harvest and provision of opportunities for public recreation. The location, amount and type of timber harvested will be determined primarily through a consideration of the habitat needs of moose and/or other wildlife. At any given time, large portions of the Moose Range will be managed to produce moose forage (willow, aspen, birch, and cottonwood) rather than commercial or personal use timber products.

ADF&G has developed a moose habitat enhancement schedule for the entire Moose Range in conjunction with the DNR, Division of Forestry (DOF) timber harvest schedules for 1986 - 1990. The major objective of the habitat enhancement schedule is to continuously maintain at least 10,000 acres of early successional deciduous vegetation suitable for wintering moose habitat. The schedule will reflect a 45 - 60 year rotation with sustained yield over that period. (A 45 - 60 year rotation is necessary to produce personal use forest products.) If necessary to maintain at least 10,000 acres of moose habitat in an early seral stage, the rotation period may be interrupted in certain areas for habitat enhancement purposes. (Seral stages are the complete series of stages occurring in succession in communities of plants and animals until the climax is reached.) Site-specific timber harvest/habitat enhancement areas are identified in Chapter Four on pages 151-161, 174-178 and 189-190. This includes ADF&G's initial details for the habitat enhancement schedule. ADF&G and DOF will

work cooperatively to approve the 1986 - 1990 schedule by January 1987 and to design the 1990 - 2005 timber harvest/habitat enhancement schedules.

The Range has the potential to produce substantial sustained yields of timber. Timber stands will be needed for moose escape and thermal cover, to act as buffers on trails, roads and private property, and to provide for personal use firewood. In the near term, timber harvest levels can be relatively high because much of the Range is covered by stands of mature timber and therefore is not of much value to moose as a food source.

While moose habitat enhancement is an overriding goal in the area, it is important that these activities occur in a way that limits their adverse impacts on other wildlife species and other beneficial uses of public lands. These limitations will include prohibitions of habitat enhancement in certain limited areas, such as campgrounds or burning adjacent to communities.

C. GUIDELINES

1. TIMBER HARVEST/HABITAT ENHANCEMENT METHODS

   a. Enhancement Priorities. For the Range as a whole, protecting and enhancing moose habitat will be given priority.

   b. Timing of Enhancement Activities. Habitat enhancement activities for fish and/or wildlife species other than moose shall occur when biological and/or population statistics indicate that improvements in survival, reproduction and/or population numbers may be significantly improved through habitat enhancement/rehabilitation activities.

   c. Areas Where Timber Harvest/Habitat Enhancement Activities will be Limited

      (1) Timber Harvest/Habitat Enhancement Buffers. Timber harvest/habitat enhancement buffers will be laid out in the field during the actual sale design and will be based upon the following guidelines:

         (a) Buffers Around Cutting Units. Cutting units should generally be surrounded by a 100 foot buffer unless such a buffer is disadvantageous to wildlife or their habitat or unnecessary as a screen between the cutting area and most users of the area. However, required buffers shall be increased or decreased based on specific summer line-of-sight requirements necessary to maintain a natural-looking environment and to provide for restricted views from one cutting unit to another cutting unit.

(b) Buffers Around Private Lands. A minimum buffer of 200 feet will be left on state land between all operations resulting in forest clearings and any private lands. However, single-tree selection harvest may occur within these buffers up to 50 feet from private lands. No harvest may occur within 50 feet of private land.

(c) Eagle and Peregrine Falcon Protection Buffers. Eagle nest trees and Peregrine Falcon nests shall be protected as required by federal law. There will be no disturbance of natural vegetation within a 330' radius around any eagle or Peregrine Falcon nesting trees and/or nesting sites. (Mike Jacobson, Ecobiologist, Juneau, USFWS, 586-7244.)

(d) Activities Allowed in Timber Harvest/Habitat Enhancement Buffers

* Selective-tree cutting as approved by ADF&G (Habitat Div.) and DNR.
* Disease and insect control and prevention with pesticides and herbicides as approved by ADF&G, DNR and DEC.
* Grazing as approved by ADF&G and DNR, consistent with the grazing guidelines in this chapter, on pages 103-117.
* Access and utility line development across buffer areas should be kept to a minimum. Access and utility facilities should be located
  - outside of buffers to the extent feasible and prudent,
  - perpendicular to buffers, upon entering the buffer, to the extent feasible and prudent,
  - so as to reduce visual impacts from primary access routes,
  - and require approval by DNR and ADF&G.

Note: See page 137 for a summary of all buffer requirements.

(2) Other Unique Habitat and/or Plant Communities. Habitat enhancement shall be restricted in certain limited areas with unusual habitats. Examples include isolated stands of overmature timber valuable for tree-hole-nesting bird life and other wildlife species or plant species such as Calypso orchid habitats. Calypso orchids are known to occur in wooded areas along the Chickaloon River Trail. Presently, there are no recorded rare or endangered species nesting sites on public land in the Moose Range. Peregrine falcons are known to migrate through the Moose Range, but to date, there are no known nesting sites. Should any nesting sites be located, they will be protected by Federal laws (see (1)(c) above). Interagency review will be required prior to resource development in the area of rare or endangered species if identified in the future.

(3) Scenic Areas. Timber sales, cuts or enhancement activities in alpine/subalpine zones visible from the Glenn Highway should minimize visual impact wherever possible. DNR, including DOPOR, should be consulted prior to actions affecting these areas. See Map 10 on page 199 to locate the scenic areas. The areas visible from the Glenn Highway are Arkose Bench, Wishbone Hill, Granite Peak, Little Granite Creek bench, and Castle Mountain. This guideline also applies to Puddingstone Hill as seen from the Chickaloon River Trail and the Chickaloon-Knik-Nelchina Trail.

(4) Elevation Restrictions. Timber harvests should generally be restricted to areas below the 1,100 foot contour on Arkose Ridge and the 2,000 foot contour below Castle Mountain. Until more research can specify the types of timber harvest methods that are the most appropriate at higher elevations, the state will concentrate timber harvesting efforts at lower elevations.

(5) Slope Restrictions. Special consideration will be given to any timber harvest/habitat enhancement projects on slopes exceeding 40%. Mechanical scarification is discouraged where slope is greater than 40%. Research projects on contoured mechanical scarification are allowed. The findings may increase the acceptable slope for scarification applications.

(6) Burning Near Coal Seams. Habitat enhancement methods which apply burning as a management tool are discouraged in areas with coal seams at or near the surface.

(7) Areas with Heritage Resources. DOF and DOPOR will work cooperatively to survey timber harvest areas for cultural and historic values when staffing and funding capability permits. All state agencies will make every effort to protect heritage resources and to notify DOPOR if any are found in the Moose Range. Timber harvest and wildlife enhancement will not be allowed in areas of known and recorded Alaska Heritage Resources until DOPOR has approved the method for protecting the heritage resource and given approval to proceed with timber harvest/habitat enhancement methods. The Castle Mountain Mine Road area will be surveyed before timber harvest.

(8) State Highway System. Moose browse enhancement areas should not be located near the Glenn Highway or in areas that will attract wintering moose to the highway corridor. The state will not purposefully increase moose browse within the Glenn Highway right-of-way.

d. Locations of Habitat Enhancement Activities.

(1) Utilize Existing Roads. Because enhancement activities have been based primarily on timber harvests, the locations of these activities in the near term generally will be in areas with sufficient road access to permit timber harvests. Habitat enhancement activities may take place in the future, in other areas, as access becomes available. At present, the four main road accessible harvest areas in the Range are located off the Permanente, Buffalo Mine, Fishhook and Castle Mountain Mine roads.

(2) Roadless Areas. Enhancement activities may also occur in roadless areas by utilizing existing trail systems and aircraft (helicopters) as necessary to maintain wildlife species.

(3) Grazing Leases. Moose habitat enhancement activities may be conducted on grazing leases or permit areas upon a 30-day notice to the lessee or permittee.

(4) Based on Research. Another factor influencing location and design of timber cuts is the availability of results from research currently underway on vegetation regeneration. To the extent practical, new habitat enhancement activities should wait until the results of initial activities are evaluated. Research efforts currently are concentrated in the southwestern portion of the Range. Additional research projects may be initiated in other management subunits to assist in developing vegetation regeneration techniques. Once evaluated and proven successful, habitat enhancement in other areas may proceed according to the five-year timber harvest/habitat enhancement schedules.

(5) Eastern Management Subunit. Timber harvest or enhancement efforts may not take place in the Eastern Management Subunit until more information is available on the likely success of regeneration in this area. Pilot habitat enhancement projects may be conducted in the Eastern Management Subunit for the purposes of identifying the basis on which to conduct additional habitat enhancement activities. Timber harvest/habitat enhancement efforts are being concentrated in the western and middle two-thirds of the Range (the Middle and Western Subunits) in the near term. Habitat enhancement may occur wherever the need exists and newly developed timber harvest access provides the opportunity to enter habitat areas having a high to moderate potential for providing moose browse. It is important to distribute moose enhancement areas throughout the Moose Range in order to better distribute forage production areas and moose.

e. Process for Scheduling Timber Harvest/Habitat Enhancement Activities

(1) Completion Dates. DNR and ADF&G will prepare five-year timber harvest/habitat enhancement schedules. The initial steps for the first five-year schedule are included in Chapter Four of this plan. ADF&G and DOF will complete the first schedule by January 1987. The final schedule must be made available for public and interagency review and must be approved by DNR (including the DLWM) and ADF&G. Succeeding five-year schedules may be submitted for interagency and public review at any time, but no later than 60 days prior to their effective implementation dates of January 1, 1991; January 1, 1996; January 1, 2001.

(2) Requirements. Physical data inventory may be completed as part of the individual project layout in the field. The five-year timber harvest/habitat enhancement schedule will include:

(a) Project description, including individual timber sales.
(b) Location or sale area of the cutting unit.
(c) Existing and proposed access.
(d) Estimated size of cutting units and volumes (if any) to be removed.
(e) Physical data inventory for the sale area including: vegetation; slope/aspect; description; elevation; general soil description including depth, moisture content, and analysis; and general wind condition.
(f) Ownership analysis
(g) Target vegetation for revegatation/enhancement
(h) Proposed regeneration enhancement methods including use of chemicals and controlled burning.
(i) Restrictions that are required for protection of critical and/or sensitive habitats, visual quality, water quality or other resources.
(j) Follow-up research plans to ascertain success of project, including control plots, photo plots and monitoring requirements.
(k) Compatibility with recreational uses and visual qualities of the area.

(3) Research Report. A report will be developed by DOF and ADF&G for each activity unit and completed by June of the year following completion of the project. The report will include discussion of the regeneration and plant competition in each area and the information required in the five-year timber harvest/habitat enhancement schedule, as detailed above.

(4) Interagency Field Reconnaissance. Interagency field reconnaissance of the proposed five-year timber harvest/habitat enhancement schedules will be performed. The purpose of the field work is for DOF,DLWM, ADF&G (and other affected Divisions) to work cooperatively towards accomplishing the requirements in e(2) above. The first reconnaissance sessions will be held in summer 1986.

(5) Review and Approval. Timber harvests and habitat enhancement activities require DNR and ADF&G approval. Each five-year timber harvest/habitat enhancement schedule must be approved by DNR (including DLWM) and ADF&G prior to implementation. If a new cutting area is proposed after review and approval of the five-year schedule, it requires ammending the five-year schedule through the same review and approval process as the original schedule. Minor modifications to the schedule (e.g. changing the order in which areas are to be cut, or minor boundary adjustment once the exact site is located in the field) require only ADF&G and DNR approval.

The approval process will follow existing procedures: burning, the use of pesticides or other chemicals, or commercial timber harvest activities require public and agency review. In areas where habitat enhancement is the intent for management of the subunit, habitat enhancement activities (scarification or hinge and brush cutting) do not require additional public review.

The only exception to following existing procedures for ammendments to the approved five-year timber harvest/habitat enhancement schedule involves personal firewood cutting. Normally, the Division of Forestry only solicits agency comments on personal firewood cuts, and does not notify the public. In the Moose Range, any additions to or new personal firewood cutting areas, not approved by the public as part of the five-year schedule or this plan, require public and agency review. Adding personal firewood cuts in areas shown on Map 10 on page 199 as timber harvest areas will not require additional public review, as the timber harvest areas on Map 10 were approved by the public and agencies during the development of the management plan.

(6) Agency Yearly Review. The DLWM will hold a yearly review of the proposed timber harvest/habitat enhancement activities with DOF and ADF&G. The meeting will be held in April of each year to review the entire year's proposals. The meeting will be used to determine whether or not there are any proposed changes and to determine if any changes are major enough to warrant public review. Any major changes in location of cuts or types of timber harvest or habitat enhancement techniques will also require public review.

(7) Public Notice and Review. Public notice requires DNR and/or ADF&G to notify the public of actions to be taken by the agencies in at least two local newspapers (Anchorage, Palmer, or Sutton). Public review requires public notification of at least one public meeting, holding at least one public meeting (Palmer or Sutton) and allowing the public to mail in written comment on the proposed agency actions.

f. Design of Timber Cuts to Maximize Moose Habitat Enhancement

(1) Forest Clearing Size. The width of any harvest enhancement operation resulting in forest clearings shall be cooperatively developed by DOF and ADF&G. The DNR will consult with ADF&G to design forest clearings that are most appropriate for moose habitat enhancement consistent with other public benefits. As a general guideline, large group selection cuts or clearcuts should not exceed 600 feet in width. The edge of these clearings may not exceed 1,000 feet without meandering. The preferred size of timber cuts may cover 15 acres or less. No harvest unit resulting in a forest clearing shall exceed 50 acres except when approved by ADF&G and DNR. The shape of the clearcut will consider the prevailing wind direction. Topography, elevation and other on-site factors will be considered in determining forest clearing size. These guidelines may be changed in the future, based upon research findings from habitat enhancement research efforts on the Moose Range or other applicable research projects.

(2) Revegetation of Cuts. All harvested units shall be revegetated. Site preparation operations shall be designed to encourage principally the natural regeneration of one or more of the following preferred moose browse species: paper birch, black cottonwood, quaking aspen and/or willow. Site preparation methods shall be determined by ADF&G and DNR.

DOF in consultation with ADF&G shall identify the amount and location of birch seed trees that shall be left standing in timber sales/cuts/enhancement projects to produce seeds for birch reproduction.

(3) Escape Cover. Moose require forested areas for escape cover. ADF&G will determine the suitable vegetation width for escape cover. Escape cover shall be left on appropriate locations within each harvest unit. These areas should be wide enough to prevent line-of-sight viewing through the escape cover. Utilization of coniferous species may be used to strengthen buffers and/or to develop cover as approved by ADF&G.

g. Erosion Control. Silvicultural operations and access development will be designed to minimize erosion.

h. Habitat Enhancement Methods. Specific habitat enhancement methods should be determined through consideration of their cost effectiveness, browse production capabilities and impact on goals for other resources. In addition to timber harvests, the following methods may be applied.

(1) Grazing. Carefully managed intensive grazing is, at this time, an unproven habitat enhancement technique that may improve moose habitat in areas where the growth of browse species is limited by rapidly growing bluejoint reedgrass. Research pilot projects will be conducted at the request of ADF&G to determine if using intensive grazing as an enhancement method will reduce competitive grasses.

(2) Burning. Controlled burning may be used as a means of manipulating vegetation, as a method of site preparation and/or as a means of slash disposal.

(a) Burning Prescription. All broadcast burning operations shall require preparation of a site specific burning prescription and a burn plan. No broadcast burning will be conducted outside the area described in the burning prescription. Members of the public who will be affected by the burn will be contacted according to DOF policy. The public and local community councils will receive written notice of burning activities when DOF prepares the burn plan. Signs will be posted on major roadways to notify the public of any ongoing controlled burning in process.

(b) Burning Near Private Land. No broadcast burning operation will be conducted within 1,320 feet (1/4 mile) of privately owned buildings or improvements and 1/8 mile of undeveloped private land.

(c) Slash Disposal Burns. DOF slash disposal burns utilizing the pile and burn method will not require a burn plan, except where the Area Forester determines this to be in the best interest of the State.

(d) Heliotorch. Aerial habitat enhancement techniques including the use of the heliotorch may be used in roadless areas and will be defined in the five-year timber harvest/habitat enhancement schedules.

(3) Pesticides and Herbicides. Pesticides and herbicides may be used on the Range when the Area Forester determines the use will benefit habitat enhancement efforts, meet DEC requirements and receive ADF&G concurrence for use.

(a) Plan of Operations. Any use of pesticides and/or herbicides shall require a written plan of operations, describing in detail the pesticides or herbicides to be used, the reasons for use, potential effect on humans, wildlife and vegetation types, the expected results, the area the chemicals will be used in, the method of application, and the application rates. In addition to this, the plan shall describe how an evaluation of the effectiveness will be prepared after the application.

(b) Application. Generally, pesticide/herbicide application will be done through ground application to remove grass. It is unlikely aerial application will be used. Aerial application may be used to prevent a large disease outbreak. Pesticides and/or herbicides will not be applied within one-quarter mile of private dwellings.

(c) Evaluation. After pesticide/herbicide application, an evaluation of the effectiveness will be prepared.

(d) Agency Review and Public Notice. Interagency review and public notice and the opportunity for written public review of and comment on the plan of operations is required prior to application of pesticides and herbicides in the Range. The Sutton and Chickaloon Community Councils will be notified prior to use of pesticides and/or herbicides in the Range.

(4) Mechanical Crushing/Hydro-axing. Mechanical crushing, hydro-axing or chain-saw thinning may be used independently or in conjunction with other methods to manipulate vegetation changes. This method will be used where salvage of forest products is not feasible.

(5) Scarification. Scarification will be used in the Moose Range to enhance wildlife habitat. Regeneration of desired browse species in the southwest corner of the Moose Range has proven more successful when the seedbed is scarified. Scarification, the mechanical removal of the surface organic layer or the mixing of this layer with mineral soil, removes competitive plant species and allows seedlings to establish themselves.

i. Acreage Target for Moose Winter Habitat. The Range will be managed to continuously maintain at least 10,000 acres of early successional deciduous vegetation suitable for wintering moose habitat.

j. Timber on Coal Leases. The Division of Forestry will utilize timber on public lands that are leased for coal development wherever possible. The Division of Mining and Geology (DOMG) and the lessee will work cooperatively with DOF and review all proposed timber sales on state lands leased for coal development. DOF, DOMG and the mining lessee will work cooperatively to utilize surface and subsurface resources in an appropriate manner and sequence.

k. Cooperative Research Efforts

(1) Monitor Enhancement Activities. DNR, ADF&G and the University of Alaska will work cooperatively to establish plots and techniques to monitor the success of past and planned habitat enhancement activities. This may include, but is not limited to, gathering resource inventory data on specific soil typing, slope, elevation, aspect, ground water, existing vegetation types (overstory and understory), indicator species, small mammal populations, and wind and climatic conditions. Research is needed to gain knowledge regarding alternative regeneration techniques, livestock and wildlife food habits, use of grazing to enhance wildlife habitat, habitat enhancement costs, impacts of enhancement costs, and impacts of enhancement on water quality and other resources. This knowledge will be used to modify and improve the five-year timber harvest/habitat enhancement schedules and activities.

(2) Calypso Orchid. DNR, with assistance from the U of A or other plant ecologists, should perform field analysis and biological studies to determine the habitat requirements for the Calypso orchid. The studies will determine whether or not the Calypso orchid requires special protection and/or warrants establishment of an ecological preserve. The only field verified sites known to date in the Moose Range are two areas along the Chickaloon River Trail -- mile 3 and 6.

(3) Lands Mined For Coal. The state encourages research for enhancing moose browse on lands mined for coal.

2. WILDLIFE VIEWING

In order to provide opportunities for wildlife viewing, DNR and ADF&G will take the following steps (contingent on available funding):

a. Preserve Wildlife Habitat. Preserve wildlife habitat, especially special features like snags, beaver ponds/waterways, naturally occurring mineral licks, raptor nest trees, fish and wildlife breeding and seasonal concentration areas, and transition zones.

b. Avoid Important Areas. Avoid disturbance/development in fish and wildlife nesting, calving, spawning and other birthing and rearing areas.

c. Education. Educate the public through information displays in facilities serving the Moose Range. Included should be information about wildlife-habitat relationships, so that people know the right place to look for certain species and the right season and time of day to look for desired wildlife.

d. Scenic Turnouts. ADF&G, DOPOR and DOT/PF will work cooperatively to designate the appropriate vehicle pullouts at locations determined to be good for wildlife viewing during realignment of the Glenn Highway.

e. Public Information. Provide information about trails to wildlife viewing overlooks or special habitat features.

f. Interpretive Signs. Post interpretive signs along roads, the Chikaloon River Trail, the Chickaloon-Knik-Nelchina Trail, the Old 98 Trail, trailheads, picnic areas and campgrounds.

3. DALL SHEEP

a. Minimize Impact. Surface resource uses such as timber harvests and other methods of habitat enhancement will be designed in a manner that minimizes their impact on Dall sheep habitat. DNR will consult with ADF&G on the location of these areas and appropriate stipulations to apply to them during the preparation of the timber harvest/habitat enhancement schedules. (Guidelines regarding domestic sheep grazing in Dall sheep range is addressed in grazing guidelines, C5c, on page 114.)

b. Mineral Licks. Subsurface resource development effects on Dall sheep mineral licks are covered in the subsurface resource guidelines section C3d. See pages 84-86.

4. HIGHWAY REALIGNMENT

During the environmental review process for the future reconstruction of the Glenn Highway, DOT/PF will evaluate a mitigation option to offset any significant loss of important fish and/or wildlife habitat in cooperation with ADF&G and the Federal Highway Administration. Implementation of the option agreed upon by all three parties shall take place during the construction phase.

5. HABITAT VALUES ON PRIVATE LAND

The plan does not direct the use of private lands. However, where the private landowner desires, DNR and ADF&G should seek to develop cooperative agreements with willing private landowners living within the Moose Range for game and habitat management purposes. Wherever agreed to by private owners, habitat enhancement principles should be implemented on private land. DOF will assist private landowners to enhance wildlife habitat on their lands through the Cooperative Forest Management Program when funding and staff are available.

6. ANADROMOUS FISH STREAMS

ADF&G will work toward maintaining, protecting, and enhancing anadromous fisheries in Wasilla, Moose, Eska, Young and Boulder Creeks and in Kings and Chickaloon Rivers. ADF&G will obtain the necessary data for reserving instream flow requirements for fish and wildlife, funding permitting.

7. ACCESS TO TIMBER HARVEST/HABITAT ENHANCEMENT AREAS

Guidelines for access for timber harvest operations or wildlife habitat enhancement are covered in the Transportation and Access section of this chapter on pages 125-127. Buffer requirements for access routes are also covered in the above referenced section.

8. MAINTENANCE OF EXISTING MOOSE HABITAT

The plan does not preclude the protection of existing wildlife habitat as a method of enhancing moose and other populations; it allows for known suitable habitat areas be undisturbed where appropriate as determined by ADF&G.

SUBSURFACE RESOURCES

A. GOALS

1. Allow and encourage development of coal and other subsurface resources.

2. Reduce the adverse impacts of coal development on environmental and habitat values in the Range through compliance with the provision of the Alaska Surface Coal Mine Control and Reclamation Act (ASCMCRA) (AS 27.21) and other applicable state, federal, and local laws and specific plan guidelines.

3. Assure that mined lands are reclaimed as wildlife habitat, primarily beneficial to moose.

B. MANAGEMENT STRATEGY

All land within the Moose Range will be open to mineral exploration and development with the exception of the southern face of Castle Mountain, certain small areas around specific mineral licks, and, at least temporarily, mental health lands. The southern face of Castle Mountain will be closed to locatable mineral entry and will not be available for mineral leasing to assure that this unique, highly visible geologic feature is protected in its existing natural state. This closure will protect scenic values, maintain the local community character and promote tourism. Mineral licks (shown on Map 3 on page 23) will be closed to locatable mineral entry for one year for approximately 1/2 mile around each lick. During that year, criteria for permanant closures will be developed and further evaluations of each lick will be made. (This constitutes an amendment to the Susitna Area Plan for the licks to which it applied. Three licks are currently under a leasehold location order and cover nine sections each (see guidelines C3d on mineral licks, pages 84-86). The leasehold location order for the balance of the nine sections will be lifted when the area in the immediate vicinity of the lick is closed.

When coal leases are offered within the Range, they will be in response to industry interest. The areas that are most likely to be offered in the near term are the areas judged by the Division of Mining and Geology to have the highest commercial potential. These areas are small tracts contiguous with existing leases in the Wishbone Hill area and large tracts in the Young Creek area, and at the base of Castle Mountain. The preferred order in which they will be offered for leasing is as listed above. However, this order may be changed due to new information, development of new mining technology, changed conditions or market demand. These existing 1984 coal lease sale areas are shown on Map 5b: on page 35. The future potential coal lease sale areas are shown on Map 10, page 199.

C. GUIDELINES

1. COAL

a. Process for Coal Development. Approval of coal exploration, development and mining activities shall be consistent with the Alaska Surface Coal Mining Control and Reclamation Act (ASCMCRA) (AS 27.21) and its implementing regulations, with interagency agreements such as the Cooperative Agreement between DNR, ADF&G, and the Alaska Department of Environmental Conservation signed November 4, 1984, and with guidelines developed in the Susitna Area Plan and this plan. As outlined in ASCMCRA, surface coal mining activities are controlled by issuance of a surface coal mining permit after a thorough technical review of the application by state agencies. The surface mining permit is the principal mechanism for reducing the potential adverse impacts of coal development. It includes an operation and reclamation plan designed to protect environmental resources such as wildlife habitat, air quality and water quality and to ensure contemporaneous reclamation for a specified post-mining land use (see below).

b. Post-Mining Land Use. Within the Matanuska Valley Moose Range, the post-mining land use is designated as wildlife habitat. Reclamation must be directed to a habitat type and density which is primarily beneficial to moose consistent with ASCMCRA.

c. Utilization of Surface Resources. The Division of Mining and Geology (DOMG) will encourage the utilization of potential forest, grazing, habitat enhancement, and recreational resources in areas where coal leasing is projected for the future. The Division of Mining and Geology will notify affected divisions of the general area and estimated schedule of future sales. Other consumptive resource uses will be directed toward these proposed areas during the period before leasing. Generally, habitat enhancement efforts will be the resource to be given priority consideration for use, although other important resource uses, such as use of existing historic trails or use of existing available material sources, should also be considered. However, these other uses should not interfere with or disturb the natural condition to the extent that the use may interfere with the collection of necessary baseline data under ASCMCRA. The presence of these uses prior to leasing will not preclude, limit or affect lease issuance.

d. Preferred Order of Development. The preferred sequence for issuing coal leases in the Moose Range is from the west to the east. The preferred order for offering leases will be:

(1) Small (80 - 160 acre) tracts contiguous with the Wishbone Hill coalfield leases in existence at the time of adoption of this plan (except that a tract that does not exceed one section in size may be offered adjacent to ADL 501265).

(2) The Young Creek area.

(3) The base of Castle Mountain.

(4) Other areas within the Range.

2. LOCATABLE MINERALS (e.g., GOLD, AND CHEMICAL GRADE LIMESTONE) AND OTHER LEASABLE MINERALS (e.g., OIL AND GAS)

a. Best Management Practices. ADF&G will utilize its manual, Best Management Practices for Placer Mining in issuing its own Title 16 permits and in its review of and development of recommendations for the Division of Mining and Geology's plans of operations and miscellaneous land use permits for mining. Any recommendation by ADF&G for rejection or modification of a miscellaneous land use permit or a plan of operations for placer mining will be based on the Best Management Practices. (This document is available from ADF&G or DNR for reference to any miner interested in its use in designing mining plans. It is available for review from ADF&G Habitat Division offices in Fairbanks, Anchorage and Palmer; DLWM in Anchorage and Wasilla; DOMG in Anchorage; and Palmer, Sutton, Willow and Anchorage libraries.)

b. Scenic Values. DNR authorization for mineral exploration and development must include assessment of impact on scenic values.

c. Mineral Development

(1) Mineral development will follow existing established DNR procedures and include interagency review of the following:

(a) Development plan and schedule.
(b) Operation plan.
(c) Access plan.
(d) Impact assessment on fish and wildlife, their habitat and related uses.
(e) Impact assessment on scenic values.
(f) Proposed mitigation and wildlife habitat rehabilitation.

(2) Removal of Vegetation. The area of vegetation removal will be for the immediate areas of the excavations, sites for overburden storage, settling ponds, access roads, equipment storage and necessary structures within the mine or drilling site. This must be outlined in the plan of operations or application for a miscellaneous land use permit.

(3) Tailings and Overburden. Overburden and tailings will be stockpiled and/or deposited in accordance with the mining plans.

(4) Pollution. The mine or drilling site must be managed to minimize non-point sources of pollution.

(5) Mine or Drilling Site Consultation. An on-site, predevelopment conference between the mine operator, DNR, ADF&G and DEC officials will be held when staff and budget allow. The intent is to assist the mine operator in developing the operation in a manner which will promote compatibility with wildlife and habitat enhancement in the vicinity of the mine or drilling site.

d. Rehabilitation of Mining Sites

(1) Reclamation plans will be required for mining activities authorized by a miscellanous land use permit or a plan of operations. Reclamation shall be developed for wildlife habitat primarily beneficial to moose.

(2) Disturbed acreage will be kept to a minimum and reclaimed as phases of the mine operations are completed unless this is not feasible or prudent.

(3) Excavated areas and waste disposal sites will be recontoured to a natural appearing shape at an average slope of no more than 3:1 or equivalent to the original slope, topsoil replaced and revegetated. ADF&G and DOA's Plant Materials Center should be consulted as to types of vegetation most conducive for returning the mined area to a state of wildlife productivity and/or design of contours to best benefit fish and wildlife.

e. Miscellaneous Land Use Permits. Prior to issuance of any Miscellaneous Land Use Permit within the Moose Range, the Alaska Department of Fish and Game (ADF&G) will provide comments to the Alaska Department of Natural Resources (DNR) on the consistency of the proposed action with the approved Matanuska Valley Moose Range Plan. DNR will include in Miscellaneous Land Use Permits those stipulations recommended by ADF&G that are within ADF&G authority and are necessary to provide adequate protection for fish and wildlife and their habitats consistent with ADF&G authority and the Moose Range enabling legislation.

f. Oil and Gas. The state Division of Geological and Geophysical Survey has determined that the potential for oil and gas in the entire Moose Range is low to no potential. Oil and gas exploration and development in the Moose Range may be permitted as long as development does not conflict with the enabling legislation and the Moose Range plan. Any proposals for development will follow normal DNR and ADF&G procedures.

3. AREAS CLOSED TO MINERAL LOCATION AND DEVELOPMENT

a. Castle Mountain Face. The southern face of Castle Mountain has high scenic values and is an attraction for those traveling the Glenn Highway. To preserve these values, this area is closed to locatable mineral entry and will not be made available for the exploration or development of leasable minerals (see Map 10 on page 199).

Legal Description for Castle Mountain Mineral Closing Order

T20N, R5E, S.M., Sec. 12, SW1/4, N1/2SE1/4, N1/2S1/2SE1/4, N1/2S1/2S1/2SE1/4.

Sec. 13 NW1/4NW1/4.

Sec. 14 N1/2, NW1/4SW1/4, N1/2SW1/4SW1/4, N1/2S1/2SW1/4SW1/4.

Sec. 15 N1/2, N1/2S1/2, N1/2S1/2S1/2, N1/2S1/2S1/2S1/2.

Sec. 16 N1/2, SW1/4, N1/2SE1/4, N1/2S1/2SE1/4, N1/2S1/2S1/2SE1/4.

Sec. 21 N1/2NW1/4, N1/2S1/2NW1/4, SW1/4SE1/4NW1/4, W1/2SE1/4SE1/4NW1/4

b. Mental Health Trust Lands. All mental health land is presently closed to mineral entry by order of the Supreme Court and the DNR Department Order 121 -- Mental Health Interim Management (see Map 1 on page 11). Competitive oil and gas or coal lease sales may continue.

c. Removal of Chickaloon Bench Mineral Closing Order. The state will remove the mineral closing order (MCO) within Secs. 4, 8, 9, 10, 16 and 17, T20N, R6E, S.M. The state placed the mineral closing order on this land to allow for the Chickaloon Bench Subdivision land sale. Since this sale will not take place, the mineral closing order will be removed to allow for potential mineral entry.

d. Mineral Licks. There are several known mineral licks in the Middle and Eastern Subunits. (See Map 3 on page 23 for the general location of the licks.) The northernmost three of these licks are currently restricted to mining leasing as required by the Susitna Area Plan. Based on information available at this time, these mineral licks

appear to be important to the wildlife using them, and this use is incompatible with mineral development. The mineral value of these licks is currently unknown. Therefore, all lands within approximately a one-half mile radius of each of the three northern licks will be closed to new mining locations for one year. The mineral closure will affect only locatable minerals and will be initiated following or concurrent with the Commissioner's approval of this plan. During this one-year period, DNR will approve no permits for exploration or development of leasable minerals in the lick areas. The purpose of the one-year closure is to allow field verification of the importance of each of the licks and to develop criteria by which to evaluate the importance of individual licks (both their value to wildlife and their mineral value). During the one-year period following the mineral closure, ADF&G and DNR will devote adequate staff and resources to determine if a permanent mineral closing order is justified. In order for a permanent mineral closing order to be issued the following steps must occur:

(1) Data ADF&G Will Provide

(a) Species using lick.
(b) Season of use.
(c) Approximate extent of use as determined by photo interpretation and on-site examination.
(d) Chemical content of lick and feasibility of introducing new mineralized material as a substitute.
(e) The importance of the lick (see criteria below).

Additional data which could help make a decision, but which may not be required:

(f) Sex and age of animals using the licks.
(g) Animal behavior at the lick.
(h) Access routes used by wildlife to the lick.
(i) Literature which describes how mineral licks contribute to the behavioral and physiological well-being of wildlife.

(2) Data DNR Will Provide. Geologic evaluation of the lick to determine if the lick may host an important mineral deposit.

(3) Criteria to Evaluate Importance. During the one-year closure, ADF&G and DNR will develop criteria that will be the basis for deciding whether a mineral lick is sufficiently important to close to mineral entry or to restrict to mineral leasing. The basis for the criteria will include, but not necessarily be limited to, the following:

(a) Items (1)(a) through (e) above.
(b) Importance of the lick to the health and productivity of the animals using it.

(c) Extent to which the lick is meeting the needs of the animals that use it; whether the animals using this lick may also use other licks for the same purpose; availability of alternate licks within a reasonable distance (at least 1 mile).
(d) Relationship of animals using this lick to animal populations within the Moose Range, e.g., percent of population using this lick, importance of those animals to the Moose Range population.
(e) Potential damage done to the lick or animals if mineral development were to occur.
(f) Potential for mineral development

(4) Procedure for Closure. Following development of criteria by DNR and ADF&G, an evaluation of the relative importance of each lick will occur. DNR will process the mineral closing or leasing requests under existing procedures including public and agency notice and review. The existing three mineral leasehold location orders on the three northern most mineral licks will be lifted on the balance of the nine sections following a permanant mineral closure of the immediate areas around the licks. Only important mineral licks will be protected. Those licks determined not to merit a closure or leasing restriction will be open to mining claims.

(5) Additional Licks. Mineral licks discovered in the future will be evaluated on a case-by-case basis as outlined in steps 1 through 4 above.

4. RELATIONSHIP OF MINERALS TO OTHER RESOURCE VALUES

a. Recreational Values. Mining operations should attempt to minimize the impact on the recreational use and values of an area. DOPOR will be consulted during the review of mining plans of operation and miscellaneous land use permits for suggestions for stipulations that will mitigate the impacts of mining on recreation. Recreational trails may be relocated if necessary to maintain safe public access around active mining operations. DOPOR and ADF&G will be consulted regarding trail relocation.

b. Scenic Value. Stipulations will be included in miscellaneous land use permits, plans of operations or mining leases that are designed to minimize adverse impacts on important scenic values. (See Map 10 on page 199 for areas with high scenic values. Also reference the Recreation guidelines, C7, page 91.)

c. Cultural Resources

(1) Resource Surveys. DNR should perform heritage resource surveys, as funding permits, in order to identify the location of important cultural resources prior to actual mining operations.

(2) Future Discoveries. Mining will be managed to minimize the impact on and, to the extent possible, avoid areas with cultural resources. If artifacts are discovered while mining, the discovery must be reported immediately to the Office of History and Archeology, DOPOR; work which would disturb the artifacts must be stopped until the State Historic Preservation Officer has given directions as to the preservation of the artifacts in accordance with AS 41.35.010.

d. Public Access Across Mining Sites

(1) Possible Restrictions. Public access within an operating mine area may be restricted only if authorized under an approved plan of operations, or land use permit, in order to protect public safety, or to prevent unreasonable interference with the rights of the miner to operate.

(2) Signs. "No trespass" signs may only be posted in the immediate working area or on storage buildings only after access restrictions have been authorized. They must not be used to block or intimidate the public's use of legal access. Posting of signs requires written approval by the Division of Mining and Geology as outlined in d.(1) above.

5. MINING RECLAMATION RESEARCH

The state encourages research efforts to develop techniques for enhancing moose browse on lands mined for coal.

RECREATION

A. GOALS

1. Provide opportunities for dispersed public recreation.

2. Manage public recreational use so that the level and type of use does not adversely affect moose populations and habitat and/or interfere with moose rehabilitation activities.

B. MANAGEMENT STRATEGY

The Moose Range will be managed as undeveloped open space to provide dispersed public recreation activities to the extent this does not cause significant conflicts with the overall goal of supporting moose populations. The primary management actions to provide recreation opportunities are summarized below.

C. GUIDELINES

1. PUBLIC FACILITY DEVELOPMENT

   a. Location of Facilities

      (1) Location of Development. Development of recreational facilities on state lands will be limited to areas outside of or adjacent to the edge of the Moose Range. Trailhead facilities will be located within the Moose Range, at the beginning of major, important trails. The purpose of these developments is to provide for needed camping and picnicking opportunities and to provide parking. The management intent is to direct public use to developed facilities and specific locations while limiting the amount of development within the Range.

      (2) Expansion and New Development Liklihood. Expansion of existing facilities or development of new recreation sites in the future will be based on public demand and use patterns, as well as funding and staffing constraints.

      (3) Priorities for Upgrading Established Sites. There is already a concentration of recreational use occurring along the Glenn Highway. Therefore, upgrading existing recreational facilities will be a high priority along the Glenn Highway to meet current and projected recreational demand near the Moose Range. DOPOR will emphasize the management of existing public facilities for overnight camping at Long Lake, King Mountain and Moose Creek State Recreation Sites rather than develop new facilities in the Moose Range. The only new area that may be developed for overnight camping in the Range is at the mouth of the Kings River.

(4) Trailhead Facilities. Trailhead facilities will be developed to provide parking and restroom facilities at key access points in the Range. Trailhead facilities are covered in the Recreation section of Chapter Four, on pages 180 and 181, 3a(1)(b) and 3a(4)(a) and (b), and pages 192 and 193, 3a(2) and (3).

2. COMMERCIAL AND NON-COMMERCIAL DEVELOPMENT

a. Commercial. Commercial recreational facility developments will not be permitted on state land within the Moose Range due to their potential impacts on wildlife habitat enhancement objectives. Permit or lease applications for the use of the public lands for commercial recreational purposes (in conjunction with a development located on non-state land) within the Moose Range will be evaluated on a case-by-case basis and require interagency review and approval. Permits or leases will be issued only if the activity is found to be consistent with the Moose Range Plan by DNR and ADF&G.

b. Non-commercial. Non-commercial recreational developments may be considered on a case-by-case basis. These developments must be for the public benefit and be consistent with the intent of the management plan and enabling legislation. Non-commercial developments require DNR and ADF&G approval.

3. PUBLIC SAFETY

a. Discharge of Firearms. Discharge of firearms will be prohibited for public safety reasons in administratively designated areas such as campgrounds, picnic areas and trailheads.

b. No Facilities in Hazard Areas. Many of the creeks and rivers in the Range are subject to flooding and steep mountainous areas are subject to avalanche. Site selection and design of any new recreation facilities will be located to avoid flood and avalanche hazards.

c. Enhancement Near Facilities. Big game, such as bears and moose, will not be considered as target species for habitat enhancement in or near recreation campgrounds or picnic areas because they bring a high level of hazard and conflict to people.

4. PUBLIC-USE CABINS

a. Liklihood and Location. Public-use cabins will not be located within the Moose Range at this time. In the future, if the state adequately funds a public-use cabin program, and funding is available to operate and maintain public-use cabins within the Moose Range, public-use cabins may be reconsidered. Public review of any future proposals is required. Establishment of public-use cabins also requires DNR and ADF&G approval. Public-use cabins will not be encouraged in remote areas, particularly where habitat values are high or timber/wildlife enhancement is occurring.

b. Potential Locations. The areas within the Moose Range that may be considered for the establishment of public-use cabins are along the Lower Boulder Creek Trail, the Chickaloon-Knik-Nelchina Trail near Sawmill Gorge, the Chickaloon River Trail and the Old 98 Trail on the Chickaloon Bench. Note: These sites are located on what was formerly mental health lands. (See explanation in Chapter One, pages 3 and 4.) Before public-use cabins could be established on any of these sites, notice would have to go to the plaintiffs and intervenor in Weiss vs. Alaska.

c. Existing Cabins. Existing unauthorized cabins in these areas will be evaluated for possible conversion to public-use cabins.

d. Funding Necessary. DNR will only manage public-use cabins if there are adequate funds available to construct new cabins or upgrade unauthorized use cabins, and to maintain and operate the facilities.

e. Volunteer Assistance. To support and supervise use of public-use cabins, the Department may work with volunteer organizations. Members of volunteer organizations that assist the state in maintaining cabins will not be given exclusive use.

5. INFORMATION AND EDUCATION

a. Displays. To educate the public about the Moose Range, information displays will be developed in camping, picnicking and trailhead facilities servicing the Moose Range (funding permitting). These displays may include an explanation of the legal access, public natural resource values, recreational opportunities, wildlife habitat enhancement efforts and the multiple use concept being used to manage the Moose Range, wildlife viewing opportunities, unique ecosystems and geological features and natural hazards in the Range. ADF&G and DNR shall jointly develop the wording of information signs concerning the Moose Range.

b. Brochures. To educate the public about the above listed topics, informational brochures may be prepared by ADF&G, DNR and the Matanuska-Susitna Borough. The Borough can apply for grant monies to assist in this effort. DNR and ADF&G shall jointly develop the wording of informational brochures concerning the Moose Range.

c. School and Group Involvement. To educate the public and encourage research on multiple use management and habitat enhancement procedures, DNR and ADF&G will encourage area grade and high schools, community schools and the University of Alaska systems to use the Moose Range as an outdoor laboratory. DLWM, Southcentral Region Office, and ADF&G, Habitat Division, should be contacted before any field study projects, or use of the area as an outdoor laboratory, take place. Use of the range by outing clubs, scouts, 4-H groups, etc. does not require a permit at this time.

6. MANAGEMENT OF RECREATIONAL USES

In areas where recreational use may cause significant adverse effects on wildlife populations and their habitats, some site-specific restrictions on certain recreational activities may be necessary. Areas that are particularly sensitive to recreational activity may require restrictions on use. These areas may include, but are not limited to, areas where habitat enhancement efforts are occurring, and specific sites ADF&G determines to be critical habitat for wildlife. ADF&G will monitor the effects of recreation on fish and wildlife values and where appropriate, suggest restrictions to mitigate the impacts. Any restrictions will require interagency review. (See also Transportation and Access Section of this chapter, guideline 3g, Trail Management: Recreation Trail Use Conflicts, page 123.)

7. SCENIC VALUES

a. Views From Glenn Highway and Major Trails. Although habitat enhancement areas may be scarified, cleared of timber and controlled burned in areas viewed from the Glenn Highway, such operations should be done in a manner that minimizes, where possible, the contrast between natural and enhanced areas. The intent is to maintain the scenic values of the important viewed areas (shown on Map 6, page 39,) while allowing for habitat enhancement to occur. In enhancement areas, standing vegetation and topography should be used to screen affected areas where possible. Other techniques to blend in enhancement and rehabilitation projects should be applied where applicable and practical. This guideline applies to Arkose Ridge, Wishbone Hill, Granite Peak, Little Granite Creek Bench, and Castle Mountain, and to the major view of Puddingstone Hill from the Chickaloon River Trail and Chickaloon-Knik-Nelchina Trail (see Map 6 on page 39).

b. Foreground Scenery of Travelled Routes. The quality of foreground scenery along roads, trails and floatable waterways should be maintained during habitat enhancment or timber harvesting efforts wherever possible.

c. Communication Sites, Utility Lines. Scenic values will be maintained by properly locating and constructing telecommunication sites, power lines and other large structures to reduce visual impact. Where possible, power and telephone lines will be placed in a manner to reduce the visual impact from the Glenn Highway. For example, in certain situations power lines create less of a visual impact if placed on the uphill side of the highway where they blend with the background than if placed on the downhill side of the highway where they stand out against the sky or create a line across the distant view of mountains.

8. RECREATIONAL MANAGEMENT ON NON-STATE LAND

   a. Borough Involvement. The recreational needs of local communities should, in part, be provided for by the Matanuska-Susitna Borough. The Department of Natural Resources will work with the Matanuska-Susitna Borough to ensure that the demand for recreational opportunities is met on either state, borough or other land where appropriate. Both Sutton and Chickaloon communities have recreational needs which could be met through the use of borough lands within or adjacent to the Moose Range. The borough is encouraged to consult with DNR and ADF&G prior to the development or dedication of a recreational area within the Moose Range.

   b. Private Citizen Involvement. DNR encourages the borough to undertake a program with local landowners to promote voluntary protection of visual quality on private lands. Such a program might include restrictions on removal of vegetation and incentives to remove junk cars and similar refuse.

9. TRAILS, ACCESS AND MANAGEMENT OF OFF-ROAD VEHICLE USE

   See the Transportation and Access section in this chapter on page 118 for policies regarding trails, access for public recreation and off-road vehicle use.

HERITAGE RESOURCES

A. GOALS

1. Identify and protect significant heritage resources.

2. Provide educational and interpretive information regarding heritage resources.

B. MANAGEMENT STRATEGY

All administrative actions within the Moose Range will abide by the Alaska Historic Preservation Act (AS 41.35.010) which calls for the state to preserve and protect the historic, prehistoric and archaeological resources of the state.

C. GUIDELINES

1. RESOURCE SURVEY

Cultural and historical values located in the Moose Range will be surveyed, assessed and researched by DNR, funding permitting. Map 7 on page 43 shows priority areas for this survey.

2. INTERPRETATION

Cultural and historical values will be interpreted to the public through signs, displays, rehabilitation, and other methods where appropriate and as funding is available.

3. NEW DISCOVERIES

At any time when a cultural or historical resource is located through an administrative action, or by a member of the public, the Office of History and Archaeology, Division of Parks and Outdoor Recreation, DNR will be notified and the site will be protected until an evaluation of the resource values can take place.

4. NATIONAL HISTORIC REGISTERS

Trails, structures and other heritage resources determined by the state (DOPOR) to be significant and containing potential for qualifying on the National Register of Historic Places should be recommended for placement on the Register, as funding is available. The historic Chickaloon-Knik-Nelchina and Chickaloon River Trials are likely candidates. The Chickaloon-Knik-Nelchina trail should receive priority for placement on the National Register of Historic Places.

WATER

A. GOALS

1. Provide for the use of water for the maximum benefit to people through the established statutes and regulations related to water management.

2. Initiate the research necessary for, and then establish instream flow reservations for fish and wildlife populations and related recreational activities.

3. Permit resource development use of waters through established statutes and regulations.

4. Assure water quality is maintained.

B. MANAGEMENT STRATEGY

People, fish and wildlife and resource development activities all require the use of water. The state has established laws for the protection of water quality, which the Department of Environmental Conservation is responsible for enforcing. The state has also established a system for reserving instream flow. The Department of Natural Resources administers the system. The state does not have a system established for reserving surface or ground water (other than instream flow), but rather a law which allows for the first user in time to have the first right to use.

The following water resource policies are included to inform the reader of policies already in existence, and additional policy which has been developed for management of the Moose Range.

C. GUIDELINES

1. WATER RIGHTS

   a. Priority of Use. Except for public water supply and domestic use, the enhancement, protection and maintenance of fish and wildlife habitat is generally the highest priority water use in the study area. Therefore, the DNR should not allow an appropriation of water to cause the instream flow or lake levels to fall below the amount determined necessary by ADF&G to protect or maintain fish and wildlife habitat, unless, under the procedures outlined in AS 46.15.080, the commissioner of DNR makes a finding based on public review that the competing use for water is in the best public interest and no feasible and prudent alternative exists.

b. Criteria To Be Met. The appropriation of water shall be allowed to fulfill the purposes of a grazing lease, forest practice, mining operation or other activites as long as the appropriation of water does not adversely affect the ability of prior water right holders to obtain their water, meets the criteria for issuance of a permit in accordance with AS 46.15.080, meets the water quality requirements of ADEC and meets all of the requirements and guidelines in this plan established to protect fish and wildlife populations, habitat and related public uses.

c. Application for Use. A specific reservation of water (instream flow) for any surface source within the Matanuska Valley Moose Range must be applied for under the authority of AS 46.15.145.

d. Uses. Under DNR's statutes, reservation of instream flow is possible for four types of uses:

(1) Protection of fish and wildlife habitat, migration and propagration; instream flow reservations to protect habitat may be made for streams that: (a) have significant anadromous or resident fish populations; (b) flow into wetlands that support significant waterfowl, fish, furbearer or other wildlife populations; or, (c) provide the water supply needed for other habitat types that support significant wildlife populations;

(2) Recreation and park purposes;

(3) Navigation and transportation purposes; and,

(4) Sanitary and water quality purposes.

e. Application Steps. An applicant filing for a reservation of water should include the following steps for each stream, stream segment or other water body under consideration.

(1) Identify the management objective.

(2) Estimate the quantity of water seasonally available by direct measurement (hydrograph), predictive methods (regional hydrographic models) or other appropriate methods.

(3) Determine the quantities of water already appropriated. This information is on record with the Division of Land and Water Management.

(4) In consultation with appropriate agencies, use site-specific studies or other information to determine the instream flow requirements for the resources and uses to be protected. For habitat resources this will require cooperative work and consultation with the Alaska Department of Fish and Game to identify necessary conditions for rearing, staging, reproduction, spawning, incubation, overwintering and migration of valuable fish and wildlife resources.

f. Application Processing. Upon receipt of an application for water rights, the DNR shall process the application in accordance with AS 46.15. If objections to the appropriation or reservation of water are filed by any person, state or federal agency, the objector is responsible for giving adequate reasons why a permit to appropriate water or Certificate of Reservation should not be issued. Reasons for objections must be documented; the objector must describe how the proposed appropriation does not meet the requirements of AS 46.15.080.

2. RESERVATION PRIORITIES

a. Support for Studies and Reservations. In accordance with applicable statutes, regulations and procedures, and as time and funding allow, management agencies shall give support to instream flow studies and reservations that are necessary to protect and promote resource values and uses identified in this plan for streams and other waterbodies.

b. Priority for Instream Flow Studies. High priority streams and other waterbodies for instream flow study and possible reservation include Wasilla Creek, Moose Creek, Eska Creek, Granite Creek, Young Creek, Kings River, Chickaloon River, Boulder Creek, Wishbone Lake, Seventeen Mile Lake, and Drill Lake. These have been identified because of their high public values particularly for habitat and recreation and the high potential for competition for water between these uses and resource developments. If necessary, instream flow reservations applied for under AS 46.15.145 will be made on these priority rivers, creeks and lakes.

3. WATER QUALITY

Water quality shall be maintained in the streams, stream segments, or water bodies occurring in the Moose Range as required by existing law.

LAKESHORES AND STREAM CORRIDORS

A. GOALS

1. Provide for common use of water by people for the maximum benefit to people through the established statutes and regulations related to water management.

2. Protect riparian habitat, breeding areas for fish and wildlife, lakeshores and river corridors for fish and wildlife and other recreational uses.

3. Assure water quality is maintained.

B. MANAGEMENT STRATEGY

The overall management intent for lakeshores and stream corridors is to maintain and protect riparian zones, water quality, lake shorelines and river banks while allowing for multiple use of the resources. Public access to public waters will be maintained.

C. GUIDELINES

1. RIPARIAN ZONES

   a. Activities Requiring Review. Any timber harvest/habitat enhancement activity altering the habitat/vegetation within the riparian zone shall require concurrence by DNR and ADF&G and other appropriate state and federal agenices as necessary, subject to existing laws. The following activities require review and concurrence.

      (1) Road and trail construction.

      (2) Habitat enhancement projects/vegetation removal.

      (3) Timber harvest and sales.

      (4) Material removal.

   b. Coal Mining Requirements. Coal mining activities that are approved and occur within riparian zones will follow existing procedures established in ASCMCRA, as well as the guidelines in this plan.

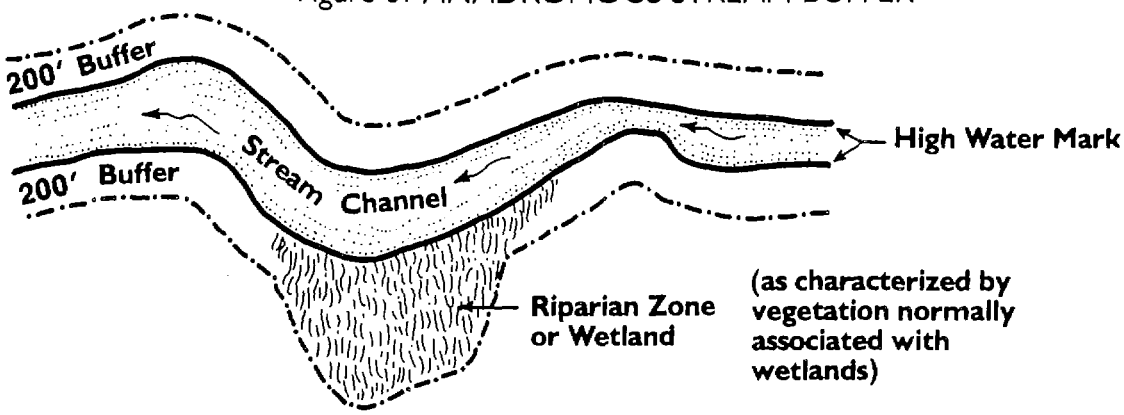
   c. Interagency Review. Mining for other leasable minerals and activities associated with mining for locatable minerals require interagency review of the land use permits and leasing authorizations prior to approval.

2. STREAM BUFFERS

In order to protect water quality, riparian habitat, and recreational values, a buffer of essentially undisturbed land and vegetation should be protected along streams.

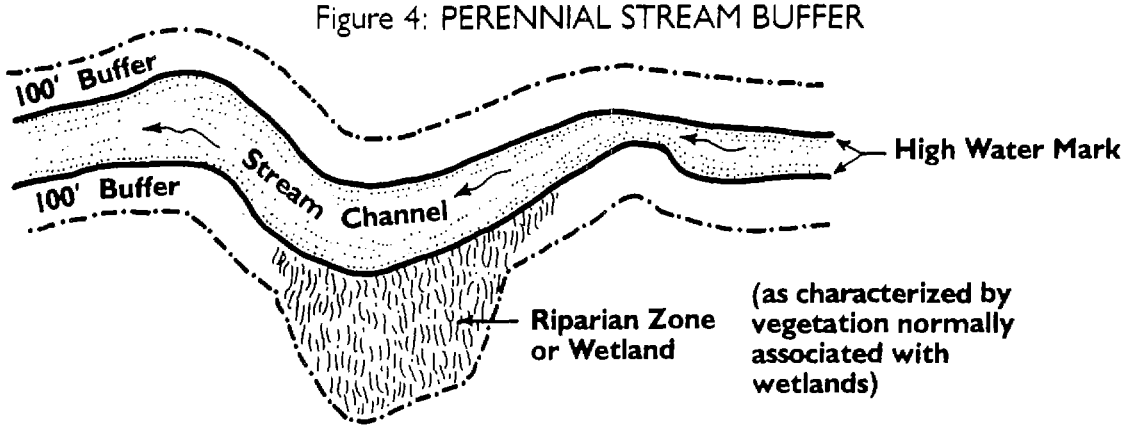
a. Group I - Anadromous Fish Streams. The buffer area shall be normally 200 feet on both sides of the high water mark and shall include all streamside riparian vegetation zones (see Map 3 on page 23 and Figure below). In the case of coal development, the buffer will follow existing standards in the Alaska Surface Coal Mining Control and Reclamation Act (ASCMCRA), and will require a minimum 100 foot setback on all streams.

Figure 3: ANADROMOUS STREAM BUFFER



b. Group II - Perennial Streams not known to have anadromous fish but which are identified on a U.S.G.S. 1 to 63,360 topographic map or field verified by ADF&G and DNR: The buffer shall be 100 feet wide on both sides of the high water mark and shall encompass the adjacent riparian vegetation zones. (See Map 8 on page 47 and Figure below.)

Figure 4: PERENNIAL STREAM BUFFER



c. Buffer Adjustments

(1) Riparian Zone Less Than 100'. The buffer width on Group II streams may be reduced to the width of the riparian zone or 50 feet, whichever is greater, if field verification by ADF&G and DNR concludes the riparian zone is less than 100 feet wide.

(2) Slope Effects. Buffer widths on Group I and II streams should be adjusted to reduce potentially adverse impacts of development within sloping buffer areas. Buffer widths should conform to the following table:

Average Side Slope	Buffer Width
0 - 20%	SB
20 - 40%	SB + 25%
40% or greater	SB + 50%

SB = Standard buffer (Group I = 200; 100' for coal) and Group II = 100')

(3) Wind Effect. Riparian buffer widths should be widened as necessary to increase resistance to windthrow of the residual buffer trees in areas subject to strong winds.

d. Activities Allowed in Group I and II Stream Buffers

(1) Selective-tree cutting as approved by ADF&G and DNR.

(2) Disease and insect control and prevention with pesticides and/or tree removal as approved by ADF&G, DNR and DEC.

(3) Grazing as approved by ADF&G and DNR, consistent with the grazing guidelines in this chapter on pages 103-117.

(4) Road and trail access to and/or across streams for recreation, habitat enhancement, or forest product harvest purposes as approved by ADF&G and DNR.

(5) Access to and/or across streams for utility lines such as powerlines and waterlines, etc. as approved by ADF&G and DNR. Utility systems should not be located so that they parallel stream systems; rather they should cross streams in a perpendicular fashion to the extent feasible and prudent.

3. LAKESHORE BUFFERS

a. 5 Acre Lakes. Buffer widths for lakes up to 5 acres in size are set at 200' landward of the lake's high water mark.

b. 5-100 Acre Lakes. Buffer widths for lakes between 5 and 100 acres in size are set at 300' landward of the lake's high water mark.

c. 100+ Acre Lakes. Buffer widths for lakes exceeding 100 acres in size are set at 400' landward of the lake's high water mark.

d. Slope Effects. Buffer widths for lakes should be adjusted to reduce potentially adverse impacts on wetlands from development on adjacent side slopes. Buffers should be the standard buffer width for side slopes of 0-20%, 25% percent additional buffer should be added to the normal buffer width for side slopes of 20-40% and 50% additional buffer should be added to the normal buffer width for side slopes of 40% or greater.

e. Activities Allowed. Activities allowed within lakeshore buffers include the following:

1. Selective-tree cutting as approved by ADF&G and DNR.

2. Disease and insect control and prevention with pesticides and/or tree removal as approved by ADF&G, DNR and DEC.

3. Grazing as approved by ADF&G and DNR, consistent with the grazing guidelines in this chapter on pages 103-117.

4. Road and trail access to lakes for recreation (including sportfishing), habitat enhancement, or forest product harvest purposes as approved by ADF&G and DNR. These roads and trails should not be located so that they parallel the lakeshore within the buffer.

5. Access to lakes for utility lines such as powerlines and waterlines, etc. as approved by ADF&G and DNR. Utility systems should not be located so that they parallel lakeshores.

NOTE: See page 137 for a summary of all buffer requirements.

WETLANDS

GUIDELINES

1. DEFINITION OF WETLANDS

For purposes of inventory and regulation of wetlands, DNR will use the definition adopted by the State of Alaska under the regulations of the Coastal Management Program [6 AAC 80.90(19)]:

> Freshwater wetlands means those environments characterized by rooted vegetation which is partially submerged either continuously or periodically by surface freshwater with less than .5 parts per thousand salt content and not exceeding three meters in depth.

For purposes of these management guidelines, wetlands are further divided into three classes: Class I, wetlands larger than 100 acres and all wetlands with a locatable stream outlet (the stream shall be considered part of the wetland); Class II, wetlands between 40 and 100 acres with no outlet; and Class III, wetlands less than 40 acres with no outlet.

2. PROTECTION

All wetlands shall be preserved within the Moose Range according to existing state and federal laws and the Susitna Area Plan. Habitat enhancement efforts in wetlands require interagency review, concurrence by DNR and ADF&G, and will follow the Susitna Area Plan and Moose Range guidelines.

3. WETLAND BUFFERS

a. Width. Buffer widths for all wetlands are set at 100' landward of the wetland edge (defined as the limit of wetland vegetation as described in Guideline 1 above).

b. Slope Effects. All wetland buffers should be adjusted to reduce potentially adverse impacts on wetlands from development on adjacent side slopes. Buffers should be the standard buffer width for side slopes of 0 - 20%, 25% additional buffer should be added to the normal buffer width for side slopes of 20 - 40% and 50% additional buffer should be added to the normal buffer width for side slopes of 40% or greater.

c. Activities Allowed. Activities allowed within wetland buffers include the following:

1. Selective-tree cutting as approved by ADF&G and DNR.

2. Disease and insect control and prevention with pesticides and/or tree removal as approved by ADF&G, DNR and DEC.

3. Grazing as approved by ADF&G and DNR, consistent with the grazing guidelines in this chapter on pages 103-117.

4. Road and trail access to wetlands for recreation (including sportfishing), habitat enhancement, or forest product harvest purposes as approved by ADF&G and DNR. These roads and trails should not be located so that they parallel the wetland within the buffer.

5. Access to wetlands for utility lines such as powerlines and waterlines, etc. as approved by ADF&G and DNR. Utility systems should not be located so that they parallel wetlands.

d. Access. Access through wetland buffers and wetlands will be allowed only on winter ice roads for recreation, habitat enhancement, forest product harvest and other activities as approved by ADF&G and DNR.

NOTE: See page 137 for a summary of all buffer requirements.

GRAZING

A. GOALS

1. Utilize and manage the grazing resources that exist in the Moose Range on a sustained yield basis in a manner which is consistent with wildlife management goals and wildlife habitat enhancement efforts.

2. Preserve the integrity of the rangeland ecosystem.

3. Conduct research to determine whether grazing can be used as a moose habitat enhancement method to reduce bluejoint reedgrass competition.

B. MANAGEMENT STRATEGY

The management strategy for grazing in the Moose Range is to allow for utilization of rangelands in areas where grazing will not conflict with wildlife management objectives or where it can benefit wildlife habitat enhancement. The guidelines in the Chapter detail the grazing operation plans required for leases or permits. The details include incorporation of SCS stocking density recommendations, annual monitoring of forage utilization and range condition and the use of fencing for range management.

The majority of the known grazing resources is already under permit or lease within the Moose Creek drainage (see Map 10 on page 199). Currently, use of these sites is minimal. Common use of leased areas by several users is to be encouraged. The goals of common use are:

1. Increased utilization on the better grazing sites.

2. Sharing of costs for range improvements.

3. Reduced number of individual grazing areas.

4. Reduced fencing requirements.

5. Fewer administrative costs.

6. Better use of research projects.

New leases and permits will be non-exclusive use. Holders of existing leases will be encouraged to allow other users to share the leased area through private arrangements.

Once active grazing commences, the intent is to use the existing lease/permit sites as research areas whenever possible. The research focus for the Moose Creek lease/permit sites is range trend condition studies and monitoring wildlife-livestock interaction for food preferences.

There are three proposed new grazing sites in the Range -- the southwestern corner, the area below Knob Hill and the Castle Mountain Mine Road area (see Map 10 on page 199). The intent for these new sites is to issue leases/permits according to the following guidelines to determine if grazing can occur without adversely affecting fish and wildlife resources.

C. GUIDELINES

1. RANGE MANAGEMENT PLAN. The grazing guidelines in this document constitute the "Range Management Plan" required in the Susitna Area Plan prior to extensive permitting or leasing.

2. AUTHORIZATION REQUIREMENTS

   a. Permit or Lease Required. All grazing of domestic livestock shall be authorized by a permit or lease on all state lands not now under permit or lease. Permits would not be required for grazing use incidental to non-commercial recreational use of horses such as packing game or trail riding.

   b. Term of Leases or Permits

      (1) Policy for term of leases/permits

         (a) Long term leases (6 to 10 years) and short term leases (1 to 5 years) will be issued where grazing is a designated use.

         (b) Permits (1 to 5 years) may be issued wherever grazing is not prohibited as long as they do not adversely affect fish and wildlife.

(2) Guidelines to be used to determine whether lease or permit is appropriate are listed in the following table. No guideline should be used exclusive of the other guidelines; rather, all the guidelines should be considered collectively.

GUIDELINES FOR DETERMINING IF A LEASE OR PERMIT IS APPROPRIATE

PERMIT	LEASE
(a) Small numbers of livestock, generally 50 or less.	(a) Larger number of livestock, 50 head or more.
(b) Non-commercial livestock.	(b) Commercial livestock.
(c) Specific area considerations.	(c) Specific area considerations.
* Small areas.	* Larger areas.
* Potentially high conflict area.	* Potential conflicts are better known and manageable.
* Shorter grazing period requirements.	* Better sites and longer seasons of use.°
* Less costly range improvements that will suffice.	* Higher cost range improvements needed to mitigate other resource conflicts.
* Site specific benefits, i.e., intensive grazing to reduce grass competition with other moose browse species.	

°The length for the season of use is specified by the guidelines in this chapter on page 113, 4.

(3) Guidelines to be used to determine whether a long or short term lease is appropriate are listed in the following table. No one guideline should be used exclusively from the others, rather they all shoul be considered.

GUIDELINES FOR DETERMINING SHORT OR LONG TERM LEASE

SHORT TERM LEASE (1-5 years)	LONG TERM LEASES (6-10 years)
(a) 25-50 head of livestock	(a) Greater than 50 head
(b) Less than $10,000 investment in first 5 years	(b) Greater than $10,000 investment in first 5 years
(c) Manageable but significant conflict	(c) No serious conflicts known
(d) Non-commercial operation	(d) Commercial operations
(e) Horses, sheep, cattle	(e) Horses, Cattle
(f) Lesser levels of vegetation and water monitoring needed due to better data, smaller areas and/or fewer animals	(f) Extensive amount of vegetation, and water monitoring desired
(g) Soil/vegetation and water conditions not well established	(g) Soil/vegetation/water conditions are well known
(h) Range condition and trend unknown	(h) Range condition and trend well established
(i) Potential conflict with moose browse enhancement.	(i) Minimal conflict with with wildlife or moose browse enhancement.

c. Leasing. Requirements prior to issuance of a lease, the following conditions must be met:

(1) A range survey must be completed by the U.S. Soil Conservation Service (SCS), University of Alaska or other recognized range management specialist.

(2) A grazing operating plan will be completed by the lessee with assistance from SCS, ADF&G, DOA, and DLWM. Note: SCS participates only if the lessee is a district cooperator and requests assistance. DNR and ADF&G must approve the grazing operating plan and lease agreement prior to issuance of lease.

(3) The grazing operating plan will be made a part of the grazing lease.

d. Grazing Operating Plans. Grazing operating plans for leases will include the elements listed below which are common in Range Conservation Plans (RCP) prepared in cooperation with SCS. (Range Conservation Plans are soil and water conservation plans.) The RCP is a primary element in the grazing operating plan required for DNR leases. Grazing operating plans may be revised annually to allow changes in stocking rates, improvements, etc. as indicated by range conditions and trend information.

(1) Updated range survey and soils data.

(2) Documentation of range condition and trend information.

(3) Range conservation practices, including but not limited to,

- grazing system to be used,
- proper grazing use guidelines,
- stocking rates,
- seasons of use,
- key areas for range readiness and utilization studies.

(4) Range improvements and support facilities.

(5) Monitoring system.

(6) Special use areas and treatments.

(7) Location and legal description.

(8) Maps

- range site map
- soils map
- range improvements
- condition and trend maps

(9) Future considerations

(10) Special treatment areas where a restrictive grazing policy should be applied will be identified by ADF&G and DNR during the development of the grazing operation plan. See Map 10 for potential grazing areas.

(11) RCPs will provide non-technical range site descriptions and interpretations for grazing suitability.

(12) RCPs should be developed during a timeframe which allows SCS and the cooperator to examine the potential lease or permit area during the growing season (May through August) prior to approval of the permit or lease.

(13) SCS and ADF&G will work cooperatively to inventory the annual production (current annual growth) of moose browse.

e. Common Use Areas. A grazing operations plan is required for common use areas. Common use areas are encouraged in order to fully utilize the range resource and to reduce fencing and facility requirements. future leases and permits will be structured so as to allow commmon use. Where existing leases are in place, lessee cooperation should be pursued to allow stocking of range areas that are underutilized.

f. Grazing Permits. Individual permits may be issued with a simplified grazing operating plan. The grazing operating plans for permits should address the following subjects:

(1) SCS range survey data or sufficient on-site range inspection by DNR, ADF&G, SCS and the applicant to verify existing range conditions.

(2) Range conservation practices, including but not limited to:

- grazing system
- use quidelines
- stocking rates
- seasons of use

(3) Range improvements to be required.

(4) Monitoring system to be used.

(5) Location and legal description

(6) Maps

- range site map
- range improvements

The grazing operating plans will be a part of the permit.

g. Public Access. Public access to state lands is not to be restricted by a grazing permittee or lessee.

h. Termination of Grazing Privileges. Failure to comply with lease or permit terms shall result in termination of all grazing privileges. Standard DNR appeal procedures will be followed.

i. Conservation Agreement. If the permittee or lessee unilaterally cancels the "Conservation Agreement" with the DNR, Soil and Water Conservation District, the lease or permit will be subject to termination.

j. Examination for Disease. Prior to placing stock on the permit or lease area, all livestock shall be examined by a state licensed large animal veterinarian for the diseases and parasites identified in Table 4 on page 111. All livestock shall be free of visible symptoms of any contagious/infectious disease and parasites prior to placing them on the Range. Livestock found to carry an infectious/contagious disease will be restricted from placement on the Range for a 60-day period to allow for treatement and re-testing by a licensed veterinarian.

k. Parasite Treatment. All livestock shall be treated for and free of ectoparasites and endoparasites by using standard treatments and acceptable drugs prior to release on Moose Range lands.

l. Notification. DNR shall be formally notified by the permittee/lessee a minimum of 48 hours prior to the release of livestock on state lands. The notification shall include:

(1) The number and type of livestock to be released;

(2) Doctor of Veterinary Medicine certification that the livestock have been inspected for infectious diseases that are a threat to wildlife and are found by visual examination to be free of infectious and contagious diseases, ecto- and endoparasites.

Note: Imported feeder cattle are exempt from the BRT test and are therefore by state law restricted to the owner's property. They cannot be put on public rangeland.

m. Overutilization of Moose Browse Species. Stock shall be removed from that portion of the Range where the annual production of moose forage species (willow, aspen, birch) has been determined by SCS and ADF&G to be overutilized. Fifteen percent (15%) utilization of the existing annual growth is considered over utilization.

n. Renewals. Existing grazing leases or permits may be reissued to the lessee if the lessee has fulfilled the requirements of the lease/permit. Should the lessee forfeit the lease/permit, the grazing lands may be reissued to another party. The grazing operating plan should be reviewed by ADF&G, SCS and DNR prior to renewal to the new lessee to determine if changes are needed. A new Range Conservation Plan must be written for the new lessee.

Table 4: TREATMENT AND MANAGEMENT OF LIVESTOCK DISEASES AND PARASITES

Disease/Parasite	Testing and Treatment Before Release on Public Rangeland	Required Action if Animal Tests Disease Positive
Brucella-Tuberculosis	BRT test at least 60 days prior to release.	Required Action if animal tests disease positive. Quarantine; remove from Range; Innoculation.
Blue Tongue Anaplasmosis	Visual examination by licensed veterinarian 60 days prior to release date.	Restrict from release on public rangeland for 60 day period to allow retesting/ recovery.
Leptospirosis	"	"
Malignant Edema	"	"
Black Leg	"	"
Pasturella	"	"
Parainfluenza III	"	"
Respiratory Syncytial Virus	"	"
Infectious Bovine Rinstracheiti (IBR)	"	"
Contagious Ecthyma	"	"
Equine Infectious Anemia	"	"
Scabies	"	"
Ovine Viral Diarrhea	"	"
Ovine Progressive Pneumonia	"	"
Endoparasites	" Administer by ingestion (Ivermectin) or other similar drug 60 days prior to release date.	"
Ectoparasites	" Dust/spray with appropriate Chemicals 60 days prior to release date.	"

3. RANGE CONSERVATION PRACTICES

a. Range Proper Use. Utilization of key species (Blue joint and fescues) shall be limited to no more than 30% of the annual forage production of those species.

Modification of this guideline can occur as a result of range condition and trend studies and utilization checks if those studies or checks prove a higher utilization will be beneficial for forage production without adverse effect on wildlife habitat. Modification can also be authorized if higher utilization is desired for wildlife habitat enhancement or recreation management reasons. ADF&G approval is necessary for modification of the 30% utilization guideline.

b. Grazing Systems

(1) Where season-long grazing occurs, utilization shall be no more than 40% of the estimated initial stocking rate during any given 30 day period.

(2) Other systems may be developed as a result of research and utilized if approved by the ADF&G and DNR (Division of Agriculture).

(3) A multiple pasture (rotational) grazing system is generally preferred for long-term lease areas.

c. Stocking Rates. Initial stocking rates will be determined using the range survey data as a general guide. Modification to the stocking rates may occur as a result of changes identified from conducting annual utilization checks or identifying changes in condition and trend.

d. Monitoring. The DNR or its qualified designee shall monitor grazing operations by conducting timely seasonal range condition and trend and utilization surveys to ensure that overgrazing and environmental degradation does not occur and that recommended stocking rates and densities are followed. Survey findings shall be reported to the permittee or lessee, Division of Agriculture (DOA), Division of Land and Water Management (DLWM) and ADF&G.

If environmental degradation is found to be caused by livestock activities, the grazing operating plan and livestock activities shall be modified to eliminate the undesirable action. Any restoration or rehabilitation needed as a result of overgrazing must be approved by DNR and ADF&G.

e. Changes. Stocking rates, densities, length of season, and percent forage utilization levels may change as a result of research activities sanctioned by the DLWM, Division of Agriculture (DOA) and conducted in cooperation with the ADF&G.

f. Riparian Zones. Riparian zones will be recognized as special treatment areas when developing the grazing operating plan.

g. Waterbodies. The grazing operating plans will identify waterbodies to be given special consideration. These include but are not limited to all streams and lakes shown on the U.S.G.S. 1:63,360 topographic maps.

h. Access to Certain Identified Waters. Cattle shall be prevented from having open access to certain streams and riparian habitat identified by DNR and ADF&G. Livestock may have access to these streams at predesignated fenced watering areas.

i. Buffers. Buffers established to protect threatened riparian zones will be at least 100 feet wide on each side of the waterbody above the ordinary high water mark. There will be no grazing allowed in these areas. The grazing operating plan will identify those riparian zones to which this applies.

j. Salting. Salting may be used to disperse concentrations of livestock use.

4. SEASON OF USE

a. Range Readiness. Stocking the range shall not occur before Blue Joint (Calamagrostis spp.) grass reaches four to eight inches in height. A determination on range readiness shall be made by Alaska Department of Natural Resources (DNR). Key locations to determine range readiness shall be established where grass growth can be determined. The Soil Conservation Service (SCS) in cooperation with the DNR shall assist in making the determination on how and where these plots shall be established.

b. Maximum Grazing Period. The maximum grazing period in any one grazing season is 75 days.

c. Stock Removal Date. Generally, all stock shall be removed from the range prior to August 31.

d. Flexibility of Removal Date. Stock removal dates will be specified in each lease or permit. Flexibility to modify the grazing period and stock removal date beyond August 31 depends on the individual grazing operating plans, current utilization checks and ADF&G approval.

5. WILDLIFE CONFLICT

a. Brown Bear. Livestock shall not be grazed in areas determined by ADF&G to have concentrations of brown bear.

b. Moose. Livestock shall not be grazed in areas having high summertime concentrations of moose.

c. Domestic Sheep. Domestic sheep shall not be grazed above 1,500 feet elevation or in the alpine transition zones in or near wild sheep range as determined jointly by ADF&G and DNR.

d. Browse Species Conservation. Browse species will be conserved for primary use by wildlife through selection of areas and season of use guidelines.

e. Livestock Predation. Grazing conducted in known or suspected predator range (wolf or bear) is done at the permittee's or lessee's own risk. The ADF&G will not conduct predator control activities for the purpose of reducing livestock losses due to predators. Permittees (or lessees) should be advised to comply with regulation 5 AAC 92.410, Taking Game in Defense of Life or Property.

6. RANGE IMPROVEMENTS

a. Approval. All range improvements must be approved as a part of the grazing operating plan and lease agreement.

b. Facilities. No permanent "headquarters" facilities capable of human habitation will be authorized as a part of a grazing permit or lease.

Support facilities such as holding pens, equipment storage buildings, loafing sheds and livestock treatment facilities shall be specified in the grazing operating plan and approved by DNR and ADF&G. Location of these facilities shall minimize impact on the area's moderate and/or high valued wildlife habitat, enhancement areas and scenic qualities according to the following criteria.

(1) Screening. Facilities should be screened from view of the roads, heavily used trails or areas and public facilities to the extent feasible either by vegetation or natural contours.

(2) Containment Facilities. Containment facilities will be sufficient to isolate diseased/contagious livestock temporarily should the need arise. Extended treatment for recovery purposes should occur off the public rangeland lease or permit area.

(3) Grouping. Facilities will be grouped together.

(4) Locating in Habitat. Facilities shall not be located in moderate or high rated wildlife habitat.

c. Fencing. Fencing plans should be specified in the grazing operating plan after consultation with ADF&G and DNR during the grazing operating plan development or amendment process.

d. Interim Fencing Guidelines. The details of a permanent fencing plan will be developed by ADF&G and DNR during the 1987 fiscal year.

(1) A fencing plan shall be submitted for approval as part of a grazing operating plan for permits and leases. The fencing plan will address the following subjects:

* Type of fencing.
* Construction specifications
* Purpose of fencing (e.g. confine livestock, exclude livestock, sub-divide grazing land).
* Location of fencing.
* Fence management.
  - Drop down areas/requirements
  - Intersections with recreation trails/roads
  - Maintenance
  - Permanent nature of fence

(2) Fences shall to the extent feasible and practical be located and constructed so as to permit passage by moose through an area while reducing to the minimum the potential injury to moose.

(3) To this end, ADF&G recommends that barbed wire will not be used for wire fences. The fence height and spacing of wires will be such that potential injury to moose is minimized and passage of adults and juveniles is maximized. (Specific guidelines for fence height and wire spacing will be developed.) One, two or three-wire electrified fencing may be acceptable.

(4) Fence construction should be designed so as to allow dropping the fence to the ground if necessary at the end of the grazing season in areas of intensive recreational use, established wildlife travel patterns, and/or areas of heavy snow accumulation.

(5) Fence construction will provide for easy passage of people where recreation trails and fences intersect. Foot traffic can be accommodated by pass-throughs or stile construction. Off-road vehicle or snow machine traffic on trail/fence intersections will be accommodated by cattle guards or similar devices to allow safe off-road vehicle passage.

(6) Fence lines should be cleared of any obstructions prior to construction so as to allow the fence to be clearly visible by animals and people. Such clearing will be maintained for the life of the fence.

(7) Fences should be constructed and maintained so the top wire is made highly visible by use of "poly tape" or other sight barrier material.

(8) An alternative permanent fencing method for known moose migration routes may be pole fencing. Sections of pole fencing across known moose trails should be tested as an alternative fencing method to wire fencing.

(9) All materials used in the construction of fences shall have a minimum life expectancy of 15 years or the length of the lease or permit.

e. Removal at End of Lease/Permit. Facilities and fencing will be removed at the end of the grazing lease or permit period if not renewed. The permittee's rights of removal will be specified in the permit or lease.

7. FEDERAL LEASES

DNR will honor preference grazing rights from leases issued by the Federal Government where applicable.

8. RESEARCH NEEDS

The following areas of livestock-wildlife interactions need field observations and documentation.

Grazing permitees/lessees should be encouraged to participate in the process of documenting the effects of grazing in their permit/lease areas. Specific lease/permit areas should be assigned a specific set of observations and documentation requirements as a part of the lease or permit.

Knowledge of moose and livestock food habits and behavior are largely unknown in these areas although Alaska Department of Fish and Game (ADF&G) is learning more about moose habitat distribution. In order to intensively manage moose, livestock, and vegetation in these areas, research is needed on food habits, forage quantity and quality, plant tolerance to utilization, and habitat manipulations.

a. Food Habits and Behavior. Information is needed on the physical locations of moose year around and livestock grazing patterns in the summer. Observation of where livestock grazing is concentrated is needed to determine long-term trends in vegetation changes. Food habits must be identified to determine which species to consider in available forage calculations. Moose are assumed to browse in both winter and summer and may also graze to some extent in the summer. Livestock are primarily grazers, but are known to browse. No detailed food studies have been done in the area. Food items must be identified before one can determine how many animals a range will ultimately support.

b. Forage Quantity and Quality. The initial stocking rate of a range is based on quantity of available forage and the nutritional value. At different times of the year, lower nutritional levels may be acceptable while at other times, such as prior to calving, higher levels are needed. Before any new grazing is allowed, DNR will establish control plots within the area to be grazed. Condition and trend plots must also be established to monitor range condition, species composition, and nutrient production.

c. Tolerance to Utilization. Most plants that are grazed or browsed require utilization to maintain productivity. However, too much can be harmful, and this varies by species. Few long-term studies have been done in Alaska on this topic. Sometimes grazing and browsing may change the vegetation composition in an area. This could be either beneficial or detrimental depending on management objectives. For instance, overgrazing grass would be harmful to the grass, but this would reduce competition for the woody species. Hence, browse and forest products would increase. Species specific studies are needed to determine the effects of livestock grazing on the main forage species.

d. Habitat Manipulations. The Department of Natural Resources, Division of Forestry, in cooperation with ADF&G, is managing the firewood and commercial cutting in the southwest corner of the Moose Range to improve moose browse, to research regeneration of species and to research cut area shape and size effects on moose. The major component of much of the understory is bluejoint reedgrass, a competitive grass with poor nutrient value at the end of the summer unless it has been grazed. Improvements following the cutting program could include revegetation with a less aggressive, more nutritional grass. Better range would be available and browse and wood products would be increased. An analysis is needed of the results of different cutting practices and regeneration techniques under a variety of physical conditions.

TRANSPORTATION AND ACCESS

A. GOALS

1. Provide access to public lands for the purpose of maintaining, improving and enhancing fish and wildlife populations and their related recreational uses.

2. Continue public rights-of-way and access on historic trails in the Moose Range.

3. Minimize significant disturbance or damage to wildlife populations and wildlife habitats that could occur as a result of increased public use of the Range.

B. MANAGEMENT STRATEGY

State agencies and the public require legal access into the Moose Range for the purpose of maintaining, improving and enhancing fish and wildlife populations, and perpetuating public multiple use of the area. The state will base access for resource development on existing road systems wherever possible, rather than develop additional roads until further field analysis determines the need for additional road construction. The state will use public land for access whenever possible. Inhabited private property will be avoided when a feasible alternate access exists. The primary developed access systems are Fishhook Road, Buffalo Mine Road, Permanente Road, Fish Lake Subdivision Road and the Chickaloon River Road. (See Maps 1 and 6, pages 11 and 39 for Access.) New access may be developed as a result of timber harvest/habitat enhancement efforts. Public use of these roads will be decided in the future through interagency review and approval. (See pages 125-127 of this chapter.)

The overall management approach for providing outdoor recreational opportunities is to allow non-developed, dispersed activities within the Range and not to actively encourage increased public use. The state will not aggressively develop or manage recreational use. Allowing the use of existing trails, establishing legal public access for motorized and non-motorized travelers and development of trailhead-parking facilities have the highest priority. No new recreational trail developments within the Moose Range are proposed with the exception of potential public recreational use of post timber harvest roads/trails or mining-access roads.

Public recreational use will be directed to trails used historically in the Range: the Chickaloon-Knik-Nelchina Trail, the Chickaloon River Trail, the Old 98 Trail and the Boulder Creek Trail. Public recreational use of post mining roads between Buffalo and Premier Mine and Seventeen Mile Lake and along Permanente Road may also be allowed.

The state will assert public right-of-way on legal public access routes. The state will strive to educate the public as to legal access, and clarify private and public lands to reduce trespass, as funding allows. The state also encourages the Matanuska-Susitna Borough to provide public access to state and borough lands during the platting process whenever possible in areas where public access is blocked by private lands.

C. GUIDELINES

1. GLENN HIGHWAY

   a. Scenic Views. Realignment and/or reconstruction of the Glenn Highway should be done in a manner that preserves the scenic views from the highway to the extent feasible. If necessary to accomplish this, needed development on state land may occur within the Moose Range rather than outside it (for example, power lines).

   b. Providing Access. The realignment of the Glenn Highway will provide for access to major roads, trails and recreational facilities within the Range. The access points will include:

      (1) the Buffalo Mine Road;
      (2) Jonesville Mine Road;
      (3) Mile 58 Road;
      (4) Permanente Road;
      (5) the proposed Kings River campground;
      (6) Chickaloon Branch Road (Chickaloon River Road).

   c. Avoiding Important Habitat. The realignment of the Glenn Highway should avoid important wildlife habitat and enhancement areas.

   d. Scenic Turnouts. The realignment of the Glenn Highway will include scenic turnouts. The location of these turnouts will be identified by DOT/PF during the reconstruction of the Glenn Highway. DOPOR will work with DOT/PF to identify turnouts with key scenic or recreational values. Management of the scenic turnouts will be negotiated between DOPOR and DOT/PF on a case-by-case basis during development of the realignment project. Potential scenic turnouts to be considered are shown on Map 6 on page 39.

2. PUBLIC RIGHT-OF-WAY ASSERTION

a. Continuing Assessment. Assessment of public rights-of-way on roads and trails within the Moose Range will continue. The legal status of each trail within the Moose Range will be individually researched by DNR. (See Table 3 on page 52 and Map 6 on page 39.)

b. Verification and Maintenance of Access. The state will verify and maintain public access on existing roads and trails throughout the Moose Range on the following roads and trails, whenever possible.

Roads

(1) Fishhook Road
(2) Buffalo Mine Road
(3) Permanente Road
(4) Fish Lake Subdivision Road
(5) Chickaloon River Road

Trails

(1) Post mining roads from Buffalo Mine Road to Seventeen Mile Lake and Sutton.
(2) Trail to Little Granite Creek bench.
(3) Permanente Road.
(4) The Chickaloon-Knik-Nelchina Trail.
(5) The Chickaloon River Trail.
(6) The Old 98 Trail.
(7) The Boulder Creek Trail.

c. Procedures for Rights-of-Way Assertion. For all rights-of-way on roads and trails assessed by DLWM to be valid, and for which access is being restricted, denied or the state's position differs from the public, the following process is recommended for asserting validity:

(1) Open an ADL casefile to identify the exact problems, management options and recommended actions to be taken on each trail/road. Each casefile will include the following information:

(a) State status plat.
(b) BLM master title plats.
(c) Rectangular surveys and/or USGS 1:63,360 maps with the trail marked on them.
(d) Patents to third parties.
(e) Affidavits from users.
(f) Historical report.
(g) Other relevant information in chronological order.
(h) List of recommended actions - purchase of ROW, width of ROW; 17b easement, RS2477, etc.

(2) Enter on LAS-Case type 581, Public Easement.

(3) Send LAS-11 form to Division of Management for notation to status plats.

(4) Obtain names and addresses of all current property owners along the trail from the Matanuska-Susitna Borough.

(5) Send letter of notification to all private property owners.

(6) The state will take legal action on public access blocked by private citizens.

3. TRAIL MANAGEMENT

a. Parking. Trailhead parking facilities will be developed at Purinton Creek, Chickaloon River and Permanente Road in order to provide the public with access to trails used historically in the Moose Range.

b. Signs. Signs will be posted only along major roads and trails where public access is desirable and in accordance with management needs. The Chickaloon-Knik-Nelchina and Chickaloon River Trails will be marked by signs. Trail signs will help the public stay on the trail and not on private lands, thereby reducing trespass situations.

c. Trail Buffers.

(1) Non-historic Trails. No standard minimum vegetated buffer is recommended for most trails since they are located in areas that will be used for multiple use purposes. This diversity of use will provide a variety of viewing opportunities. For example, a trail may transect a habitat enhancement area thus providing a greater opportunity to view and/or harvest wildlife.

(2) Historic Trails. The Chickaloon-Knik-Nelchina, Chickaloon River and the Old 98 Trails are historically significant and shall have a minimum standard 100' vegetated buffer on each side of the existing trail center line. The buffer width may increase up to 300' maximum based on the summer line-of-sight requirement, which dictates that the buffer extends just beyond the point where the line-of-sight is blocked by standing summer vegetation. Artificial strengthening of the buffer through seedling transplants may be incorporated with the approval of ADF&G and DNR.

Activities allowed within these historic trail buffers include the following:

(a) Disease and insect control and prevention with pesticides or selective tree cutting as approved by ADF&G, DNR, and DEC.

(b) Other recreational trails may cross these trails and their buffers.

(c) Logging roads and utility lines may cross these trails and their buffers if no feasible and prudent alternative exists. Such crossings should be at a 90° or as close to that as possible.

(d) Material sites solely for the purpose of maintaining the trail.

(e) Habitat enhancement activities that involve the conversion of brush are allowed. Selective tree cutting of large trees (8" diameter or larger) is not allowed.

NOTE: See page 137 for a summary of all buffer requirements.

d. Maintenance. Trails will be maintained as funds and volunteer support permit. Increased levels of recreational trail use and recreational use within enhancement areas could interfere with habitat enhancement efforts and wildlife use of the area. Therefore, existing trails will generally be maintained at current levels and will not be upgraded, so as not to encourage additional use.

(1) Trailwork will generally be done only in areas where over-use has detrimental effects on water quality, anadromous fish, or where over-use or natural occurences make the trail impassable or result in severe erosion.

(2) The trailwork will be designed to return the trail to its original condition, not to widen or improve it. Clearing brush along trails to maintain the existing trailbed is allowed.

(3) Historic trails that are not currently passable may be restored for foot use. This includes the Chickaloon-Knik-Nelchina Trail, the Chickaloon River Trail, and the Old 98 Trail.

(4) Trail improvement or trail construction may be used to direct people away from key wildlife areas.

e. Volunteers. Agreements with volunteer groups for trail work are encouraged but will specify that the group has no exclusive rights to use.

f. Trail Requirements. All recreation trails shall:

(1) Be open for public use.

(2) Be open to motorized uses.

(3) Have established legal access along the route through private and public lands.

(4) Provide parking at designated trailheads.

(5) Be approved by DNR and ADF&G.

g. Recreational Trail Use Conflicts

(1) Reasons for Restrictions. No restrictions on motorized or non-motorized recreational trail uses are proposed at this time. Future limitations on recreational use may be considered by DNR and ADF&G for the following reasons:

(a) Public Safety. To promote the safety of all users of public land and waters. Public safety can include consideration of hazardous situations, such as major trail/road wash-outs, where leaving the trail/road open to public use would endanger public lives.

(b) Wildlife Maintenance and Protection. To maintain and protect wildlife populations, wildlife enhancement efforts or critical habitat.

(c) Environmental Damage. To minimize the occurrence of unacceptable environmental damage to existing soils, trails, watersheds, vegetation, natural or cultural/historic values.

(d) User Conflicts. To minimize conflict between motorized and non-motorized recreationalists.

(2) Procedures for Restrictions. When DNR and ADF&G agree that a conflict exists and needs to be resolved the following procedures will be followed:

(a) DNR and ADF&G Agreement. DNR and ADF&G will clearly identify the issues and problems involved and develop criteria necessary to determine the acceptable level of environmental degredation or disturbance, and the actions required to alleviate the problem.

(b) Public Involvement. The state will involve the public recreational user groups affected by the conflict in developing a resolution.

(c) Resolution Options. Options for resolution to be considered include, but are not limited to, the following:

* seasonal use restrictions, such as vehicle access closures during periods of critical vegetation growth, calving season, or moose critical winter feeding periods;
* use of electric fencing around habitat research study plots to eliminate potential damage of the plot by recreationalists or grazing livestock;
* relocation or reclamation of a trail away from areas of conflict; solicit volunteer trail construction support from recreational users.
* closure of a specific trail or area to motorized vehicle use.

(d) Motorized Vehicle Closures.

* Temporary Closures. Temporary closures may be necessary to prevent severe road deterioration or permanent damage to the roadbed during break-up or heavy rain seasons. Temporary closures require DNR and ADF&G approval. The state will notify the public of temporary closures in local newspapers. Temporary closures lasting longer than six weeks requires public review.

* Permanent Closures. Any permanent closure requires public review, and comment, as well as DNR and ADF&G approval. (See the Fish, Wildlife and Forestry guidelines on page 74, Cle(7), for definition of public review and notice.)

4. ACCESS FOR MINING

a. Mining Access in Restricted Areas. Permits may be granted for development of mining access in any future proposed non-motorized areas.

b. Minimum Amount Necessary. Access roads for mining will be kept to the minimum necessary to perform mineral production operations.

c. Pre-construction Approval. Proposed mining roads will be located on a topographical map and submitted for review as part of the plan of operations.

d. Maintenance of Visual and Environmental Quality. Roads will be sited in such a manner as to minimize visual impacts and erosion.

e. Interagency Analysis. An analysis of proposed mining roads will be performed by ADF&G and DNR (including DOPOR) and recommendations made for routing of the road in a manner which will enhance or have minimum impact on wildlife, fisheries and recreation values. A well-placed road, for example, could serve the miner and also provide motorized access for grazing, hunting and other recreational pursuits.

f. Public Access. Mining access roads will serve as public access except when:

(1) A determination is made by DNR in cooperation with ADF&G that public use would negatively impact wildlife populations.

(2) Public access would create public safety or other management problems or adversely impact the mining operation.

g. Future Closure. Where access roads are detrimental to management for wildlife or public recreation, they may be kept closed to the public and removed and rehabilitated when mineral production ends.

h. Stream Crossings. Culverts and/or bridges will be used at all stream crossings and shall follow ADF&G standards for fish passage.

5. ACCESS FOR TIMBER HARVEST OPERATIONS AND WILDLIFE HABITAT ENHANCEMENT

a. Upgrading Existing Roads/Trails. DOF will concentrate on using existing road/trail networks during timber harvest or habitat enhancement operation whenever possible. Upgrading of existing roads will take place when an analysis shows that upgrading existing road beds is less expensive than constructing new ones. Should new road construction be the least expensive and desirable, a new road will be constructed. All road construction plans will receive interagency review during the review of the DOF five-year timber harvest/habitat enhancement schedule.

b. Level of Upgrading. Access roads/trails constructed in the Moose Range during timber harvest will be upgraded only to a level necessary to perform timber harvest/habitat enhancement work or other resource development. Public recreational use of these access roads developed by DOF will not be encouraged. Posting of trail signs or developing trailheads on these trails will be limited and only done where and when it is necessary to direct public use away from timber or enhancement efforts, or to direct the public to stay on public trails. Historic trails may be signed. New access routes will receive an interagency review during the review of the DOF five-year timber harvest/habitat enhancement schedules to determine future public use of trails/roads. Some logging roads may be closed to public use.

c. Determination of Public Access. Roads/trails created through resource development efforts will receive interagency review to determine whether or not the road/trail should remain open to the public. The review shall consider effects of the new access on wildlife, habitat enhancement efforts, resource development efforts, availability of funding for maintenance, and the public desire to use the roads/trails for recreational purposes.

d. Road Requirements. Forest harvest or wildlife habitat enhancement roads or trails shall meet the following requirements:

(1) Utilize winter road access wherever possible.

(2) Running surface - 12 foot minimum width.

(3) Pullouts - one each 1/4 mile.

(4) Ditching - required only when necessary to prevent severe erosion.

(5) Logging roads will be located and designed to allow the public to collect firewood, assist in habitat enhancement, and subsequently to accomodate recreational use where appropriate.

(6) At a minimum, the road should be usable by four-wheel drive vehicles.

e. Road Buffers. Buffers of naturally occurring vegetation will be maintained along major roads such as the Glenn Highway, Permanente, Fish-Drill Lake, Buffalo Mine, Castle Mountain Mine and Chickaloon River Roads. These buffers shall be 100 feet wide measured from the outside edge of the right-of-way. However, entry to or exit from the timber harvest/habitat enhancement areas shall be allowed from the road beds. These entry/exit ways may be harvested and therefore should not be more than 100 feet wide nor should the minimum distance between the entry/exit way be closer than 0.25 mile along these roads. The standard 100 foot buffer may be modified based on the line-of-sight requirements as necessary to provide for restricted views through these buffers.

Activities allowed in road buffers are include the following:

(1) Selective-tree cutting as approved by ADF&G (Habitat Div.) and DNR.

(2) Disease and insect control and prevention with pesticides as approved by ADF&G, DNR, and DEC.

(3) Grazing as approved by ADF&G and DNR and consistent with the grazing guidelines in this chapter, on pages 103-117.

(4) Roads, trails and utility lines may cross the buffer and should be as close to a 90° angle as possible.

(5) Powerlines may be located within the buffer if the purpose is to screen them from the road and sufficient vegetation exists in the right-of-way and buffer to accomplish this.

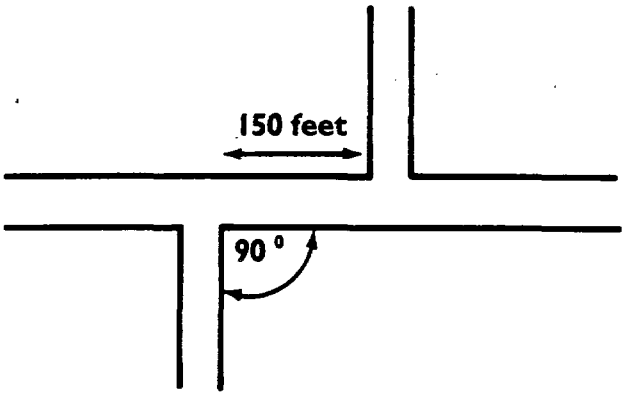
(6) Recreational trails (e.g. for snowmobiles or 3-wheelers) may be located within the buffer if there is no room for them in the right-of-way and putting them in the buffer does not significantly reduce its screening capability.

Note: See buffer summary on page 137 for all buffer requirements.

f. Spur Road Access. When personal use firewood cutting occurs along a trail, DOF will build spur side trails through the buffer to access the timber rather than allow cutting of buffers.

g. Off-set Crossing of Logging Roads. Logging roads or trails shall cross existing trails at a 90° angle or as close to that as possible. On those portions of the Chickaloon River and the Chickaloon-Knik-Nelchina Trails on which there is vehicular use. Such crossings shall be offset at least 150 feet. (See Figure below.)

Figure 5: OFFSET CROSSING OF LOGGING ROADS



h. Cutting Permits. Personal firewood cutting permits shall specify that no cutting is allowed within the buffer.

Note: See page 137 for a summary of all buffer requirements.

6. RIGHT-OF-WAY POLICY FOR STATE ROADS

a. Development Within. Any development within the DOT/PF road rights-of-way will require the prior approval of DOT/PF. The DOT/PF

rights-of-way include the following state roads within or adjacent to the Moose Range:

(1) Glenn Highway

(2) Chickaloon Branch Road (Chickaloon River Road)

(3) Buffalo Mine Road

(4) Mile 58 Road

(5) Jonesville Mine Road

b. Preserve Natural Vegetation. DOT/PF is encouraged to preserve the natural vegetation in the right-of-way to the extent feasible and prudent.

7. PUBLIC WATERS

DNR and ADF&G will work cooperatively to ensure access to public lands and waters wherever possible.

8. SECTION LINE EASEMENTS

Use of section lines for access routes within the range will be discouraged in favor of other routes based on topography, gradient and road standards. Use of section lines for access routes to the Range again should be secondary to other routes based on good management practices in locating roads and trails. Section line easements may be used, however, if other routes are unavailable.

9. PUBLIC EDUCATION

DNR and ADF&G will work to clarify private and public land ownership as well as resolve clear public legal access within the Moose Range to help alleviate trespass on private land.

10. NEW ACCESS

a. Upper Moose Creek Restriction. No new trails or roads shall be built beyond or north of the natural knob at Sec. 1, T19N, R2E, S.M. on Moose Creek (see Chapter Four, page 168, C8d(1)).

b. Arkose Bench Restriction. The Arkose Bench Trail shall not be reconsidered until after 1991 (see Chapter Four, page 168, C8d(3)).

c. Upper Granite Creek Restriction. No new trails or roads shall be built into the Upper Granite Creek drainage, north of Sec. 36, T20N, R3E (see Chapter Four, page 184, C8c).

MATERIALS

A. GOAL

Utilize materials (sand, gravel, building stone, limestone) within the Moose Range in a manner which does not adversely effect the fish and wildlife habitat or the scenic values.

B. MANAGEMENT STRATEGY

At the present time, the major demand for materials in the vicinity of the Moose Range is for gravel for maintenance and reconstruction of the Glenn Highway. The major material sources are existing pits outside the Moose Range. However, it is expected that there will be some demand for materials within the Moose Range for logging or mining roads, trail maintanence, and local use. It is intended that applicants be allowed to use the source that is most economical for their purpose so long as that use is consistent with the following guidelines.

C. GUIDELINES

1. LOCATION OF MATERIALS SOURCES

   a. Preferred Order. The preferred order of the sources for the extraction of sand and gravel is:

      (1) Private lands.

      (2) Existing upland pits outside the Moose Range (unless extraction from these sources has a negative impact on the views from the Glenn Highway).

      (3) Matanuska River Floodplain.

      (4) Upland areas of the Moose Range.

      (5) Inactive floodplain sites in the Moose Range.

      (6) Active floodplain sites in the Moose Range.

      The public and agencies are encouraged to seek the most preferred source that is economic and feasible.

   b. Floodplain Sites. Floodplain sites within the Moose Range may become the preferred material source. They may be combined with a fisheries enhancement project at the request of ADF&G. These sources require ADF&G approval.

   c. Alleviate Flooding. DNR will work with the Army Corp of Engineers to help alleviate flooding due to removal of materials.

d. Sites Within Water Sources. Material sites located within stream, lake, or wetland buffers will be considered on a case-by-case basis with the concurrance of ADF&G. ADF&G shall review and approve any proposal to remove material from stream beds and floodplains within the Moose Range boundaries (see Map 8 on page 47).

e. Sites Within Historic Trail Buffers. Material sites may not be located within the buffer of the Chickaloon-Knik-Nelchina and Chickaloon River Trails except for the purpose of maintaining the trail. The material site shall not be visible from the historic trail.

f. Sites Within Scenic Areas. Material sites may not be allowed in high value scenic areas from the Glenn Highway, as shown on Map 10 on page 199.

2. SCREENING

A natural, topographic or embankment screen sufficient to shield the material sites and equipment from the view of motorists traveling along the Glenn Highway, Buffalo Mine road, Jonesville Mine Road, and Chickaloon River Road will be maintained where prudent and feasible.

3. ACCESS

The cleared area for an access road to a material site will be limited to 40 feet in width and the road shall be constructed with sufficient curvature to prevent direct view of the open excavation by the traveling public.

4. STREAM CROSSINGS

Where stream crossings are required for material site access roads, adequate bridges or culverts will be required to allow for high water flows and fish passage. An ADF&G Title 16 permit is required for anadromous fish streams (see Map 3 on page 23).

5. VEGETATION REMOVAL

a. Utilization of Timber. If there is sufficient volume, standing timber in areas to be excavated for a material site or access road should be offered to the public. Trees less than 5 inches in diameter and brush should be buried or clipped and stockpiled within the site and later used for site rehabilitation.

b. When and Where. Vegetation may be stripped no more than one year before pit development. The area of vegetation removal will be for the immediate areas of the excavation, access, sites for overburden storage, material stockpiles and equipment.

6. REHABILITATION

a. Overburden. Stripped overburden will be stockpiled within the boundaries of each site. Upon completion of material excavation, the overburden which was temporarily stockpiled will be spread as evenly as possible across the floor and sides of the pit.

b. Revegetation of Sites. Material sites will be rehabilitated and revegetated to a plant species primarily beneficial to moose and approved by ADF&G. The expense of the rehabilitation will be borne by the developer of the pit.

c. Slope Requirements. The sites will be excavated leaving side slopes of 3:1 or flatter, and all excavated surfaces dressed to relatively smooth contours for rehabilitation.

d. ADF&G Approval. Material site rehabilitation plans must be approved by ADF&G. Sites adjacent to the Glenn Highway will not be enhanced to promote wildlife habitat for public safety reasons. Consideration should be given to rehabilitating these sites for long-term use as recreation facilities, e.g. roadside parking areas.

7. SITE MANAGEMENT

a. Material Stockpiles. Material stockpiles will be located within the excavated pit when there is adequate room to store them there.

b. Equipment. Screen decks, crushers and hot mix plants should be located within the pit when feasible. Hot mix plants should not be allowed near waters with fisheries values.

c. Site Expansion. Excavated slopes suitable for future site expansion will be excavated leaving interim slopes of 4:1 or flatter but will not be rehabilitated until site expansion is completed. Plans for expansion of material sites must be reviewed by DNR and ADF&G for compatibility with public use, scenic views and wildlife habitat.

d. Fuel Storage Facilities. Stationary fuel storage facilities must not be placed within the annual floodplain of a watercourse, closer than 100 feet to a waterbody and should be located outside of stream/lakeshore buffers. These must be contained or confined in a manner which would prevent any spillage from entering an adjacent waterbody.

e. Fueling Activities. Fueling activities shall not be conducted within 100 feet of any lake, river, stream, or drainage system, or on an annual floodplain of a watercourse. Such activities shall occur outside of stream/lakeshore buffers.

f. Fuel Spills. Absorbent material in sufficient quantity to handle operational spills must be on hand at all times for use in the event of fuel spill. The mining plan may require this is the operation is of sufficient size and duration.

g. Permanent Structures. Permanent structures are prohibited.

8. BEST MANAGEMENT PRACTICES

ADF&G will utilize its manual, Best Management Practices for Placer Mining in issuing its own Title 16 permits and in its review of and development of recommendations for the plans of operations and miscellaneous land use permits for materials extraction. Any recommendation by ADF&G for rejection or modification of a miscellaneous land use permit or a plan of operations for materials extraction will be based on the Best Management Practices. (This document is available from the ADF&G Habitat Division in Anchorage, Palmer or Fairbanks, local libraries, DOMG in Anchorage and DLWM Anchorage and Wasilla offices for anyone interested in referencing the document while designing a mining plan of operations.)

9. WATER QUALITY

Drainage should be retained within the working site, with no turbid water allowed to enter adjacent streams from upland pit sites. Subsequent release of water must meet water quality standards of the Alaska Department of Environmental Quality.

10. WATER BODIES AND RIPARIAN HABITAT

a. Water Body Requirements. There shall be no gravel removed below the active water table or within 50 feet of a waterbody unless material extraction is part of a fishery enhancement project and approved as an exception to Group I and II stream buffer requirements (see page 98). Fifty feet is a minimum; a greater distance may be specified where necessary due to site conditions. Vegetation will not be disturbed within this buffer zone unless approved by ADF&G.

b. Shallow, Even Removal. Gravel shall be removed in shallow, even lifts so as not to create any pits or depressions which could entrap fish after periods of high water.

c. ADF&G Guidelines. Material sites used for fisheries enhancement will be done in accordance with ADF&G guidelines.

11. PUBLIC REVIEW

a. Subject to Public Review. Any material site greater than one acre in size shall go through the public review process.

b. Exempt From Public Review. Use authorizations of 25,000 cubic yards or less per year from existing material sites will not go through public or agency review.

12. BUILDING STONE

Applications to quarry building stone in commercial quantities within the Moose Range will be considered on a case-by-case basis. Rock quarry operations will be subject to the applicable guidelines in this chapter.

MISCELLANEOUS GUIDELINES

A. SOILS

The DNR has requested SCS to survey the entire Moose Range for detailed soils information. In the event that this request is not feasible, the state will request SCS to concentrate their efforts on the five-year timber harvest/habitat enhancement sites. The soils data shall then be evaluated and utilized throughout the Range when determining habitat enhancement methodology, rehabilitation efforts and road construction.

B. ENGINEERING GEOLOGY

1. UTILIZATION OF DGGS DATA. DGGS data gathered in 1985 or thereafter will be utilized when developing habitat enhancement projects, timber harvests and road construction in the Moose Range. Field reconnaisance of the DGGS data will occur whenever possible.

2. GEOLOGIC CONSTRAINTS. If any development is proposed in the vicinity of known geologic constraints, such as the Castle Mountain Fault, abundant rock glaciers, bedrock, ice contact deposits, unstable slopes, mining tailings, avalanche potential and undifferentiated drift, the proposed site will be evaluated for specific development restrictions as needed. These restrictions are especially important where public safety is a concern and in determining the location of public facilities.

C. MENTAL HEALTH LANDS

1. REVENUE PRODUCTION. Mental health lands will be managed to produce revenue for the mental health trust according to the Supreme Court decision.

2. BEST LAND USE. The production of revenue will be based upon the best use of the land, and revenue will be produced through timber production or mineral development whenever possible.

D. COMMUNICATION SITES

CRITERIA. Communication sites may be located within the Moose Range if:

The development plan for locating the site includes an analysis of the effect of the site on multiple use management of natural resources at the site and within the Moose Range;

the analysis determines that the site will not have an unacceptable adverse effect on wildlife habitat, scenic qualities, or water quality, or promote severe erosion, or that no feasible and prudent alternative exists; and

the location is agreed upon by DNR and ADF&G.

E. LAND EXCHANGES

1. CRITERIA. Land exchanges in the Moose Range will be considered if:

   The exchange improves public access to public lands within the Moose Range;

   the exchange enables the state to enhance additional habitat within the Moose Range;

   the exchange enables the state to have subsurface rights on additional high valued mineral lands;

   public outdoor recreational opportunities are improved; or

   the state can gain additional public acreage within the Moose Range boundaries and

   the exchange meets ADF&G and DNR approval.

2. BOROUGH LANDS. The Matanuska-Susitna Borough selected lands in T19N, R2E, Sec. 22, knowing these were lands leased for coal. DNR is not considering an exchange of these lands.

F. AGENCY WORK CABIN

CRITERIA.

DOF will seek funding to support maintenance and operation of an agency work cabin along the Glenn Highway that can physically house official personnel during field operations in the Moose Range. A work cabin will increase the field presence capabilities of management staff, reduce travel time and expense and improve efficiency in field operations. The work cabin will be a simple log structure with bunks and a stove. It will be located in the eastern half of the Range.

G. REMOTE CABINS

CRITERIA.

Remote cabins will not be permitted in the Moose Range. At present one-third of the Moose Range is in private ownership. Under the Susitna Area Plan guidelines, remote cabins may not be located within a unit that has access by road or railroad or where such access is likely within 10 years. All drainages in the Range have road or trail access except Granite Creek. Granite Creek is extremely unstable geologically and permanent structures should not be developed in Granite Creek. The public involved in the planning process did not support additional private use including remote cabins. In addition, remote cabins could adversely affect habitat enhancement efforts.

H. UNAUTHORIZED USE OF STATE LAND

DNR's policy is to promote lawful use of state public land and water resources in accordance with applicable laws and regulations.

Currently DNR is aware of three parties living on state land off the Jonesville Road near Sutton without state land use permits or leases. DNR will follow existing procedures (as outlined in the Division of Land and Water Management's Policy and Procedure Manual, Chapter 5800 Section 02) for resolving these and any other unauthorized use situations in the Moose Range.

BUFFERS SUMMARY

A. TIMBER HARVEST/HABITAT ENHANCEMENT BUFFERS (see pages 68-69)

Timber harvest/habitat enhancement buffers will be laid out in the field during the actual sale design and will be based upon the following guidelines:

1. BUFFERS AROUND CUTTING UNITS

Cutting units should generally be surrounded by a 100 foot buffer unless such a buffer is disadvantageous to wildlife or their habitat or unnecessary as a screen between the cutting area and most users of the area. However, required buffers shall be increased or decreased based on specific summer line-of-sight requirements necessary to maintain a natural-looking environment and to provide for restricted views from one cutting unit to another cutting unit.

2. BUFFERS AROUND PRIVATE LANDS

A minimum buffer of 200 feet will be left on state land between all operations resulting in forest clearings and any private lands. However, single-tree selection harvest may occur within these buffers up to 50 feet from private lands. No harvest may occur within 50 feet of private land.

3. EAGLE AND PEREGRINE FALCON PROTECTION BUFFERS

Eagle nest trees and Peregrine Falcon nests shall be protected as required by federal law. There will be no disturbance of natural vegetation within a 330' radius around any eagle or Peregrine Falcon nesting trees and/or nesting sites. (Mike Jacobson, Ecobiologist, Juneau, USFWS, 586-7244.)

4. ACTIVITIES ALLOWED IN TIMBER HARVEST/HABITAT ENHANCEMENT BUFFERS

a. Selective-tree cutting as approved by ADF&G (Habitat Division) and DNR.

b. Disease and insect control and prevention with pesticides and herbicides as approved by ADF&G, DNR and DEC.

c. Grazing as approved by ADF&G and DNR, consistent with the grazing guidelines in this chapter on pages 103-117.

d. Access and utility line development across buffer areas should be kept to a minimum. Access and utility facilities should be located:

(1) Outside of buffers to the extent feasible and prudent;

(2) Perpendicular to buffers, upon entering the buffer, to the extent feasible and prudent;

(3) So as to reduce visual impacts from primary access routes;

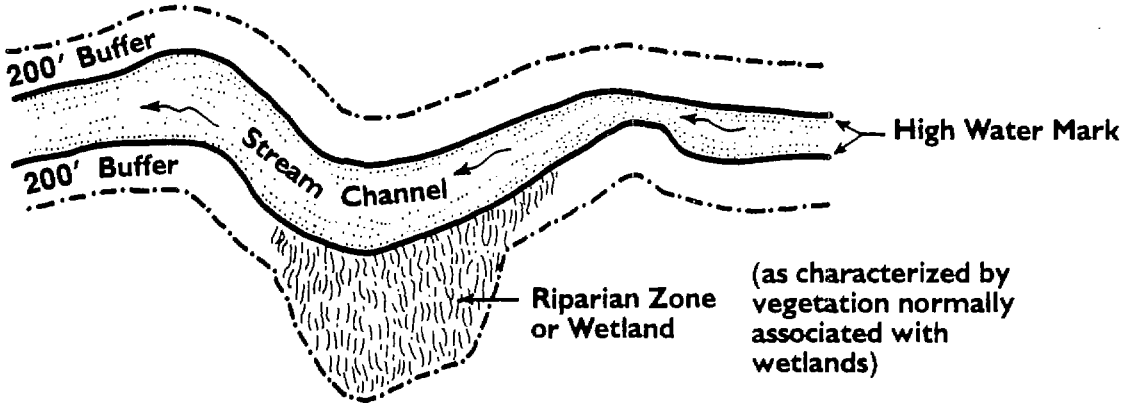
(4) And require approval by DNR and ADF&G.

B. LAKESHORES AND STREAM CORRIDOR BUFFERS (see pages 98-100)

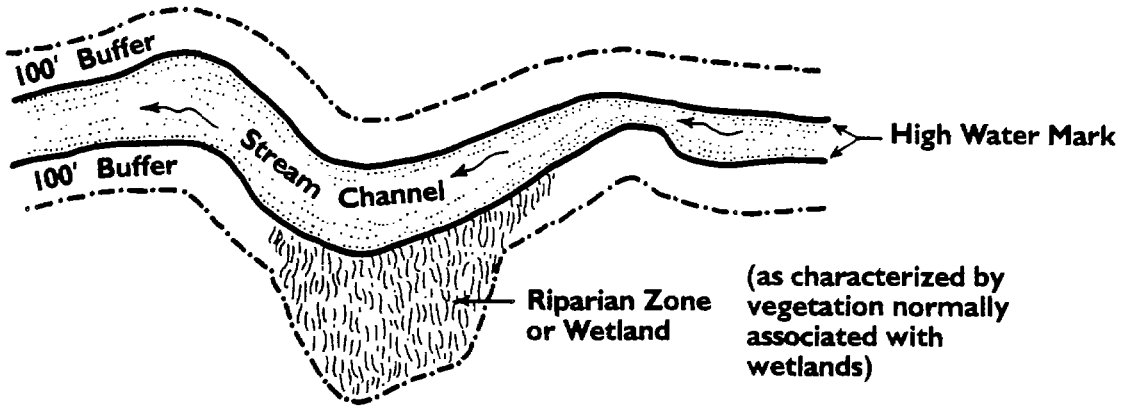
1. STREAM BUFFERS

In order to protect water quality, riparian habitat, and recreational values, a buffer of essentially undisturbed land and vegetation should be protected along streams.

a. Group I - Anadromous Fish Streams. The buffer area shall be normally 200 feet on both sides of the high water mark and shall include all streamside riparian vegetation zones. (See Map 3 on page 23 and Figure below.) In the case of coal development, the buffer will follow the existing standards in the Alaska Surface Coal Mining Control and Reclamation Act (ASCMCRA), and will require a minimum 100 foot setback on all streams.



b. Group II - Perennial Streams not known to have anadromous fish but which are identified on a U.S.G.S. 1 to 63,360 topographic map or field verified by ADF&G and DNR: The buffer shall be 100 feet wide on both sides of the high water mark and shall encompass the adjacent riparian vegetation zones. (See Map 8 on page 47 and Figure below.)



c. Buffer Adjustments

(1) Riparian Zone Less Than 100'. The buffer width on Group II streams may be reduced to the width of the riparian zone or 50 feet, whichever is greater, if field verification by ADF&G and DNR concludes the riparian zone is less than 100 feet wide.

(2) Slope Effects. Buffer widths on Group I and II streams should be adjusted to reduce potentially adverse impacts of development within sloping buffer areas. Buffer widths should conform to the following table:

Average Side Slope	Buffer Width
0 - 20%	SB
20 - 40%	SB + 25%
40% or greater	SB + 50%

SB = Standard buffer (Group I = 200', 100' for coal and Group II = 100')

(3) Wind Effect. Riparian buffer widths should be widened as necessary to increase resistance to windthrow of the residual buffer trees in areas subject to strong winds.

d. Activities Allowed. Activities allowed within Group I and Group II stream buffers include the following:

(1) Selective-tree cutting as approved by ADF&G and DNR.

(2) Disease and insect control and prevention with pesticides and/or tree removal as approved by ADF&G, DNR and DEC.

(3) Grazing as approved by ADF&G and DNR, consistent with the grazing guidelines in this chapter on pages 103-117.

(4) Road and trail access to and/or across streams for recreation, habitat enhancement, or forest product harvest purposes as approved by ADF&G and DNR.

(5) Access to and/or across streams for utility lines such as powerlines and waterlines, etc. as approved by ADF&G and DNR. Utility systems should not be located so that they parallel stream systems; rather they should cross streams in a perpendicular fashion to the extent feasible and prudent.

2. LAKESHORE BUFFERS

a. 5 Acre Lakes. Buffer widths for lakes up to 5 acres in size are set at 200' landward of the lake's high water mark.

b. 5-100 Acre Lakes. Buffer widths for lakes between 5 and 100 acres in size are set at 300' landward of the lake's high water mark.

c. 100+ Acre Lakes. Buffer widths for lakes exceeding 100 acres in size are set at 400' landward of the lake's high water mark.

d. Slope Effects. Buffer widths for lakes should be adjusted to reduce potentially adverse impacts on wetlands from development on adjacent side slopes. Buffers should be the standard buffer width for side slopes of 0 - 20%, 25% additional buffer should be added to the normal buffer width for side slopes of 20 - 40% and 50% additional buffer should be added to the normal buffer width for side slopes of 40% or greater.

e. Activities Allowed. Activities allowed within lakeshore buffers include the following:

(1) Selective-tree cutting as approved by ADF&G and DNR.

(2) Disease and insect control and prevention with pesticides and/or tree removal as approved by ADF&G, DNR and DEC.

(3) Grazing as approved by ADF&G and DNR, consistent with the grazing guidelines in this chapter on pages 103-117.

(4) Road and trail access to lakes for recreation (including sportfishing), habitat enhancement, or forest product harvest purposes as approved by ADF&G and DNR. These roads and trails should not be located so that they parallel the lakeshore within the buffer.

(5) Access to lakes for utility lines such as powerlines and waterlines, etc. as approved by ADF&G and DNR. Utility systems should not be located so that they parallel lakeshores.

C. WETLAND BUFFERS (see pages 101-102)

1. WETLAND BUFFERS

a. Width. Buffer widths for all wetlands are set at 100' landward of the wetland edge (defined as the limit of wetland vegetation as described on page 101).

b. Slope Effects. All wetland buffers should be adjusted to reduce potentially adverse impacts on wetlands from development on adjacent side slopes. Buffers should be the standard buffer width for side slopes of 0 - 20%, 25% additional buffer should be added to the normal buffer width for side slopes of 20 - 40% and 50% additional buffer should be added to the normal buffer width for side slopes of 40% or greater.

c. Activities Allowed. Activities allowed within wetland buffers include the following:

(1) Selective-tree cutting as approved by ADF&G and DNR.

(2) Disease and insect control and prevention with pesticides and/or tree removal as approved by ADF&G, DNR and DEC.

(3) Grazing as approved by ADF&G and DNR, consistent with the grazing guidelines in this chapter on pages 103-117.

(4) Road and trail access to wetlands lakes for recreation (including sportfishing), habitat enhancement, or forest product harvest purposes as approved by ADF&G and DNR. These roads and trails should not be located so that they parallel the wetland within the buffer.

(5) Access to wetlands for utility lines such as powerlines and waterlines, etc. as approved by ADF&G and DNR. Utility systems should not be located so that they parallel wetlands.

d. Access. Access through wetland buffers and wetlands will be allowed only on winter ice roads for recreation, habitat enhancement, forest product harvest and other activities as approved by ADF&G and DNR.

D. TRAIL BUFFERS (see pages 121-122)

1. TRAIL BUFFERS

a. Non-historic Trails. No standard minimum vegetated buffer is recommended for most trails since they are located in areas that will be used for multiple use purposes. This diversity of use will provide a variety of viewing opportunities. For example, a trail may transect a habitat enhancement area thus providing a greater opportunity to view and/or harvest wildlife.

b. Historic Trails. The Chickaloon-Knik-Nelchina, Chickaloon River and the Old 98 Trails are historically significant and shall have a standard minimum 100' vegetated buffer on each side of the existing trail center line. The buffer width may increase up to 300' maximum based on the summer line-of-sight requirement, which dictates that the buffer extends just beyond the point where the summer line-of-sight is blocked by standing vegetation. Artificial strengthening of the buffer through seedling transplants may be incorporated with the approval of ADF&G and DNR.

2. ACTIVITIES ALLOWED. Activities allowed within historic trail buffers include the following.

a. Disease and insect control and prevention with pesticides or selective tree cutting as approved by ADF&G, DNR and DEC.

b. Other recreational trails may cross these trails and their buffers.

c. Logging roads and utility lines may cross these trails and their buffers if no feasible and prudent alternative exists. Such crossing should be at 90° or as close to that as possible.

d. Material sites solely for the purpose of maintaining the trail.

e. Habitat enhancement activities that involve the conversion of brush are allowed. Selective tree cutting of large trees (8 inches or larger) is not allowed.

E. ROAD BUFFERS (see pages 126-127)

1. ROAD BUFFERS

Buffers of naturally occurring vegetation will be maintained along major roads such as the Glenn Highway, Permanente, Fish-Drill Lake, Buffalo Mine, Castle Mountain Mine and Chickaloon River Roads. These buffers shall be 100 feet wide measured from the outside edge of the right-of-way. However, entry to or exit from the timber harvest/habitat enhancement areas shall be allowed from the road beds. These entry/exit ways may be harvested and therefore should not be more than 100 feet wide nor should the minimum distance between the entry/exit way be closer than 0.25 mile along these roads. The standard 100 foot buffer may be modified based on the line-of-sight requirements as necessary to provide for restricted views through these buffers.

2. ACTIVITIES ALLOWED. Activities allowed within road buffers include the following:

a. Selective-tree cutting as approved by ADF&G (Habitat Div.) and DNR.

b. Disease and insect control and prevention with pesticides as approved by ADF&G, DNR and DEC.

c. Grazing as approved by ADF&G and DNR and consistent with the grazing guidelines in this chapter on pages 103-117.

d. Roads, trails and utility lines may cross the buffer and should be as close to a 90° angle as possible.

e. Powerlines may be located within the buffer if the purpose is to screen them from the road and sufficient vegetation exists in the right-of-way and buffer to accomplish this.

f. Recreational trails (e.g. for snowmobiles or 3-wheelers) may be located within the buffer if there is no room for them in the right-of-way and putting them in the buffer does not significantly reduce its screening capability.

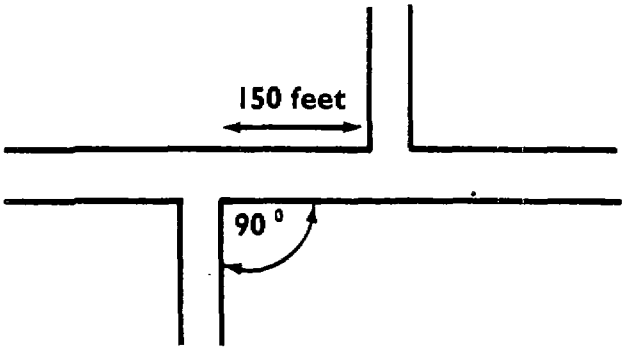
3. SPUR ROAD ACCESS

When personal use firewood cutting occurs along a trail, DOF will build spur side trails through the buffer to access the timber rather than allow cutting of buffers.

4. OFF-SET CROSSING OF LOGGING ROADS.

Logging roads or trails shall cross existing trails at a 90° angle or as close to that as possible. On those portions of the Chickaloon River and the Chickaloon-Knik-Nelchina Trails on which there is vehicular use. Such crossings shall be offset at least 150 feet. (See illustration below.)

Figure 5: OFFSET CROSSING OF LOGGING ROADS



5. CUTTING PERMITS

Personal firewood cutting permits shall specify that no cutting is allowed within the buffer.

CHAPTER 4

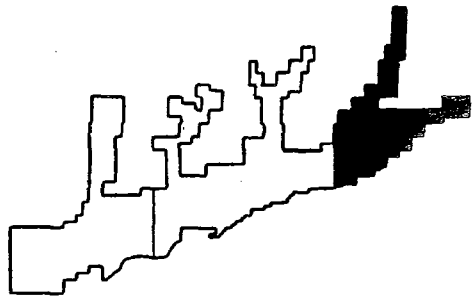
MANAGEMENT PLAN: LAND MANAGEMENT POLICIES FOR INDIVIDUAL UNITS

4. MANAGEMENT PLAN: LAND MANAGEMENT POLICIES FOR INDIVIDUAL UNITS

This chapter describes the management plan for managing the Matanuska Valley Moose Range.

The Moose Range is divided into three management subunits - the Western, Middle and Eastern. Each subunit is described individually and includes background information, a management intent statement, subunit specific management guidelines, and a land use designation summary.

Map 10, the Land Use Plan Map on page 199, shows the areas of management for each resource. The map should be referred to as the reader reviews each individual subunit to aid in clarifying areas of proposed resource management.



THE WESTERN MANAGEMENT SUBUNIT

A. BACKGROUND

The Western Management Subunit includes the portions of the Moose Range that lie east of Fishhook Road and includes portions of the Moose Creek drainage, and lands around Wishbone Hill and the Sutton community. The subunit has moderate-to-high values for fish, wildlife and forestry resources. Big and small game hunting, fishing and trapping are historic uses of the subunit and occur throughout the subunit. Subsistence and sport harvest both occur but cannot be readily distinguished. Wildlife viewing occurs in road and trail-accessible areas of the subunit. Habitat enhancement research efforts and regeneration of habitat projects have been established in this subunit and are ongoing. Moose habitat is being enhanced in the subunit to offset critical habitat being lost to development elsewhere in the Matanuska Valley. Wishbone Lake has high valued rainbow sportfishing opportunities.

Lower elevations of this subunit have high potential for personal and commercial firewood harvest, while upper elevations, above 2,000 feet, have minimal timber value. Some of the highest valued coal resources in the state are located in the lower half of the Western Management Subunit. Existing coal leases include 7,550 acres of land around Wishbone Hill. Within existing coal leases, the most probable location of mining development is off the Premier Mine Road, along existing mining roads at T19N, R2E, and northeast of Jonesville, near Knob Hill in T19N, R3E. The site for mine buildings cannot be determined until more is known about the exact location of the best coal. It may be on state, borough or private land. If the lessee applies for the use of additional state land for this purpose, a surface lease will be necessary and will be subject to interagency and public review. If the lessee uses state land within the existing coal lease for this purpose, the location will be subject to review and approval as part of the plan of operations.

Public lands in the Western Management Subunit are used at moderate levels for dispersed outdoor recreational activities. There are no existing developed outdoor recreational facilities inside the Moose Range in this subunit. The predominant scenic values in this subunit, as viewed from the Glenn Highway, include Arkose Ridge, Wishbone Hill and Granite Peak. The best grazing lands in the Range are found in the subunit, and approximately 7,000 acres are already under lease or permit.

B. MANAGEMENT INTENT

The management intent for the Western Management Subunit is to enhance a maximum amount of suitable acres of land into browse-producing habitat and to apply the knowledge learned in the southwest corner of the subunit to other areas in the Range. The subunit will continue to be managed for maximum moose harvesting and utilization of other fish and wildlife species through hunting, trapping and fishing. There is a local need for personal firewood, and this need will be met to the extent possible by emphasizing maintenance and improvement of fish and wildlife habitat in conjunction with timber harvest.

Coal development in the Western Management Subunit will proceed in the Wishbone Hill area according to existing lease contracts. The post-mining land use is designated as wildlife habitat primarily beneficial to moose and reclamation efforts will be directed toward producing habitat that is primarily beneficial to moose. In situations where coal development is scheduled, utilization of timber and grazing resources on lands leased for coal will be encouraged. The entire subunit will remain open for locatable mineral entry and for the leasing of coal and oil and gas. It is possible that the state will lease small tracts adjacent to the existing coal leases if it appears that they contain coal.

Dispersed outdoor recreational activities will be allowed to continue in the Western Management Subunit. Popular activities such as hunting big and small game, trapping, wildlife viewing, fossil hunting, off-road vehicle riding on old mining roads between the Jonesville and Premier Mines, horseback riding, hiking, and fishing in Wishbone Lake will continue. The only proposed outdoor recreational development in the subunit is the expansion of the existing Moose Creek State Recreation Site (this is actually outside the Range, adjacent to this subunit). Important scenic areas viewed from the Glenn Highway are Arkose Bench, Wishbone Hill and Granite Peak. Habitat enhancement may occur in these areas, but its effect on the scenic values should be determined and enhancement techniques selected that will have minimum adverse effect on the view.

There is one long-term grazing lease and one short-term grazing permit in the Western Management Subunit. These areas are appropriate for grazing under the guidelines in this plan. Two additional grazing areas are identified in this subunit. These areas should be utilized for grazing research purposes whenever possible. Existing grass forage located on coal-leased lands around Wishbone Hill may be utilized for grazing under a grazing permit.

C. GUIDELINES

1. FISH, WILDLIFE AND FORESTRY

a. Resource Management. This subunit will be managed primarily to maintain, protect and, if necessary, enhance the following fish and wildlife resources and habitats:

Moose throughout the subunit.
Brown bear in upper Moose Creek drainage.
Black bear throughout the subunit.
Dall sheep in upper Moose Creek, near Eska Mountain and in higher elevations.
Small game and fur bearers.
Riparian habitats and instream flow along Moose and Eska Creeks.
Chinook and coho salmon and Dolly Varden in Moose Creek.
Coho and Chinook salmon, Dolly Varden and rainbow trout in upper Wasilla Creek.
Dolly Varden in Eska Creek.
Rainbow trout in Slipper and Wishbone Lakes.
Habitat for moose and other wildlife species.
Buffer around Wishbone Lake, Moose and Wasilla Creeks.
And other species and habitats identified by ADF&G.

b. Fish and Wildlife Utilization. The subunit will be managed to allow continuation of the following activities:

Hunting of big and small game and trapping throughout the subunit.
Sportfishing for anadromous, resident and stocked fish.
Wildlife viewing throughout the subunit.

c. Habitat Enhancement

(1) Research. The southwest portion of the Western Management Subunit (shown on Map 10, page 199) will be managed to produce moose habitat and secondarily to research and develop preferred methods for habitat enhancement and regeneration of browse. DNR, ADF&G, the U of A and others will work cooperatively on research efforts whenever possible. Techniques being tested include willow bundle planting, scarification, use of seed trees, chaining, selective cutting of spruce, and variations in the size and shape of cuts. Techniques to be tested include, but are not limited to, overstory removal, burning, pesticides, and plant trimming to promote sprouting.

(2) Application. Habitat enhancement techniques that are proven to be cost-efficient and environmentally sound will be applied to the Wishbone Hill area and throughout the Moose Range.

d. Timber Harvest and Habitat Enhancement Location

(1) Coal Leases. Timber harvest will be pursued on existing coal development leases near Wishbone Hill to utilize existing timber resources (refer to Map 10 on page 199 for specific locations).

(2) Elevation. No timber may be harvested above 1,100 feet elevation except for habitat enhancement purposes.

(3) Locations. Timber harvest in the Western Management Subunit will occur in the areas shown on Map 10, page 199, with ADF&G approval. Specific sales locations and dates are listed in Table 5, on page 151. For 1986 - 1990, habitat enhancement efforts will be coordinated with timber harvests. (See Chapter Three--Fish, Wildlife and Forestry guideline on page 68 and 69, C.1.c for exceptions.) Possible road development is also indicated in Table 5 on page 151. The criteria for determining the location of cutting units includes access on existing roads/trails to allow the public to obtain firewood. Commercial timber harvests will occur in areas where cost effectiveness and habitat enhancement methods justify such harvests. Approximately 10,500 acres of timber in this management subunit may be harvested for personal or commercial use throughout the rotation period (45-60 years).

(4) Schedule. The schedule for forest product harvest in the Western Management Subunit is detailed in Table 5 on page 151. Any changes to this schedule are governed by Fish, Wildlife, and Forestry guideline C.1.e.(5) on page 73.

(5) Buffers. See Buffer guidelines on page 165 and 166 in this section and pages 68-69 in Chapter Three.

e. Access for Timber Harvest and Habitat Enhancement. Where feasible, access related to timber harvest and habitat enhancement activities will be via the Buffalo Mine Road and existing mining roads between Premier Mine and Seventeen Mile Lake and north of Jonesville.

f. Fisheries. ADF&G will maintain, protect, and enhance the fisheries and habitats of Wasilla, Moose and Eska Creeks and Wishbone Lake. To accomplish this, ADF&G will assess and update available biologic, hydrologic and water quality information, establish stream priorities and develop appropriate recommendations for field investigations and/or Board of Fisheries consideration, as time and funds allow.

Table 5: FIVE YEAR TIMBER HARVEST/HABITAT ENHANCEMENT SCHEDULE FOR THE MATANUSKA VALLEY MOOSE RANGE, WESTERN MANAGEMENT SUBUNIT

Abbreviations Used:

O/M :	overmature	A :	aspen
B :	birch	LFP :	low forage production
S :	spruce	HPP :	high production potential
C :	cottonwood		

NOTE: Cutting units and burn locations are general areas only. Actual burns and cuts will be much smaller but within the given area. Burns will not exceed 150 acres.

PROJECT YEAR 1986

1.	Project Reference Code:	SC-920M (Elk's Lake #2).
	Location:	SE1/4, Sec. 35, T19N, R2E, S.M.
	Acreage:	160 acres.
	Pre-resource Assessment:	O/M, B/S, LFP, HPP.
	Forestry Management Category/Practices:	Commercial seed tree cut - retain birch.
	Enhancement Action:	Soil scarification pre-birch seed fall.
	Projected Results:	Regeneration of birch seedlings; birch has a high moose forage production potential.
	Post-project Results:	Report on vegetation regeneration and plant competition will be completed in June, 1987.
	Access:	Upgrade existing road.
	Notes:	Being cut at present time. This site is actually outside the Moose Range, but will privide the same benefits (forest products and habitat enhancment) as the others listed.
2.	Project Reference Code:	SC-1000M (Premier Fuelwood #4).
	Location:	S1/2, Sec. 32, T19N, R2E, S.M.
	Acreage:	320 acres.
	Pre-resource Assessment:	O/M B/S; LFP, HPP.
	Forestry Management Category/Practices:	Commercial seed tree cut - retain birch.
	Enhancement Action:	Soil scarification pre-birch seed fall.
	Project Results:	Regeneration of birch seedlings; birch has a high moose forage production potential.
	Post-project Results:	Report on vegetation regeneration and plant competition will be completed in June, 1987.
	Access:	Existing forestry road.

PROJECT YEAR 1986 (continued)

3. Project Reference Code: MR-86-2 (Fishhook II) (Western Subunit pilot project).
   Location: SW1/4, Sec. 36, T19N, R1E, S.M.
   Acreage: 160 acres.
   Pre-resource Assessment: O/M, B, S; LFP, HPP.
   Forestry Management Category/Practices: Personal use firewood - scarify.
   Enhancement Action: Scarify, retain seed trees.
   Projected Results: Regeneration of birch seedlings.
   Post-project Results: Report on regeneration and plant competition will be completed in June following project completion.
   Access: Road already in existence.
   Notes: Area already cut. Scarification not performed.

4. Project Reference Code: MR-86-3.
   Location: N1/2N1/2, Sec. 1, T18N, R1E, S.M., S1/2S1/2 Sec. 36, T19N, R1E, S.M.
   Acreage: 320 acres.
   Pre-resource Assessment: O/M B, S; LFP, HPP.
   Forestry Management Category/Practices: Chain down; scarify - retain seed trees.
   Enhancement Action: Scarify adjacent to buffer.
   Projected Results: Regneration of birch seedlings.
   Post-project Results: Report on regeneration and plant competition will be completed in June following project completion.
   Access: Existing roads.
   Notes: Chaining complete. Scarification needs to be performed.

5. Project Reference Code: MR-86-4.
   Location: SW1/4, Sec. 5, T18N, R2E, S.M.
   Acreage: 160 acres.
   Pre-resource Assessment: O/M B, A, S; LFP, HPP.
   Forestry Management Category/Practices: Commercial seed tree cut - retain birch.
   Enhancement Action: Scarify pre-birch seed fall.
   Projected Results: Regeneration of aspen/birch seedlings.
   Post-project Results: Report on regeneration and plant competition will be completed in June following project completion.
   Access: Existing road.
   Note: Already sold contract.

PROJECT YEAR 1986 (continued)

6. Project Reference Code: SC-1002M (Tsadaka Canyon #2).
   Location: NW1/4, Sec. 34, T19N, R2E, S.M.
   Acreage: 160 acres.
   Pre-resource Assessment: O/M B, C, A; LFP, HPP.
   Forestry Management Category/Practices: Commercial seed tree cut - retain birch.
   Enhancement Action: Soil scarification pre-birch seed fall.
   Projected Results: Regeneration of birch seedlings; birch has a high moose forage production potential.
   Post-project Results: Report on vegetation regeneration and plant competition will be completed in June, 1987.
   Access: Upgrade of existing road.

7. Project Reference Code: SC-1190M (MacDonald Fuelwood #1).
   Location: N1/2, Sec. 29, T19N, R2E, S.M.
   Acreage: 320 acres.
   Pre-resource Assessment: O/M B, S; LFP, HPP.
   Forestry Management Category/Practices: Commercial seed tree cut - retain birch.
   Enhancement Action: Soil scarification pre-birch seed fall.
   Projected Results: Regeneration of birch seedlings; birch has a high moose forage production potential.
   Post-project Results: Report on vegetation regeneration and plant competition will be completed in June, 1987.
   Access: Winter road via Murphy Road.

8. Project Reference Code: SC-1191M (MacDonald Fuelwood #2).
   Location: S1/2SW1/4, Sec. 20, NW1/4 Sec. 29, T19N, R2E, S.M.
   Acreage: 240 acres.
   Pre-resource Assessment: O/M B, S; LFP, HPP.
   Forestry Management Category/Practices: Commercial seed tree cut - retain birch.
   Enhancement Action: Soil scarification pre-birch seed fall.
   Projected Results: Regeneration of birch seedlings; birch has a high moose forage production potential.
   Post-project Results: Report on vegetation regeneration and plant competition will be completed in June, 1987.
   Access: Winter road via Murphy Road.

PROJECT YEAR 1986 (continued)

9. Project Reference Code: SC-1189M (Soapstone #4B).
   Location: N1/2SE1/4, SW1/4SE1/4, S1/2NE1/4, Sec. 5, T18N, R2E, S.M.
   Acreage: 200 acres.
   Pre-resource Assessment: O/M A, S, B; LFP, HPP.
   Forestry Management Category/Practices: Commercial seed tree cut - retain birch.
   Enhancement Action: Soil scarification pre-birch seed fall.
   Projected Results: Regeneration of birch seedlings; birch has a high moose forage production potential.
   Post-project Results: Report on vegetation regeneration and plant competition will be completed in June, 1987.
   Access: MEA Powerline R/W.
   Note: This is a re-offer of an old sale.

10. Project Reference Code: SC-919M (Tsadaka Canyon #1)
   Location: NE1/4, Sec. 34, T19N, R2E, S.M.
   Acreage: 160 acres.
   Pre-resource Assessment: Mature spruce, cottonwood and birch.
   Forestry Management Category/Practices: Commerical seed tree cuts.
   Enhancement Action: Soil scarification pre-birch seed fall.
   Projected Results: Regeneration of aspen and birch seedlings.
   Post-project Results: Report on regeneration will be completed in June following project completion.

11. Project Reference Code: SC-987M (Soapstone Fuelwood #5)
   Location: N1/2, Sec. 6, W1/2NW1/4,Sec. 5, T18N, R2E, S.M.
   Acreage: 400 acres.
   Pre-resource Assessment: Mature birch.
   Forestry Management Category/Practices: Commercial seed tree cuts.
   Enhancement Action: Soil scarification pre-birch seed fall.
   Projected Results: Regeneration of birch seedlings.
   Post-project Results: Report on vegetation regeneration will be completed in June following project completion.

12. Project Reference Code: SC-989M (Soapstone Fuelwood #6)
   Location: N1/2, SE1/4, Sec. 4, T18N, R2E, S.M.
   Acreage: 80 acres.
   Pre-resource Assessment: Mature birch.
   Forestry Management Category/Practices: Commercial seed tree cuts.
   Enhancement Action: Soil scarification pre-birch seed fall.
   Projected Results: Regeneration of birch seedlings.
   Post-project Results: Report on vegetation regeneration will be completed in June following project completion.

PROJECT YEAR 1986 (continued)

13. Project Reference Code: SC-998M (Soapstone Fuelwood #7)
Location: SE1/4, Sec. 31, T19N, R2E, S.M.
Acreage: 160 acres.
Pre-resource Assessment: Mature birch.
Forestry Management Category/Practices: Commercial seed tree cuts.
Enhancement Action: Soil scarification pre-birch seed fall.
Projected Results: Regeneration of birch seedlings.
Post-project Results: Report on vegetation regeneration will be completed in June following project completion.

PROJECT YEAR 1987

1. Project Reference Code: MR-87-1 (Buffalo Mine).
Location: SE1/4, Sec. 28, T19N, R2E, S.M.
Acreage: 160 acres.
Pre-resource Assessment: O/M A, B; LFP, HPP.
Forestry Management Category/Practices: Personal use firewood; seed tree cut - retain birch.
Enhancement Action: Scarify, pre-birch seed fall.
Projected Results: Regeneration of birch seedlings.
Post-project Results: Report on regeneration and plant competition will be completed in June following project completion.
Trail Construction: 1 mile.
Access: Existing roads.
Notes: Harvest area will be east of Moose Creek. Area has high potential for heritage values.

2. Project Reference Code: MR-87-2 (Baxter Mine).
Location: NE1/4, Sec. 27, T19N, R2E, S.M.
Acreage: 160 acres.
Pre-resource Assessment: O/M B, S; LFP, HPP.
Forestry Management Category/Practices: Personal use firewood; seed tree cut - retain birch.
Enhancement Action: Scarify, pre-birch seed fall.
Projected Results: Regeneration of birch seedlings.
Post-project Results: Report on regeneration and plant competition will be completed in June following project completion.
Access: Existing road + .5 mile new constructin (temporary).
Notes: On existing coal lease area. High heritage potential.

PROJECT YEAR 1987 (continued)

3.	Project Reference Code:	MR-87-3 (Western Subunit Pilot Project).
	Location:	Sec. 27, T19N, R2E, S.M.
	Acreage:	640 acres.
	Pre-resource Assessment:	Mature aspen/birch stands; LFP, HPP.
	Forestry Management Category/Practices:	Checkerboard hinge cuts and clearcuts for personal use.
	Enhancement Action:	Stump and root sprouts.
	Projected Results:	Regeneration of aspen stands.
	Post-project Results:	Establish 1/2 meter plots and determine number of seedlings. See case file. Conduct assessment in June of following year.
	Access:	1.5 miles new construction (temporary).
	Note:	High heritage potential.
4.	Project Reference Code:	MR-87-4.
	Location:	E1/2NW1/4, Sec. 34, T19N, R2E, S.M.
	Acreage:	80 acres.
	Pre-resource Assessment:	Scattered mature birch; LFP, HPP.
	Forestry Management Category/Practices:	Scarification only.
	Enhancement Action:	Soil scarification pre-birch seed fall.
	Projected Results:	Regeneration of birch seedlings.
	Post-project Results:	See case file.
	Access:	Temporary roads already in.
	Note:	Existing sale (cut area).
5.	Project Reference Code:	MR-87-7 (Porcupine Ridge).
	Location:	NE1/4, Sec. 30, T19N, R2E, S.M.
	Acreage:	160 acres.
	Pre-resource Assessment:	O/M B, S; LFP, HPP.
	Forestry Management Category/Practices:	Commercial seed tree cut - retain birch.
	Enhancement Action:	Soil scarification pre-birch seed fall.
	Projected Results:	Regeneration of birch seedlings.
	Post-project Results:	Report on vegetation regeneration and plant competition will be completed in June, 1988.
	Access:	.75 mile construction for winter access only.
6.	Project Reference Code:	MR-B-00-87 (proposed burn project).
	Location:	Sec. 11, 12, 1, T19N, R2E, S.M.
7.	Project Reference Code:	MR-B-01-87 (proposed burn project).
	Location:	Sec. 16, 17, 18, T19N, R2E, S.M.
	Note:	In scenic area.

PROJECT YEAR 1988

1. Project Reference Code: MR-88-1.
   Location: N1/2, Sec. 25, T19N, R2E, S.M.
   Acreage: 320 acres.
   Pre-resource Assessment: O/M B, C, S; LFP, HPP.
   Forestry Management Category/Practices: Commercial seed tree cut - retain birch, cottonwood.
   Enhancement Action: Soil scarification, pre-birch, cottonwood seed fall.
   Projected Results: Regeneration of birch, cottonwood seedlings.
   Post-project Results: See case file.
   Access: .5 mile new construction; develop section line easement.
   Note: On existing coal lease.

2. Project Reference Code: MR-88-4 (Long Island Habitat).
   Location: SW1/4, Sec. 30, T19N, R2E, S.M.
   Acreage: 160 acres.
   Pre-resource Assessment: O/M B, S; LFP, HPP.
   Forestry Management Category/Practices: Commercial or personal use seed tree cut - retain birch.
   Enhancement Action: Soil scarification pre-birch seed fall.
   Projected Results: Regeneration of birch seedlings.
   Post-project Results: Report on vegetation regeneration and plant competition will be completed in June, 1989.
   Access: 1 mile new construction of winter only access road.

3. Project Reference Code: MR-88-5 (Arkose Fingers).
   Location: SW1/4, Sec. 19, T19N, R2E, S.M.
   Acreage: 160 acres.
   Pre-resource Assessment: O/M, B, S; LFP, HPP.
   Forestry Management Category/Practices: Commercial or personal use seed tree cut or hinge cuts - retain birch.
   Enhancement Action: Soil scarification pre-birch seed fall.
   Projected Results: Regeneration of birch seedlings.
   Post-project Results: Report on vegetation regeneration and plant competition will be completed in June, 1989.
   Access: 1 mile new construction of winter-only access road.
   Note: Part of area is in high value scenic area.

THE WESTERN MANAGEMENT SUBUNIT

PROJECT YEAR 1989

1. Project Reference Code: MR-89-1.
   Location: SE1/4, Sec. 4, T18N, R2E, S.M.
   Acreage: 160 acres.
   Pre-resource Assessment: Mature birch, aspen, spruce; LFP, HPP.
   Forestry Management
   Category/Practices: Personal use, seed tree cut - retain birch and aspen.
   Enhancement Action: Soil scarification pre-birch seed fall.
   Projected Results: Regeneration of birch and aspen.
   Post-project Results: See case file.
   Access: 1 mile new construction of temporary road.

2. Project Reference Code: MR-89-5.
   Location: SW1/4, Sec. 24, T19N, R1E, S.M
   Acreage: 160 acres.
   Pre-resource Assessment: O/M B, S; LFP, HPP.
   Forestry Management
   Category/Practices: Commercial seed tree cut - retain birch.
   Enhancement Action: Soil scarification pre-birch seed fall.
   Projected Results: Regeneration of birch seedlings.
   Post-project Results: Report on vegetation regeneration and plant competititon will be completed in June, 1990.
   Access: 2 miles construction of winter only roads.
   Note: In high valued scenic area.

3. Project Reference Code: MR-89-6 (Swamp Dog).
   Location: SE1/4, Sec. 25, T19N, R1E, S.M.
   Acreage: 160 acres.
   Pre-resource Assessment: O/M B, S; LFP, HPP.
   Forestry Management
   Category/Practices: Commercial or personal use seed tree cut - retain birch.
   Enhancement Action: Soil scarification pre-birch seed fall.
   Projected Results: Regeneration of birch seedlings.
   Post-project Results: Report on vegetation regeneration and plant competititon will be completed in June, 1990.
   Access: 2.5 miles construction of winter-only roads.

PROJECT YEAR 1990

1. Project Reference Code: MR-90-3 (Murphy Point).
   Location: SE1/4, Sec. 29, T19N, R2E, S.M.
   Acreage: 160 acres.
   Pre-resource Assessment: O/M B, white spruce; LFP, HPP.
   Forestry Management Category/Practices: Commercial seed tree cut - retain birch.
   Enhancement Action: Soil scarification pre-birch seed fall.
   Projected Results: Regeneration of birch seedlings.
   Post-project Results: See case file.
   Access: 1 mile construction of temporary road.
   Note: Some of area is already cut.

2. Project Reference Code: MR-90-5 (Freckles Patch).
   Location: SE1/4, Sec. 30, T19N, R2E, S.M
   Acreage: 160 acres.
   Pre-resource Assessment: O/M B, white spruce; LFP, HPP.
   Forestry Management Category/Practices: Commercial or personal use seed tree cut - retain birch.
   Enhancement Action: Soil scarification pre-birch seed fall.
   Projected Results: Regeneration of birch seedlings.
   Post-project Results: See case file.
   Access: Existing roads.

3. Project Reference Code: MR-90-5 (Little Su Get-a-Way).
   Location: NW1/4, Sec. 25, T19N, R1E, S.M.
   Acreage: 160 acres.
   Pre-resource Assessment: O/M B, white spruce; LFP, HPP.
   Forestry Management Category/Practices: Commercial seed tree cut - retain birch.
   Enhancement Action: Soil scarification pre-birch seed fall.
   Projected Results: Regeneration of birch seedlings.
   Post-project Results: See case file.
   Access: 1.25 miles construction of temporary trails.

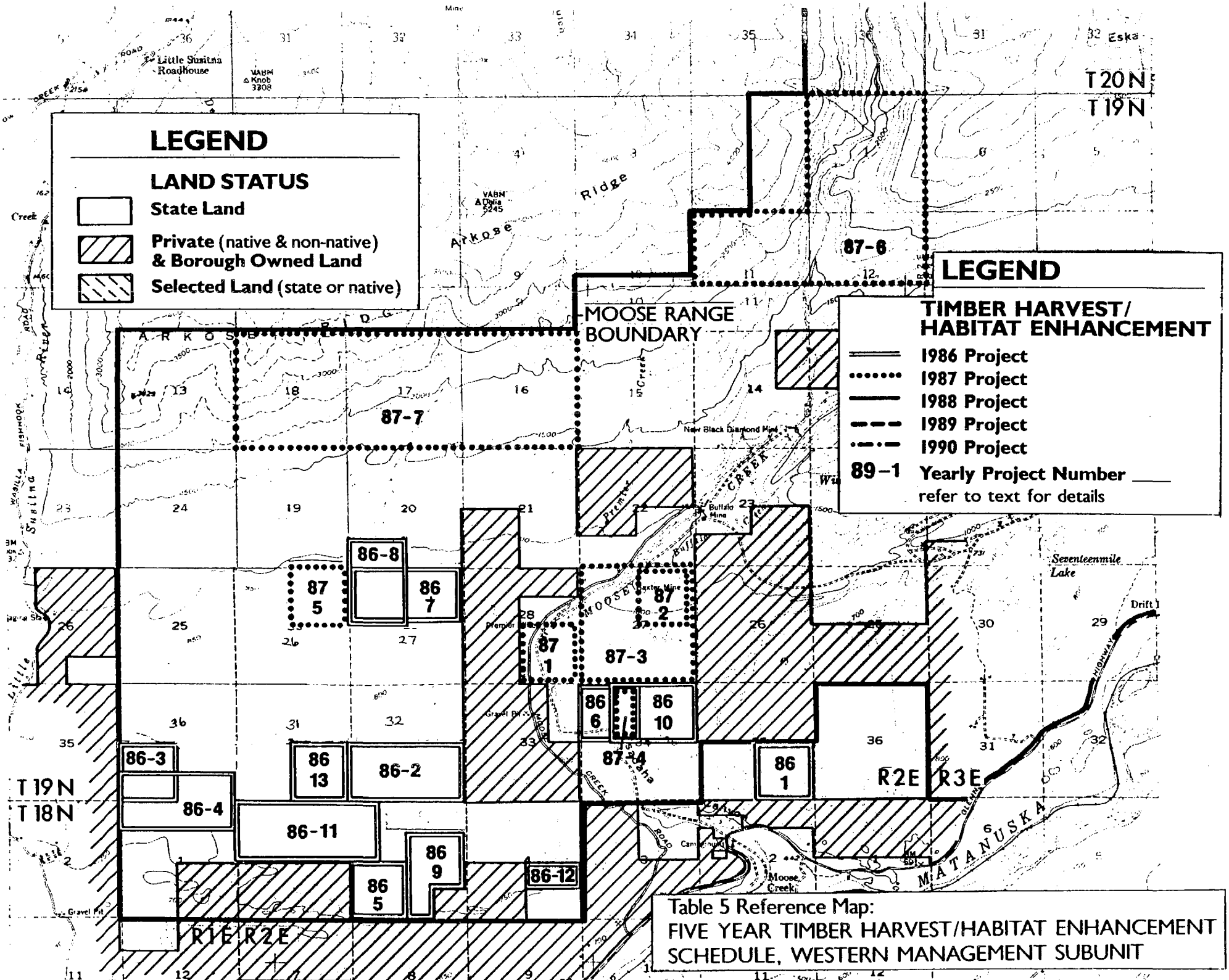
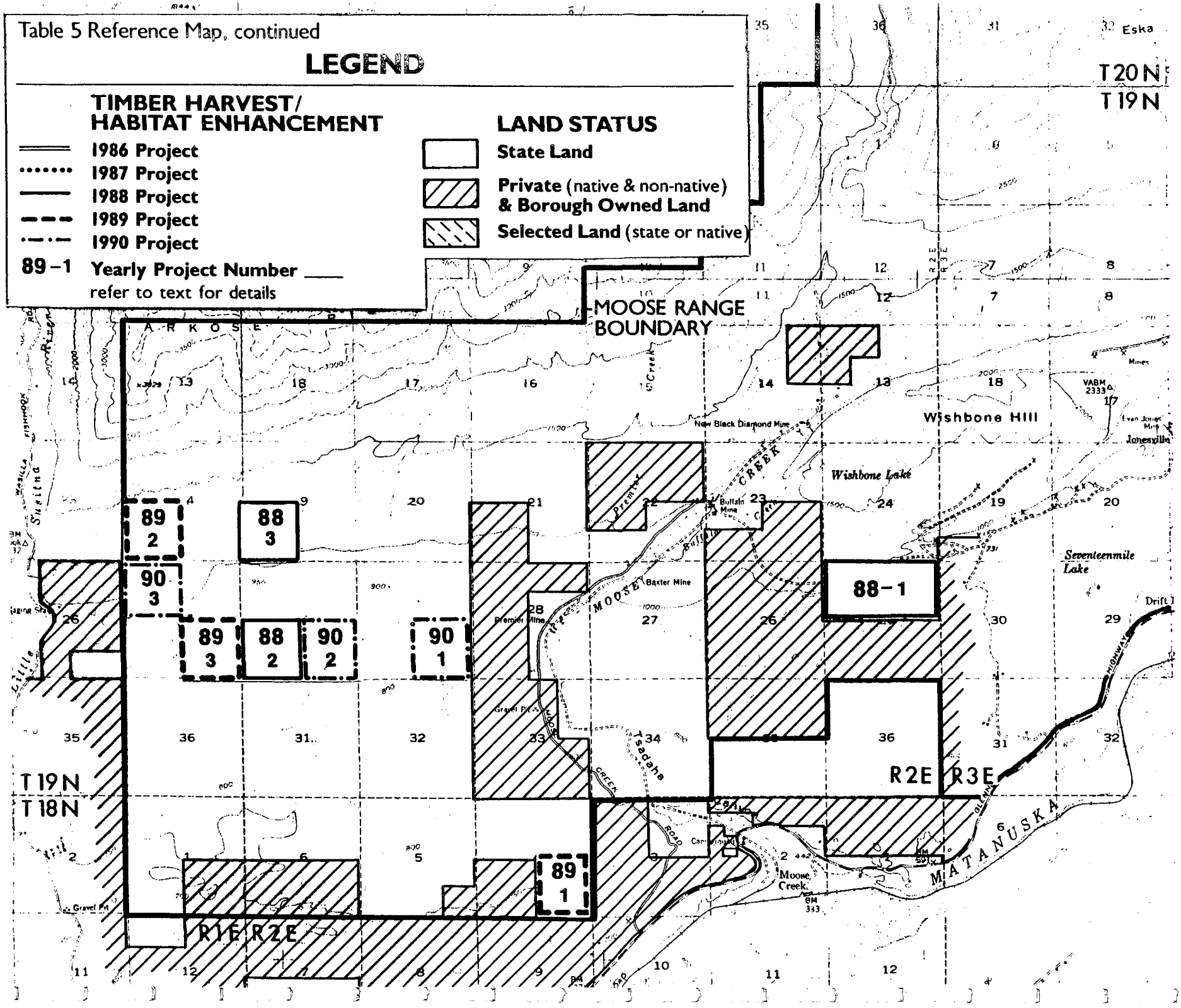

LEGEND
LAND STATUS
State Land
Private (native & non-native) & Borough Owned Land
Selected Land (state or native)
MOOSE RANGE BOUNDARY
LEGEND
TIMBER HARVEST/ HABITAT ENHANCEMENT
1986 Project
1987 Project
1988 Project
1989 Project
1990 Project
89-1 Yearly Project Number ____ refer to text for details
T20N
T19N
T19N
T18N
R1E R2E
R2E R3E
87-6
87-7
87-3
87-4
86-8
86-3
86-4
86-11
86-2
86-12
87 5
86 7
87 1
87 2
86 6
86 10
86 13
86 9
86 5
86 1
Table 5 Reference Map:
FIVE YEAR TIMBER HARVEST/HABITAT ENHANCEMENT SCHEDULE, WESTERN MANAGEMENT SUBUNIT

Table 5 Reference Map, continued



2. SUBSURFACE

The Western Management Subunit is open to locatable and leasable mineral development. There is no known coal potential in upper Moose Creek.

a. Coal Lease Location

(1) Existing Leases. The state will follow existing procedures to allow for development of high valued coal resources on lands now leased for coal development near Wishbone Hill. Map 5b on page 35 shows the location of the existing leases.

(2) Possible Complementary Leases. Small tracts that complement and generally lie adjacent to existing leases may be leased in order to consolidate holdings and maximize utilization of the resources. (See Map 5b on page 35).

(3) Agency/Lessee Cooperation. The DOM will work actively with the lessee on the existing Wishbone Hill coal leases. DNR and ADF&G will review the mining plans of operation once the lessee submits them to the state. State agencies will follow the intent of this plan and follow established ASCMCRA procedures in approving the plans for operation. State agencies will make recommendations to minimize impacts on fish and wildlife habitat and populations.

(4) Wishbone Lake. Wishbone Lake will be protected and/or replaced if destroyed as a result of mining.

b. Post-Mining Land Use. Post-mining land use is designated as wildlife habitat for the Wishbone Hill area coal mined lands. Reclamation must be directed to a habitat type and density which is primarily beneficial to moose consistent with ASCMCRA. The DOM will monitor coal mining and reclamation activities at Wishbone Hill according to the ASCMCRA. This will include water quality in Moose Creek, the rainbow fisheries in Wishbone Lake, groundwater and air quality of the subunit.

c. Post-Mining Roads. The location and development of mining roads will receive interagency review during the review of authorization for mining. The determination of post-mining road use will be made at that time. Roads which are designated to be used by the public will remain open after mining operations have ceased or until an agency management decision is developed to do otherwise.

d. Potential Locations for Coal Mine Mouth Plants. As of 6/19/86, the Wishbone Hill area mining lessees have indicated four potential sites for locating a coal mine mouth plant near Sutton. The potential locations and possible conflicts with the sites are as follows:

(1) SW1/4, T19N, R2E, Sec. 35. Adjacent to the Moose Range, close to water supply, major transportation and power corridor. Possible conflict with proposed realignment of the Glenn Highway. Coordination with timber harvest plans necessary. Soil data needed for engineering.

(2) N1/2, NE1/4, T19N, R2E, Sec. 34. Possible conflicts warrant coordination with timber harvest/habitat enhancement efforts. Soils data needed for engineering.

(3) S1/2, T19N, R2E, Sec. 26. Private property; requires purchase.

(4) SE1/4, S1/2SW1/4, NW1/4SW1/4, T19N, R2E, Sec. 23. Private property requires negotiation with Cook Inlet Region Inc. (see Map 5a on page 33).

3. RECREATION

a. Hunting and Trapping. This management subunit is a major big and small game harvest and trapping area. These recreational activities will continue to be allowed and will be regulated by the Game Board.

b. State Picnicking and Camping Roadside Facilities

(1) Moose Creek State Recreation Site. The enabling legislation that established the Moose Range requires the state to provide for roadside recreation sites, including picnicking and camping areas. To meet this need DOPOR will pursue funding and staffing to expand the existing Moose Creek State Recreation Site (on lands outside of the Range) to provide for overnight camping. The preferred location for this expansion is adjacent to the Buffalo Mine Road at NE1/4, Sec. 3, T18N, R2E, S.M.

Since this is mental health land, campground expansion at this site is dependent upon the final management scheme for mental health lands approved by a court of competent jurisdiction. The May 15, 1986, Department Order 121 prohibits Interagency Land Management Assignments (ILMAs) at this time on mental health lands which precludes use of this land for a public campground. If a public campground at this location is not an option, the Division of Parks should consider a privately run campground under lease

(which would produce revenue and, therefore, might be approved by the Mental Health Commission); or the investigation of privately owned land in the vicinity for purchase if any is suitable; or encouraging private parties to provide a campground on private land; a land exchange; or purchase of these lands.

(2) Interpretive Displays. When expanded, the Moose Creek site will include interpretive displays to inform the public about the purposes of the Moose Range, existing outdoor recreational opportunities, natural, cultural and historic values, and unique geologic features. The displays can be used to educate the public about natural resource values, multiple use management of the natural resources and how resource use may improve wildlife productivity of some sites. ADF&G will co-author the interpretive signs regarding the Moose Range.

c. Matanuska-Susitna Borough Facilities. The state recommends that the Matanuska-Susitna borough retain title to property along Fishhook Road (NE1/4NW1/4, Sec. 26, T19N, R1E, S.M.). The state also recommends the parcel to be dedicated for recreational classification. If access to the borough property is feasible, the property may serve as public access to the Arkose Bench area after 1991.

The state recommends that the Matanuska-Susitna Borough dedicate Borough lands around Coyote Lake (NE1/4 NW1/4, Sec. 15, T19N. R3E, S.M.) for recreational classification. The Sutton Community can apply to the borough and DOPOR for capital improvement grant money to obtain funding for development of recreational improvements at Coyote Lake.

d. Fossil Hunting. Fossil hunting is a dispersed outdoor recreational activity that is popular in the Western Management Subunit. The subunit will be managed to allow public access to Moose Creek and the Wishbone Hill areas for the purpose of collecting fossils. The activity will be restricted by DNR when the public's safety is endangered or when public activity interferes unreasonably with coal mining operations. Permits and leases for commercial use of the fossils may be prohibited when DOPOR evaluates the heritage resource value, determines whether or not the fossil types warrant protection and identifies the appropriate method for protection.

e. Scenic Values. Scenic views of Arkose Ridge, Wishbone Hill, or Granite Peak from the Glenn Highway should be protected (see Map 10 on page 199). Habitat enhancement may be allowed in the areas viewed from the Glenn Highway to maintain wildlife habitat. Review of enhancement plans by DNR and ADF&G will occur and habitat enhancement/timber harvest activities should be designed to minimize their adverse effect on the view.

4. HERITAGE RESOURCES

a. Known Sites. Four known heritage resource sites have been recorded in the Western Management Subunit. These sites will be managed according to the guidelines in Chapter Three on page 93. (See Map 7 on page 43).

b. Undiscovered Sites

(1) Resource Extent. The Western Management Subunit has been used historically by native populations primarily traveling along the Matanuska River. Coal mining near Jonesville/Sutton subsequently spurred the development of the non-native communities. With the extent of past historic use (both native and that related to mining) it is likely that additional cultural and historic resources will be located. Areas in the Western Management Subunit designated by DOPOR as known and high potential areas for containing heritage resources will be surveyed for heritage values as funding and staffing allow (see Map 7, page 43).

(2) Public Education. Public knowledge of cultural and historic values is necessary to help protect the heritage resources. Therefore, the state encourages the community of Sutton to continue to promote public education on cultural values in the area through the local museum and historical society functions. The state also encourages the Alpine Historical Society to continue interpreting the mining era to the public and developing the local historical museum. If possible, the state should donate old mining equipment found on state land to the local historical museum.

5. BUFFERS

a. Lakeshores and Stream Corridors

(1) Wasilla Creek. There is a 200 foot buffer on each side of Wasilla Creek above ordinary high water. Any timber harvest or habitat enhancement activity altering the habitat/vegetation within the buffer shall require concurrence by DNR and ADF&G. See Chapter Three guidelines on stream corridors and lakeshores for other allowed activities on pages 99 and 100.

(2) Other Streams and Lakes. Habitat enhancement efforts in riparian zones along Moose and Eska Creeks, Wishbone and Seventeen Mile Lakes may take place according to the Chapter Three guidelines on buffers (see Lakeshores and Stream Corridors section, pages 97-100).

b. Wetland Buffers. Large wetlands, in excess of 700 acres, exist in the southwestern end of this subunit. A buffer will be retained around them as described in Chapter Three (see pages 101-102).

6. INSTREAM FLOW RESERVATIONS

ADF&G will establish instream flow needs on Wasilla Creek, Moose Creek and Eska Creek to maintain fish and wildlife resources, riparian habitat and associated recreational opportunities as funding and staff are available. The DLWM will work closely with ADF&G to establish the instream flow reservations.

7. GRAZING

a. Existing Leases

(1) Arkose Ridge Permit. A permittee (ADL #219994) has obtained a five-year permit for grazing on Sec. 15, S1/2N1/2, S1/2, Sec. 16 and S1/2S1/2, Sec. 17, 19, and 20, T19N, R2E, S.M. below Arkose Ridge. Approximately 2560 acres of this lease have high grazing potential. DLWM will, upon expiration of the permit in 1990, review the permit for reissuance as a permit or lease according to grazing guidelines in Chapter Three. Upon expiration or termination of the grazing permit, the state may, upon application, issue a permit or lease to another applicant. This permit area should be a primary candidate for developing a common use grazing area.

(2) Moose Creek Lease. An existing 25-year lease (ADL #40743) covers approximately 4,800 acres of high-to-moderate grazing potential along Moose Creek. This lease will be continued according to its present lease requirements for the term of the lease. Should the lease be terminated for any reason, a lease or permit may be issued to other applicants for grazing according to Chapter Three guidelines.

b. Future Leases

(1) Areas of Approved Use. Grazing is an approved use on the lands covered by existing grazing leases and permits, on Arkose Bench, below Knob Hill, and in the southwest corner of this subunit (see Map 10 on page 199). Grazing may occur in other parts of the subunit if it will benefit or not interfere with wildlife habitat, if it is consistent with the grazing guidelines in Chapter Three on pages 103-117, and if ADF&G approves.

(2) Research Sites. The proposed grazing site in the southwest corner and coal-development-generated, habitat-enhancement sites are locations that should be used as research sites to determine grazing impacts on wildlife enhancement efforts. Initiating these actions requires a request and approval from ADF&G and DNR.

c. Research Efforts. The DOF, ADF&G, Soil Conservation Service, DLWM and the University of Alaska will pursue research efforts in the southwest end of the Western Management Subunit and on existing grazing leases and permits. These research efforts are needed to determine moose-livestock-vegetation interactions, and to determine the potential for future grazing opportunities.

8. ACCESS

a. Public Lands. Public access into the Western Management Subunit is necessary for perpetuating multiple use. The state will maintain public rights-of-way, easements and/or greenbelts for public access to Wishbone Lake, Seventeen Mile Lake, Moose and Eska Creeks, Tsadaka Canyon along Moose Creek; and to public lands along the Fishhook, Soapstone, Buffalo Mine and Murphy Roads. The state recommends that the Matanuska-Susitna Borough also adopt a policy to provide public access to public lands within the Range through the subdivision platting process, acquisition, tax incentives, etc.

b. Public Use of Existing Access

(1) Areas of Open Access. Public sections of the Buffalo Mine Road, mining spur roads to Wishbone Lake and Seventeen Mile Lake, and the Jonesville Mine Road and mining spur roads to the east will remain open to motorized and non-motorized uses.

(2) Areas of Unimproved, Closed or Revegetated Roads. To help manage potential human conflicts with habitat enhancement research efforts, the DOF timber harvest roads in the southwest corner of the Western Management Subunit will not be upgraded, improved or posted with recreational signs. At the request of ADF&G, some roads may be closed or revegetated as part of the habitat maintenance or enhancement efforts.

(3) Areas With Active Assertion. The public has been using the mining roads that connect Buffalo Mine Road, Seventeen Mile Lake and the Jonesville Road since they were constructed. The state will continue researching the validity of a public right-of-way on these roads and follow Chapter Three guidelines on pages 120-121 for making a right-of-way assertion wherever necessary and possible. This includes access to Wishbone Lake off the mining roads system.

c. Existing Grazing Leases Access. Public access is guaranteed through existing permit and grazing lease areas. To assist the public in maintaining access to dispersed outdoor recreational opportunities in upper Moose Creek and the Arkose Ridge area and to aid the grazing lessee in reducing recreational related human-livestock conflicts, the DLWM, DOPOR and ADF&G will work with existing grazing lessees to determine and confirm the location of public access routes.

d. New Access

(1) Public input indicates upper Moose Creek drainage should be left undisturbed. No new trails or roads may be built beyond or north of the natural knob at Sec. 1, T19N, R2E, S.M., for recreation, timber management or wildlife enhancement activities.

(2) ADF&G will monitor winter moose habitat utilization and fall moose harvest on Arkose Ridge bench to determine if use of a proposed trail along the Arkose Ridge bench would adversely affect moose populations.

(3) Developed public access to the Arkose Bench areas from the Buffalo Mine and Murphy roads will not be developed at this time but may be reconsidered after 1991. Similarly, access from Fishhook Road, through Mat-Su Borough land, will not be developed in the near future. DNR, ADF&G, and borough will work cooperatively to develop a trail proposal if the public need for a trail arises, and the proposal is consistent with the intent of the management plan.

9. MATERIALS

Potential Sources

(1) Five potential sources for material are located in the Western Management Subunit. These five sources are shown on Map 2 on page 13. They include potential sites at Mile 1.3 of the Buffalo Mine Road, the upper end of Murphy Road, a site between Elks Lake and Premier Mine Road, a site on borough land off an unnamed road that leaves the Glenn Highway at Mile Post 59.9 and a site beyond the end of the Jonesville Road. (See Chapter Three, Materials guidelines, on page 129.)

(2) The Division of Land and Water Management, Matanuska-Susitna Borough and ADF&G will work cooperatively to do the necessary field analysis prior to development of these sites. Upon completed use of these sites, they will be rehabilitated for wildlife habitat as specified by ADF&G.

10. UNAUTHORIZED USE

DLWM will pursue unauthorized uses of state land according to existing procedures. There appear to be three unauthorized parties living on state land in Sutton at this time, at the following locations:

(1) SW1/4 SE1/4, Sec. 16, T19, R3E, SM

(2) SE1/4 SE1/4, Sec. 16, T19, R3E, SM

(3) NE1/4 SE1/4, Sec. 16, T19, R3E, SM

D. LAND USE DESIGNATIONS SUMMARY

SURFACE

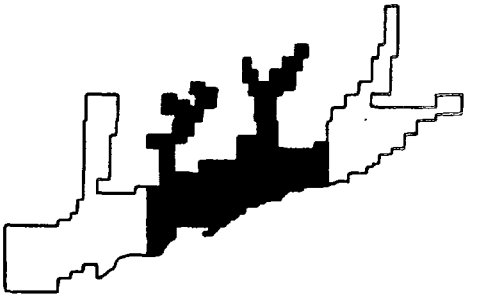
Primary Uses and Classifications. Wildlife habitat, coal, forest.
Secondary Use. Grazing, public recreation, heritage resources.

SUBSURFACE

Locatable Minerals. Open.
Leasable Minerals. Available for leasing.

PROHIBITED SURFACE USE. Land disposals, remote cabins (private), new roads/trails into upper Moose Creek drainage for recreation, timber management, or wildlife enhancement activities beyond the natural knob.

MENTAL HEALTH ACREAGE. 9,600 acres patented, 1,920 acres tentatively approved.



THE MIDDLE MANAGEMENT SUBUNIT

A. BACKGROUND

The Middle Management Subunit includes portions of the following drainages in the Moose Range-Granite Creek, Young Creek, Kings River and Chickaloon River. The area has moderate-to-high values for fish and wildlife. Moose, small game, furbearers, black bear, Dall sheep and resident fish are harvested throughout the subunit by residents from Anchorage, Palmer, Sutton and Chickaloon. Subsistence and sport harvest effort both occur, but cannot be readily distinguished. Wildlife viewing occurs in road or trail accessible areas of the subunit. Mature forests dominate the subunit below the 2,000 foot elevation level. Moose habitat will be enhanced in the subunit to offset critical habitat being lost to development elsewhere in the Matanuska Valley.

The Young Creek area and area around Castle Mountain have known high-value coal resources. Although the Kings River drainage contains low-value coal, there are potentially marketable limestone deposits in the upper east side of the drainage and haydite deposits near the confluence with the Matanuska.

Upper Granite Creek drainage is the only drainage in the Moose Range that does not have existing road access. This drainage also has unstable geologic conditions, rugged terrain, avalanche potential and sub-alpine and alpine vegetation.

Dispersed outdoor recreation activities occur throughout the management subunit along the Chickaloon-Knik-Nelchina Trail, Young Creek Trail, and Permanente Road. The predominant scenic resources in the subunit are Granite Peak and Castle Mountain.

B. MANAGEMENT INTENT

The management intent for this subunit is to maintain, improve and enhance fish and wildlife populations. The subunit will continue to be managed for maximum sustained yield moose harvesting and utilization of other fish and wildlife species through hunting, trapping and fishing. Due to the good potential for improved access, the mature forests below 2,000 feet along Young Creek, Kings River and the base of Castle Mountain will be managed for habitat enhancement through timber harvest and other applicable methods.

The state may offer high-value coal in the Young Creek area and at the base of Castle Mountain for lease. The potentially marketable limestone and haydite deposits along the Kings River will also be available for development. To

accomodate mineral development, the Middle Management Subunit will remain open to locatable mineral entry and will be available for the development of leasable minerals, with the exception of the southern face of Castle Mountain and wildlife mineral licks. Castle Mountain has unique scenic values and the southern face will be closed to locatable mineral entry and will not be available for the exploration or development of leasable minerals in order to protect these values.

The management intent for the upper Granite Creek drainage (the area north of Sec. 36, T20N, R3E) is to emphasize minimal changes in its existing condition due to the unstable geologic conditions, rugged terrain and fragile sub-alpine or alpine vegetation. There will be no new trail or road development into upper Granite Creek.

Dispersed outdoor recreational opportunities will be maintained throughout the Middle Management Subunit. The legislative requirement to provide for roadside recreational sites will be met through the proposed development of campground and picnicking faciltities at the mouth of Kings River, a trailhead-parking lot facility at the beginning of Permanente Road (SE1/4,SE1/4, Sec. 6, T19N, R5E) and a possible trailhead-parking area near the Chickaloon River (Sec.25, T20N, R5E). These facilities will also serve as key access to the Chickaloon-Knik-Nelchina Trail.

A grazing permit may be issued near the base of Castle Mountain, off Castle Mountain Mine Road (see Map 10 on page 199). Community grazing by permit may occur in forested timber harvest and habitat enhancement areas along Young Creek, Kings River and Permanente Road with ADF&G approval. Grazing leases or permits will not be issued along a portion of the east fork of Granite Creek, north of Little Granite Creek, due to unstable slopes and possible conflicts with Dall sheep concentrations (see Map 10 on page 199).

C. GUIDELINES

1. FISH, WILDLIFE AND FORESTRY

   a. Resource Management. This subunit will be managed primarily to maintain, protect and, if necessary, enhance the following fish and wildlife resouces and habitats:

      Moose throughout the subunit.
      Brown Bear in upper Granite Creek and Young Creek.
      Black bear habitat throughout the subunit.
      Dall sheep winter and summer ranges.
      Mineral Licks.
      Riparian habitats and instream flow along the following drainages: Granite Creek, Young Creek, Kings River and lower Chickaloon River.
      Chinook, coho, and chum salmon and Dolly Varden in Granite Creek and Kings River.

Rainbow trout in Chain Lakes and Kings River.
Bald Eagle nests along lower Granite Creek.
Primary attention will be given to maintenance or enhancement of moose summer and winter concentration areas, fall harvest areas and rutting concentrations area.
And other species and habitats identified by ADF&G.

b. Fish and Wildlife Utilization. The subunit will be managed to allow continuation of the following activities:

Hunting of big and small game and trapping throughout the subunit.
Sportfishing for anadromous, resident and stocked fish.
Wildlife viewing throughout the subunit.

c. Application of Research. Timber harvest and habitat enhancement activities in the Middle Management Subunit will use the results of regeneration research efforts on-going in the southwest corner of the Range as one of the sources of information for enhancement. Pilot enhancement projects may be conducted in this subunit to establish base line parameters and vegetation response indicators.

d. Timber Harvest and Habitat Enhancement Location

(1) Forestry Related Enhancement. ADF&G will actively pursue enhancement of wildlife habitat on approximately 9,000 acres of state land in the Young Creek and Kings River drainages, and below Castle Mountain, primarily through the harvest of timber for commercial and personal uses (see Map 10 on page 199). Specific sales locations and dates are listed below in Table 6 on page 174. For 1986-1991, habitat enhancement efforts will be coordinated with timber harvest and occur in the same order and locations. However, changes may be necessary due to wildlife requirements or field analysis results; see Chapter Three--Fish, Wildlife, and Forestry guideline C.1.e.(5) on page 73, for how they will be handled.

(2) Mineral Related Enhancement. In addition, timber harvest will be pursued on state land in the Young Creek drainage or at the base of Castle Mountain on any lands the state leases for coal development in order to utilize the existing timber resources.

(3) Schedule. The schedule for forest product harvest in the Middle Management Subunit is detailed in Table 6 on pages 174-178.

(4) Buffers. See Buffer guidelines on page 183 in this section and Chapter 3, pages 68-69.

Table 6: FIVE YEAR TIMBER HARVEST/HABITAT ENHANCEMENT SCHEDULE FOR THE MATANUSKA VALLEY MOOSE RANGE, MIDDLE MANAGEMENT SUBUNIT

Abbreviations Used:

O/M:	overmature	A:	aspen
B :	birch	LFP:	low forage production
S :	spruce	HPP:	high production potential
C :	cottonwood		

PROJECT YEAR 1986

1. Project Reference Code:	MR-86-1 (King River).
Location:	NE1/4, Sec. 16, T19N, R4E, S.M.
Acreage:	160 acres.
Pre-resource Assessment:	O/M C, S, B; LFP, HPP.
Forestry Management Category/Practices:	Personal use firewood; clearcut, retain seed trees.
Enhancement Action:	Soil scarification pre-birch seed fall.
Projected Results:	Regeneration of birch seedlings.
Post-project Results:	Report on regeneration and plant competition will be completed in June following project completion.
Access:	Existing roads.
Notes:	Portion of area already cut. Area also site of proposed campground.

PROJECT YEAR 1987

1. Project Reference Code:	MR-87-5.
Location:	NW1/4, Sec. 29, T20N, R5E, S.M.
Acreage:	160 acres.
Pre-resource Assessment:	O/M B, A; LFP, HPP.
Forestry Management Category/Practices:	Clearcut for personal use - retain seed trees.
Enhancement Action:	Scarify pre-birch/aspen seed fall.
Projected Results:	Regeneration of birch and aspen.
Post-project Results:	See case file.
Access:	Permanente Road, .75 mile new construction.
Note:	All of cut will be east of Kings River.

2. Project Reference Code: MR-87-6.
   Location: SE1/4, Sec. 22, T20N, R5E, S.M.
   Acreage: 160 acres.
   Pre-resource Assessment: Mature birch/cottonwood stands; LFP, HPP.
   Forestry Management Category/Practices: Personal use, clearcut with seed trees.
   Enhancement Action: Scarification pre-birch/cottonwood seed fall.
   Projected Results: Regeneration birch and cottonwood.
   Post-project Results: See case file.
   Access: 2 miles new construction.

PROJECT YEAR 1988

1. Project Reference Code: MR-88-2.
   Location: Sec. 9, T19N, R4E, S.M.
   Acreage: 640 acres.
   Pre-resource Assessment: Mature aspen stands; LFP, HPP.
   Forestry Management Category/Practices: Hinge cuts.
   Enhancement Action: Stump/root sprouts, plus horizontal tree alignment. Regeneration of aspen stump sprouts, limb sprouts.
   Post-project Results: See case file.
   Access: 1 mile new trail construction, helicopter.
   Note: Part of area is very steep.

2. Project Reference Code: MR-88-3.
   Location: SE1/4, Sec. 15, SW1/4, Sec. 14, T20N, R5E, S.M.
   Acreage: 320 acres.
   Pre-resource Assessment: Mature aspen; LFP, HPP.
   Forestry Management Category/Practices: Hinge cuts and burns.
   Enhancement Action: Stump/root sprouts, horizontal tree alignment.
   Projected Results: Regeneration of aspen stump sprouts, limb sprouts.
   Post-project Results: See case file.
   Access: 2.5 miles new trail construction.

3. Project Reference Code: MR-B-02-88 (proposed burn project).
   Location: Sec. 34, 35, 36, T20N, R4E, S.M.

4. Project Reference Code: MR-B-03-88 (proposed burn project).
   Location: Sec. 14,15, 16, T20N, R5E, S.M.
   Note: Area in high value scenic area.

PROJECT YEAR 1989

1. Project Reference Code: MR-89-2.
   Location: Sec. 2,Sec. 3, T19N, R4E, S.M., excluding portion Sec. 2 which is Native.
   Acreage: 1280 acres.
   Pre-resource Assessment: O/M B, A; LFP, HPP.
   Forestry Management Category/Practices: Checkerboard hinge cuts with clearcuts for personal use.
   Enhancement Action: Stump/root sprouts plus horizontal tree alignment.
   Projected Results: Regeneration of birch/aspen through scarification, stump sprouts, and horizontal tree alignment.
   Post-project Results: See case file.
   Access: 1.75 miles of trail upgrade/helicopter.

2. Project Reference Code: MR-89-3.
   Location: NE1/4, Sec. 34, T20N, R4E, S.M.
   Acreage: 160 acres.
   Pre-resource Assessment: Mature aspen stands; LFP, HPP.
   Forestry Management Category/Practices: Hinge cuts.
   Enhancement Action: Stump/root sprouts, horizontal tree alignment.
   Projected Results: Regeneration of aspen stump sprouts, limb sprouts.
   Post-project Results: See case file.
   Access: 2.5 miles trail upgrade.

3. Project Reference Code: MR-89-4.
   Location: N1/2N1/2, Sec. 22, T20N, R5E, S.M.
   Acreage: 160 acres.
   Pre-resource Assessment: Mature aspen stands; LFP, HPP.
   Forestry Management Category/Practices: Hinge cuts - personal use.
   Enhancement Action: Stump/root sprouts, plus horizontal tree alignment.
   Projected Results: Regeneration of aspen stump sprouts, limb sprouts.
   Post-project Results: See case file.
   Trail Construction: 1.5 miles.

PROJECT YEAR 1990

1.	Project Reference Code:	MR-90-1.
	Location:	NE1/4, Sec. 35, T20N, R4E, S.M.
	Acreage:	160 acres.
	Pre-resource Assessment:	Mature aspen stands; LFP, HPP.
	Forestry Management Category/Practices:	Hinge cuts.
	Enhancement Action:	Stump/root sprouts, horizontal tree alignment.
	Projected Results:	Regeneration of aspen stump sprouts, limb sprouts.
	Post-project Results:	See case file.
	Access:	Helicopter.
2.	Project Reference Code:	MR-90-2.
	Location:	SW1/4, Sec. 21, T20N, R5E, S.M.
	Acreage:	160 acres.
	Pre-resource Assessment:	O/M B, A; LFP, HPP.
	Forestry Management Category/Practices:	Clearcut for personal use, leave seed trees.
	Enhancement Action:	Scarify pre-birch/aspen seed fall.
	Projected Results:	Regeneration of birch and aspen.
	Post-project Results:	See case file.
	Access:	Off Permanente Road; 1.5 miles of construction of temporary access..

1. FISH, WILDLIFE AND FORESTRY guidelines continued from page 173.

   e. Access for Timber Harvest and Habitat Enhancement. Where feasible, access related to timber harvest and habitat enhancement activities will be via the existing Young Creek trail, Permanente Road, and Castle Mountain Mine Road.

   f. Cooperative Management on Private Lands. The Cooperative Forest Management Program will be available to private landowners, in the Fish Lake-Chickaloon communities, who wish to enhance wildlife habitat or forestry values on their land.

   g. Enhancement Above 2,000 Foot Elevation. Utilization of habitat enhancement techniques that would allow for the development of moose browse at higher elevations in transition zones or riparian zones require interagency review. Review is required before applying the techniques in Granite Creek, Young Creek or Kings River in sites above 2,000 foot elevations.

   h. Fisheries. ADF&G will maintain, protect, and enhance the fisheries of Granite and Young Creeks, Kings River, and other waters. To accomplish this, ADF&G will assess and update available biologic, hydrologic, and water quality information, establish stream priorities and develop appropriate recommendations for field investigations and/or Board of Fisheries considerations, as time and funds allow.

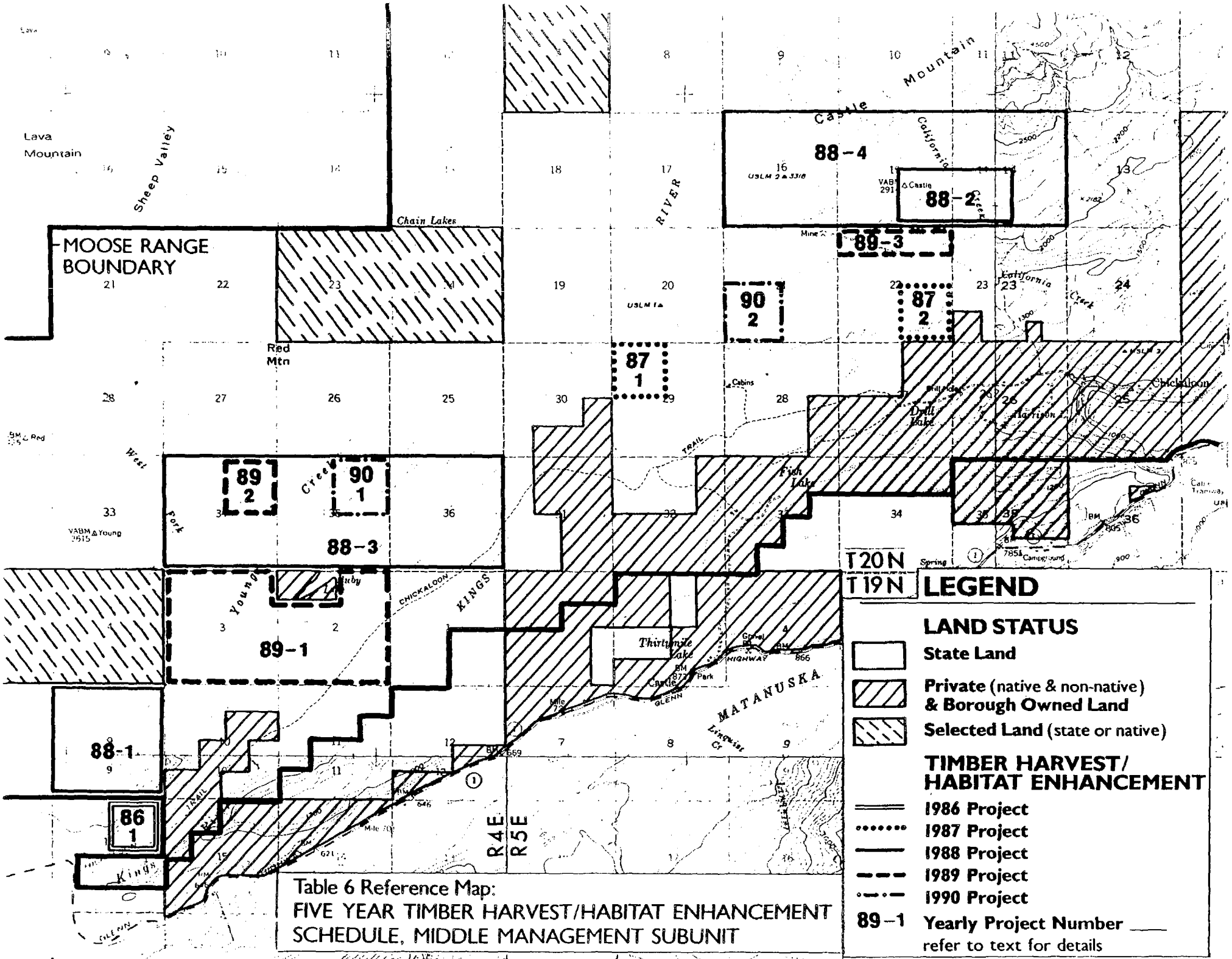


Table 6 Reference Map:
FIVE YEAR TIMBER HARVEST/HABITAT ENHANCEMENT SCHEDULE, MIDDLE MANAGEMENT SUBUNIT

2. SUBSURFACE

a. Coal Lease Location

(1) Young Creek. If the market provides a demand for further coal leasing (and funding is available), the state will offer coal leases in the Young Creek area and base of Castle Mountain as shown on Map 10, page 199. Preferably, DNR will offer the Young Creek lease sale area first, and the Castle Mountain lease area second.

(2) Castle Mountain. If tracts are leased for coal at the base of Castle Mountain, the lessee's plan of operations will require public and interagency review to carefully consider the effects of the proposed actions on the scenic value of Castle Mountain.

b. Mineral Licks. An area with an approximate radius of 1/2 mile around each mineral lick in this subunit will be closed to locatable mineral entry for one year (see Map 3 and 10, pages 23 and 199 and Chapter Three, Subsurface guideline 3.d., pages 84-86). There is an existing mineral leasehold location order (#2) on some of these licks. Following a permanent mineral closure on these licks, the leasehold location order on the balance of the nine sections covered by the leasehold location order will be lifted. (This change constitutes an amendment to the Susitna Area Plan.)

c. Mineral Closures. The southern face of Castle Mountain shall be closed to locatable mineral entry to protect the unique scenic quality of the mountain. The southern face of Castle Mountain will not be made avaiable for the exploration or development of leasable minerals.

Legal Description for Castle Mountain Mineral Closing Order and Area That Will Not Be Opened For the Exploration or Development of Leasable Minerals:

T20N, R5E, S.M., Sec. 12, SW1/4, N1/2SE1/4, N1/2S1/2SE1/4, N1/2S1/2S1/2SE1/4.

Sec. 13 NW1/4NW1/4.

Sec. 14 N1/2, NW1/4SW1/4, N1/2SW1/4SW1/4, N1/2S1/2SW1/4SW1/4.

Sec. 15 N1/2, N1/2S1/2, N1/2S1/2S1/2, N1/2S1/2S1/2S1/2.

Sec. 16 N1/2, SW1/4, N1/2SE1/4, N1/2S1/2SE1/4, N1/2S1/2S1/2SE1/4.

Sec. 21 N1/2NW1/4, N1/2S1/2NW1/4, SW1/4SE1/4NW1/4, W1/2SE1/4SE1/4NW1/4

d. Gore Coal Leases. There are two coal leases in the Castle Mountain area: ADL 53509 is located in S1/2NE1/4, Sec. 21; 33978 is located in the N1/2NE1/4, Sec. 21 and the W1/2NW1/4NW1/, Sec. 22. Both are T20N, R5E,S.M. These leases are adjacent and held by the same lessee. Local residents sometimes refer to them collectively as the Gore Mine or Castle Mountain Mine. The leases were issued by the federal government in 1958 and 1968. They were later transferred to the state when the land was patented to the State of Alaska. The Division of Mining now administers the leases.

According to DOM records, the mine has been inactive for many years. The public has expressed concern over litter and debris left on site, as well as potential safety hazards from deteriorating mine buildings. DOM has scheduled a field inspection of the leases to determine whether the lessee is complying with lease requirements to remove all debris and unused structures. If the lessee is found not in compliance, the lessee will be notified to correct the situation. If the lessee fails to take the necessary steps, the state as lessor has the right to begin legal proceedings for forfeiture and cancellation of the leases.

3. RECREATION

a. Picnicking, Camping and Trailhead Facilities

(1) Kings River Proposal. The enabling legislation that established the Moose Range requires the state to provide for roadside recreation sites, including picnicking and camping areas. To meet this need, DOPOR will develop a new campground at the mouth of Kings River. This campground will be located on state land both outside and inside of the Moose Range to utilize the site and to minimize direct interference with habitat enhancement efforts.

(a) Management Authority. DLWM will issue an interagency land management assignment (ILMA) to DOPOR for management of this site. The ILMA will be at least 200 acres in size and include the bluff and usable land within the proposed site and the land that lies east of the Glenn Highway right-of-way in the NE1/4, E1/2NW1/4 and N1/2S1/2 Sec. 16, T19N, R4E S.M..

(b) Site Plan Requirements. The Kings River campground development will be preceded by a flood plain analysis and a site plan that provides for public access to the adjoining Chickaloon-Knik-Nelchina and Young Creek trail systems. This site plan shall also include a road for possible future access to upper Young Creek for mineral development or timber harvest/habitat enhancement.

(2) King Mountain State Recreation Site. DOPOR will also rehabilitate and expand the existing King Mountain State Recreation Site to allow for six additional camping sites.

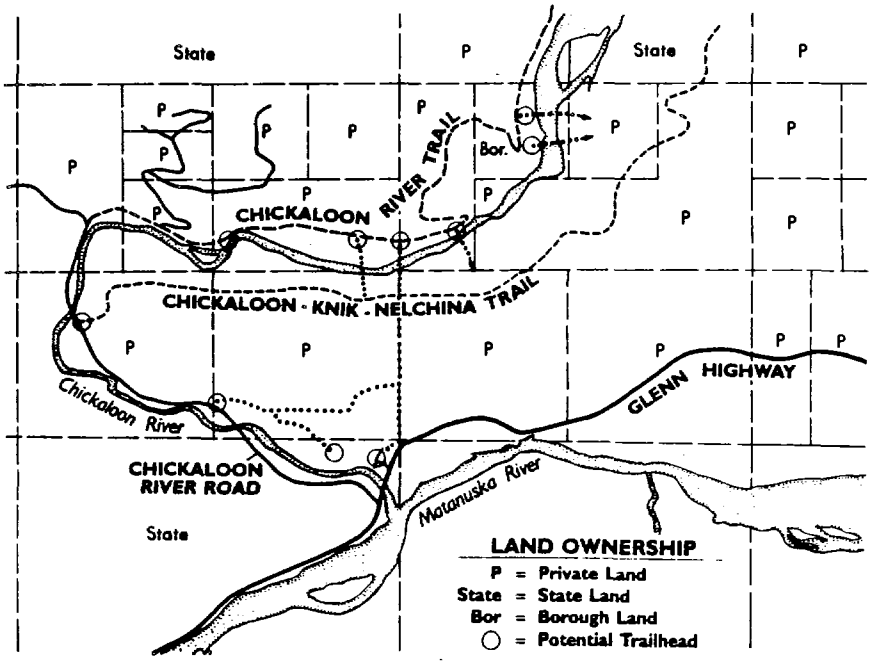
(3) Interpretive Displays. Site development plans for the Kings River Campground and King Mountain Recreation Site may provide for interpretation of multiple use management in the Moose Range. ADF&G will co-author the interpretative signs.

(4) Trailhead Facility.

(a) A public trailhead facility will be developed along Permanente Road, as close to the Glenn Highway as possible. DOPOR will analyze the existing land status and terrain to determine the most appropriate location for the facility. The facility will be designed to allow for horse and ORV trailer parking, and include restroom facilities.

(b) Once legal public access to the Chickaloon River, the Chickaloon River Trail and the Chickaloon-Knik-Nelchina Trail is clarified, a public parking area to serve all three will be needed near the mouth of the Chickaloon River. DOPOR may pursue funding to locate, construct, maintain, and operate this trailhead facility. All possible trailhead locations in this subunit are on private property. The State should negotiate with private property owners to obtain a site for a trailhead. The precise location will require DNR, ADF&G and public approval. See Figure 6 below. See also Recreation guideline 3.a.2 in the Eastern Management Subunit on page 192.

Figure 6: POTENTIAL TRAIL ACCESS IN THE CHICKALOON AREA



(5) Commercial Fossil Use. Permits and leases for commercial use of fossils may be prohibited when DGGS evaluates the heritage resource value, determines whether or not the fossil types warrant protection and the appropriate method for protection.

b. Scenic Values. Scenic views of the Little Granite Creek bench and the southern face of Castle Mountain from the Glenn Highway should be protected where possible to promote tourism in the Sutton and Chickaloon areas (see Map 10 on page 199). Habitat enhancement may be allowed in the areas viewed from the Glenn Highway to maintain wildlife habitat. Review of enhancement plans by DNR and ADF&G will occur and habitat enhancement/timber harvest activities should be designed, where feasible, to minimize their adverse effect on the view.

4. HERITAGE RESOURCES

a. Known Sites.

(1) Seven known heritage resources sites are recorded in the Middle Management Subunit (see Map 7 on page 43). These sites will be managed according to the guidelines in Chapter Three on page 93. As funding allows, DOPOR will work with private landowners to evaluate the importance of the old cabins on Drill Lake and the Chickaloon townsite. If they are determined to be important historic resources, DOPOR should then determine what steps are necessary to protect them.

(2) National Register of Historic Places. DOPOR may also pursue funding to review and propose the Chickaloon-Knik-Nelchina trail and the Chickaloon River trail for the National Register of Historic Places.

b. Undiscovered Sites

(1) Newly Located Sites. The state, through DOPOR and DGGS, will protect and interpret any significant cultural or historic features further identified in this subunit as funding and staffing capability permits.

(2) Survey Priorities. The Chickaloon Townsite, the Chickaloon-Knik-Nelchina Trail corridor, and the Permanente Road all have moderate to high potential for heritage resources and should be surveyed prior to resource development.

(3) Wickman Cabin. Working with the private owner, DOPOR should evaluate the Carl Wickman cabin and barn on Drill Lake to determine its heritage resource value. Recommendations as to its use or protection should be made available to the private owner.

5. BUFFERS

   a. Lakeshores and Stream Corridors. Habitat enhancement efforts in riparian zones along Granite and Young Creek and Kings River and in the vicinity of all lakes in the subunit will take place according to the Chapter Three guidelines on buffers (see Lakeshores and Stream Corridors section, pages 98-100).

   b. Wetland Buffers. A buffer will be retained around the 160 acre wetland on Little Granite Bench as described in the Chapter Three guidelines on buffers (see pages 101-102).

6. INSTREAM FLOW RESERVATIONS

   ADF&G will establish instream flow needs on Granite Creek, Young Creek, Kings River and Chickaloon River to maintain fish and wildlife resources, riparian habitat and associated recreational opportunities as funding and staff are available. These instream flow reservations should be completed as soon as possible to protect fish and wildlife from any potentially adverse effects related to potential low-head hydro power development on the Kings and Chickaloon Rivers. The DLWM will work closely with ADF&G to establish the instream flow reservations.

7. GRAZING

   a. Future Leases and Permits. Grazing is an approved use near the base of Castle Mountain, off Castle Mountain Mine Road, consistent with Chapter Three grazing guidelines. Grazing may also occur under permit in forested timber harvest and habitat enhancement areas along Young Creek, Kings River and Permanente Road if grazing research determines grazing can benefit habitat enhancement or will not interfere with it. These permits or leases will be issued according to Chapter Three grazing guidelines and require DNR and ADF&G approval.

   b. Grazing Prohibited. Due to potential conflict with Dall sheep and unstable soils, livestock grazing will be prohibited in an area north of Little Granite Creek and East of Granite Creek (see Map 10 on page 199).

8. ACCESS

   a. Public Use of Existing Access

      (1) Maintenance of Existing Access. The state will attempt to secure public rights-of-way or easements for public access along the Permanente Road, the Fish Lake Subdivision Road, the Castle Mountain Mine Road, the Chickaloon River Road, the Chickaloon-Knik-Nelchina Trail, the Chickaloon River Trail and the Young Creek Trail, and to public lands along the Fish Lake Subdivision.

(2) Access Priorities. The DNR will verify legal access for the historic Chickaloon River Trail and the Chickaloon-Knik-Nelchina Trail according to Chapter Three guidelines. If acquisition of access is required, these trails are priority. Relocation of the Chickaloon River Trail north of private land through state lands will be allowed to provide an alternative horse and foot trail if necessary.

(3) Access To Little Granite Creek Bench. Access to trails is often blocked by private lands. Public access to the Little Granite Creek bench is important for providing outdoor recreational opportunities such as hunting, and for future moose management of the Moose Range. There is an existing private access road to the bench that is blocked to public use. Private land on the bench also blocks public access to public land beyond. The state encourages the borough to obtain a public right-of-way on the private access road and upgrade it to borough standards. If the private road is upgraded to borough standards, public access to state lands in the area should be pursued by the borough by requiring dedication of a right-of-way during subdivision platting procedures.

b. Chickloon-Knik-Nelchina, Chickaloon River and Young Creek Trails

(1) These trails will be maintained at their existing functional level but will not be substantially upgraded or improved (except that trailwork to reestablish foot use on the Chickaloon-Knik-Nelchina and Chickaloon River Trails is allowed if necessary). Access will remain open to the public for existing uses, including hunting and trapping activities. Timber harvest or habitat enhancement activities along these trails will follow the Chapter Three guidelines on buffers (see pages 68-70). Signs may be placed along the trails as necessary to assert public right-of-way, mark the proper trail route, and help keep the public from trespassing on private lands.

(2) See Buffers in Chapter Three on pages 121-122 for buffer requirements related to other activities on these trails.

c. New Access

Construction of new trails and roads into the upper Granite Creek drainage (the area north of Sec. 36, T20N, R3E) is prohibited for recreation, timber management, or wildlife enhancement activities. Foot and helicopter access will be used to access the upper drainage for habitat enhancement if necessary to maintain a wildlife species. If mining roads or trails are built, they must be temporary and must be rehabilitated after use.

9. MATERIALS

a. Private Sources. Chapter Three guidelines, C1a, page 129, encourage materials extraction from private land before public land within the Moose Range. There are two potential sources on private land in this subunit:

(1) At the intersection of Granite Creek and the Glenn Highway there are approximately 700 acres of potential material sources on private land.

(2) A potential 40 acre material site lies between Drill Lake and the Chickaloon River on private land.

b. State Sources. Extraction from state sources is governed by the materials guidelines in Chapter Three, pages 129-133. There are six potential sources for materials located on state land within the Middle Management Subunit. These six sources are shown on Map 2, page 13:

(1) The mouth of the Kings River - 160 acres.

(2) The predominant bend in Young Creek - 20 acres.

(3) 1.5 miles up the Kings River in the floodplain - 640 acres.

(4) Six miles up the Permanente Road - 40 acres.

(5) A site up the Castle Mountain Mine Road - 40 acres.

(6) An inaccessible site off the Castle Mountain Mine Road of approximately 160 acres. See Chapter Three, Materials guidelines, on pages 129-133.

D. LAND USE DESIGNATIONS SUMMARY

SURFACE

Primary Uses and Classification. Wildlife habitat, coal, forest.

Secondary Use. Public recreation, heritage resources, grazing.

SUBSURFACE

Locatable Minerals. Open, except for the southern face of Castle Mountain (see legal description below) and wildlife mineral licks.

Leasable Minerals. Generally available for leasing. Probable next area available for leasing, Young Creek. Long range leasing possible in lower Castle Mountain area, although not likely in the near future. Not available for leasing: the south face of Castle Mountain.*

PROHIBITED SURFACE USE. Land disposals; remote cabins (private); new roads/trails into upper Granite Creek drainage for recreation, timber management, or wildlife enhancement activities; grazing in a portion of east Granite Creek (see Map 10 on page 199).

MENTAL HEALTH ACREAGE. 10,275 acres patented, 2,240 acres tentatively approved.

*Legal description for Castle Mountain mineral closing order and area that will not be opened for the exploration or development of leasable minerals:

T20N, R5E, S.M., Sec. 12, SW1/4, N1/2SE1/4, N1/2S1/2SE1/4, N1/2S1/2S1/2SE1/4.

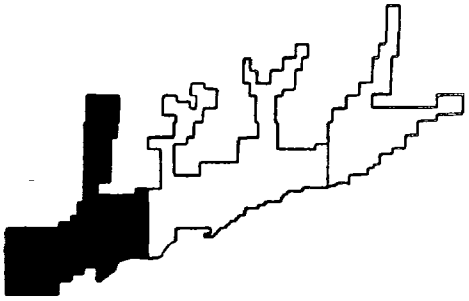
Sec. 13 NW1/4NW1/4.

Sec. 14 N1/2, NW1/4SW1/4, N1/2SW1/4SW1/4, N1/2S1/2SW1/4SW1/4.

Sec. 15 N1/2, N1/2S1/2, N1/2S1/2S1/2, N1/2S1/2S1/2S1/2.

Sec. 16 N1/2, SW1/4, N1/2SE1/4, N1/2S1/2SE1/4, N1/2S1/2S1/2SE1/4.

Sec. 21 N1/2NW1/4, N1/2S1/2NW1/4, SW1/4SE1/4NW1/4, W1/2SE1/4SE1/4NW1/4



THE EASTERN MANAGEMENT SUBUNIT

A. BACKGROUND

The Eastern Management Subunit includes the portion of the Moose Range that lies east of R5E, S.M. and includes most of the Chickaloon River drainage and a portion of the Boulder Creek drainage. The area has high-to-moderate values for fish and wildlife. Moose, small game, furbearers, black bear, Dall sheep and resident fish are harvested by residents from Anchorage, Palmer, Sutton and Chickaloon. Subsistence and sport harvest effort both occur, but cannot be readily separated or distinguished. Wildlife viewing occurs in road or trail accessible areas of the subunit. Unlike the Western or Middle Management Subunits, this subunit has low-to-moderate timber values along the lower Chickaloon River and lower Boulder Creek. Moose habitat will be enhanced in this subunit to offset critical habitat being lost to development elsewhere in the Matanuska Valley.

The Eastern Management Subunit has moderate coal values, located near Anthracite Ridge.

Public lands in this subunit have moderate-to-high values for dispersed outdoor recreation. Most use occurs along the existing Chickaloon-Knik-Nelchina Trail, the Chickaloon River Trail and the Boulder Creek Trail and on the Chickaloon River. The Chickaloon River provides a highly valued remote wilderness Class II, III and IV whitewater boating opportunity in southcentral Alaska. The predominant scenic value in the Eastern Management Subunit is Puddingstone Hill. This feature is viewed most frequently from the existing trails within the subunit.

There are limited grazing resources in this subunit. The grass resources here are located in small pockets. A preference right to a grazing lease in upper Boulder Creek may exist based on an earlier federal government lease.

B. MANAGEMENT INTENT

The management emphasis in the Eastern Management Subunit is to maintain, improve and enhance fish and wildlife populations and moose habitat, using habitat enhancement techniques. The state will utilize the results from projects conducted in the southwest corner of the Western Management Subunit or other related studies to enhance moose habitat in the Eastern Mangement Subunit.

Forested lands in this subunit will be managed to provide personal use firewood to meet the local demand on a sustained yield basis. Timber harvest activities will be limited, due to the limited supply of timber available in the subunit.

Nearly all of the entire Eastern Subunit will be available for exploration and development of leasable minerals and will remian open to leasable and locatable mineral entry, except for a mineral closure around one mineral lick in the upper Chickaloon River. However, no new leasing is planned at this time.

Dispersed outdoor recreational activities will continue in the Eastern Management Subunit. The state will verify and assert public rights-of-way on the Chickaloon-Knik-Nelchina and Chickaloon River Trail to guarantee continued public use of these popular trails. The scenic views of Puddingstone Hill from the Chickaloon River, Chickaloon-Knik-Nelchina and Boulder Creek Trails should be given consideration during any surface or subsurface development.

C. GUIDELINES

1. FISH, WILDLIFE AND FORESTRY

   a. Resource Management. This subunit will be managed primarily to maintain, protect, and if necessary, enhance the following fish and wildlife resources and habitats:

      Moose, throughout the subunit.
      Brown and black bear and moose throughout the subunit.
      Caribou in the middle and upper Chickaloon and Boulder Creek drainages.
      Dall sheep habitat throughout the subunit and lambing in the Puddingstone Hill area.
      Wolves in the middle and upper reaches of the drainages.
      Chum salmon, grayling, rainbow trout and Dolly Varden in Chickaloon River.
      Dolly Varden and grayling in the Boulder Creek drainage.
      Riparian habitats and instream flow along Chickaloon River and Boulder Creek.
      And other species and habitats identified by ADF&G.

b. Fish and Wildlife Utilization. The subunit will be managed to allow continuation of the following activities:

Hunting of big and small game and trapping throughout the subunit.
Sportfishing for anadromous and resident stocked fish.
Wildlife viewing throughout the subunit.

c. Timber Harvest and Habitat Enhancement

(1) Enhancement Considerations: The Eastern Management Subunit has small pockets of moderate timber value along the Chickaloon River, below 2,200 feet. The majority of the subunit has limited timber potential (see Map 10 on page 199). In the subunit, because of its poorer soil types, limited vegetation, and poor access, the management emphasis will be on maintenance of wildlife habitat rather than active timber management. It has been determined that habitat enhancement is desirable for this area. The state will apply the most appropriate techniques available, based on research findings from the test sites located in the southwest corner of the Range and other related studies. Any active habitat enhancement requires DNR and ADF&G approval.

(2) Future Timber Sales. No timber harvest/habitat enhancement is planned in this subunit prior to 1992. Any proposed sales will be included in the five-year timber harvest/habitat enhancement schedule and will be subject to interagency review prior to a final decision. There is currently one research pilot project proposed in the Eastern Management Subunit. Pilot Project Reference Code: MR-B-04-89 (proposed burn project); location: Sec. 10, 11, 12, T20N, R6E, S.M. Additional research pilot projects may be identified and submitted to ADF&G and DNR for approval. See Table 7 on page 190.

d. Fisheries. ADF&G will maintain, protect and enhance the fisheries in the Chickaloon River, Boulder Creek and other waters. To accomplish this, ADF&G will assess and update available biologic, hydrologic and water quality information, establish stream priorities and develop appropriate recommendations for field investigations and/or Board of Fisheries consideration, as time and funds allow.

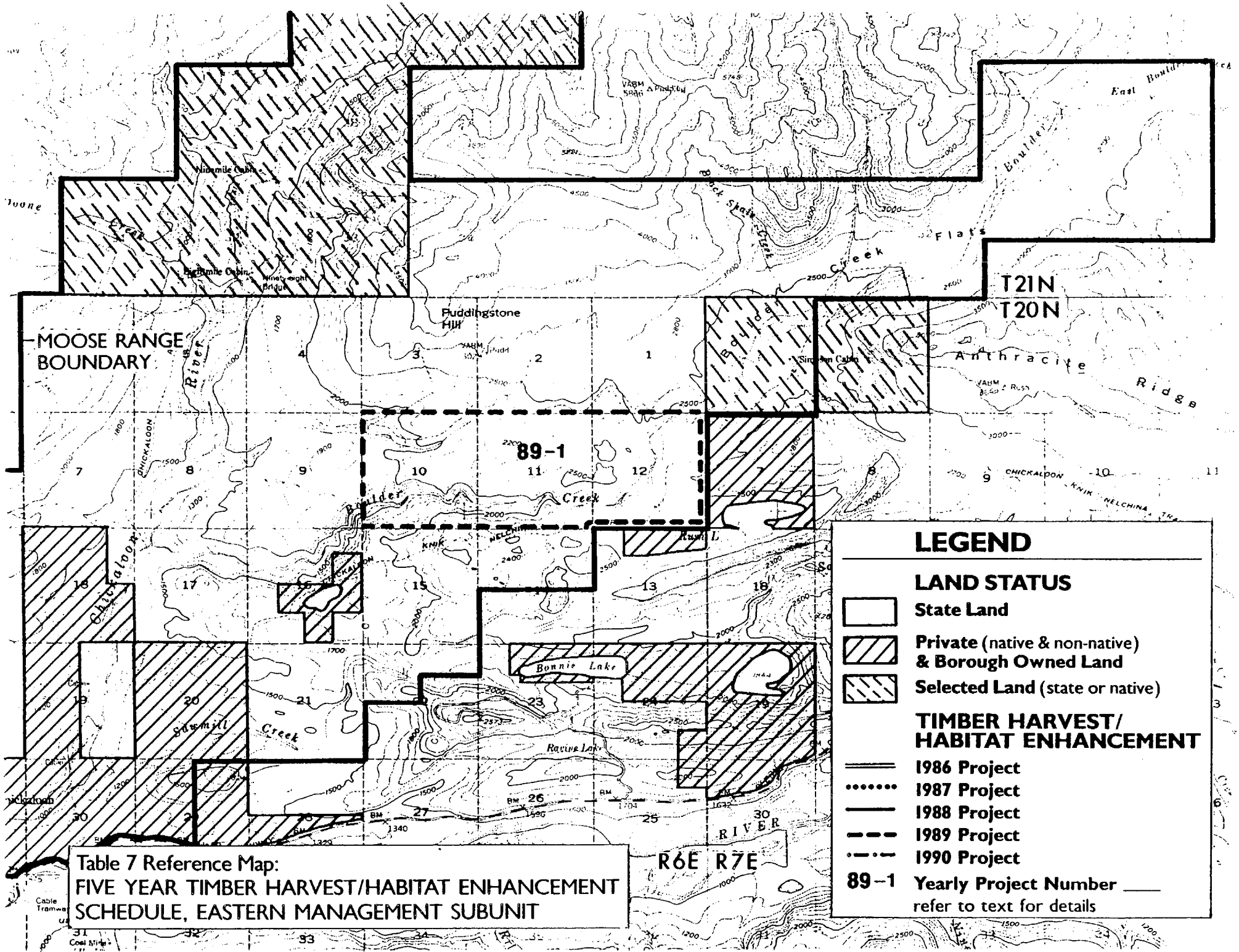


Table 7 Reference Map:
FIVE YEAR TIMBER HARVEST/HABITAT ENHANCEMENT SCHEDULE, EASTERN MANAGEMENT SUBUNIT

2. SUBSURFACE

a. Locatable and Leasable Mineral Entry

(1) Coal. The Eastern Management Subunit contains limited pockets of moderate to high potential coal resources, which would be difficult and expensive to develop. The plan does not preclude development of this coal for the long-term; however, near-term development is not recommended.

(2) Other Minerals. The Eastern Management Subunit is open to locatable and leasable mineral development, except for the mineral lick area (see 2b, below). The state will remove the existing Mineral Closing Order No. 97, within Sec. 4, 6 and 10, T1ON, R6E, S.M. from the Eastern Management Subunit to allow for future mining. This area was originally closed to mineral entry to avoid conflict with the then-proposed Chickaloon Bench land disposal. These lands are mental health lands and therefore, will still be closed to locatable mineral entry for the present. The purpose for removing Mineral Closing Order 97 is to ensure that these lands become available for mineral entry in the future on the same basis as other mental health lands.

b. Mineral Licks. An area with an approximate radius of 1/2 mile around the mineral lick in this subunit will be closed to locatable mineral entry for one year (see Maps 3 and 10, pages 23 and 199 and Chapter Three, Subsurface guideline 3.d., pages 84-86). There is an existing mineral leasehold location order (#2) on the licks in Sec. 10-15, and S1/2, Sec. 1-3 and N1/2, Sec. 22-24, T21N, R6E, S.M. Following permanent mineral closure on the lick, the leasehold location order on the balance of the nine sections covered by the leasehold location order will be lifted. (This change constitutes an amendment to the Susitna Area Plan.)

c. User Conflicts. The DOM will evaluate the existing mining location in Sec. 27 and 28, T21N, R7E, S.M. to determine whether existing surface uses are consistent with regulations, and whether or not a conflict is present between the miner and recreationists, as funding allows.

3. RECREATION

a. Picnicking, Camping and Trailhead Facilities

(1) Long Lake Recreation Site. DOPOR will pursue funding to upgrade and expand the Long Lake State Recreation Site facility (refer to Map 10 on page 199). This facility is outside the Moose Range boundaries. The expansion will focus on providing overnight camping facilities and developing day-use picnicking areas.

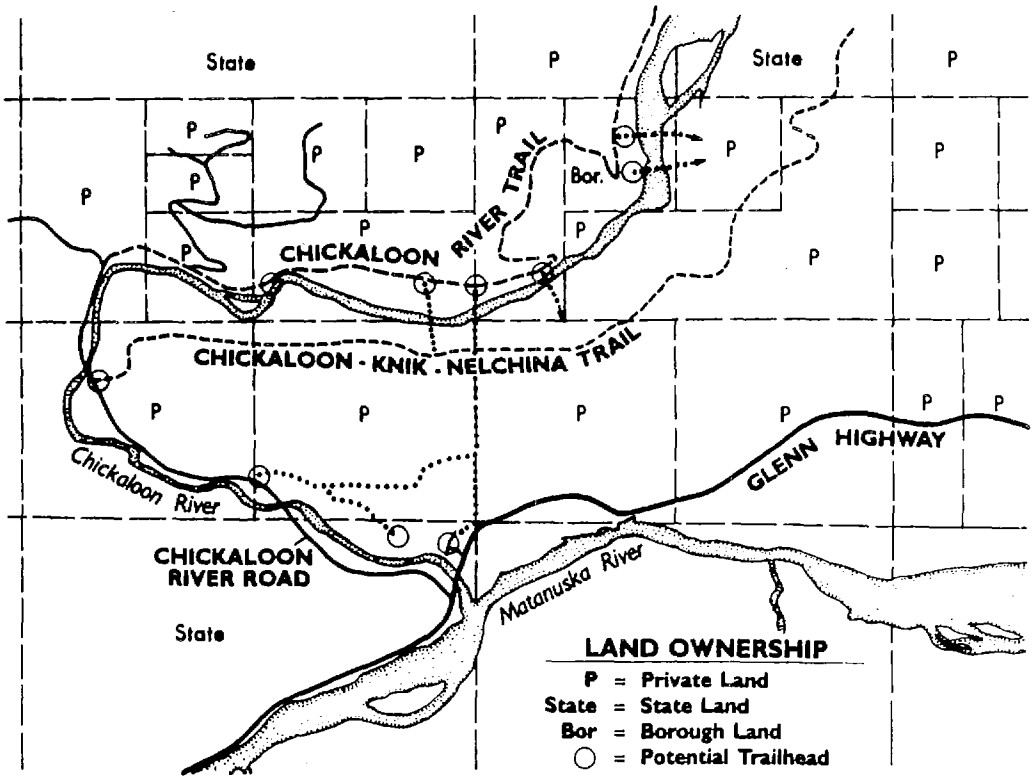
(a) Interpretive Displays. Site design will provide for information displays that interpret multiple use management,

and give information on legal public access, unique geological features and recreational opportunities available in the Range near the facility. ADF&G will co-author the interpretive displays.

(b) Long Lake Management Authority. DLWM will issue an interagency land management assignment to DOPOR for management of land adjacent to the existing Long Lake State Recreation Site. The exact size needed will be determined after a site analysis, but will be less than 640 acres.

(2) Trailhead Facility. Once public right-of-way on the Chickaloon River Trail, the Chickaloon-Knik-Nelchina Trail and to the Chickaloon River is verified, a public trailhead facility will need to be developed. The best location for this trailhead is in the Middle Management Subunit on private property, but possible alternate locations for trailheads are in the Eastern Management Subunit. To utilize trailhead locations in the Eastern Management Subunit, a right-of-way would have to be asserted through private property on the Chickaloon River Trail based on the federal law AS 2477. All other possible trailhead locations are on private land. A possible location for a trailhead for the Chickaloon River Trail is on Matanuska-Susitna Borough land in Sec. 30, T20N, R6E, S.M. See Figure 6 below.

Figure 6: POTENTIAL TRAIL ACCESS IN THE CHICKALOON AREA



(3) Purinton Creek. One of the key access points to the Chickaloon-Knik-Nelchina trail is at Purinton Creek. The Purinton Creek Trail access to the Chickaloon-Knik-Nelchina Trail crosses private land. The owner of this land may be interested in developing a private campground. The state encourages such development, and DNR will work with the landowner to ensure that public access to the Chickaloon-Knik-Nelchina Trail is preserved. In the event that it is determined that this route is not a legal access, and the landowner and DNR are unable to agree on the existence and location of public access, the Matanuska-Susitna Borough is encouraged to provide alternate access across its land east of Purinton Creek; DNR (DOPOR) and the borough will negotiate the necessary acres of land (within the W1/2 of Sec. 24, T20N, R7E, S.M.) to be dedicated for public recreation. DNR should work with the borough to develop and maintain a trailhead parking lot here. DNR and/or borough management of the facility will be determined prior to construction.

c. Public Use Cabins.

(1) Public Position. Due to the total lack of public support for public use cabins, the state will not propose any public use cabins within the Moose Range. The public's major concern was with the state's inability to maintain and manage a public use cabin system. The public also felt camping to be the appropriate method for overnight stays in the Range.

(2) Future Reconsideration. In the future, if the state does adequately fund a public use cabin program, and funding is available to operate and maintain public use cabins within the Moose Range, public use cabins may be reconsidered. Public review of any future proposals is required.

(3) Potential Locations. The Eastern Management Subunit is the highest priority area in the Range for the development of a system of public-use cabins. If funding becomes available for public-use cabins, they may be considered at the following locations within this subunit: 1) on the Chickaloon-Knik-Nelchina Trail near Sawmill Gorge; 2) on the Old 98 Trail on the Chickaloon Bench (at the formerly proposed land disposal site); 3) along the lower Boulder Creek trail; and 4) along the Chickaloon River Trail. (NOTE: These sites are on what was formerly mental health lands. (See explanation in Chapter One, pages 3-4.) Before public-use cabins could be established on any of these sites, notice would have to go to the plaintiffs and intervenor in Weiss v. Alaska.

d. Scenic Values. The spectacular views of Castle Mountain from the Glenn Highway and Castle Mountain and Puddingstone Hill from the Chickaloon River Trail and Chickaloon-Knik-Nelchina Trail systems should be conserved. The impact of various activities in the management subunit on these scenic resources will be dealt with on a case-by-case basis as timber harvest and habitat enhancement efforts are evaluated through interagency review. The intent is to minimize visual impacts from these activities on the scenic features, as viewed from the Glenn Highway and the trails (see Map 10 on page 199). Habitat enhancement may be allowed in order to maintain fish and wildlife species if determined to be necessary for a particular population.

4. HERITAGE RESOURCES

a. Known Sites.

(1) There is one known heritage site on the Alaska Heritage Resources Survey Record in the Eastern Management Subunit (see Map 7 on page 43). This site will be managed according to the guidelines in Chapter Three on page 93.

(2) National Register of Historic Places. DOPOR may also pursue funding to review and propose the Chickaloon-Knik-Nelchina trail and the Chickaloon River trail for the National Register of Historic Places.

b. Undiscovered Sites. It is likely that there are other cultural resources in the vicinity of the Old Chickaloon townsite and along the Chickaloon River Trail, the Chickaloon-Knik-Nelchina Trail and the Old 98 Trail. Trails up the Boulder Creek drainage may also have high heritage resource values. Areas in the Eastern Management Subunit designated by DOPOR as known high potential areas for containing heritage resources will be surveyed for heritage values as funding and staffing allows (see Map 7 on page 43).

5. BUFFERS

a. Lakeshores and Stream Corridors. Habitat enhancement efforts in riparian zones along the Chickaloon River and Boulder Creek will take place according to Chapter Three guidelines on buffers (see Lakeshores and Stream Corridors Section, pages 97-100).

b. Wetland Buffers. A buffer will be maintained around the wetlands in the area of Simpson's cabin on the Chickaloon-Knik-Nelchina Trail as described in the Chapter Three Wetland buffer guidelines (see pages 101-102).

6. INSTREAM FLOW RESERVATIONS

ADF&G will establish instream flow needs on the Chickaloon River and Boulder Creek to maintain fish and wildlife resources, riparian habitat and associated recreational opportunities. The DLWM will work closely with ADF&G to establish the instream flow reservations.

7. GRAZING

a. Existing Leases. If the old federal grazing lease in Boulder Creek is converted to a state lease and a renewal is subsquently requested, SCS should analyze the suitability of the area for grazing prior to DNR issuing a renewal or a new lease or permit.

b. Future Leases

(1) Long Term Leases. New, long-term grazing leases will not be issued in the Eastern Management Subunit. The small pockets of grass resources that exist can best be utilized by recreationists on horseback.

(2) Permits. Seasonal permits for use by horsepackers may be considered on a annual basis if an analysis of the grazing potential in the upper Chickaloon and Boulder drainages is performed by SCS, and the studies show that the grazing potential is adequate to maintain the requested permit. DNR and ADF&G approval is required prior to issuing a permit.

8. ACCESS

a. Public Use of Existing Access. Public access into the Eastern Management Subunit is from the Glenn Highway and Chickaloon River Road through a network of trail systems. The public has traditionally used these trails to reach public land for outdoor recreational and commercial purposes. The state will verify and assert public rights-of-way where possible. Trails requiring verification and potential assertion include portions of the Chickaloon River Trail, the Chickaloon-Knik-Nelchina Trail, the Old 98 Trail and the Boulder Creek Trail. DNR will also verify legal public access to the Chickaloon River.

b. Chickaloon-Knik-Nelchina, Chickaloon River, Old 98, and Boulder Creek Trails

(1) Uses. Existing motorized and non-motorized use will continue on the Chickaloon River Trail, Chickaloon-Knik-Nelchina Trail, the Old 98 Trail and the Boulder Creek Trail.

(2) Physical Maintenance. The Chickaloon River Trail, Chickaloon-Knik-Nelchina Trail, Old 98 Trail and Boulder Creek Trail will be maintained at their existing functional level, but will not be substantially upgraded or improved. Only routine maintenance of these trails is permitted except that trailwork to restore foot access on the first three trails is allowed if necessary.

(3) Access on Native Allotment. The DNR will coordinate with the Bureau of Land Mangement (BLM) to attempt to secure public access on the Chickaloon-Knik-Nelchina Trail, Old 98 Trail and Boulder Creek Trail across the native allotment application AA 7240 in N1/2SE1/4, S1/2NE1/4, Sec. 6, T19N, R7E, S.M. Public access through the allotment is essential to management of public lands in the Eastern Management Subunit.

(4) Access on ANCSA Lands. The DNR will coordinate with the Bureau of Land Management (BLM) to guarantee public access on native selected lands when the native party receives title to the land. Sec. 5 & 6, T20N, R7E, S.M. are selected by the Chickaloon Moose Creek Village Corporation as part of their ANCSA settlement lands. The Chickaloon-Knik-Nelchina Tral, Old 98 Trail and Boulder Creek Trail intersect and pass through these sections. These trails provide vital links to the public lands in the Eastern Subunit of the Moose Range.

9. MATERIALS

Potential sources. In the floodplain of the Chickaloon River in the E1/2 of Sec. 19,T20N, R6E, S.M., there is a 160 acre potential materials site. This site should be utilized only for trail maintenance or construction. If gravel is taken here, the potential for fishery enhancement in conjunction with the extraction should be considered (see Chapter Three, Materials guidelines, C1b, on page 129).

D. LAND USE DESIGNATIONS SUMMARY

SURFACE

Primary Uses and Classification. Wildlife habitat, public recreation.

Secondary Uses. Heritage resources, forest.

SUBSURFACE

Locatable Minerals. Open, except for an approximate 1/2 mile closure around the mineral lick in the upper Chickaloon River drainage.

Leasable Minerals. Available for leasing. No new leasing likely in near future.

PROHIBITED SURFACE USE. Land disposals, remote cabins (private).

MENTAL HEALTH LANDS. 10,560 acres patented.

NOTE: ALL MENTAL HEALTH LANDS ARE PRESENTLY CLOSED TO MINERAL ENTRY

LAND STATUS

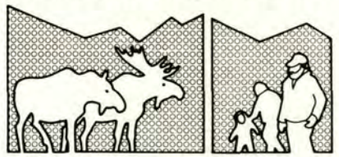
Private (native & non-native) **& Borough Owned Land**

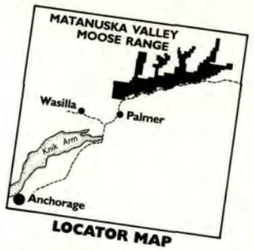
Selected Land (State and/or Native)

State Land (patent or tentative approval)

MAP 10: LAND USE PLAN

MATANUSKA VALLEY MOOSE RANGE MANAGEMENT PLAN





LOCATOR MAP

MOOSE CREEK DRAINAGE

GRANITE CREEK DRAINAGE

KINGS RIVER DRAINAGE

CHICKALOON RIVER DRAINAGE

BOULDER CREEK DRAINAGE

WESTERN MANAGEMENT SUBUNIT

MIDDLE MANAGEMENT SUBUNIT

EASTERN MANAGEMENT SUBUNIT

MOOSE RANGE BOUNDARY

R. 1 E. | R. 2 E. | R. 3 E. | R. 4 E. | R. 5 E. | R. 6 E. | R. 7 E.

T. 22 N.
T. 21 N.
T. 20 N.
T. 19 N.
T. 18 N.

Little Susitna River
Moose Creek
Granite Creek
Young Creek
Kings River
Chickaloon River
Boulder Creek
Matanuska River

GRANITE PEAK
CASTLE MOUNTAIN

JONESVILLE ROAD
MURPHY RD.
BUFFALO MINE ROAD
SOAPSTONE RD.
FISHHOOK-WILLOW ROAD
GLENN HIGHWAY
PERMANENTE ROAD
CHICKALOON RIVER ROAD
OLD 98 TRAIL
CHICKALOON RIVER TRAIL
KNIK NELCHINA TRAIL

Sutton
Chickaloon
Palmer

MP 6.7 SUNVALLEY DRIVE
MP 52.8 SOAPSTONE ROAD
MP 53.1 BUFFALO MINE ROAD
MP 54.5 MOOSE CREEK STATE RECREATION SITE
MP 56.7 MOOSE RANGE BOUNDARY SIGN
MP 61 SUTTON AND JONESVILLE ROAD
MP 66.7 KINGS RIVER AND CHICKALOON—KNIK—NELCHINA TRAIL ACCESS
MP 71.8 PERMANENTE ROAD
MP 73 IDA LAKE/FISH LAKE ACCESS ROAD
MP76.0 KING MOUNTAIN STATE REC. SITE
MP 76.2 KING MOUNTAIN LODGE
MP 77.5 CHICKALOON RIVER ROAD
MP 80.8 MOOSE RANGE BOUNDARY SIGN
MP85.3 LONG LAKE STATE RECREATION SITE
MP 89.2 PURINTON CREEK TRAIL

0 1 2 3 miles

LEGEND

ALASKA DEPARTMENT OF FISH AND GAME

Fish and wildlife habitat enhancement may be applied throughout the entire Moose Range.

▲ Mineral Licks (see text)

MATANUSKA-SUSITNA BOROUGH

Proposed Recreational Interest

ALASKA DEPARTMENT OF NATURAL RESOURCES

DIVISION OF AGRICULTURE

- Existing Grazing Leases
- Proposed Controlled Common Grazing Sites
- Closed to Grazing

DIVISION OF PARKS AND OUTDOOR RECREATION

- Existing State Park Units
- Proposed State Park Management
- High Scenic Values

DIVISION OF FORESTRY

- Primary Areas
- Secondary Areas

DIVISION OF MINING

- Existing Leases
- Future Lease Areas
- Closed to Mineral Entry and Not Opened to Leasable Minerals

PUBLIC TRAILS

CHAPTER 5

IMPLEMENTATION

5. IMPLEMENTATION

This chapter describes the actions which the state and other agencies will undertake to implement the Matanuska Valley Moose Range Management Plan. The actions are listed under the agency that is most responsible for implementation of the action. Each agency's responsibilities are established by law. A summary of state law is provided in Appendix VIII on page 247. The lists of actions appear in the order of importance, with the most important actions appearing first. Where possible, agencies have provided budget estimates of the approximate cost of implementing the action. ALL NEW ACTIVITIES LISTED ARE DEPENDENT ON AVAILABILITY OF FUNDS AND STAFF. These actions will occur as funding and staffing capabilities permit.

The purpose of the implementation section of the plan is to:

a. bring together the actions called for in the plan in a summary format;

b. present the actions in order of priority; and

c. indicate the staff and financial resources needed to carry out the proposed actions.

AGENCY RESPONSIBILITIES FOR IMPLEMENTATION

I. ALASKA DEPARTMENT OF FISH AND GAME

a. Ongoing Responsibilities, Existing Budget.

(1) Timber Harvest and Habitat Enhancement

(a) Update and expand existing wildlife enhancement management schedule that is coordinated with DOF timber harvest schedules to maximize moose habitat enhancement efforts.

(b) Continue to evaluate and document results of completed enhancement projects.

(c) Continue development of new techniques and methods for habitat enhancement.

(d) Recommend to the Game Board the types of hunts that will provide opportunities to utilize wildlife consistent with stabilizing and increasing game populations in the Moose Range.

(e) Develop permanent fencing requirements for grazing leases and permit areas through cooperative effort with DNR and other suitable agencies and/or sources.

Funding: items a.(1) and a.(2) are activities ADF&G intends to accomplish with existing staff and budget.

(2) Review

(a) Review mining plans of operations for the purpose of:
* ensuring that moose rehabilitation occurs in a timely fashion and in the desired manner;
* minimizing impact on fish and wildlife habitat, populations and related uses;
* identifying where mitigation may be required and the type of mitigation that may be necessary;
* ensuring that mining operations are in compliance with plan guidelines and existing statutes.

(b) Review Matanuska-Susitna Borough trail proposals cooperatively with DNR.

(c) Review applications for material sales within the Moose Range according to established procedures.

(d) Review the DNR proposed location for a work cabin for compatibility with legislatively identified purposes, plan guidelines and potential impacts on fish and wildlife resources, fish and game mangement and related public uses (see page 135).

(e) Review water rights application for appropriations of 1,000 GPD or more.

(3) Mineral Licks

(a) ADF&G will provide DNR with the data required in Chapter Three, on pages 84-86, regarding mineral licks.

(b) ADF&G will continue to work with DNR to complete development and evaluation of the criteria necessary to evaluate the importance of mineral licks.

b. New Responsibilities, New Funding Required

(1) Timber Harvest and Habitat Enhancement (Near term activities Fiscal Years 87-90)

(a) In cooperation with DOF or another qualified person or agency, perform field reconnaissance of the aerial photography vegetation analysis and provide verified ground cover data for moose habitat areas. Prepare data for the Habitat Suitability Assessment (HSA) and carrying capacity Moose Models.

Funding: these are desirable activities provided funding is available. Maintaining basic Game Division functions is paramount. The activities listed above would require supplemental funding from sources outside of the Game Division.

(b) Assist DNR with monitoring of vegetation responses to forest harvesting practices and silvicultural treatments (that directly pertain to habitat enhancement) for the 1986 - 1991 five-year timber harvest/habitat enhancement schedule (see pages 151-161, 174-178, and 189-190).

Funding: the Alaska Legislature appropriated $30,000 for use within the Moose Range during Fiscal Year 87. This money will be used on browse enhancement projects, including scarification and trail development, salaries and monitoring of both past enhancement activities and the moose population itself. ADF&G will continue to seek appropriations for future years.

(c) Work cooperatively with DNR, U of A and/or other biological institutions or qualified persons, to research and develop the best methods for enhancing habitat and resolving wildlife and livestock conflicts.

Funding: ADF&G will continue to seek appropriations for funding.

(d) Study the potential impact of recreational use on moose harvest and habitat on Arkose Bench prior to 1991, as agreed to for the purpose of assessing the effects of recreational trail improvements that have been and/or may be proposed for this area.

Funding: requires supplemental funding. (May be able to apply USFWS research efforts.)

(e) Work with private landowners to initiate habitat enhancement efforts on private lands.

Funding: as funding permits. (Enhancement on state lands within the Range has a higher priority.)

(2) Wildlife Management Plan (Fiscal Years 88 - 90): Long Range Tasks

(a) Apply, refine, or develop moose "models" identified in (a) above. The models will present the following data and recommendations:
* Moose Range habitat suitability (as per the ADF&G HSA model).
* Carrying capacity model.
* Habitat enhancement potentials.

(b) Prepare a long range moose management plan. Elements of the plan will include but should not be limited to:
* Moose "models" data.
* Objectives for moose management:
  - habitat goals
  - moose population goals
* Habitat enhancement plan:
  - recommended habitat types/areas/locations
  - recommended forest practices
* Harvest objectives.
* Access management supporting hunting, trapping, fishing, and related objectives.
* Coordination schedule for enhancement efforts with DNR timber and grazing plans.
* Effects on other wildlife species.

(c) Prepare a general wildlife management plan which addresses the "key species" and gives consideration to species diversity concepts.

(d) A wildlife management brochure aimed at informing the public of ongoing management activities, and public hunting, trapping, fishing and wildlife viewing opportunities within the Moose Range may be prepared.

Funding: requires supplemental funding; (a) and (b) are higher priority.

(3) Fisheries Management

(a) Determine priorities for fisheries and fisheries habitat program.

(b) Determine specific actions to be taken, including but not limited to: initiating fisheries research, spawning counts and species distribution, fisheries inventories, and initiating stream flow research to allow for establishment of instream flow reservations for fish and wildlife on Wasilla Creek, Moose Creek, Eska Creek, Granite Creek, Young Creek, Kings River, Chickaloon River and Boulder Creek.

Funding: requires supplemental funding. ADF&G does not anticipate initiating funding for (3)(a) or (b), as these are low priority regional rivers.

(c) The chinook salmon in Moose Creek and coho salmon in Wasilla Creek will continue to be monitoried through the statewide survey conducted each year. A new statewide instream flow program began on July 1, 1986. The streams have not been selected for the program as of publication of this plan.

2. DIVISION OF FORESTRY

a. Ongoing Responsibilities, Existing Budget

(1) Timber Harvest and Habitat Enhancement

(a) Develop four five-year timber harvest schedules (over the 20 year life of this plan) cooperatively with ADF&G to maximize habitat enhancement efforts while allowing for sustained yield of personal forest products.

Funding: estimated cost--$5,000/plan

(b) Ground truth aerial photography interpretation of the vegetation and provide ground cover analysis for timber potential.

Funding: estimated cost--$10,000/year

(c) Cruise, lay out and administer personal use and commercial forest product sales in the locations and sequence described in Chapter Four and for sites determined after 1992.

Funding: estimated cost--$5,000/year

(d) Lay out and administer habitat enhancement projects (in cooperation with and as specified by ADF&G) as part of managing the timber sales described in Chapter Four and for sites determined after 1992.

Funding: estimated cost--$500/year

(e) Survey and lay out necessary access roads and administer construction contracts.

Funding: estimated cost--$500/year

(f) Investigate and take action on timber trespass (poaching).

Funding: estimated cost--$1,000/year

(2) Review.

Review mining plans of operations and determine the appropriate time and method to utilize surface timber resources on mining leases.

b. New Responsibilities, New Funding Required

(1) Timber Harvest and Habitat Enhancement

(a) Work cooperatively with ADF&G, U of A and other qualified agencies and persons to research and develop improved methods for wildlife habitat enhancement through timber harvest. Apply these methods in forest management practices.

Funding: area office will request funding. Estimated cost--$5,000/year (1987)

(b) Expand and perform regeneration surveys on all harvest and enhancement areas. Evaluate the regeneration success.

Funding: estimated cost--$1,000/year (1987)

(c) Assist mining lessees in developing coal mining reclamation methods based on research developed through wildlife habitat rehabilitation efforts.

Funding: estimated cost--$1,000/year (1988)

(d) Work with DLWM and DOPOR to establish a DNR work cabin for staff use while performing timber harvest and habitat enhancement work.

Funding: estimated cost--$1,000/year (1988)

(e) Work with private landowners to initiate cooperative forest management on private lands.

Funding: Estimated cost--$2,000/year (1988)

3. DIVISION OF MINING AND GEOLOGY

a. Ongoing Responsibilities, Existing Budget

(1) Mining Activities

(a) Review and approve all mining permits.

(b) Review and implement interagency comments on the mining plans of operation which are necessary to guarantee compatibility with the Moose Range enabling legislation and management plan.

(c) Continue to perform Abandoned Mined Lands Program projects as funding allows.

(d) Conduct coal lease sales as outlined in the management plan.

(e) Perform the necessary field reconnaisance of mining reclamation efforts to guarantee that coal mined lands are reclaimed to wildlife habitat and that ASCMCRA is followed.

(f) Perform field evaluation on existing mining locations in the Moose Range to determine whether existing surface uses are consistent with state regulations, including the Boulder Creek claims and Gore Mine leases.

(g) Work cooperatively with the current mining lessee on the existing Wishbone Hill district coal leases to develop wildlife habitat on lands mined for coal.

(h) Assist and support ADF&G in assessing revegetation reclamation techniques.

(i) Monitor mining activities on a regular basis to assure compliance with stipulations.

(2) DOMG will assist DOPOR, DLWM and ADF&G in planning and development of interpretive displays and educational program information by identifying interesting geological and other natural features in the Moose Range.

(3) Provide DLWM with information on the mineralization of mineral licks identified by ADF&G as important.

b. New Responsibilities, New Funding Required

(1) Continue automation of the existing vegetation and geological resource data available for the Moose Range to aid in management capability.

(2) Use the geoprocessor and computer graphic capabilities to prepare a management model for the Moose Range based on data analysis completed in 1985 to aid the land managers in incorporating resource data into field management actions.

(3) The Water Resource Section will continue to collect baseline water data, monitor and gather stream flow data and water quality analysis as funding is available.

4. DIVISION OF PARKS AND OUTDOOR RECREATION

(a) Ongoing Responsibilities, Existing Budget

(1) Review

(a) Review ADF&G and DOF habitat enhancement and timber harvest schedules to analyze the effects on the scenic values and outdoor recreational opportunities.

(b) Review mining plans of operation to assist in determination of public access, relocation of trails as necessary and maintenance of scenic values.

(c) Work with DOT/PF and ADF&G on the Glenn Highway realignment project to determine the appropriate locations for scenic turnouts and access to the Moose Range.

(d) Review the DOF proposal for developing a state work cabin.

(b) New Responsibilities, New Funding Required

(1) Facility Development or Expansion

The following list is ranked in order of priority. The order may be changed due to availability of project funding, or public interest.

(a) Upgrade the existing King Mountain State Recreation Site.

(b) Develop, operate and maintain the proposed Kings River State Recreation Site; the planning process should include floodplain analysis of the proposed site, interpretive displays co-authored with ADF&G, and access to the Chickaloon-Knik-Nelchina Trail.

(c) Expand the existing Long Lake State Recreation Site (requires additional staff).

(d) Evaluate alternative locations for and locate and develop the proposed trailhead(s) to provide access for the Chickaloon River Trail, Chickaloon-Knik-Nelchina Trail, and the Chickaloon River in cooperation with ADF&G.

(e) Develop the proposed Permanente Road/Trail trailhead in cooperation with DOT/PF and ADF&G.

(f) Work with the Matanuska-Susitna Borough to request lands for a Purinton Creek trailhead to be classified recreational, develop a cooperative management agreement for developing and managing the trailhead. (This action will be ongoing). The exact size, location and management of the site will be determined during future negotiations.

(g) Expand the Moose Creek State Recreation Site.

(h) Develop (and co-author) with ADF&G interpretative displays in recreation facilities along the Glenn Highway that describe natural resource values, the multiple-use management concept being used in the Moose Range, the outdoor recreational and cultural opportunities that are available, and the unique natural history and geologic features near the subunits. (This action will occur with all park facility proposals).

(2) Historic.

(a) Review and propose appropriate trails and cultural features for the National Register of Historic Places. The Chickaloon-Knik-Nelchina Trail and Chickaloon River Trail shall be researched and included on the National Register if they qualify.

(b) Survey the areas with known and high potential in the Moose Range for cultural and historic resources, and geologic resources (fossils) when funding exists, prior to resource development.

(3) Interagency Management. DOPOR will work with DOF and DLWM to establish a state work cabin for official use by staff while working in the Moose Range.

5. DIVISION OF LAND AND WATER MANAGEMENT

a. Ongoing Responsibilities, Existing Budget

(1) Review

(a) Review and approve the DOF timber harvest schedules.

(b) Review and approve the ADF&G habitat enhancement program.

(c) Review mining plans of operation.

(d) Review and issue DLWM surface use permits and leases within the Range.

(2) Interagency Action

(a) Work with grazing lessees or permittees to establish a public route through the existing grazing leases in the Moose Creek drainage to guarantee public access to public lands beyond the existing leases.

(b) Develop and/or review trail recommendations and game management habitat enhancement assessments on Arkose Bench with the Matanuska-Susitna Borough and ADF&G for the proposed Arkose Bench Trail after 1991.

(3) Standard Procedure

(a) Issue Interagency Land Management Assignments to DOPOR at Moose Creek State Recreation Site (if allowed under the final management scheme for mental health land), the Permanente Road trailhead, the proposed Kings River Campground and at the Long Lake State Recreation Site to allow for future expansion and development of recreational facilities.

(b) Work with ADF&G to reserve instream flow on streams and lakes within the Moose Range.

(c) Adjudicate water rights.

(d) Adjudicate construction or modification of dams.

(e) Issue land use permits, rights-of-way, and material sales.

(f) Issue land leases and disposals.

(g) Reclassify public lands.

(h) Remove the mineral closing order near the once proposed Chickaloon Bench subdivision. Issue mineral closing orders for the face of Castle Mountain and appropriate mineral licks.

(i) Work with ADF&G to complete development and evaluation of the criteria necessary to evaluate the importance of mineral licks.

(j) Place mineral closing orders on the appropriate mineral licks as stated on pages 84-86 in the Subsurface Resources guidelines C3d.

(i) Perform land use classification actions for the three subunits.

b. New Responsibilities, New Funding Required

(1) Public Rights-of-Way. Research and assert public rights of way on existing roads and historic trails (as listed on Table 3: Evaluation of Access, page 52). Make major legal public road and trail information available to the public to reduce trespassing situations and to aid in asserting public right-of-way. Work with CIRI and private land owners to negotiate public rights-of-way on historic routes.

(2) Unauthorized Use. Resolve known unauthorized use of state land in Sutton following existing procedures (see page 136 and 169). Evaluate and resolve unauthorized uses identified in the future.

(3) Work with DOA, U of A, other qualified agencies and persons and ADF&G to set up research efforts, procedures and the permitting process to allow for common use and grazing sites on habitat enhancement areas.

(4) Interagency

(a) Assist SCS, ADF&G and DOA in monitoring and reviewing research efforts and lease requirements on the existing grazing leases.

(b) Work with BLM to guarantee public access on trails and roads through native allotment lands and native selections receiving patent.

(c) Develop brochures to inform the public of natural resource values and management strategies, clearly identify public access, and differentiate between private and public lands to reduce trespass.

(d) Work cooperatively with agencies and private individuals to encourage research on reclamation of coal mined lands.

(e) DLWM will work with DOF and DOPOR to establish a state work cabin. DLWM will work with ADF&G on determining the appropriate location for the cabin.

6. DIVISION OF AGRICULTURE

a. Ongoing Responsibilities, Existing Budget.

Work with SCS and DLWM to monitor the existing grazing leases and determine if there is compliance with the existing permits/leases.

b. New Responsibilities, New Funding Required

(1) Work with grazing lessees and ADF&G to establish research exclosures on existing grazing leases to study the effects of grazing on wildlife and their habitat.

(2) Cooperatively work with other DNR divisions, ADF&G, and U of A to research and develop the best methods for enhancing wildlife habitat.

DNR recommends that the following agencies perform the listed actions as funding allows, to assist with the overall management of the Moose Range.

7. DEPARTMENT OF TRANSPORTATION AND PUBLIC FACILITIES

a. DOT/PF should work with DNR and ADF&G during the Glenn Highway realignment to minimize environmental impacts, to mitigate for loss of habitat and to reduce conflicts with moose and vehicles.

b. DOT/PF should work with DOPOR, DLWM and ADF&G during the Glenn Highway realignment to guarantee that access into the Moose Range is continued and scenic turnouts are developed in the appropriate locations.

c. DOT/PF should work with DOPOR during development of the proposed Permanente Trailhead, Kings River Campground and Purinton Creek Trailhead to guarantee access to these sites.

8. MATANUSKA-SUSITNA BOROUGH

a. Develop creative incentives for protecting scenic qualities on private lands along the entire Glenn Highway corridor such as tax benefits or using subdivision platting procedures.

b. Dedicate lands along Fishhook Road and Coyote Lake for recreational classification (see Map 10 on page 199).

c. Encourage the public to dedicate private lands for public recreation, greenbelts, or to provide public access to the Little Granite Creek Bench and public lands off Murphy Road. This can be accomplished through the platting process or tax incentives.

d. Support state and local trail programs to guarantee the public access to waterbodies and public lands in the Moose Range, with ADF&G approval.

e. During the platting board review process of subdivisions within or adjacent to the Moose Range, approve subdivision designs which guarantee public access to public lands and waters.

f. Dedicate municipal lands east of Purinton Creek for public recreation, to guarantee and retain future public access to the Chickaloon-Knik-Nelchina Trail. The exact size of the parcel needed for the trailhead will be determined in future negotiations between the borough and DOPOR. If access is denied on the existing trail through existing private property (west of Borough land), the Borough should work cooperatively with DOPOR to develop and maintain a trailhead facility on the municipal land.

g. After 1991, DNR, ADF&G and borough will work cooperatively to develop a trail proposal for an Arkose Bench Trail if the public need for a trail arises. This proposal requires DNR and ADF&G approval prior to implementation.

h. Apply for grant monies or state aid to assist in mapping and providing informational brochures on specific trails -- the uses, conditions, destination and terrains, etc. The Borough and ADF&G shall jointly develop the wording of informational brochures concerning the Moose Range.

9. UNIVERSITY OF ALASKA

a. Assist in research efforts to determine moose-livestock-vegetation interaction, including food habits and behavior, forage quantity and quality, plant tolerance to utilization and habitat manipulations.

b. Work with the grazing lessee and or permittees to establish study area enclosures on existing and proposed grazing leases.

c. DNR encourages the University to assist with education of multiple-use resource management through coursework and utilization of the Moose Range as a practical field and laboratory for students. ADF&G and DNR will work with U of A to recommend study topics and sites.

d. Assist in research efforts to determine best forest regeneration and moose habitat enhancement methods.

10. SOIL CONSERVATION SERVICE

a. Extend the recorrelation study of the Matanuska Soil Survey to include the Moose Range. To concentrate efforts, the first priority areas for soil recorreleation studies in the Range should be the five-year timber harvest/habitat enhancement sites. This includes performing an expanded and detailed soils survey of the Moose Range to assist habitat moose enhancement efforts as funding is made available.

b. Work with existing and potential grazing lessees to develop Range Conservation Plans for potential grazing leases within the Moose Range.

c. Assist in monitoring research efforts and effects of grazing on grazing leases.

11. LOCAL GROUPS

a. Promote public education regarding the historic, cultural and natural resource values of the area.

b. Continue active community council participation in the planning process.

APPENDICES

LEGISLATION __ AN ACT CREATING THE MATANUSKA VALLEY MOOSE RANGE

*Section 1. AS 16.20 is amended by adding new sections to read:

Sec. 16.20.340. PURPOSE. The purpose of AS 16.20.340 - 16.20.360 is to establish the area described in AS 16.20.360 as the Matanuska Valley Moose Range. The primary purposes of the Matanuska Valley Moose Range are to maintain, improve and enhance moose populations and habitat and other wildlife resources of the area, and to perpetuate public multiple use of the area, including fishing, grazing, forest management, hunting, trapping, mineral and coal entry and development, and other forms of public use of public land not incompatible with the purpose stated in this section.

Sec. 16.20.350. DESIGNATION OF MANAGEMENT RESPONSIBILITY. (a) The Department of Fish and Game is responsible for the management of fish and game resources on the state land and water described in AS 16.20.360 consistent with the purposes of AS 16.20.340 - 16.20.360.

b) Management of the surface and subsurface estate is the responsibility of the Department of Natural Resources. After adequate public hearings the Department of Natural Resources shall develop and adopt a management plan for the Matanuska Moose Range that shall reflect the concurrence of the Department of Fish and Game. The management plan shall be adopted, implemented, and maintained within three years of the establishment of the Matanuska Valley Moose Range. The management plan shall be revised, if necessary and appropriate under the same procedure followed for initial adoption. The plan shall provide for roadside recreation sites, including picnicking and camping areas.

(c) The Department of Natural Resources may, after consulation with the Department of Fish and Game, adopt regulations governing the public use of the area. The regulations must include provisions for multiple use, as defined in AS 38.04.910(4) and for public multiple uses listed in AS 16.20.340. Regulations adopted for the Matanuska Valley Moose Range shall not apply to private land within the boundary described in AS 16.20.360.

(d) The area shall be managed to sustain fish and wildlife resources in perpetuity, according to the principle of sustained yield.

(e) The Commissioner of Natural Resources may acquire in the name of the state, by negotiated purchase only, without an option of first purchase, title or interest in real property lying within the boundaries of the Matanuska Valley Moose Range. The lands described herein are to be managed by the Department of Natural Resources.

Sec. 16.20.360. DESIGNATED STATE LAND AND WATER. The state-owned land and water, vacant and unappropriated, and all that acquired in the future by the state, lying within the boundary described in this section, are designated as the Matanuska Valley Moose Range, and are reserved from all uses incompatible with their primary purposes as public use land. The lands described herein are to be managed by the Department of Natural Resources.

Approved by the Governor: June 1, 1984

Actual Effective Date: August 30, 1984

LIST OF ACRONYMS

ADF&G	ALASKA DEPARTMENT OF FISH AND GAME
ADL	ALASKA DIVISION OF LANDS (now separated into several divisions)
ASCMCRA	ALASKA SURFACE COAL MINING CONTROL AND RECLAMATION ACT
BLM	BUREAU OF LAND MANAGEMENT
CIRI	COOK INLET REGION INC.
C-K-N	CHICKALOON-NELCHINA-KNIK TRAIL
DEC	DEPARTMENT OF ENVIRONMENTAL CONSERVATION
DGGS	DIVISION OF GEOLOGICAL AND GEOPHYSICAL SURVEYS
DLWM	DIVISION OF LAND AND WATER MANAGEMENT (DNR)
DNR	DEPARTMENT OF NATURAL RESOURCES
DOA	DIVISION OF AGRICULTURE (DNR)
DOF	DIVISION OF FORESTRY (DNR)
DOM	DIVISION OF MINING (DNR)
DOMGS	DIVISION OF MINING AND GEOLOGICAL SURVEYS (July 1986)
DOPOR	DIVISION OF PARKS AND OUTDOOR RECREATION (DNR)
DOT/PF	DEPARTMENT OF TRANSPORTATION AND PUBLIC FACILITIES
LAS	LAND ADMINISTRATION SYSTEM
MH	MENTAL HEALTH
MLLO	MINERAL LEASEHOLD LOCATION ORDER
ORV	OFF-ROAD VEHICLE
ROW (R/W)	RIGHT-OF-WAY
RS 2477	REVISED STATUTE #2477
SCS	SOIL CONSERVATION SERVICE
TA	TENTATIVE APPROVAL
U of A	UNIVERSITY OF ALASKA

DEFINITIONS

Adjudicate: The administrative determination of the validity and amount of a right (water) and includes the settlement of conflicting claims among competing lawful users of record.

Assertion (as used with RS2477): The process of publicly declaring a valid existing right-of-way. This includes opening a case file on the trail, entering the case file on Land Administration System (LAS) as a public easement, marking trails on status plats, and sending a letter to all land owners along the trail, informing them of the right-of-way.

Broadcast Burning: Burning logging slash, unwanted vegetation or other organic materials as they are found rather than piling and burning. This form of burning may cover large areas of land surface while piling and burning burns only concentrated areas.

Browse Species: Woody vegetation upon which wildlife and domestic animals feed including but not limited to willow, birch, poplar, cottonwood and aspen.

Buffer: A strip of natural (native) vegetation, left undeveloped for the purpose of insulating activities or developments from detrimental effects of neighboring activities.

Calypso Orchid: (Calypso bulbosa) A fairly uncommon flower found in shady, moist woods, with one basal, soon-wilting leaf and one solitary flower, mostly pink with a broad, purple-spotted lip. (Hultén, Flora of Alaska, (pg. 331)

Clearcutting Method: A harvest method in which all the trees, large or small, in a stand are removed. It leads to the establishment of an even-aged forest.

Commercial Operation (timber related): An operation or harvest producing wood products for sale. Commercial operations are run by private individuals.

Common Use Grazing Site: An area in which grazing rights and obligations are shared among two or more permitees.

Concurrence: Agreement or approval. Concurrence is intended to be binding on a decision.

Consultation: Processes followed by DNR under existing statutes, regulations and procedures to inform other groups of the intention to take some action and seek their advice or assistance in deciding what to do. Consultation is not intended to be binding on a decision. It is a means of informing affected organizations and individuals about forthcoming decisions and getting the benefit of their expertise.

DEFINITIONS

Controlled or Prescribed Burning: The practice of using regulated fires to reduce or eliminate the unincorporated organic matter of the forest floor or low, undesirable vegetation. The burning is conducted under such conditions that the size and intensity of the fires are no greater than necessary to achieve some clearly defined purpose of timber production, reduction of fire hazard, wildlife management, or improvement of grazing.

Critical Habitat: Land areas which support essential life functions of a species of fish and/or wildlife and are therefore crucial to the perpetuation of that species (This is not the legislative designation definition.)

Dispersed Recreational Use: A general term for recreational activities occurring outside developed recreation sites. These are activities such as hiking or snowmobiling that cover a large area.

Feasible: Capable of being accomplished in a successful manner within a reasonable period of time, taking into account economic, environmental, technical and safety factors.

Flood Hazard Areas: The lowlands with possibility of flood endangering any human life, property or natural or man-made structures.

Flood Plain: The lowland bordering a river, stream, lake or other body of standing water that has been or may be covered by floodwater.

Forb Community: An herbacious, non-grasslike plant community.

Goal: A general statement of intent, usually not quantifiable nor having a specified date of completion. Goals identify desired long-range conditions.

Grazing Operation Plan: A plan which must be developed before a grazing permit or lease may be granted. The plan must include a cooperative agreement between the lessee/permittee and SCS, a physical resource map, the proposed management activities and the scheduled stocking densities.

Guideline: A course of action required to be followed by DNR resource managers or required of land or water users when the manager permits, leases, or otherwise authorizes the use of state land or resources. Guidelines range in their level of specificity from giving general guidance on how a decision should be made, or what factors are to be considered, to detailed standards that will be followed when making on-the-ground decisions.

Habitat Enhancement: The process of improving the quality of an attribute which promotes a life function of a species in the place where that species naturally lives and grows.

Heliotorch: A tool used to ignite fires from a helicopter. The mechanism ignites a flammable liquid, which is directed towards the ground material (see controlled or prescribed burning).

Hinge Cut: A technique in felling a tree in which the tree is not completely severed from the stump. The objetive is to leave a portion of the cambium layer in the bark intact so nutrients and water continue to nourish the tree. In some species, this will result in prolific stump, root and branch sprouts. Under good conditions, these sprouts will provide good forage for moose and other animals and will develop into the beginnings of a new forest.

Horizontal Tree Alignment: A technique used in a habitat enhancement project in which the trees are felled to lie in the same general direction. The objective is to make subsequent wildlife travel much easier.

Instream Flow: An instantaneous flow rate of water through a stream during specified periods of time, from a designated location upstream to a designated location downstream; this information is required to support an application to reserve water for one or more permissible purposes, as determied by an appropriate study.

Lake: Any water body whose depth exceeds three meters and is identified on a 1 to 63,360 U.S.G.S. topographic map or has been field verified by ADF&G and DNR.

Leasable Minerals: "Leasable" minerals include, but are not limited to, coal, oil and gas, and geothermal resources. These resources are available only when opened to entry and only by lease.

Lease: A contract by which the state conveys a long-term use of a resource to the lessee for a period generally exceeding 5 years.

Line-of-Sight Requirement: A determination, usually related to buffers, of a minimum distance beyond which sight is blocked by standing vegetation. For example, a buffer would extend just beyond the point where vision is possible through standing vegetation at eye level. Applies during summer only.

Local Lifestyle: The activities the local public want to see maintained in the Moose Range include but are not limited to community character; public use of land for dispersed outdoor recreation -- hunting, trapping, fishing, camping, picnicking, wildlife viewing, horseback riding, ATV riding; use of undeveloped open space; personal firewood and house log cutting; use of trails; fossil hunting.

DEFINITIONS

Locatable Minerals: Those minerals that may be obtained by staking a mining location; including most other types of materials that are not covered by leasable minerals or materials. They are obtained by "making a discovery," staking a location and recording a notice in the local recorder's office. These minerals include gemstones, gold, silver, iron, uranium, copper, lead, zinc, molybdenum, etc.

Material: Includes, but not limited to, the common varieties of sand, gravel, peat, stone, pumice, pumicite, cinders, clay, topsoil, peat, and sod.

Material Sites: Areas used for the extraction of sand, gravel, rock, or other materials.

Mental Health Lands: Federal lands selected by the state of Alaska under the Alaska Mental Health Enabling Act. These lands were intended to form the economic base for a public trust. Proceeds from this trust are to be primarily used for the treatment of the mentally ill in Alaska.

Mineral Closing Order: An order issued by the Commissioner of the Department of Natural Resources that closes an area of land to the staking locatable minerals. Valid existing locations are not affected.

Mineral Leasehold Location Order (MLLO): An order issued by the Commissioner of the DNR that restricts future locatable mineral entry in a given geographic area to a leasing method. Valid existing locations are unaffected, but any new entries will be "leasehold locations," rather than mining claims. The holder of a leasehold location must obtain a lease before mining can begin.

Mineral Lick: An area with soil containing high concentrations of a mineral(s) which is utilized by wildlife to supplement their diet.

Mitigation of Habitat Loss: The process of replacing or improving the quality of existing habitat for damage or loss of other habitat due to some activity or development.

Multiple Use: According to Section 38.04.910 of the Alaska Statutes: "the management of state land and its various resource values so that it is used in the combination that will best meet the present and future needs of the people of Alaska, making the most judicious use of the land for some or all of these resources or related services over areas large enough to provide sufficient latitude for periodic adjustments in use to conform to changing needs and conditions; it includes:

(A) the use of some land for less than all of the resources, and
(B) a combination of balanced and diverse resource uses that takes into account the short-term and long-term needs of present and future generations for renewable and nonrenewable resources, including, but not limited to, recreation, range, timber, minerals, watershed, wildlife and fish, and natural scenic, scientific, and historic values."

Permit: A contract by which the state of Alaska conveys the short-term use of a resource to the permittee for a period generally not greater than one year.

Public Notice: Public notice requires DNR and/or ADF&G to notify the public of actions to be taken by the agencies in at least two local newspapers (Anchorage, Palmer or Sutton).

Public Review: Public review requires public notification of at least one public meeting, holding at least one public meeting (Palmer or Sutton) and allowing the public to mail in written comment on the proposed agency actions.

Public Use Cabin: A cabin, owned and administered by the state of Alaska, for public use.

Raptor: A group of birds of prey with a strong notched beak and sharp talons, for example, the eagle, hawk and owl.

Remote Cabin Permit Program: A program established by the Legislature in which the permittee may construct a cabin on state land and use that cabin for 25 years. (The program may include additional requirements as it is developed.) The permit is non-renewable and conveys "no interest, right, or title in or to the land."

Reservation of Water: An appropriation of water for maintaining a specified instream flow or level of water at a specified point on a stream or water body or in a specified part of a stream or water body for specified periods of time and for one or more permissible purposes.

Revised Statute (RS)2477 (established 1866, repealed 1976) granted "right of way for construction of highways over public lands, not reserved for public purposes." Right-of-ways were established by territorial or state legislative action, or by public use of privately constructed roads and trails on unreserved federal lands.

Scarification: A technique of preparing the seedbed by removing the forest floor, that is, the layer of unincorporated organic matter which lies on top of the mineral soil, or mixing it with the mineral soil by mechanical action.

Section Line Easement: The RS2477 law provides for a minimum of 66 feet public right of way along all surveyed section lines.

Seed Tree Cutting Method: A harvest method in which the old stand is removed in one cutting, except for a small number of trees left as a source of seed for natural regeneration. The seed trees selected are chosen for their health, vitality, location, seed crop and large crown.

DEFINITIONS

Streams (Rivers, Creeks): Group I - Anadromous Fish Streams: A stream in which fish migrate to breed. An example of an anadromous fish is salmon. Group II - Perennial Streams: For reference in the Moose Range plan, streams not known to have anadromous fish but that are identified on a USGS 1 to 63,360 topographic map or as field verified by ADF&G and DNR.

Temporary Water Use Permit: Permit to allow for the use of water for a period of time not to exceed two years.

Tentative Approval: An assurance from the federal government that conveyance to the state of a tract of land appears unobstructed and, when survey plat is completed, the land should proceed to patent. When such assurance is given, the land is managed by the party to whom the land is approved.

Transition Zone: An area in which one vegetation type or ecotype is blending into another ecotype such as treeline.

Water Body: Means surface water in a depression of land, including intragravel water or sloughs, which is supplied from drainage upwellings, springs or groundwater.

Water Use Permit: Permit to allow for the development and use of water. Period of time varies from one to ten years depending on type of water use. Upon development and use, a certificate of appropriation may be issued.

Wetlands: A freshwater wetland means those environments characterized by rooted vegetation which is partially submerged either continuously or periodically by surface freshwater not exceeding three meters in depth.

REVISION PROCEDURES

PLAN MODIFICATION

The land use designations, policies, implementation actions and management guidelines of this plan may be changed if conditions warrant. The plan will be updated periodically as new data and new technologies become available and as changing social and economic conditions place different demands on public lands. The Department of Natural Resources and the Department of Fish and Game jointly will review proposed modifications of the plan.

PERIODIC REVIEW

The plan will be reviewed periodically to determine if revisions are necessary. The time frame for periodic review will be based upon demands on state land and the need for review as compared to other division responsibilities. An interagency planning team will coordinate this periodic review at the request of the Commissioner of the Department of Natural Resources or the Commissioner of the Department of Fish and Game. The Matanuska-Susitna Borough or other interested parties may also request that DNR and ADF&G review the plan. The planning team will be coordinated by the Division of Land and Water Management, Southcentral Regional Office. The plan review will include meetings with all interested groups and the general public.

AMENDMENTS

The plan may be amended. An amendment adds to or modifies the basic intent of the plan. Changes to the planned uses, policies, guidelines or certain implementation actions constitute amendments. Amendments must be approved by the Commissioner of DNR and the Commissioner of ADF&G. Amendments require public notice and consultation with affected agencies and may require public hearings if the Commissioners decide the level of controversy warrants. Amendments also may be proposed by agencies, municipalities, or members of the public. Requests for amendments are submitted to the Anchorage office of the DNR, Division of Land and Water Management, Southcentral Regional Office. The following actions are examples of changes which would require an amendment:

- Allowing a use in an area where it is currently prohibited.
- Changes in Chapter Three Buffer Guidelines.

The Director of the Division of Land and Water Management determines what constitutes an amendment or just a minor change. Amendments that are adopted as part of the plan will be reviewed when the plan is periodically reviewed.

REVISION PROCEDURES

MINOR CHANGES

A minor change is one which does not modify or add to the basic intent of the plan. Minor changes may be necessary for clarification, consistency, or to facilitate implementation of the plan. Minor changes are made at the discretion of the Director of the Division of Land and Water Management, with the concurrence of ADF&G, and do not require public review. Minor changes may be proposed by agencies, municipalities, or members of the public. Requests for minor changes affecting state land are submitted to the Southcentral Regional Office of the Division of Land and Water Management, DNR. The Director will notify affected agencies when minor changes are made. Affected agencies will have the opportunity to review and comment on minor changes following notification; the comment period may be provided through existing interagency review processes for associated actions that necessitate minor changes. Examples of minor changes include:

- Changing the order of timber harvest cuts approved in the five-year schedule -- cutting 1989 cuts in 1988 in the approved 1986-1991 schedule.
- Temporary motorized vehicle closures during break-up to prevent permanent damage to the roadbed.

SPECIAL EXCEPTIONS-DNR PROCEDURES

Exceptions to the provisions of the plan may be made without modification of the plan. Special exceptions shall occur only when complying with the plan is excessively difficult or impractical and an alternative procedure can be implemented which adheres to the purposes, spirit of the plan, and the enabling legislation.

There may be situations where the state did not consider an option for management in 1986 that may become feasible in the future without causing any detrimental effects in the Range. For example, the plan specifies that no new trails may be constructed in the Range for recreational purposes with the intent of not increasing recreational pressures.

A special exception would be a "muscle-powered" recreationalists' proposal that an alternate section of trail along the Permanente Road be developed for foot and horse use. The purpose of the trail proposal would be to by-pass a heavily used motorized section of trail. If the proposal does not adversely effect wildlife, habitat enhancement efforts and improves public safety, while not changing the overall intent for management of the Range, the proposal could be considered as a special exception.

The Department of Natural Resources, with concurrence from the Department of Fish and Game, may make a special exception in the implementation of the plan through the following procedures.

1. The Regional Manager of the Division of Land and Water Management shall prepare a finding which specifies the following:

   a. The extenuating conditions which require a special exception.
   b. The alternative course of action to be followed.
   c. How the intent of the plan will be met by the alternative.

2. Agencies having responsibility for land uses with primary or secondary designations in the affected area will be given an opportunity to review the findings. In the event of disagreement with the regional manager's decision, the decision may be appealed to the Director of the Division of Land and Water Management and the director's decision may be appealed to the commissioner. If warranted by the degree of controversy, the commissioner will hold a public hearing before making the decision.

PUBLIC INVOLVEMENT

Public participation played an important role in the planning process. The mailing list used for the project included two hundred and fifty individuals, sixty interest groups, the state legislators, thirty agencies and the planning team members.

The public became involved in the planning process at the beginning of the project. In April of 1985, seventy-nine citizens attended the public meetings held at Sutton, Palmer and Anchorage. The meetings were designed to discuss the overall goals and issues and for the public to be able to address concerns about management of the Moose Range.

Throughout the planning process the planning team meetings were open to the public. Public attendence varied, depending upon the agenda. Generally two to six members of the public attended the planning team meetings. Most of the people who did attend the meetings on a regular basis have been able to provide the planning team with valuable comments.

During the summer the planning team members participated in weekly field trips. State staff met with or interviewed local citizens whenever possible. At times, local citizens led the field trips.

Periodically the project manager distributed project up-date newsletters to the entire mailing list. These letters informed the public of the progress made in the planning process.

After the resource data was collected the planning team developed a list of proposed alternatives for management. In early November, 1985, sixty people attended open house sessions held in Sutton, Palmer and Anchorage. These sessions were designed to help the public learn more about the resources in the Moose Range, to look at the proposed management alternatives and resource maps and to discuss their concerns with state staff members.

The proposed management alternatives were formally presented to the public at meetings in November, 1985. The public attending the meetings completed workbooks. The public comment in the workbooks provided the team with a more detailed version of how the public felt the Moose Range should be managed. These meetings were held at Sutton, Palmer and Anchorage and were attended by eighty people.

Once the public data was compiled, the planning team reviewed the data and a map of the public's proposed alternative prior to developing the preferred management alternative. The preferred alternative is a combination of the public desires, the legislative intent, the state's statutory responsibilities and the actual resource capabilities.

PUBLIC INVOLVEMENT

Three interest groups contacted the project manager prior to release of the public draft plan and requested a briefing on the preferred management alternative as it was developing. The project manager and assistant attended monthly meetings of the Frontier Trappers Association, the Alpine Civic Club and the Chickaloon Pass Improvement Association. At the meetings the state staff members answered questions and listened to comments by members of the clubs.

Due to budget constraints there were only 400 copies of the draft plan printed. Therefore, the draft plans were sent to all interest groups and made available to the general public at local libraries, government offices and local businesses. Key active members of the public who had been involved throughout the planning process also received an individual copy.

Public meetings were held during May of 1986 in Sutton, Anchorage and Palmer to receive comment on the draft plan. Fifty-one people attended the meetings. The planning team also received 34 letters containing comments on the draft plan. A copy of all comments is available at the Southcentral Region Office, Division of Land and Water Management, Department of Natural Resources.

The public also received a copy of the final major decisions to review 30 days in advance of the signing of the final plan by the Commissioners of the Department of Natural Resources and Alaska Department of Fish and Game.

WATER RESOURCE INFORMATION

Table A: DEFINITIONS OF UNITS AND ABBREVIATIONS USED FOR MEASURING WATER USE AND FLOW

FLOWRATE

cfs: Cubic feet per second. Used for measuring streamflow rates. 1 CFS = 449 GPM = 646,272 GPD

GPD: Gallons per day. Used for measuring domestic, commercial and some industrial water use on a daily basis.

GPM: Gallons per minute. Used for measuring well yields and other relatively small flowing systems. 1 GPM = 1,440 GPD

MGD: Million gallons per day. Used for the total daily water use for larger appropriations. 1 MGD = 1,000,000 GPD

VOLUME

AF: Acre-feet. A volume of water that would cover one acre to a depth of one foot. Used for large volume measurements. A flow of 1.5 CFS for 24 hours produces approximately 3 AF, which is approximately equal to one million gallons. 1 AF = 325,851 gallons.

CONCENTRATION

ppm: Part per million. Used for measuring the concentrations of substances in water.

Table B: MISCELLANEOUS FLOW MEASUREMENTS (DGGS)

SURFACE WATER DATA

	Date	Discharge (cfs)	Water Temp. (°C)	pH	Dissolved Oxygen (ppm)
Chickaloon River	4/12/84	125	1.9	7.4	13.5
Kings River	4/10/84	52	2.5	6.9	13.9
Granite Creek	4/10/84	22	1.8	6.8	14.0
Moose Creek	4/11/84	19	2.1	6.8	13.8
" "	8/15/84	145	12.3	---	---

Table C: SURFACE WATER DATA

MISCELLANEOUS DISCHARGE MEASUREMENTS (DGGS)

Stream	Location	Drainage Area (sq. mi.)
Eska Creek near Sutton	Lat 61°43'44", Long 148°54'31", in NE1/4 Sec. 21, T.19N., R.3E., Matanuska-Susitna Borough, on right bank 100 ft. below culverts on Eska-Jonesville Road and 1.5 mi. northeast of Sutton.	13.4

Date	Discharge (cfs)	Date	Discharge (cfs)	Date	Discharge (cfs)
8- 4-65	24.4	5-12-75	46	7-18-79	63
5-19-66	7.70	5-19-75	34	5- 7-80	18
6-28-66	34	6-23-75	60	5-25-80	12
8-27-66	24	7-21-75	59	6- 6-80	61
9-29-66	11	9- 2-75	17	6-27-80	74
5-20-67	29	9-11-75	112	9-15-80	500
7-25-67	67	7-12-76	47	9-16-80	228
8-10-71	680	7- 5-77	55	9-17-80	135
7- 5-72	106	9-30-77	48	5-28-81	41
8-14-72	17	5-22-78	10	6-28-82	77
9-30-72	58	8- 2-78	22	9-13-82	89
6- 5-73	18	5- 2-79	83	5-11-83	21
6-16-73	94	5- 4-79	90	8-25-83	73
7-17-73	26	7-15-79	205	8-25-83	78
5-11-74	18				

Table D: EXISTING WELL LOG INFORMATION
(prior to December 1985)

Total wells in Moose Range = 26 (22 possibly additional)

Well Locations	Aquifer Material	Material Depth	Depth to Bedrock	Well Depth	Q (gal/min)
T19N, R2E, Sec. 33					
DAAD	--	--	36	40	1
DABB	gravel	34	--	28	5
DACB	sands	51	51	45	3
T19N, R3E, Sec. 10					
CDCA	--	--	2	--	--
CDDD	--	--	21	--	--
DCBA	--	--	18	--	--
DCDB	--	--	18	--	--
T19N, R3E, Sec. 15					
BAAC	--	--	14	--	--
BABB	--	--	18	--	--
BBAB	--	--	38	--	--
BBCB	--	--	36	--	--
BBDB	--	--	49	--	--
BCCB	--	--	--	21	10
T19N, R3E, Sec. 16					
BCAA	--	--	5	--	--
BCDC	--	--	54	--	--
BCDD	--	--	14	--	--
T19N, R3E, Sec. 21					
CACC	sand & gravel	48	--	48	10
T19N, R3E, Sec. 22					
BCBC	--	--	--	118	7.5
BCDB	--	--	--	18	17
CADA	--	--	--	88	--
CADD	--	--	--	91.5	--
CDCD	--	--	--	51	--
DDDD	sand & gravel	74	--	70	117
T19N, R3E, Sec. 23					
BCCC	--	--	--	98	15
T19N, R3E, Sec. 30					
CDDD	gravel, fine clay	178	--	178	--
T20N, R5E, Sec. 34					
BADB	--	--	6	--	2

Table E: WATER RIGHTS ON STATE FILE
(prior to December 1985)

WATER RIGHTS
within
MATANUSKA VALLEY MOOSE RANGE

Township 18 North, Range 1 East, SM ..... NONE

Township 18 North, Range 2 East, SM ..... NONE

Township 19 North, Range 1 East, SM ..... NONE

Township 19 North, Range 2 East, SM ..... NONE

Township 19 North, Range 3 East, SM 18
- Section 22 ... ADL 212244 & ADL 214647
- Section 23 ... ADL 47807, 51119, & 77827; LAS 1919 & 2174
- Section 24 ... ADL 47808 & 51120
- Section 26 ... ADL 209748*, 210958*, 212267*, & 215285; LAS 1808
- Section 27 ... ADL 75453, 213125, & 214835; LAS 2668

Township 19 North, Range 4 East, SM 1
- Section 10 ... ADL 209844

Township 19 North, Range 5 East, SM ..... NONE

Township 20 North, Range 2, 3, & 4 East, SM ..... NONE

Township 20 North, Range 5 East, SM 6
- Section 25 ... ADL 214862 & 214863 & LAS 2866
- Section 27 ... ADL 40884 & 209457
- Section 34 ... ADL 209822

Township 20 North, Range 6 East, SM 2
- Section 29 ... ADL 40525
- Section 30 ... ADL 200649

Township 20 North, Range 7 East, SM ..... NONE

Township 21 North, Range 2, 3, 4, 5, & 6 East SM ..... NONE

Township 21 North, Range 7 East, SM 1
- Section 28 ... LAS 2055

Township 22 North, Range 6 East, SM ..... NONE

TOTAL 28

Note: *is for water rights which may or may not be within range boundaries.

Table E (continued)

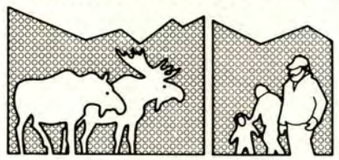
WATER RIGHTS
within
MATANUSKA VALLEY MOOSE RANGE

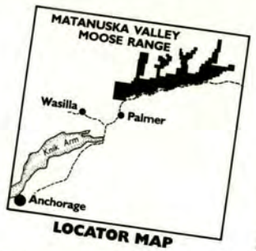
	ADL/LAS	Quantity	Source	Application Permit or Certificate	Number of Months Of Use	Type
1.	A 47807	96.0 AF	strm	cert	3	farming
2.	A 47808	4500 GPD	well	cert	12	domestic
3.	A 51119	96.0 AF	strm	cert	3	farming
4.	A 51120	96.0 AF	strm	cert	3	farming
5.	A 75453	500 GPD	well	cert	12	domestic
		200 GPD			3	lawn & garden
6.	A 77827	700 GPD	well	cert	12	domestic
7.	A 209748	500 GPD	well	cert	12	domestic
8.	A 210958	500 GPD	well	cert	12	domestic
9.	A 212244	500 GPD	well	permit	12	domestic
10.	A 212267	500 GPD	well	cert	12	domestic
		19 GPD				livestock
11.	A 213125	500 GPD	well	cert	12	domestic
12.	A 214647	500 GPD	well	cert	12	grade school
13.	A 214835	500 GPD	well	permit	12	domestic
14.	A 215285	500 GPD	well	permti	12	domestic
15.	L 1808	500 GPD	well	cert	12	domestic
		48 GPD				livestock
16.	L 1919	500 GPD	well	appln	12	domestic
17.	L 2174	500 GPD	well	cert	12	domestic
		3 GPD				livestock
18.	L 2669	500 GPD	well	appln	12	domestic
		30 GPD				livestock
19.	L 779	2500 GPD	well	permit	8	coal mine
20.	A 40884	600 GPD	strm	cert	12	domestic
		00 GPD			3	farming
21.	A 209457	500 GPD	well	cert	12	domestic
22.	A 209822	500 GPD	well	permit	12	domestic
		.2 AF			5	lawn & garden
23.	A 214862	500 GPD	well	permit	12	domestic
24.	A 214863	265 GPD	strm	permit	12	domestic
		10 AF			5	lawn & garden
25.	A 40525	3500 GPD	well (2)	cert	12	domestic
						livestock
26.	A 200649	6.5 AF	strm	cert	3	farming
27.	L 2055	1000 GPM	strm	appln	7	placer mine

Appendix VIII
GEOLOGY RELATED MAPS

MAP 11: POTENTIAL CONSTRUCTION MATERIAL

MATANUSKA VALLEY
MOOSE RANGE
MANAGEMENT PLAN





LOCATOR MAP

MOOSE CREEK DRAINAGE

GRANITE CREEK DRAINAGE

KINGS RIVER DRAINAGE

CHICKALOON RIVER DRAINAGE

BOULDER CREEK DRAINAGE

MOOSE RANGE BOUNDARY

GRANITE PEAK

CASTLE MOUNTAIN

Little Susitna River

Granite Creek

Young Creek

Kings River

Chickaloon River

Boulder Creek

Eska Creek

Matanuska River

R. 1 E. R. 2 E. R. 3 E. R. 4 E. R. 5 E. R. 6 E. R. 7 E.

T. 22 N.
T. 21 N.
T. 20 N.
T. 19 N.
T. 18 N.

JONESVILLE ROAD

MURPHY RD.

BUFFALO MINE ROAD

SOAPSTONE RD.

FISHHOOK-WILLOW ROAD

GLENN HIGHWAY

PERMANENTE ROAD

CHICKALOON RIVER ROAD

Sutton

Palmer

Chickaloon

MP 6.7 SUNVALLEY DRIVE

MP 52.8 SOAPSTONE ROAD

MP 53.1 BUFFALO MINE ROAD

MP 54.5 MOOSE CREEK STATE RECREATION SITE

MP 56.7 MOOSE RANGE BOUNDARY SIGN

MP 61 SUTTON AND JONESVILLE ROAD

MP 66.7 KINGS RIVER AND CHICKALOON—KNIK—NELCHINA TRAIL ACCESS

MP 71.8 PERMANENTE ROAD

MP 73 IDA LAKE/FISH LAKE ACCESS ROAD

MP76.0 KING MOUNTAIN STATE REC. SITE

MP 76.2 KING MOUNTAIN LODGE

MP 77.5 CHICKALOON RIVER ROAD

MP 80.8 MOOSE RANGE BOUNDARY SIGN

MP85.3 LONG LAKE STATE RECREATION SITE

MP 89.2 PURINTON CREEK TRAIL

0 1 2 3 miles

LEGEND

POTENTIAL CONSTRUCTION MATERIAL

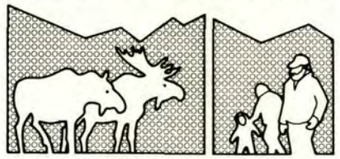
- **High**
- **Moderate to High**
- **Low**

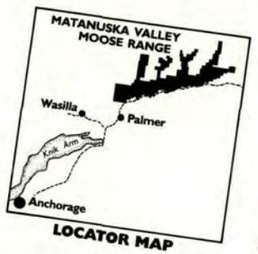
- **DOT/PF MATERIAL SITES**
- **EXPLORATORY BOREHOLES**

map compiled by DGGS (5-85)

MAP 12: SNOW AVALANCHE POTENTIAL

MATANUSKA VALLEY MOOSE RANGE MANAGEMENT PLAN





LOCATOR MAP

MOOSE CREEK DRAINAGE

GRANITE CREEK DRAINAGE

KINGS RIVER DRAINAGE

CHICKALOON RIVER DRAINAGE

BOULDER CREEK DRAINAGE

MOOSE RANGE BOUNDARY

GRANITE PEAK

CASTLE MOUNTAIN

JONESVILLE ROAD

MURPHY RD.

BUFFALO MINE ROAD

SOAPSTONE RD.

FISHHOOK-WILLOW ROAD

GLENN HIGHWAY

PERMANENTE ROAD

CHICKALOON RIVER ROAD

Chickaloon

Sutton

Palmer

Little Susitna River

Moose Creek

Granite Creek

Young Creek

Kings River

Chickaloon River

Boulder Creek

Esko Creek

Matanuska River

R. 1 E. | R. 2 E.

R. 2 E. | R. 3 E.

R. 3 E. | R. 4 E.

R. 4 E. | R. 5 E.

R. 5 E. | R. 6 E.

R. 6 E. | R. 7 E.

T. 22 N.

T. 21 N.

T. 20 N.

T. 19 N.

T. 18 N.

MP 6.7 SUNVALLEY DRIVE

MP 52.8 SOAPSTONE ROAD

MP 53.1 BUFFALO MINE ROAD

MP 54.5 MOOSE CREEK STATE RECREATION SITE

MP 56.7 MOOSE RANGE BOUNDARY SIGN

MP 61 SUTTON AND JONESVILLE ROAD

MP 66.7 KINGS RIVER AND CHICKALOON—KNIK—NELCHINA TRAIL ACCESS

MP 71.8 PERMANENTE ROAD

MP 73 IDA LAKE/FISH LAKE ACCESS ROAD

MP76.0 KING MOUNTAIN STATE REC. SITE

MP 76.2 KING MOUNTAIN LODGE

MP 77.5 CHICKALOON RIVER ROAD

MP 80.8 MOOSE RANGE BOUNDARY SIGN

MP85.3 LONG LAKE STATE RECREATION SITE

MP 89.2 PURINTON CREEK TRAIL

0 1 2 3 miles

LAND STATUS

- **Private** (native & non-native) **& Borough Owned Land**
- **Selected Land** (State and/or Native)
- **State Land** (patent or tentative approval)

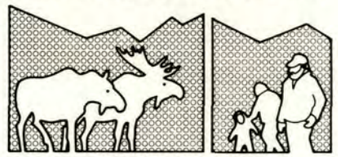
LEGEND

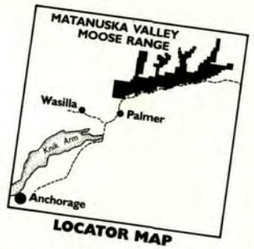
- **HIGH POTENTIAL**
- **POTENTIAL**
- **NO POTENTIAL**

map compiled by DGGS (5-85)

MAP 13: ENGINEERING CONSTRAINTS

MATANUSKA VALLEY
MOOSE RANGE
MANAGEMENT PLAN





MOOSE CREEK DRAINAGE

GRANITE CREEK DRAINAGE

KINGS RIVER DRAINAGE

CHICKALOON RIVER DRAINAGE

BOULDER CREEK DRAINAGE

MOOSE RANGE BOUNDARY

CASTLE MOUNTAIN FAULT

GRANITE PEAK

CASTLE MOUNTAIN

JONESVILLE ROAD

MURPHY RD.

BUFFALO MINE ROAD

SOAPSTONE RD.

FISHHOOK-WILLOW ROAD

GLENN HIGHWAY

PERMANENTE ROAD

CHICKALOON RIVER ROAD

Little Susitna River

Moose Creek

Granite Creek

Esko Creek

Kings River

Chickaloon River

Boulder Creek

Matanuska River

Palmer

Sutton

Chickaloon

R. 1 E. | R. 2 E. | R. 3 E. | R. 4 E. | R. 5 E. | R. 6 E. | R. 7 E.

T. 22 N.
T. 21 N.
T. 20 N.
T. 19 N.
T. 18 N.

MP 6.7 SUNVALLEY DRIVE

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MP 80.8 MOOSE RANGE BOUNDARY SIGN

MP85.3 LONG LAKE STATE RECREATION SITE

MP 89.2 PURINTON CREEK TRAIL

0 1 2 3 miles

LAND STATUS

- **Private** (native & non-native) **& Borough Owned Land**
- **Selected Land** (State and/or Native)
- **State Land** (patent or tentative approval)

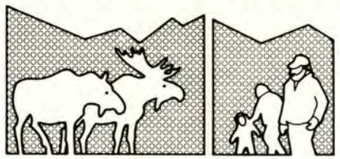
LEGEND

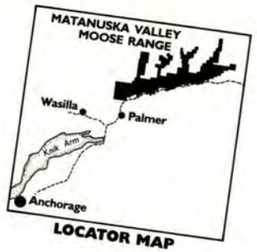
- **UNSTABLE SLOPES**
- **ROCK GLACIERS**
- **UNSUITABLE FOUNDATION SOILS**
- **MINE TAILINGS**
- **FAULT ZONES**

map compiled by DGGS (7-85)

MAP 14: ENGINEERING GEOLOGY

MATANUSKA VALLEY MOOSE RANGE MANAGEMENT PLAN





LOCATOR MAP

MOOSE CREEK DRAINAGE

GRANITE CREEK DRAINAGE

KINGS RIVER DRAINAGE

CHICKALOON RIVER DRAINAGE

BOULDER CREEK DRAINAGE

R. 2 E. | R. 3 E.
R. 3 E. | R. 4 E.
R. 4 E. | R. 5 E.
R. 5 E. | R. 6 E.
R. 6 E. | R. 7 E.
R. 1 E. | R. 2 E.

T. 22 N.
T. 21 N.
T. 20 N.
T. 19 N.
T. 18 N.

MOOSE RANGE BOUNDARY

GRANITE PEAK

CASTLE MOUNTAIN

Little Susitna River
Granite Creek
Moose Creek
Kings River
Chickaloon River
Boulder Creek
Matanuska River
Essy Creek

JONESVILLE ROAD
MURPHY RD.
BUFFALO MINE ROAD
SOAPSTONE RD.
FISHHOOK-WILLOW ROAD
GLENN HIGHWAY
PERMANENTE ROAD
CHICKALOON RIVER ROAD

Sutton
Palmer
Chickaloon

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MP 80.8 MOOSE RANGE BOUNDARY SIGN
MP85.3 LONG LAKE STATE RECREATION SITE
MP 89.2 PURINTON CREEK TRAIL

0 1 2 3 miles

LEGEND

- VALLEY-FILL ALLUVIUM
- OUTWASH DEPOSITS
- OLDER TILL
- TALUS
- SWAMP - MUSKEG
- FLOODPLAIN ALLUVIUM
- ICE-CONTACT DEPOSITS
- DRIFT; UNDIFFERENTIATED
- COLLUVIUM
- BEDROCK
- ALLUVIAL FAN DEPOSITS
- YOUNGER TILL
- LANDSLIDE DEPOSITS
- ROCK GLACIER
- MINE TAILINGS

map compiled by DGGS (5-85)

LAWS, REGULATIONS AND POLICIES APPLICABLE TO THE MATANUSKA VALLEY MOOSE RANGE

PUBLIC LAW 92-203; 85 Stat. 688; 43 U.S.C., 1601 etseq. Alaska Native Claims Settlement Act

ALASKA STATE CONSTITUTION

Article VIII Natural Resources
Sections 1-18

ALASKA STATUTES

AS 03.05	Powers and Duties of Commissioners of Natural Resources and Environmental Conservation
AS 03.30	Fences
AS 03.35	Grazing Districts
AS 03.40	Brands and Marks
AS 03.45	Diseased Livestock
AS 16.05	Fish and Game Code
AS 16.10	Fisheries and Fishing Regulations
AS 16.20	Conservation and Protection of Alaskan Wildlife
AS 16.25	Stocking of Public Lands
AS 16.30	Destruction of Big Game Animals and Wild Fowl
AS 16.35	Predatory Animals
AS 19.05	Highways and Ferries: Administration
AS 19.10	State Highway System
AS 19.20	Cooperation By and With the State
AS 19.22	Landscaping and Scenic Enhancement
AS 19.25	Protection and Use of State Highways and Roads
AS 19.30	Access Roads
AS 27.21	Alaska Surface Coal Mining Reclamation Act
AS 38.04	Policy for Use and Classification of State Land Surface
AS 38.05	Alaska Land Act
AS 38.35	Right-of-Way Leasing Act
AS 41.17	Forest Resources and Practices Act
AS 41.21	Parks and Recreational Facilities
AS 41.35	Alaska Historic Preservation Act
AS 46.03	Environmental Conservation, Sections 46.03.010-46.03.900
AS 46.15	Water Use Act, Sections 46.15.010-46.15.270

ALASKA ADMINISTRATIVE CODE (Regulations)

5 AAC 81. Fish and Game: Game -- Hunting
5 AAC 82. Big Game Photography Contest
5 AAC 84. Trapping
5 AAC 90. General Provisions
5 AAC 95. Fish and Game Habitat
6 AAC 80. Standards of the Alaska Coastal Management Program
11 AAC 14. Parks, Recreation and Public Use: Contracts
11 AAC 15. Trails and Footpaths Grant Program
11 AAC 16. Historic, Prehistoric and Archaeological Resources
11 AAC 17. Outdoor Recreational, Open Space and Historic Properties Development Fund Grant Program
11 AAC 40. Geological Survey: Miscellaneous Programs
11 AAC 42. Prospector Assistance
11 AAC 44. Mine Safety
11 AAC 46. Coal Conservation
11 AAC 55. Land Planning and Classification
11 AAC 58. Leasing of Lands
11 AAC 60. Grazing Leases
11 AAC 62. Tide and Submerged Lands
11 AAC 65. Personal Use Cabins
11 AAC 70. Water Quality Standards, Sections 70.010-70.090
11 AAC 71. Timber and Material Sales
11 AAC 80. Pipeline Right-of-Way Leasing
11 AAC 82. Mineral Leasing Procedures
11 AAC 83. Oil and Gas Leasing
11 AAC 84. Other Leasable Minerals
11 AAC 85. Coal
11 AAC 86. Mining Rights
11 AAC 87. Geothermal Drilling and Conservation
11 AAC 88. Practice and Procedure
11 AAC 90. Surface Coal Mining
11 AAC 93. Water Management, Sections 93.010-93.970
11 AAC 94. Trapping Cabin Construction Permits
11 AAC 95. Forest Resources and Practices
11 AAC 96. Miscellaneous Uses
17 AAC 10. Transportation and Public Facilities: Engineering: Encroachments, Driveways and Road Approaches
17 AAC 15. Utility and Railroad Permits
17 AAC 20. Maintenance
17 AAC 25. Operations, Wheeled Vehicles
17 AAC 40. Aviation

POLICY AND PROCEDURES MANUAL

Lands Section

Chapter	5110	Land Disposal
Chapter	5114	Municipal Programs
Section	01	Entitlements
Chapter	5120	Leases
Section	00	General
	01	Auction
	02	Negotiated
	03	Pipeline Rights-of-Way
	05	Grazing
Chapter	5121	Management Planning
Chapter	5122	Permits
Section	01	Land Use Permits/Personal Use Cabins
	02	Public Easements
	03	Easement Management
	08	Plans of Operation
	09	Private Easements
Chapter	5125	Material Sales
Section	01	Competitive
	02	Negotiated
Chapter	5800	DLWM Administration

Water Section

Water Management Policies and Procedures Manual
SOPs 3200-1 through 3200-25

DNR Policy and Procedure Manual
Chapters 5600 through 5617

Agriculture Section

DNR-DLWM Policy and Procedure Manual

Chapter	5120	Leases
Section	05	Grazing Leases
Chapter	5122	Permits
Section	01	Grazing Prmits

LAWS

DIVISION OF AGRICULTURE POLICY AND PROCEDURE MANUAL

Chapter	10	Agriculture Development
Chapter	20	Agriculture Financing
Chapter	30	Agricultural Research and Extension Service
Chapter	40	Director's Office/Administration

DIVISION OF MINING

Only divisional policies and procedures are for surface mining -- pertain to permitting, violations and enforcement. The Division of Mining uses primarily Alaska Administrative Code for direction, and has not established a Policy and Procedure Manual per se.

DIVISION OF PARKS AND RECREATION

Policy and Procedures Manual (pertains to State Parks System only)

Chapter 1	Administration
Chapter 2	Fiscal
Chapter 3	Planning
Chapter 4	Design and Construction
Chapter 5	History and Archaeology
Chapter 6	Resource Management
Chapter 7	Public Safety
Chapter 8	Visitor Service
Chapter 9	State Equipment
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Policy Document

Alaska State Park System: Statewide Framework Mission 86 -- Goals and Objectives of the Alaska State Park System 1983-1986

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81-003	Alaska Coastal Management Program
81-005	Sensitive Information: Locatable Minerals
81-007	Uniform Mapping Standards
81-008	Grazing and Rangeland Policy
81-011	Approval of Surface Activities Relating to Oil, Gas and Other Mineral Developments
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81-014	Trespass Situations on State-Selected Lands
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82-006	Review and Approval of Annual Placer Mining Permits
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82-012	Alaska Coastal Management Program

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Title 17.24 Talkeetna Mountains Special Use District
Title 17.32 Moose Creek Reserve Special Use District
Municipal Ordinance 84-61
Comprehensive Development Plan: Trails

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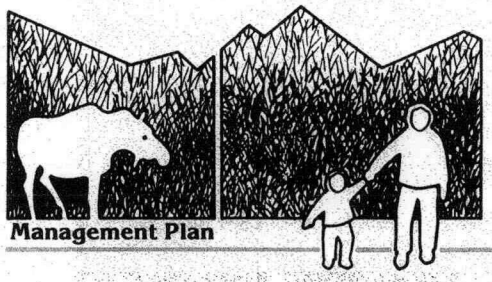
Matanuska Valley Moose Range



Management Plan

Alaska Department of
NATURAL
RESOURCES

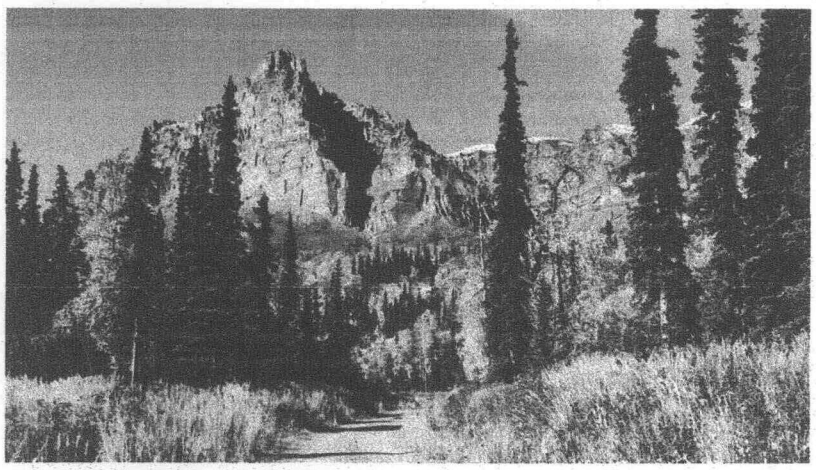
Introduction

The 130,000 acre Matanuska Valley Moose Range was established by the Alaska legislature and signed into law by Governor Sheffield in June 1984. In creating the Moose Range lawmakers stated that its primary purposes were to "Maintain, improve and enhance moose populations and habitat and other wildlife resources of the area, and to perpetuate public multiple use of the area..."

Under the legislation, the Alaska Department of Natural Resources (DNR) in cooperation with the Alaska Department of Fish and Game (ADF&G) are charged with the responsibility to prepare a land use plan for the Moose Range to guide its management for the next two decades.

DNR's Susitna Area Plan identified primary land uses for the Moose Range: wildlife habitat, coal, forestry and public recreation, with grazing as a secondary land use. These designated uses will direct land use within the state Moose Range.

Included within the Moose Range boundaries are state-owned lands within the drainages of Wasilla, Moose, Eska, Granite and Boulder Creeks and the Kings and Chickaloon Rivers. Several management jurisdictions exist within portions of the Moose Range boundaries and are subject to guidelines from DNR's Susitna Area Plan and the Willow Sub-Basin Area Plan. Additionally, some sections are included in the Matanuska-Susitna Borough's Talkeetna Mountains and Moose Creek Reserves Special Use Districts and Coastal Zone Management area. Developing one management plan for the entire unit will coordinate and simplify management of state lands. Borough, private and university lands within the Moose Range will not be directly affected by the plan.



Photograph by Pete Martin

Why A Plan?

The legislation that created the Moose Range called for a management plan to be developed by 1987 to assure that there would be a framework for rational, orderly use and protection of the area's resources. This need arose because recent large population increases in Southcentral Alaska have placed greater demands on natural resources in the area.

A comprehensive plan that defines land use allocations and management guidelines will play an essential role in orderly use and protection of those resources, and future actions of DNR and Fish and Game will be based on the approved management plan.

What Will the Management Plan Include?

The final product is a document that describes intended uses of state lands. The plan will:

1) Include a natural resource inventory of timber, minerals, wildlife habitat, social and economic data and other information.

2) Identify, develop and select land use management alternatives for the entire Moose Range.

3) Specify guidelines for management of each resource.

4) Describe necessary state actions.

5) Identify methods for future revisions.

Who is Developing the Plan?

Agencies represented on the planning team preparing the Matanuska Valley Moose Range Management Plan include:

Alaska Department of Natural Resources
- Division of Land and Water Management
- Division of Mining
- Division of Agriculture
- Division of Forestry
- Division of Parks and Outdoor Recreation

Alaska Department of Fish and Game
- Division of Habitat
- Division of Game

Technical assistance and cooperative planning efforts will be provided by:

Alaska Department of Environmental Conservation
Alaska Department of Transportation and Public Facilities
Matanuska-Susitna Borough

Citizens, interest groups, private organizations and other state and local agencies are invited to participate in the planning process to help develop the plan.

Alaska Department of Natural Resources
Division of Land and Water Management
Southcentral Regional Office
3601 "C" St.
Pouch 7-005
Anchorage, AK 99510-7005

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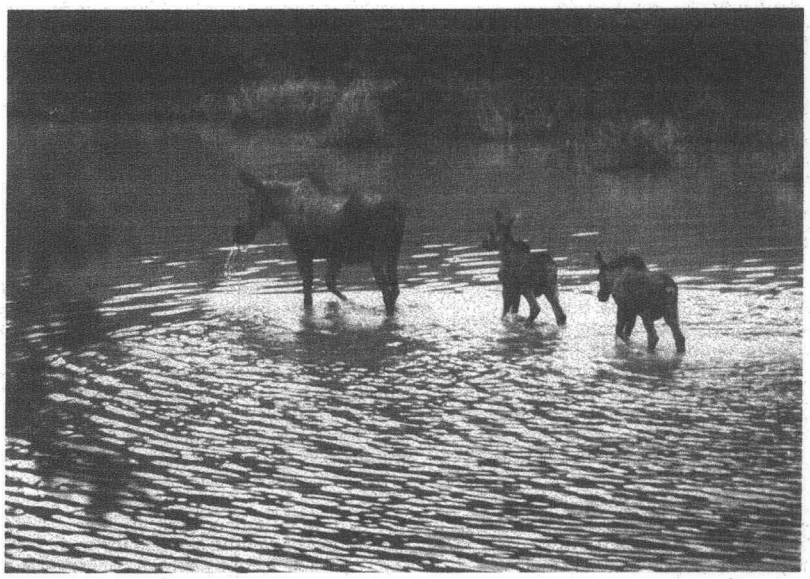


Photograph by Mike Lee

How Will the Plan be Prepared?

The plan will be prepared through a process which collects the best available data and then reviews and evaluates this information and public concerns. Individuals, citizen's groups, private landowners and local and state governments will be involved throughout the process.

Major Steps in Developing the Plan:

Public Issues are Identified: Public meetings are held to learn about local knowledge of the area, local problems, land use preferences, and concerns about uses of state lands.

Information is Gathered and Analyzed: Information about natural resources, existing land uses, land ownership, economic and social characteristics is gathered, mapped and analyzed. Public input is an important part of this step.

Management Alternatives are Prepared: Different plans for use of the resources in the Moose Range are developed. These alternative plans will be based on legislative intent, existing state policies, public comments and resource characteristics.

Public Alternatives are Reviewed: Public comments and preferences on the alternatives are obtained at public meetings.

Draft Plan for State Lands is Prepared: Using public and agency comments, land uses are determined and a draft management plan is developed.

Public Draft Plan is Reviewed: Public hearings are held to obtain final comments on the draft management plan.

Final Plan is Prepared: A final plan recommending management actions and management guidelines is developed, based on agency and public comments.

Plan is Adopted and Implemented: The commissioners of the DNR and Fish and Game approve and adopt the final plan. The plan guides the state's land and resource management decisions in the Matanuska Valley Moose Range.

Photograph by Pat Beckley

How Can You Participate?

Public involvement is an important part of the planning process. You are encouraged to:

- Attend planning team meetings
- Participate in public meetings, workshops and hearings throughout the planning process
- Meet with interest groups
- Attend meetings with local governments or communities
- Write or phone the planning team staff if you have any comments or suggestions.

If you would like to be added to the mailing list, please contact the project manager by mail or telephone:

Lisa Holzapfel, Project Manager
Matanuska Valley Moose Range Management Plan
Alaska Department of Natural Resources
Division of Land and Water Management
Southcentral Regional Office
3601 "C" St.
Pouch 7-005
Anchorage, AK 99510-7005
Phone (907) 786-2258

History

The Matanuska River Valley has served as the primary hunting and trapping grounds and as a transportation corridor for the people in the area. The earliest known inhabitants of the Matanuska River region were Tanania Indians who lived along the Chikaloon River and near the mouth of the Matanuska River. They were ingenious fishers who used the Eskimo kayak as well as birch-bark canoes. The Alaska natives from the Copper River Plateau would travel the river to the head of Knik Arm to trade, then return home along the Matanuska River by a foot trail. Russian fur traders also used the trail up the Matanuska Valley in the mid-1800's.

With the discovery of gold at Hope in 1888, Willow Creek in 1898, and Hatcher Pass in 1906, more white people settled in southcentral Alaska, yet the mid-Matanuska Valley still remained on the fringes of major settlement. In 1898 U.S. Army exploration parties, one led by Lt. E.F. Glenn, traversed the entire region in search of a route to the Yukon River. This was the first official U.S. military activity in the area.

By 1905 the community of Knik, at the upper end of navigability in Cook Inlet, had become a supply and transportation hub for gold seekers. From Knik, transportation trails radiated in all directions, one of which led not to gold but to coal. W.C. Mendenhall, a geologist with the 1898 exploration party, was the first to note a large seam of coal in the Chickaloon River drainage. However, transportation of the coal to Knik, the distribution point, involved a 2½ day horse trip, which made mining impractical at that time.

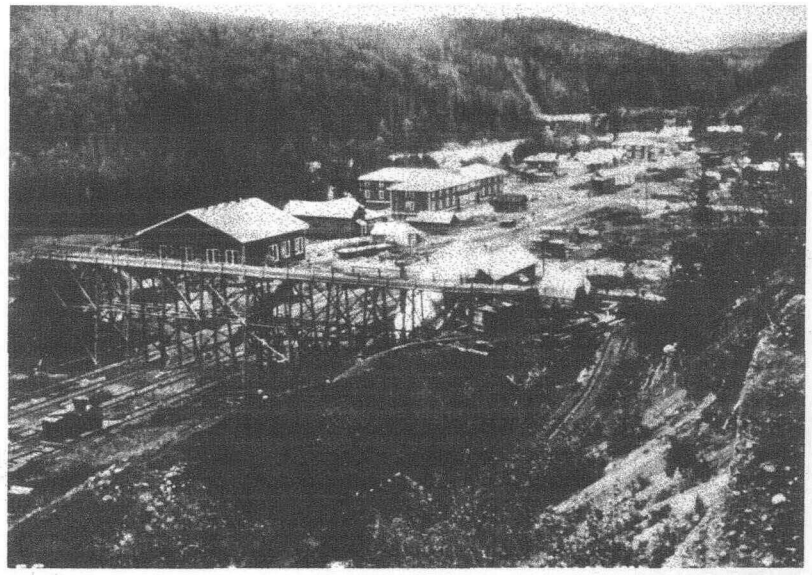
Coal miners needed a railroad for transport and the railroad needed coal to fire its steam engines. That bond of mutual dependence helped develop and settle the mid-Matanuska Valley. In the early 1900's the Matanuska coal lands attracted national interest, and a mining camp was set up in 1913 at Eska Creek by the federal government.

In 1915 a rail line was built from Seward to Fairbanks and in 1917 a 38 mile spur line to Chickaloon was added. During this time the navy built a "government" town at the Chickaloon coal mines but despite the extensive townsite development and plant construction, Chickaloon's mines did not go into production because a more readily available fuel began to flow from California's oil fields. When the Navy decided to fuel its ships with oil rather than coal, it withdrew from Chickaloon and most people left. For the few residents who remained, the main source of income came from running pack trains from the railhead to the Nelchina gold fields. Today all that remains of the Chickaloon government town is the concrete foundation of the powerplant.

Meanwhile the mines of the Sutton area continued to supply coal for the railroad and many miners of the area filed for homesteads. With the arrival of the Matanuska colonists in 1935, much of the best agricultural land was settled. Clearing mature timber for homesteads and agriculture created excellent moose browse. Willow and aspen revegetated the cleared and abandoned areas and the valley's moose population expanded to all-time highs.

World War II brought increased activity in the coal fields. Population growth at Fort Richardson, Elmendorf Air Force Base and Anchorage, created a greater demand for coal to power electric generators, to provide heat, and as fuel for the railroad. A route connecting Palmer and the Richardson Highway became necessary for military purposes and the Glenn Highway, named after the earlier explorer, was completed in 1944.

Following the war the demand for coal declined. The Alaska Railroad converted its engines to diesel fuel, and in 1967 the military bases converted from coal to natural gas. Larger mines closed almost immediately and the last mine closed in 1971. In the early 1980's, however, the market changed once more and intensive exploration for coal began again. The state sale of three coal lease sites in 1984 and proposed plans for a major coal mine and power plant in the Sutton area may once again open up the coal industry in the valley.



U.S. Navy coal mining town at Chickaloon, Matanuska Valley circa 1920. Photograph courtesy of Bunnell Collection, University of Alaska Archives.

Significant increases in the human population of the lower Matanuska Valley altered moose habitat during the 1970's. Areas that once provided winter moose habitat became subdivisions and as development continued, the outlook for the future of moose habitat in the valley was poor.

In 1979 the Alaska Department of Natural Resources designated 30,000 acres of state land in the Matanuska Valley to be managed for wildlife habitat and public recreation. Later that year the Matanuska-Susitna Borough designated the same area as the Moose Creek Reserve Special Use District, to ensure the continuing presence of moose. Finally, in 1984, the Alaska legislature created the Matanuska Valley Moose Range to maintain, improve and enhance moose populations and to perpetuate public multiple uses of the natural resources.