Matanuska-Susitna Borough

Asset Management Plan:
Natural Resource Management Units

Prepared by; RWS Consulting

Contributions by; Alaska Map Company
Matanuska-Susitna Borough Staff
Northern Economics
Sanders Forestry Consulting
State of Alaska, Division of Forestry

Funded by; Matanuska-Susitna Borough

Adopted: September 21, 2010

ACKNOWLEDGEMENTS

The authors of the Asset Management Plan: Natural Resource Management Units would like to thank the scores of people, community councils, agency staff, non-profit entities, organizations and industries that helped putting together this Plan possible. There are way too many to mention by name, and no doubt some would be missed.

All those that took time to gather information, read with a critical eye, talk to peers and critics alike made this Plan better.

Special recognition needs to go to the Matanuska-Susitna Borough Real Property Asset Management Board for the time they spent over the past year reviewing various drafts, debating among themselves, providing input and suggestions during the development of this Plan.

The Real Property Asset Management Board in their Resolution (10-07) recommending adoption of this Plan stated it well when they said:

> "(t)he Plan identifies the many and varied uses and values of lands within Natural Resource Management Units, and provides land-use designations and management guidance that, if properly implemented, will maintain the health and sustainability of our forests while providing local and high value-added use of forest resources, protect our watersheds and water quality, maintain the habitat necessary to support healthy and diverse fish and wildlife populations; all of which are central to sustaining the quality of life and lifestyles of the boroughs communities, ensuring that a broad spectrum of outdoor recreation opportunities continue to be available, and supporting recreation and tourist based businesses."

Without the perseverance, dedication and assistance provided by everyone involved, the thoroughness and balance provided in the Plan would not have been possible.

Matanuska-Susitna Borough

Asset Management Plan:
Natural Resource Management Units

Volume I

Chapter 1: Introduction
Chapter 2: Natural Resource Management Unit Goals and Guidelines by Resource, Program or Management Tool
Chapter 3: Forest Management
Chapter 4: Implementation and Recommendations

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Chapter 1
Introduction

Background

The Matanuska-Susitna Borough owns approximately 365,000 acres of land that it received as part of its Municipal Land Act entitlement and through various land exchanges. Over the past decade, the borough has taken steps to adopt Asset Management Plans for these lands. These Asset Management Plans, once adopted by the Borough Assembly, become part of the Boroughs Comprehensive Plan.

Adoption of Asset Management Plans involves a series of steps that include a thorough scientific and technical inventory, reviewing past and present uses of the land including surrounding land, and soliciting public input on how these lands should be managed.

The borough adopted a *Forest Management Plan* in August 1990[1]. Adoption of that plan was based on the *Multiple Use Forest Management Plan including Land Classification Report, (July 1989).* This plan was based on forest resource estimates from soils mapping that existed at that time. No timber cruises or field verified data was utilized. The plan was written by "Resource Management Associates" who utilized a steering committee and the results of a telephone survey of 250 households located throughout the borough. Also adopted at the same time was the, *Economic/Market; Timber Sale Implementation; Timber Sale Contracts/Agreements (June, 1989).* The adopting ordinance classified approximately 137,014 acres as Forest Management Units and directed them to be managed for multiple uses. Since its adoption in 1990, the *Forest Management Plan* has been found to be inadequate for use in managing broad based resource management areas for various purposes.

In 2005 and in response to public concerns about how the borough owned forest resources were being managed and how borough timber sales were being conducted, the Borough Assembly passed a resolution[2] that placed a moratorium on timber sales until a timber harvest permit and a new forest management plan could be adopted.

The public concerns that led to the moratorium were about the need for better public notice; the need to establish "Best Management Practices" for timber harvest on all land (public and private) within the borough; how some of the timber harvests in existing borough Forest Management Units were being conducted; and the lack of a field verified forest inventory on borough land.

[1] Ordinance Serial Number 90-020 AM and AM Number 90-071
[2] Resolution Serial Number 06-136 AM

This updated plan is based on the conclusion that much has changed since the original plan was adopted almost 20 years ago. The borough is the fastest growing region of Alaska, and has one of the fastest growing populations in the country. Some of the existing Forest Management Units are located in areas that have seen an increased population growth and, in some cases, primary uses of the units have changed as the result of changes in attitudes, economics and use patterns by local residents and visitors to these areas.

Purpose of the Plan

During the course of developing this plan a wide variety of ideas were explored, including extensive public input during "Scoping" which occurred in Phase I (see *How The Plan Was Developed* later in this chapter) on how best to use and protect the multiple-use values of various natural resources of borough-owned blocks of land, which will be called Natural Resource Management Units (NRMU). This plan takes those ideas and translates them into goals, management intent, land use designations, classifications, guidelines, and implementation actions for the new Natural Resource Management Units that will replace the old Forest Management Units.

This plan does not cover or effect land under other ownerships within the unit's.

This plan will ensure that the uses of the land and natural resources occur in a responsible manner, reflecting interests of both present and future users. The goals, management intent, land use designations and guidelines developed in this natural resource asset management plan will provide the land and resource manager the tools to manage all the various resources in a compatible manner and to avoid conflicts when and where possible.

Many of the Natural Resource Management Units contain forest resources. Forest management can and must co-exist with other activities and resource uses. The revised Forest Management Plan, required by borough code[3], is included in this natural resource asset management plan (see chapter 3). This chapter, *Forest Management*, establishes how forest management will be conducted to result in a healthy and age-diverse forest, be sustainable, and provide for a variety of timber products to meet all user needs.

Chapter 3 replaces all previous forest management plans. The land use classifications in Volume II replaces all land use classifications for the geographic areas covered for each Natural Resource Management Unit.

Description of the Planning Area

The land covered by this plan is located entirely within the Matanuska-Susitna Borough. The plan covers all borough-owned land located within designated natural

[3] MSB 23.20.060

resource management units. These units are generally located in various areas along the Glenn and Parks Highways, Petersville, Oilwell and Montana Creek Roads and along the Alaska Railroad corridor.

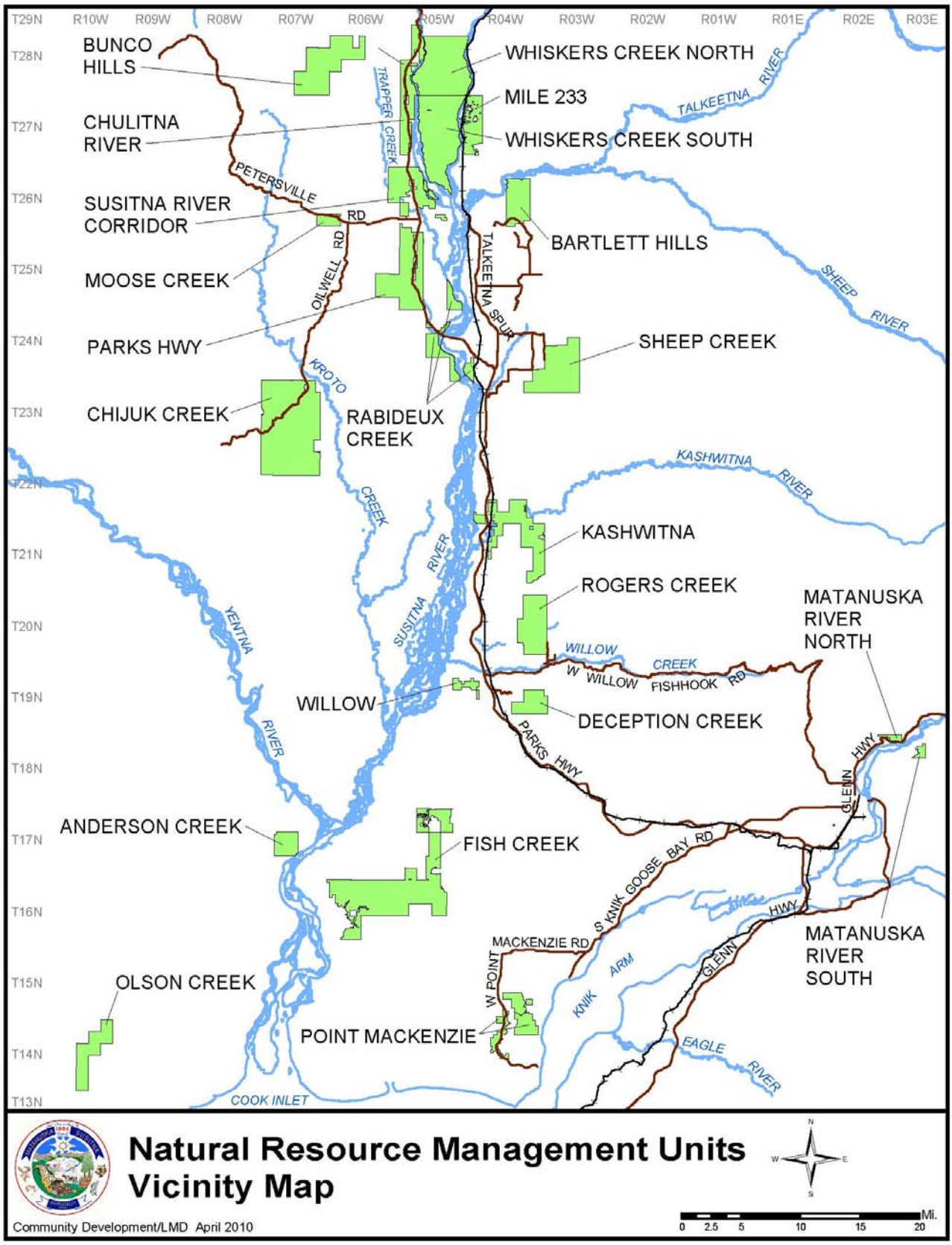
There are 22 Natural Resource Management Units that total approximately 167,000 acres. See map on the next page that shows these Units.

What the Plan Will Do

This plan establishes management intent, land use designations, and management guidelines which are the official policy for the management of various borough owned land and natural resources, including forest resources, within designated blocks or parcels, called Natural Resource Management Units.

Chapter 3, *Forest Management,* establishes how forest resources will be managed within the Natural Resource Management Units. Chapter 3 also applies to non-commercial use of forest products (firewood, salvage sales, and other non-commercial products that may occur on land outside of Natural Resource Management Units.

The plan has no direct effect on private, state, Mental Health Trust Land, School Trust Land or University of Alaska lands.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PARKS HWY
CHIJUK CREEK
WHISKERS CREEK NORTH
MILE 233
WHISKERS CREEK SOUTH
BARTLETT HILLS
SHEEP CREEK
RABIDEUX CREEK
KASHWITNA
ROGERS CREEK
MATANUSKA RIVER NORTH
WILLOW
DECEPTION CREEK
ANDERSON CREEK
FISH CREEK
MATANUSKA RIVER SOUTH
OLSON CREEK
POINT MACKENZIE
TRAPPER CREEK
PETERSVILLE RD
OILWELL RD
TALKEETNA SPUR
KROTO CREEK
SUSITNA RIVER
YENTNA RIVER
TALKEETNA RIVER
SHEEP RIVER
KASHWITNA RIVER
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W POINT
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Natural Resource Management Units
Vicinity Map
Community Development/LMD April 2010
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How the Plan is Organized

This asset management plan for Natural Resource Management Units is contained in four volumes.

Volume I

Chapter 1 includes a summary and purpose of the plan, how and why the plan was developed, what the plan covers, and a summary of plan actions.

Chapter 2 includes resource goals and guidelines for all borough land within natural resource management units. The goals and guidelines are listed by resource, program or management tool. Guidelines are specific directives that apply to land and water management decisions as resource uses and development occur.

Chapter 3 presents the specific forest management policy for all borough lands that are designated and classified in a category that allows for active forest management and timber harvest. This includes healthy forest management, forest inventory, silvicultural techniques, commercial and operable forest analysis, sustained yield, annual allowable cut, buffers, invasive species, cutting unit sizes, and timber sale processes. It also includes; contract and permit requirements; monitoring and enforcement.

Chapter 4 discusses specific actions necessary to implement the plan; how amendments to the plan can be made; research needs; and makes some future management recommendations. This chapter also recommends some changes to existing borough code that will make implementation of this plan possible.

Volume II

This volume has natural resource management plans for the twenty-one of the twenty-two natural resource management units. The *Fish Creek Management Plan* is not included in this volume because a management plan was adopted separately from this plan. All these units, including Fish Creek, will be managed for multiple-use purposes. All the units have active management or contain land and resources that are described in Volume I, Chapters 2 and 3.

Volume III

This volume contains a definitions/glossary, bibliography and informational literature, and an appendices. The appendices include a variety of background and educational information. The definitions/glossary are also included in volumes I and II to make it easier for the reader to reference commonly used technical words and terminology.

Volume IV

This volume is a summary of all the agency and public participation and involvement that lead to the development of this plan.

How the Plan Was Developed

This plan is the product of four years of work by state and federal agencies, local communities, interest groups and the public:

(1) First was a new public notice process[4], adopted in 2006, that greatly enlarged the scope of review and who will be directly notified of pending land and natural resource management actions.

(2) In 2006, timber harvest rules and guidelines that applied to all public and private land was adopted[5].

(3) An intensive "Forest Inventory Report"[6] of most of the boroughs forest resources was completed in 2006. The areas not inventoried, but identified for possible forest management and timber harvest during Phase I of development of this plan were inventoried in early 2009.

(4) The "Operable Forest Land Analysis Report"[7] was completed in 2007 for the same lands inventoried in the "Forest Inventory Report". The additional areas inventoried in 2009 were added to this report in 2009.

(5) A "Market Analysis and Timber Appraisal Report"[8] was also completed in 2007.

(6) A new chapter on Forest Management was adopted into Borough code[9] in 2007 that established Borough policy for:

- Forest Inventories
- Sustained Yield
- Annual Allowable Cut
- Forest Management Units
- Forest Management Plans
- Buffers
- Timber Sales

[4] MSB 23.05.025 (Ordinance Serial Number 06-034)
[5] MSB 28.60 (Ordinance Serial Numbers 06-222 (AM) and 06-223 (SUB)(AM)
[6] Sanders Forestry Consulting
[7] Sanders Forestry Consulting
[8] Northern Economics Inc.
[9] MSB 23.20 (Ordinance Serial Number 07-065 (AM)

- Fair Market Value Determinations
- Land Use and Timber Harvest Plans

Adoption of this new *Asset Management Plan: Natural Resource Management Units* is the final step in order to actively manage blocks of land for various multiple uses which includes, among other things, forest resources using accepted "Silvicultural" practices.

This plan also identifies and places certain borough owned land into Natural Resource Management Units. At the same time this plan classifies, provides goals, management intent and guidelines for management of these lands in an ecologically responsible manner.

Developing this Asset Management Plan, including the chapter on Forest Management, began in the fall of 2007. A review of all borough-owned land that is within existing Forest Management Units was completed along with some additional areas that had been obtained by the borough, after the Forest Management Units were created in 1990. These areas were reviewed to identify past and potential uses, forest health, and the amount of commercial and operable timber resources. The purpose was to be able to describe general information on how the forest and other resources within these units should be utilized and to determine which resource values should be protected.

During this same review it was evident that past policies and guidelines on sustained yield, annual allowable cut, forest research and study area needs, fish and wildlife protection, buffers, recreation, transportation, and water quality and quantity, wetlands, and riparian areas also needed to examined.

From January 18, 2008 through March 21, 2008, a document was made available to the public to review that contained two parts. The first part contained general information describing what had been completed so far. It also had explanations and definitions so that the reviewer could provide meaningful thoughts, comments and suggestions on recommendations on various proposed policies, and to comment on proposed goals and management guidelines for borough land within various proposed Natural Resource Management Units. The areas included in the 1990 Forest Management Units that were still owned by the borough were included in this review.

Approximately 3,350 notices were mailed to property owners, community councils, service districts, various affected industries, and interest groups. The review document was made available on the Borough's web site and at all public libraries. Public open houses were also held at the Upper Susitna Senior Center, Willow Area Community Association building, and at the Central Emergency Services facility in Wasilla.

At the conclusion of the public comment period, 78 individuals and groups submitted hundred's of comments, suggestions, edits, and other topics they thought needed to

be addressed in developing this Plan and the eventual designation, classification and management of the various management units. These comments were considered in the development of this Plan.

During April 2009 plan project staff participated in 7 public meetings with Alaska Department of Natural Resources staff working on the update for the Susitna Area Plan (now called Susitna-Matanuska Plan) and the Susitna Forest Guidelines. The public was invited to comment on the proposed management intent and land use designations for the proposed Natural Resource Management Units. Copies of the information were also sent to all affected community councils with an invitation to submit comments. Only a few comments were submitted by those attending the meetings and the mail out to the community councils. The comments received were also considered in developing this plan.

This plan was reviewed by various state agencies and borough staff as well as borough advisory boards during the summer and fall of 2009, revised as appropriate, and made available for public review beginning in December of 2009.

Notices were mailed to 4,480 property owners, community councils, service districts, various affected industries and interest groups. The draft plan was made available on the Borough's web site and at all public libraries. Copies of the plan were also sent to each affected community council. Public open houses/public meetings were held at the Trapper Creek Park Community Center, Upper Susitna Middle/High School, Wasilla Middle School and Willow Community Center. Approximately 50 people attended these meetings.

When the public comment period ended on March 15, 21010, about 82 people and groups had submitted comments which contained around 380 comments, concerns and issues that they wanted to see addressed in the plan. These issues were all summarized and appropriate changes were made to the plan.

Following these revisions the plan was again submitted to the Parks, Recreation and Trails Advisory Board and the Real Property Asset Management Board for their review and recommendations.

The Plan then went to the Planning Commission for a public hearing on July 19, 2010. The Planning Commission adopted Resolution 10-26 which recommended adoption of the Plan.

Finally the Borough Assembly held a public hearing on the Plan on September 21, 2010. The Assembly unanimously adopted the Plan through ordinance 10-083. The Assembly also adopted ordinance 10-084 (AM) which made the ordinance changes as recommended in Volume IV, Chapter 4.

More information, copies of pertinent information and summaries of public comments regarding these various elements of the public participation process

described above is included in Volume IV, *Public and Agency Participation*, of this Plan.

Natural Resource Management Units

From a forest and land management standpoint, it is often desirable to divide large areas of land into smaller units, and sometimes sub-units, as a reference for future actions. In some areas of the country, units are designated based on counties, watersheds, long-term sales, or other useful means. This same general approach was used for the boroughs' *1989 Forest Management Plan* and is being used in this new Plan[10].

In 1990, the Borough Assembly placed land into Forest Management Units. See *Appendix "C" – 1990 Forest Management Units* for a background and maps of these units. Forest management lands or units are defined in borough code[11] to be "lands which, because of physical, climatic, and vegetative conditions, are presently or potentially valuable for the production of timber and other forest products. Forest management shall emphasize the multiple use concept."

During the first phase of developing this plan, the public expressed that Forest Management Units, at least implied that land placed in these units were to be primarily managed for forest and timber harvest purposes. That is not the case in this plan. This plan does not use or place land in Forest Management Units. Instead, this plan designates blocks of land to be placed into individual "Natural Resource Management Units."

This more distinctive nomenclature, Natural Resource Management Unit, better reflects multiple resources, and does not imply one resource use has a higher priority over another resource. These units will be managed for multiple uses that reflect current and future social values and economics.

Each Natural Resource Management Unit consists of land with multiple resource values or uses. Fundamentally, multiple-use management provides that <u>not all land</u> within a unit be managed for timber harvest, or any other single resource. Some of the areas may be better suited for such purposes as fish and wildlife habitat, watershed protection, view sheds, recreation, agriculture, or simply left in a general category for a decision at a later time. This concept is very similar to multiple-use forest management by the United States Forest Service, or the Bureau of Land Management, but on a much smaller scale.

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[10] See MSB 23.20.050 (Multiple-Use Forest Management Units) and MSB 23.20.060 (Multiple-Use Forest Management Plan).

[11] See MSB 23.05.100

Figure I-1-1 illustrates the multiple resources considered in the preparation of this *Natural Resources Management Units Plan*.

Figure I-1-1
SOME NATURAL RESOURCES AND USES THAT ARE FOUND IN NATURAL RESOURCE MANAGEMENT UNITS

This plan recommends that a definition for Natural Resource Management Units be added to borough code (see Chapter 4: *Implementation and Recommendations, Ordinance Changes*).

Goals, Management Intent, Classifications, Designations, Guidelines and Best Management Practices

While all the units combined need to be managed consistent with the overall goals, management intent and objectives in this management plan, individual units and sub-units also need to be managed consistent with the various unit and sub-unit purposes contained in specific unit and sub-unit plans.

In order to mange land, various resources and uses within Natural Resource Management Units it is necessary to know what resources and uses exist, what can be done with those resources both socially and economically, and what uses can be accommodated and reasonably managed. To the natural resource management professional, these resource, social and economic factors are often described as goals, management intent, land use classifications (in some locations also called zoning), land use designations and management guidelines.

Goals are the general conditions the borough is trying to achieve. Goals are usually not quantifiable nor having a specified date of completion. Goals identify long-range conditions. Goals for different resources may conflict. For example, it may not be possible to have significant timber harvests and to maximize habitat protection for all wildlife species at the same time. The goals, however, do describe the ideal intentions for management. Multiple-use management does seek to achieve an optimal balance of public benefits, as much as possible, among all resources within a unit.

Management Intent defines near and long-term management objectives and the general approach to achieve those objectives. These statements have a specific geographic scope and usually apply to a specific management unit.

Classifications are defined in borough code.[12] Classifications identify the general purposes for how land will be managed.

Designations are categories of land used to implement the management intent and can further refine land use classifications for specific areas or parcels of land. Designations identify primary and, and sometimes, the secondary uses of land. For example, a land-use classification may be for "public recreation". Land use designations further refine the broad area into "public recreation – dispersed" or "public recreation – concentrated."

Guidelines are more specific intentions for management. They are specific standards or procedures to be followed in the issuance of permits, sales, leases, or other authorizations for the use of land or resources. Guidelines vary in their level of specificity, providing detailed management direction, general guidance, or the identification of factors that need to be considered in decision making.

[12] MSB 23.05.100, also see Volume III, Appendix "A" for a listing and descriptions of *Land Use Classifications.*

Best Management Practices are often referred to as "BMP's" and are used on a regular basis by land and natural resource managers when making decisions. Generally, BMP's are techniques, methods, processes, and activities that are more effective at delivering a particular outcome better than any another known technique, method or process. They are the most efficient (least amount of effort) and effective (best results) way of accomplishing a task, based on repeatable procedures that have proven themselves over time.

Figure 1-1-2 is a broad look on how these various social, economic and land ownership portfolio and management terms apply at different levels. Figure I-1-3 illustrates the hierarchy and function of goals, management intent, classifications, designations, guidelines and best management practices.

Figure 1-1-2
Relationship of Goals, Management Intent, Land-Use Classifications, Land-Use Designations and Guidelines to Borough Owned Land

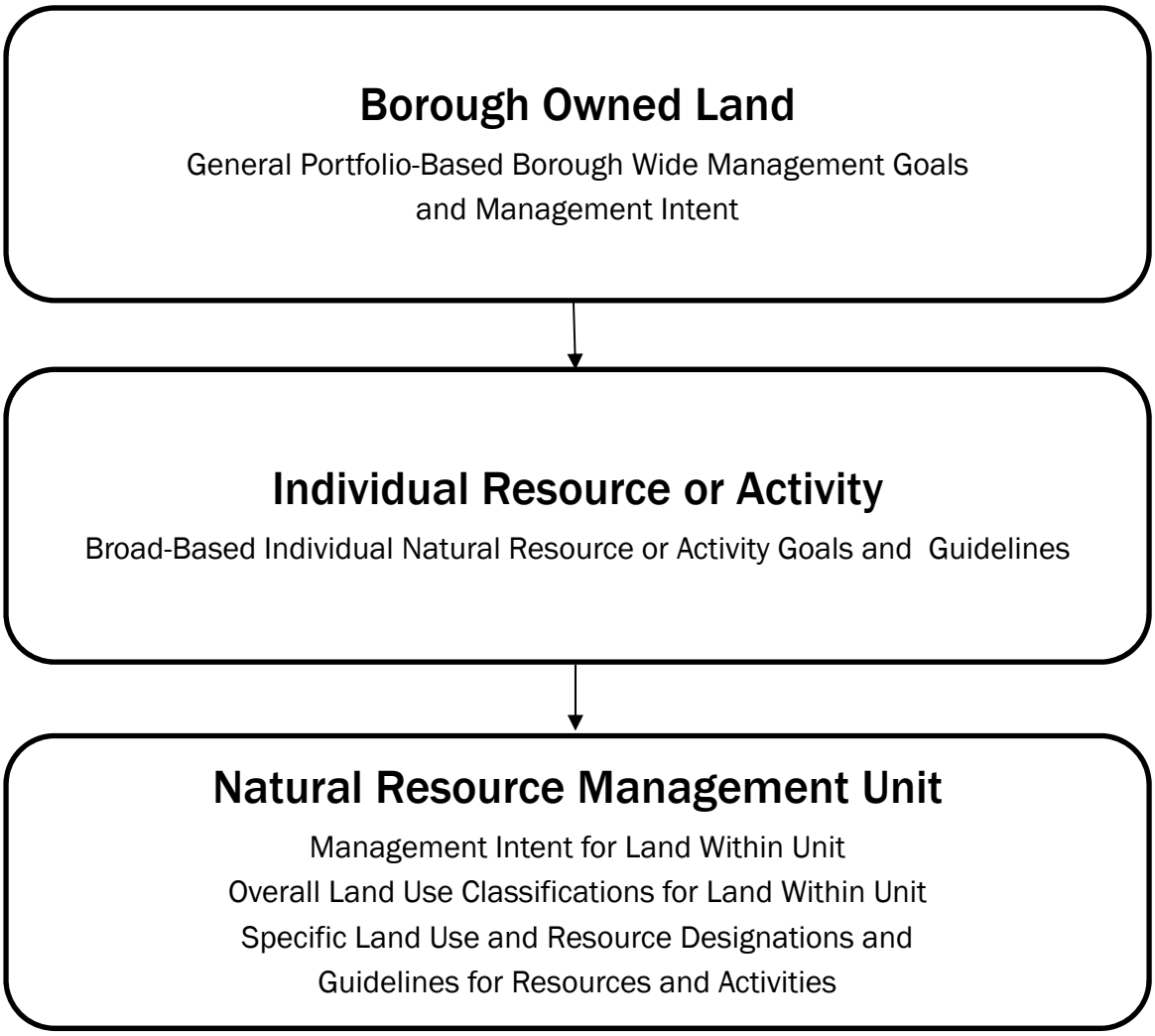


Figure I-1-3
Hierarchy and Function of Goals, Management Intent, Land-Use Designations, Land-Use Classifications, Guidelines and Best Management Practices.

Goals

- Ideal Intentions for Management
- Usually Not Quantifiable
- Usually No Completion Date

↓

Management Intent

- Near and Long Term Management Objective
- General Approach to Reach Goal
- Specific Geographic Scope

↓

Classifications

- Broad General Categories that covers Management Intent (i.e. public recreation)
- General Inventory or Portfolio of Borough Land

↓

Designations

- Implements Management Intent and Refines Classifications
- Specific Uses for Parcels of Land (i.e. public recreation-concentrated, public recreation – dispersed)
- Primary and Secondary Uses

↓

Guidelines

- Provides Standards or Procedures for Implementing Management Intent and Designations
- Can be Specific (i.e. public notice shall be given)
- Can be General (factors to consider when making a decision, i.e. market conditions)

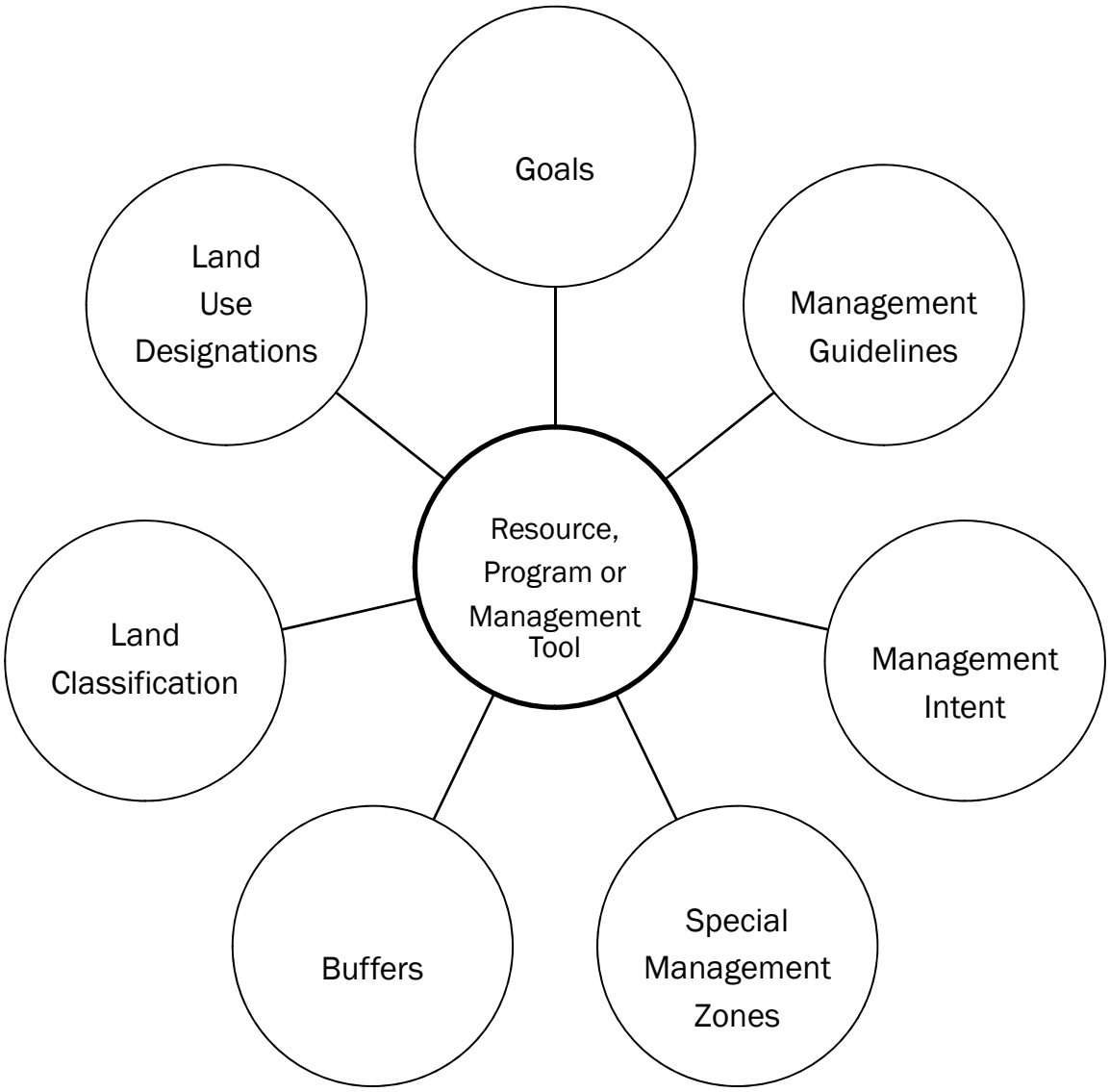
↓

Best Management Practices

- Use of Efficient and Effective ways to accomplish a task, Based on Repeatable Procedures that have proven themselves over time
- Used on a regular basis by Land and Natural Resource Managers when making Decisions and Implementing Guidelines

Protective and/or management measures also include a variety of tools, such as a combination of buffers and special management zones on which results in an extensive, integrated system of land management options to protect such resources and uses as watershed, important fish and wildlife habitat and use areas, trails, and public recreation areas. Figure I-1-4 illustrates some of these management tools.

Figure I-1-4
Resource, Program and Management Tools for Managing Various Natural Resources and Activities



Special Management Zones

This Plan introduces a new land protection and management tool, Special Management Zones, which can be used for a wide variety of purposes.

Special Management Zones will be used for special types of lands within a natural resource management unit or sub-unit providing additional protection for a specific reason, yet allowing some activities to occur with restrictions.

For example, Special Management Zones can be used by the boroughs' natural resource managers for additional shoreline or wetland protection (perhaps allowing some uses when adequate snow cover exists), seasonal wildlife concentration areas, seasonal trumpeter swan staging areas, brown bear denning areas, protecting important cultural and historic sites, designating single-tree harvesting areas, or select cut areas. Resource extraction and use activities can occur in these zones, under certain conditions, such as seasonal restrictions or methods and means.

Special Management Zones can also be used for creating Forest Education and Improvement Study Areas. (See Volume I, Chapter 3; *Forest Education and Improvement Study Area(s)* for more information). These areas can be used for both short and long-term studies of the effects of small scale logging efforts and for silvicultural, ecological and environmental on-the-ground education areas that can be integrated with school education programming.

When creating a Special Management Zone, the management intent and management guidelines for the zone must be clearly defined.

Application of this Plan for Natural Resource Management Units and other Asset Management Plans on Borough Land

This Plan contains management intent, land use designations, land use classifications, and management guidelines that apply to specific parcels or areas of land identified in this Natural resource Management Unit Plan. Land use designations, management guidelines, and land-use classifications for borough owned land in other geographic areas not included in this plan are also found in other borough land-use plans, specifically other natural resource asset management plans.

Where forest management, or any other natural resource, land use or activity is a component within a plan for a Natural Resource Management Unit, Chapter 2 (*Natural Resource Management Unit Goals and Guidelines by Resource or Activity*) and Chapter 3 (*Forest Management*) shall be used. Each individual Natural Resource Management Unit may also have more detailed guidelines or management intent that applies only to that unit.

Where an Asset Management Plan for borough land not in a Natural Resource Management Unit is silent as to general management guidelines or does not have more specific guidelines, Chapter 2, (*Natural Resource Management Unit Goals and Guidelines by Resource or Activity*) and Chapter 3, (*Forest Management*) of this plan apply.

Relationship of this Natural Resource Management Units Plan to Other Borough Plans

Alaska state law (AS 29.40.010(a)) mandates that all boroughs "shall provide for planning, platting, and land use regulations on an area-wide basis". The Matanuska-Susitna Borough has adopted a comprehensive plan, exercises platting authority, and regulates land use borough-wide except where it has delegated selected planning powers to the cities of Houston, Palmer, and Wasilla.

The borough comprehensive plan is a mosaic of many separate plan elements. The plans generally fall into one of the following categories:

- State and Federal plans;
- Borough Regional plans;
- Community plans;
- Specialty or Functional plans.

State plans generally address how state lands are to be managed. Borough plans guide the development of the various areas of responsibility. For example, transportation and public facility plans guide the development of the borough's future infrastructure. Community plans address community goals and objectives as well as how these goals and objectives will be achieved at the local level. Lastly, specialty or functional plans address specific issues, such as the management of a particular lake or the waste management function of the borough. The relevant recommendations of other borough plan elements are integrated into the Borough Wide Comprehensive Plan, by adoption of the plan into *Title 15, Planning*, of the Matanuska-Susitna Borough Code of Ordinances. Plans adopted into Title 15 are then used as the framework for preparing land use and development regulations.

This *Natural Resources Management Units* plan builds from the general policies of the Borough Comprehensive Plan among other things. The Borough Comprehensive Plan includes, but is not limited to, polices on transportation, watershed management, parks, recreation, open space, and trails. All these resource plans, individual and collectively, must be integrated into land management regimes that ensures ecologically responsible multiple-use asset management.

This plan also builds on and utilizes various community comprehensive plans that cover areas where potential forest management and timber harvest may occur. This plan is conceptually consistent with the general intent and policies of the *Matanuska-Susitna Borough Coastal Management Plan*. However, specific consistency

determinations can only be made as part of the coastal zone agency review process based on specific project proposals.

All these plans, including this *Natural Resources Management Units* plan, should be reviewed on a regular and periodic basis to monitor progress in implementing the plan and to identify when social, economic, environmental, or changes to the resource base have occurred. Significant changes are an indicator that an update, amendment or modification may be needed. All plans must be flexible enough to change as social, economic, environmental or changes to the resource base occur. Any changes that are made should be made in an integrated manner with other plans that may be affected.

Also, see Chapter 4, *Implementation and recommendations, Coordination with Other State and Borough Plans and Procedures.*

Who Developed the Plan?

The plan was developed by Ron Swanson (RWS Consulting) working under contract with the borough. RWS Consulting worked closely Richard Sanders (Sanders Forestry Consulting), Gary Greenberg (Alaska Map Service), Mike Cooney (Forest Consultant), Cal Kerr (Northern Economics) and numerous individuals with state agencies and borough land and resource staff throughout the development of this plan.

The boroughs' Parks, Recreation, and Trails Advisory Board, and particularly the Real Property Asset Management Board spent many hours reviewing, debating, and recommending additions, changes, and suggestions on how to make this plan better.

The public, interest groups, and community councils have also played a significant role in developing this plan. The hundreds of comments received throughout the development of this plan indicated that people cared about the borough land and its natural resources and how they should be managed.

Chapter 2
Natural Resource Management Unit Goals and Guidelines by Resource, Program or Management Tool

Introduction

This chapter presents general goals and guidelines for the management of each major resource and issues affected by the asset management plan for "Natural Resource Management Units" except for Forest Management, which is found in Chapter 3. The major resources and issues are not in any priority, but they are presented in alphabetical order in this chapter. They are:

- Agriculture and Grazing
- Buffers
- Cultural Resources and Historic Sites
- Fish and Wildlife Habitat
- Green Infrastructure
- Private Property
- Public Recreation and Tourism
- Rock, Sand and Gravel
- Settlement
- Special Management Zones
- Trails
- Transportation
- Water Quality and Quantity, Wetlands and Riparian Resources

In that all residents of the borough own the boroughs' land and resources borough-owned Natural Resource Management Units are managed for multiple uses for the benefit of all residents. For more information and details on individual resource policies, goals, objectives and guidelines, please refer to the particular resource management plan[13], Borough ordinances (Chapter 15 (planning), 17 (zoning), 23 (real property), 28 (natural resource utilization)), and the Division of Land and Resource Management Policy and Procedures manual for those individual resources related to real property.

The polices that follow for each natural resource, program or management tool are presented with some background information when appropriate, and then into two categories for each subject; goals and guidelines. For an explanation of goals and guidelines, see Volume I, Chapter 1; *Goals, management Intent, Classifications, Designations, Guidelines, and Best Management Practices* and the *Definitions/Glossary* in Volume III.

[13] For example; Parks and Open Space Plan, Recreational Trails Plan, etc.

General Information

The Alaska Constitution[14] and borough code[15] require that public land held by the borough shall be managed for multiple purposes. There are three exceptions to this multiple-use policy: land that is sold, leased, or otherwise taken from public management; land designated by the Borough Assembly for a particular use (such as a park, municipal building or facility); or land dedicated through the platting process for a specific public purpose (such as open space, road, trail or for a utility).

The multiple-use policy does not mean that all uses are allowed in all locations, but within all the Natural Resource Management Units combined, most opportunities can be available. Public comments received during scoping felt this was important. This plan, and all other Borough Asset Management Plans, emphasizes minimizing land use conflicts through plan guidelines rather than through prohibitions. However, if the borough determines a proposed use is incompatible with the designated use, the proposed use shall not be authorized, or it shall be modified so that the incompatibility no longer exists.

Borough land will also be managed to protect access to public resources except when it is determined that access may be significantly detrimental to a resource or for public health, safety and welfare.

General Goals for All Natural Resource Management Units

The following goals apply to all borough land within Natural Resource Management Units, except as otherwise designated or authorized by the Borough Assembly. The goals are listed alphabetically without priority.

Agriculture and Grazing. Permit agriculture and grazing on a case-by-case basis when practical, feasible and with no or minimal financial impacts to the borough for infrastructure development and maintenance.

Economic Development. Provide opportunities for jobs and income by managing public land and resources to contribute to a vital, self-sustaining local economy, consistent with community character and sentiment.

Energy Development. Consistent with other goals, seek to facilitate development of energy sources within the Borough which are necessary to supply heat and energy to borough residents, as well as to contribute to a vital self-sustaining local economy by ensuring ongoing energy supplies for local industries and businesses.

Fiscal Costs. Consistent with other goals, minimize the direct and indirect monetary impacts of providing government services and facilities, such as roads.

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[14] Article 8

[15] Generally MSB 23.05, specifically MSB 23.05.05

Public Health, Safety, and Welfare. Maintain or enhance public health, safety, and welfare for users of public land and resources.

Public Participation. Provide the public the opportunity for meaningful participation in management decisions affecting the natural resources and uses of borough owned land.

Public Use. Provide and enhance diverse opportunities for public use of borough (public) lands, by residents and visitors, consistent with the borough's ability to manage the use so as to protect the natural environment and avoid user conflicts. For example, uses may include hiking, sightseeing, wildlife viewing, hunting, fishing, skiing, dog mushing, snowmobiling, and other types of recreation.

Quality of Life and of the Natural Environment. Maintain or enhance the quality and diversity of the natural environment, including air, land and water, fish and wildlife habitat; protect cultural resources and historic sites; and, recognize the character and lifestyle of the community.

Settlement. Provide opportunities for private ownership and leasing on other land currently owned by the Borough. There shall be no land sales or leases within Natural Resource Management Units unless specifically authorized by the Borough Assembly.

Sustained Yield. Maintain the long-term productivity and quality of renewable resources on a sustained yield basis including habitat for fish and wildlife, and forest resources.

Transportation. Maintain an area-wide regional transportation system, including trails while not creating new permanent roads solely to or within Natural Resource Management Units unless specifically authorized by the Borough Assembly.

General Guidelines for All Natural Resource Management Units

The borough shall use these guidelines when issuing authorizations and conveyances or making natural resource management decisions. These guidelines apply to all land within the Natural Resource Management Units covered by this or any other borough asset management plan(s), unless a specific plan explicitly establishes different management objectives, recommendations, policy, guidelines, land-use designations or management intent.

A. **Authorizations**. All authorizations for use of borough land will be consistent with the management intent and land use designations of this plan. In considering authorizations, the borough will adjudicate applications to:

1. Minimize damage to waterbodies, fish and wildlife habitat, riparian vegetation, wetlands and other resources; and

2. Minimize conflicts between resources and users; and

3. Protect the long-term value of the resource, public safety, and the environment.

B. Other Authorizations. If authorizations from other agencies are required, the borough shall consider issuing a permit, lease or other authorization contingent upon issuance of these other agency authorizations (i.e., a surface authorization by the borough to develop a sub-surface resource owned and managed by the state).

C. Public Involvement. The borough shall provide affected community councils, property owners, non-profit organization, industry and the public the opportunity to review and comment on proposed authorizations to use or utilize borough land by:

1. Providing public notice as required by MSB 23.05.025 for all proposed sales, leases, exchanges or other disposal of borough-owned real property or resources for a period in excess on one-year.

2. Seek review and comment on all proposed management decisions affecting the natural resources and uses of borough owned land within Natural Resource Management Units from affected community councils.

3. Seek meaningful participation from local committees and/or non-profit organizations endorsed by the local community councils on the management and on proposed authorization actions for borough-owned land within Natural Resource Management Units.

4. Seek input and comments from industries and interest groups that could be affected by management decisions and proposed authorization actions for borough-owned land within Natural Resource Management Units.

5. Involve the borough's Parks, Recreation and Trails and Real Property Asset Management Board's in reviewing and making recommendations on the management and proposed authorization actions for borough-owned land within Natural Resource Management Units.

General Natural Resource Management Unit Goals and Management Guidelines by Resource, Program or Management Tool

The following resource goals and management guidelines apply to all Natural Resource Management Units unless other specific goals, management intent, and guidelines are adopted for a specific parcel or management unit.

A number of specific borough-wide resource goals and management guidelines may affect other specific resource goals and objectives in this chapter. It is important for the reader to review all the various resource goals and guidelines for any planned activity to ensure that all goals and objectives are met, addressed or mitigated, where practical.

The various natural resources, programs or management tools are not in any priority order, they are listed in alphabetic order. The goals for each resource, program or management tool are also not in any priority order, they are also listed in alphabetic order. The management guidelines for each resource, program or management tool are not in either priority or alphabetic order. There is no priority of one guideline over another. Priorities may be established in specific plans for Natural Resource Management Units or other asset management plans.

* *Agriculture and Grazing* *

Resource Goals and Guidelines

Areas for agriculture sales and leases may occur only if specifically approved in a Natural Resource Management Unit Plan or on a case-by-case basis by the Borough Assembly. Specific sales are subject to additional public notice under MSB 23.05.025. If sales are authorized by the Borough Assembly, the area shall be excluded from the specific Natural Resource Management Unit and not be subject to this plan.

Grazing may be permitted in any Natural Resource Management Unit and only as a secondary activity. Grazing may only be permitted if the activity is conducted in a way that does not diminish or prohibit the primary or other secondary management intent(s) for the unit or sub-unit.

* *Buffers* *

There are various requirements for natural buffers and setbacks in federal law; (Endangered Species Act, 16 U.S.C. 1531-1544, 87 Stat 884, etc.), state law; (AS 41.17, Alaska Forest Resources and Practices Act) and borough code; MSB 17.55 (Setbacks and Screening Easements), MSB 17.28 (Interim Materials District), MSB 17.30 (Earth Materials Extraction Activities), and MSB 28.60 (Timber Harvest). There are also numerous borough plans (i.e., scenic by-way, local comprehensive plans, Special Land Use Districts and land use and/or management plans.

The buffers described in this section are not intended to repeat or be fully definitive for all these requirements. Before undertaking any natural resource extraction or development activity, these and other applicable federal, state and borough laws and regulations should be fully researched and shall be followed.

In the case of a discrepancy between the management guidelines in this section, and federal, state, or borough laws and regulations, the more stringent shall be followed.

Some of the buffers in this section, and in the section on Special Management Zones described later in this chapter, are in addition to those listed above and are for the protection of various natural resources and to provide natural areas and open space within the various management areas.

Except for those buffers required by federal, state, or borough laws and regulations, the size of buffers and Special Management Zones may be adjusted on a case-by-case basis in Natural Resource Management Unit plans or other asset management plans as long as the guidelines for making adjustments in this plan are followed.

Management Goals

Cultural Resources and Historic Sites. Ensure protection of cultural resources and historic sites.

Endangered and Threatened Species. Protect areas used or needed by endangered and threatened species as identified by the U.S. Fish & Wildlife Service and the Alaska Department of Fish and Game.

Ensure Access to Public Lands and Waters. Maintain or enhance responsible public use and recreational opportunities.

Private Property. Establish buffers to minimize visual, noise, dust, odor, light pollution, environmental pollution, or other negative impacts to private land.

Roads, Trails and Utilities. Mandatory no-cut buffers shall be used along private property boundaries, dedicated roads, trails, and utilities to protect, among other things, scenic and visual values.

Special Management Zones. Utilize Special Management Zones, where necessary to provide an additional level of protection to important fish and wildlife habitat areas, important public recreation areas, cultural resources and historic sites or to where site specific conditions are needed, while still allowing forest management and an appropriate level of timber harvest or other specific activities.

Waterbodies. Mandatory no-cut and limited use buffers shall be used along and adjacent to all water bodies containing anadromous or high-value resident fish waterbodies to protect important fish habitat.

Watersheds and Wetlands. Utilize no-cut and limited use buffers and/or Special Management Zones shall be used to protect important watershed and wetland areas.

Management Guidelines

A. **Riparian Buffers.** When conducting any natural resource extraction, other development activity, or more than a random or occasional recreational activity or use, riparian buffers, including augmented buffers as required by the Alaska Forest Resources and Practices Act and Regulations for Region II shall be followed. See Volume III, Appendix "E*": Riparian Buffers,* for a listing and description as of the date this plan was adopted.

B. **Lakes.** A 100-foot buffer shall surround all lakes that are part of a flowing water system that are connected to creeks, streams, and rivers. On lakes that do not contain anadromous or high value fish waters, and do not provide nesting and rearing habitat for Trumpeter Swans, vegetation management is allowed in this zone to prevent or control outbreaks of insects or disease or to suppress wildfire. Harvesting to prevent or control outbreaks of insects or disease shall require public notice and reforestation should occur.

Vegetation management also is allowed to remove hazards to public safety.

C. **Borough Property**. There shall be a 100 foot no-harvest natural vegetation buffer along all borough owned property boundaries between timber harvest operations area and the immediately adjacent private property boundary.

1. Limited select harvest within the buffer may occur if:

   a. the adjacent property owner is consulted and does not object; or

   b. the concerns of the property owner have been adequately addressed.

Also see G, exceptions, below.

D. **Roads**. There shall be a 100-foot buffer either side of the right-of-way on all platted and constructed roads except scenic highways. Also, see G, exceptions below.

E. **Scenic Highways.** There shall be a 200 foot buffer either side of the right-of-way for all scenic highways (portions of the Glenn and Parks Highways and Petersville Road). Also, see G, exceptions below.

F. **Trails.** There shall be a 100 foot buffer of each side of the centerline of all trails on borough land identified in the boroughs *Recreational Trails Plan*.

G. **Buffer Exceptions.** Exceptions to the requirements for buffers along borough property, roads, scenic highways, important wildlife habitat, and trails, may be made, if during the public notice process, the specific terms and conditions or the

adjustments are addressed. Besides exceptions, Special Management Zones may also be utilized.

Examples of conditions where an adjustment to either increase or decrease buffers may be made include, but are not limited to:

1. where an adjacent property owner does not object; or

2. that are adjacent to rights-of-way on public roads where other management goals and objectives, such as wildfire prevention and other public safety hazards, disease control, or wildlife habitat enhancement (upon the recommendation of the Alaska Department of Fish and Game), are of overriding priority; or

3. protection of important habitat or to increase public safety, or

4. that are adjacent to trails where other management goals and objectives, such as wildfire prevention, are to be achieved; or

5. parking areas and trailheads where other management goals and objectives, such as wildfire prevention, and other public safety hazards, disease control, or wildlife habitat enhancement (upon the recommendation of the Alaska Department of Fish and Game), are of overriding priority.

H. Cultural Resources and Historical Sites. There shall be a mandatory 300-foot no-disturbance buffer surrounding the boundaries of known historic, archaeological or paleontological sites unless the State Historic Preservation Office or the Borough Cultural Resources Division determines, in consultation with the Community Development Department, that certain activities can occur without significantly impacting the cultural resource. In such a case, a Special Management Zone should be utilized.

I. Wildlife Species of Concern.

1. Eagle Nests. There shall be a mandatory 330-feet buffer surrounding all active eagle nesting trees. Wider buffers, or Special Management Zones may be established for individual nest sites where the Alaska Department of Fish and Game or the U.S. Fish & Wildlife Service identifies activities or site-specific factors that make special provisions necessary. Determinations of where a wider buffer, or a Special Management Zone is needed shall be made with due deference to the Alaska Department of Fish & Game. The Alaska Department of Fish and Game shall be encouraged to consult with the U.S. Fish & Wildlife Service before making a determination.

2. Peregrine Falcon Nests. There shall be a mandatory no-cut and no-disturbance 330' buffer around the radius of any peregrine falcon nesting site. Wider buffers or a Special Management Zone may be established for individual nest sites where the Alaska Department of Fish and Game or the U.S. Fish & Wildlife Service identifies activities or site-specific factors that

make special provisions necessary. Determinations of where a wider buffer, or a Special Management Zone is needed shall be made with due deference to the Alaska Department of Fish & Game. The Alaska Department of Fish and Game shall be encouraged to consult with the U.S. Fish & Wildlife Service before making a determination.

J. **Other Guidelines Affecting Buffers.** A number of other guidelines may affect buffers. For details of the guidelines, see the following sections of this chapter:

- Cultural Resources and Historic Sites
- Fish and Wildlife Habitat
- Green Infrastructure
- Private Property
- Public Recreation and Tourism
- Rock, Sand and Gravel
- Special Management Zones
- Trails
- Transportation
- Water Quality and Quantity, Wetlands and Riparian Areas

Also, see Volume I, Chapter 3: *Forest Management.*

Buffer Management Summary

Providing buffers and Special Management Zones provides an extra level of protection for such things as specific wildlife, resources, public use areas, etc. At the same time activities, such as public recreation, timber harvest, sand and gravel extraction and other similar activities may be allowed to occur on a site specific or area specific basis, but under certain conditions.

* *Cultural Resources and Heritage Sites* *

Management Goals

The *Alaska Historic Preservation Act*[16] and Borough Code dealing with historic preservation[17] establish the Borough's basic goal: to preserve, protect, and interpret the historic, prehistoric, and archaeological resources in the Borough and in Alaska so that the scientific, historic, and cultural heritage embodied in these resources may pass undiminished to future generations.

Management Guidelines

A. **Heritage Resources Identification.** Identify and determine the significance of all heritage resources on public land through the following actions:

1. Cooperative efforts for planned field surveys and inventories among the borough, state, federal, local and native groups;

2. Heritage resources surveys conducted by the borough Cultural Resources Division;

3. Research heritage resources on borough land by qualified individuals and organizations.

B. **Historic Sites Protection.** Protect significant historic sites through the following actions:

1. Review on the ground land and renewable resource projects and uses for potential conflict with heritage resources;

2. Cooperate with state, federal, local and native groups to develop guidelines and recommendations on how to protect the site so as avoid or mitigate specific identified or potential conflicts.

C. **Cultural Resources and Historic Sites in Forest Management, Sand and Gravel Extraction, and Other Development Activities.** The Borough's Cultural Resource Division shall be requested to review proposals for forest management, sand and gravel extraction, development actions and other similar activities. The Division of Cultural Resources will recommend archaeological surveys in these areas with a high potential of heritage resources. Areas of known historic, archaeological, or paleontological sites shall not be disturbed.

Forest management, sand and gravel extraction and other similar activities shall not occur within 300 feet from the boundaries of known sites unless the Planning and

[16] AS 41.35
[17] MSB 1.10.160

Land Use Director, in consultation with the Community Development Director, determines that certain and/or limited activities can occur without significantly impacting the heritage resource. In such a case, a Special Management Zone may be created.

The Cultural Resource Division shall, within the limits of staffing and funding, assess the extent and significance of the heritage resource and work with the Land and Resources Division to develop site-specific mitigation measures to protect the heritage sites while allowing appropriate timber management and harvest activities on surrounding lands to occur.

D. **Heritage Resources Adjacent to Recreation Facilities.** Recreation facilities that might subject heritage sites to vandalism because of the increased public use shall not be placed adjacent to the heritage sites.

E. **Heritage sites should be reported when found.** The Alaska Heritage Resources Survey[18] is an inventory of all reported historic and prehistoric sites. This Survey is used to protect heritage resource sites from unwanted destruction. By knowing of possible heritage sites prior to construction, conversion of land use, or natural resource utilization, efforts can be made to avoid project delays and prevent impairment of the heritage sites.

While over 22,000 sites have been reported within Alaska, this is probably only a very small percentage of the sites that may actually exist but have not yet been reported. The *Heritage Resources Survey* is not complete or static, so heritage sites, when found, shall be immediately reported to the Borough Cultural Resources Division or State Office of History and Archeology.

F. **Other Guidelines Affecting Cultural Resources and Historic Sites**. A number of other guidelines may affect cultural resources and historic sites. For details of the guidelines, see the following sections of this chapter:

- Buffers
- Green Infrastructure
- Public Recreation and Tourism
- Special Management Zones
- Trails
- Transportation

Also, see Volume I, Chapter 3: *Forest Management.*

[18] The Alaska Heritage Resources Survey is maintained by the State Division of Parks and Outdoor Recreation, Office of History and Archeology.

Cultural Resources and Cultural Sites Management Summary

Cultural resource and historic sites are not a specifically land use designation category. They are not designated or classified in order to not draw attention to the sites which could lead to vandalism theft, or other forms of damage or loss. However, important cultural resources and historic sites should be protected with management intent language and specific guidelines pertaining to each site.

The Alaska Historic Preservation Act requires that important scientific, historic, and cultural heritage resources be preserved and protected. This shall be done through the use of cultural surveys, including field investigations and protection of important sites. Mitigation measures such as buffers or Special Management Zones shall be utilized to protect cultural resources and historic sites while allowing natural resource extraction and other development activities to occur.

* *Fish and Wildlife Habitat* *

Borough land within Natural Resource Management Units contains habitats for fish and wildlife species that support healthy ecosystems as well as the economy and lifestyle of borough residents. The management of borough land will minimize the impact on these habitats, even in areas designated for resource extraction or other development activities.

Resource Goals

Ensure Access to Public Lands and Waters. Ensure access to public lands and waters to maintain or enhance responsible public use and enjoyment of fish and wildlife resources in a manner that does not degrade the habitat and resource values.

Maintain and Enhance Habitat. Maintain or enhance the existing diversity of wildlife habitat that contributes to the overall health of the ecosystem through coordinated management, establishment of protective measures, habitat enhancement, site rehabilitation and research programs.

Maintain Fish and Wildlife. Manage land to help maintain fish and wildlife resources to provide sustainable populations that support commercial, recreational and subsistence activities.

Mitigate Habitat Loss. Avoid or minimize reduction in the quality and quantity of important wildlife habitat when resource development projects occur.

Natural Habitat Areas. Maintain non-commercial and inoperable commercial forest land, and in some cases operable forest land, to provide natural habitat for wildlife that depend on undisturbed or old-growth forest habitats, provide for the sustained yield and healthy populations of fish and wildlife resources; maintain a diversity of species; and, support compatible commercial, recreational, and traditional uses.

Provide Economic Opportunities and Employment. Contribute to the borough's economy by protecting the fish and wildlife resources that contribute directly or indirectly to local, regional, and state economies through the consumptive and non-consumptive use by commercial, recreational, and personal users.

Wildlife Corridors. Provide for winter range habitat for ungulates and other wildlife species away from road and railroad corridors when timber harvest activities occur. In addition, provide wildlife movement corridors to accommodate the natural movement of wildlife, i.e., from rivers to and from high country or across drainages.

Management Guidelines

During Phase I (Scoping and Issues Identification) of developing this plan, many public comments that were received stated that the information given about wildlife (see *Definitions/Glossary* at the end of this Volume or in Volume III) was not specific enough as to species and specific locations. Unfortunately, many of these specifics are not available on a case-by-case or location specific basis at this time. What general information is available from Alaska Department of Fish and Game has been included in the individual plans for Natural Resource Management Units (see Volume II: *Natural Resource Management Units).* Information from other credible sources was utilized when the information provided could be verified.

Some of the information that is available is old and/or not site specific enough must be updated prior to any natural resource extraction or other development activities taking place.

The guidelines that follow in this section, and in other specific resource and activities in this plan, do provide methods and processes that must be followed to protect threatened or endangered wildlife species, important wildlife seasonal congregation, Trumpeter Swan and migratory bird nesting and rearing areas, denning and other important habitat areas prior to any forest management, timber harvest, sand, rock and gravel extraction or similar development activity taking place.

A. **Mitigation**. When issuing permits, leases or other authorizations, or otherwise authorizing the use or development of land, the borough will recognize the requirements of the activity or development and the impacts to habitat to establish stipulations or measures needed to protect fish, wildlife, or their habitats. The costs of mitigation, relative to the benefits gained, shall be considered in the implementation of this guideline.

All land use activities shall be conducted with appropriate inventory, survey, planning, public input and implementation to avoid or minimize adverse effects on fish, wildlife, or their habitats.

The borough shall monitor and enforce stipulations and measures, and by requiring the responsible party to remedy any significant damage to fish, wildlife, or their habitats that may occur as a direct result of the party's failure to comply with applicable law, regulations, or the conditions of the permit or lease.

When determining appropriate stipulations and measures, the borough shall apply, in order of priority, the following steps:

1. Avoid anticipated, significant adverse effects on fish, wildlife, or their habitats through siting, timing, or other management options.

2. When significant adverse effects cannot be avoided by design, siting, timing, or other management options, the adverse effect of the use or development will be minimized.

3. If significant loss of fish or wildlife habitat occurs, the loss shall be rectified by the responsible party by repairing, rehabilitating, or restoring the affected area to a useful condition.

The borough shall utilize the Wetlands Land Bank to mitigate adverse affects on qualified wetland or riparian areas.

B. Riparian Zones. Authorizations for use of riparian zones of anadromous and high-value resident fish streams should protect the habitat and water quality from significant adverse effects.

C. Habitat Manipulation. Habitat manipulation, forest management practices, or other measures may be used to improve habitat for fish and wildlife species when the Alaska Department of Fish and Game determines that it is beneficial to the species or habitat and the borough determines that it is compatible with other primary and secondary uses and management intent.

D. Important Habitat and Wildlife Areas. Information in specific natural resource management unit plans concerning important wildlife habitat or wildlife concentration, nesting, rearing and denning areas shall be as specific and current as possible. The Alaska Department of Fish and Game shall be requested to provide this information. Local landowners and other credible sources should also be used to obtain additional resource and use information that may not be otherwise available. In the case of a disagreement, due deference shall be given to the Alaska Department of Fish and Game.

E. Threatened and Endangered Species. All land use, forest management and resource extraction activities shall be conducted consistent with federal *Endangered Species Act*[19], the *Eagle Protection Act*[20], and other applicable federal and state laws to avoid jeopardizing threatened or endangered species; to provide for their continued use of an area; and to avoid modifying or destroying their habitat. Specific mitigation recommendations shall be identified through consultation with the Alaska Department of Fish and Game for any land use activity that potentially affects threatened or endangered species.

The U.S. Fish and Wildlife Service and the Alaska Department of Fish and Game shall be consulted on questions that involve federally or state listed threatened or endangered species.

F. Other Guidelines Affecting Fish and Wildlife Habitat. A number of other guidelines may affect stream corridors and wetlands. For details of the guidelines, see the following sections of this chapter:

- Buffers
- Green Infrastructure
- Public Recreation and Tourism
- Rock, Sand and Gravel
- Special Management Zones
- Trails
- Transportation
- Water Quality and Quantity, Wetlands and Riparian Areas

Also, see Volume I, Chapter 3: *Forest Management*.

Fish and Wildlife Habitat Resource and Management Summary

Protecting important or unique fish and wildlife habitat and the ability to view and harvest fish and wildlife is an emphasis of this plan. This shall be specifically addressed in parcel or Natural Resource Management Unit plans, as well as in specific Plan(s) of Operations.

Important or unique fish and wildlife habitat is designated as Habitat as a primary designation and is usually classified as Public Recreation, Watershed, or Wetland Bank. Fish and wildlife habitat as a secondary designation may also be located within areas

[19] Endangered Species Act of 1973 (16 U.S.C. 1531-1544, 87 Stat. 884) as amended.
[20] Eagle Protection Act of 1940 (16 U.S.C. 668-668d, 54 Stat. 250) as amended

classified as Forest Management, Land Bank, or Resource Management. In addition, the use of mandatory and augmented buffers and Special Management Zones will further protect important fish and wildlife resource areas and their habitat.

* *Green Infrastructure* *

Program Goals

The Environmental Protection Agency looks at Green Infrastructure as an adaptable term used to describe an array of products, technologies, and practices that use natural systems, or engineered systems that mimic natural processes, to enhance overall environmental quality. Green Infrastructure approaches are designed in part to maintain or restore natural watersheds through management of wastewater and storm water runoff. The borough has made Green Infrastructure a required component for comprehensive and asset management plans.

At the largest scale, the preservation and restoration of natural landscape features (such as forests, floodplains and wetlands) are critical components of green storm water infrastructure. By protecting these ecologically sensitive areas, communities can improve water quality while providing wildlife habitat and opportunities for outdoor recreation.

On a smaller scale, green infrastructure practices include rain gardens, porous pavements, green roofs, infiltration planters, trees and tree boxes, and rainwater harvesting for non-potable uses such as toilet flushing and landscape irrigation.

Green Infrastructure is associated with a variety of environmental, economic, and human health benefits, many of which go hand-in-hand with one another. The benefits of green infrastructure are particularly accentuated in urban and suburban areas where green space is limited and environmental damage is more extensive.

Key elements of Green Infrastructure include an interconnected network of land and water that supports native species, maintenance of natural ecological processes, and sustaining air and water resources. Other key elements are forests, water bodies, parks, trails, cultural resources and historic sites, farmland, wildlife habitat, open space, wetlands and fisheries.

Management of resources in the Natural Resource Management Units accommodates these elements through appropriate policies, water and air quality protections, land use designations and management guidelines.

Green infrastructure goals include:

Reduced and Delayed Storm water Runoff Volumes - Green infrastructure reduces storm water runoff volumes and reduces peak flows by utilizing the natural retention and absorption capabilities of vegetation and soils. By increasing the amount of pervious ground cover, green infrastructure techniques increase storm water infiltration rates, thereby

reducing the volume of runoff entering our combined or separate sewer systems, and ultimately our lakes, rivers, and streams.

Enhanced Groundwater Recharge - The natural infiltration capabilities of green infrastructure technologies can improve the rate at which groundwater aquifers are 'recharged' or replenished. This is significant because groundwater provides about 40% of the water needed to maintain normal base flow rates in our rivers and streams. Enhanced groundwater recharge can also boost the supply of drinking water for private and public uses.

Stormwater Pollutant Reductions - Green Infrastructure techniques infiltrate runoff close to its source and help prevent pollutants from being transported to nearby surface waters. Once runoff is infiltrated into soils, plants and microbes can naturally filter and break down many common pollutants found in storm water.

Reduced Sewer Overflow Events - Utilizing the natural retention and infiltration capabilities of plants and soils, green infrastructure limits the frequency of sewer overflow events by reducing runoff volumes and by delaying storm water discharges.

Increased Carbon Sequestration - The plants and soils that are part of the green infrastructure approach serve as sources of carbon sequestration, where carbon dioxide is captured and removed from the atmosphere via photosynthesis and other natural processes.

Program Guidelines

A. Cultural Resources and Historic Sites. Important archeological or cultural sites shall be identified and protected prior to any on-the-ground activity that could jeopardize the archeological or cultural resource. Any archeological or cultural resource that is identified while on-the-ground activities are being conducted shall be reported at once; and the on-the-ground activity shall stop until the appropriate clearance is given.

B. Forests. All forest resources classified as Forest Management Lands or Resource Management Lands with management intent language that allows timber harvest shall comply with this Natural resource Management Unit Plan.

C. Multiple-Use. All Natural Resource Management Units shall be managed for multiple-uses.

D. Parks and Open Space. Areas appropriate for parks, and open space including viewsheds will be identified and managed pursuant to the borough's *Park, Recreation, and Open Space Plan.* These areas shall be classified with appropriate management intent and guidelines.

E. Riparian Areas and Wetlands. Riparian and wetland areas, including adequate buffer and special use areas, will be protected by classifying important areas as Watershed Lands with appropriate management intent and guidelines, or placed in the Wetlands Land Bank, if determined eligible.

F. Trails. All trails in the Borough's Recreational Trails Plan shall be protected, including an appropriate buffer.

G. Watershed Management. All streams and water bodies with anadromous or high value resident fish or which provide nesting or rearing habitat for Trumpeter Swans, at least to the minimum requirements of the *Alaska Forest Resources and Practices Act,* and Special Management Zones created where additional watershed and/or important habitat protection is needed.

H. Wildlife Habitat. Important habitat areas, as identified by the Alaska Department of Fish and Game, or through a public notice process will include appropriate management intent including the possible use of Special Management Zones to protect and where possible enhance the wildlife resources. Working with appropriate federal and state agencies, or others, management regimes shall be adopted that may include habitat protection or habitat enhancement.

I. Other Guidelines Affecting Green Infrastructure. A number of other guidelines may affect green infrastructure. For details of the guidelines, see the following sections of this chapter:

- Buffers
- Cultural Resources and Heritage Sites
- Fish and Wildlife Habitat
- Public Recreation and Tourism
- Rock, Sand and Gravel
- Special Management Zones
- Trails
- Transportation
- Water Quality and Quantity, Wetlands and Riparian Areas

Also, see Volume I, Chapter 3: *Forest Management.*

Green Infrastructure Program Summary

Using this Plan, other land and resource asset management plans, and community comprehensive plans, and the multiple-use land in Natural Resource Management Units, results in an integrated system that provides for water and air quality. The plan provides for recreation, trails, and other outdoor activities; protects and enhances important wildlife habitat areas; and provides for natural open space and wildlife movement corridors.

At the same time, the use of renewable resources, including active forest management, resource extraction and other development activities can actively occur in a manner that meets local and borough-wide water and air quality needs.

** Private Property **

Private Property Not Affected. No private property or non-borough owned public land (State, University of Alaska, School Trust or Mental Health Trust Land) is to be included in any Natural Resource Management Units and is not subject to or directly impacted by this plan. There are instances where private property is located within the exterior boundaries of a unit. In these instances the private property has been and shall be buffered and excluded from the provisions of this plan. However, they may be indirectly affected by various natural resource management and extractive activities.

Development of Adjacent Private Property. Borough lands may be necessary for the successful development of adjacent private property lands and the borough will strive to address said needs in a cooperative and timely manner, consistent with other goals in this Natural Resource Management Unit Plan.

Resource Goals

Minimize negative impacts of resource management extractive activities, or other development activities or uses on borough owned land to adjacent private or non-borough owned public land owners.

Management Guidelines

A. Conflicts. Natural resource extraction, road development and other development activities near private and non-borough owned public land shall be designed to avoid conflicts with landowners to the extent feasible, provided that efforts are made to avoid the conflict.

B. No Cut Buffers. The borough shall, pursuant to borough code[21], require a 100-foot no-cut buffer along all borough property boundaries between the boundary of forest operations areas, sand and gravel extraction areas, and other similar activities and the immediately adjacent private or semi-public property unless the property owner has been consulted and does not object to an adjustment.

C. Roads. The borough shall consider potential impacts of roads on adjacent private land when planning road locations.

D. Public Notice. As required by borough code[22] the borough shall attempt to notify all landowners whose land is located within one-mile of a proposed timber sale, proposed road related to forest management, timber harvest or other natural resource activity.

E. Other Guidelines Affecting Private Property. A number of other guidelines may affect private property. For details of the guidelines, see the following sections of this chapter:

- Buffers
- Green Infrastructure
- Trails
- Transportation
- Water Quality and Quantity, Wetlands and Riparian Resources

Also, see Volume I, Chapter 3: *Forest Management.*

Private Property Summary

Private property rights shall be recognized for all borough resource management and extraction activities, and other similar development activities. Property owners within 1-mile (see MSB 23.05.025) and members of the public shall be provided opportunities to comment on proposed natural resource development activities.

** Public Recreation and Tourism **

Generally it is the federal government's role is to retain and manage parks, wildlife refuges, forests, wild and scenic rivers and large multiple-use areas of national significance. The state's role is to retain and manage land supporting recreational opportunities of regional or statewide significance. The borough's role is to retain and manage locations of more local,

[21] See MSB 23.20.070. This section of Borough code requires buffers on Borough land that abut private property. This same section of code provides for adjustments of this property under certain conditions.
[22] See MSB 23.05.025.

community or sub-regional significance. The federal and state governments, because of their financial and personnel resources are most capable of providing recreational opportunities that require large land areas, while the borough and cities are generally better able to provide and manage more for localized recreation.

The borough's *Park and Open Space Plan* and the *Recreational Trails Plan* provides for the overall borough policy for creating, and protecting a wide spectrum of public indoor and outdoor recreation opportunities. This includes accessible outdoor recreation sites with well-designed, maintained and conveniently located recreation facilities as well as less developed and natural areas for recreation pursuits that do not require developed facilities.

Also, see Volume III, Appendix "F": *Recreational Opportunities Spectrum*.

Program Goals

Accessible Public Use Opportunities. Develop or enhance recreation areas, trails, waysides, and sites that provide a wide range of year-round outdoor recreation opportunities for all ages, abilities and use preferences on less developed borough land areas. These should include places for both developed and less developed recreation which serve multiple-purposes.

Commercial Development. Provide opportunities for compatible commercial development of recreation facilities and services through leases, concessions and permits where public recreation needs can most effectively be provided by private enterprise, while minimizing environmental impacts and conflicts with existing users of an area.

Employment and Income. Increase per capita income and provide employment opportunities for people in the area through tourism and compatible commercial recreation.

Resource Protection. Protect important watershed areas and environmental quality.

Space for Future Needs. Reserve accessible public land, especially near communities, sufficient to meet existing and expected future recreation needs.

Tourism. Allow and encourage a wide range of recreational uses, including recreational activities associated with tourism.

Management Guidelines

A. Public Access. Access to Natural Resource Management Units shall be open to the public, but may be limited or curtailed at certain times to protect public safety, allow special uses, and prevent harm to the environment. Examples of conditions that may justify limiting public access are fire management, timber harvest

operations, and high soil moisture content when traffic may cause extensive damage to roads and trails.

Traditional means of access as well as access to traditional use areas will be maintained. Traditional means of access means those types of transportation for which a popular pattern of use has developed and continues today. Traditional outdoor activities includes those types of activities that people use for recreation, subsistence, personal enjoyment, or that have been historically conducted as part of an individual, family, or community life patters. These activities do not extend to commercial uses of any kind.

New public access facilities or routes should not be developed or facilitated unless the borough is able to provide management, monitoring and enforcement.

B. Public Recreation Sites. The borough shall identify important areas to be managed for moderate to intensive recreational activities within Natural Resource Management Units prior to any active management activities. These include, but are not limited to trailheads, camping and picnic areas, important fishing areas, and high scenic areas. These areas shall be generally identified in Natural Resource Management Unit Plans and placed in a Special Management Zone and/or be classified for public recreational purposes. Limited forest management and timber harvest or similar activities may occur in these areas, provided the activity does not degrade or significantly impact the use for why the area merits special management.

C. Dispersed Recreation. Random or dispersed recreational activities such as hunting, fishing, hiking, snowmobiling, dog mushing and skiing are common activities in many Natural Resource Management Units. Forest management activities and timber harvest shall be allowed, provided the forest management activity or timber harvest does not unreasonably limit or prevent random or dispersed recreational activities on a long-term basis. However, some recreational activities may be limited during active forest management or timber harvest operations.

D. Commercial Recreation. The borough may use land use permits, lease lands or use concessionaire contracts for commercial recreation purposes. Commercial authorizations may be used where specific types of recreation needs can most appropriately be provided by private enterprise, while minimizing environmental impacts and conflicts with other public recreation activities and users or uses of an area.

E. Scenic Values. Development activities, such as timber harvesting, rock, sand and gravel extraction and other similar activities shall be sited, designed and carried out to minimize adverse impacts to high scenic values. This shall be done through a variety of methods and means. For example, using silvicultural techniques, timber harvest design, revegetation, and using Special Management Zones for managing such things as harvesting schedules, harvesting systems, etc., in forest management

and timber harvest areas. Areas with high scenic values in Natural Resource Management Units shall be identified in specific unit plans along with proposed management regimes.

Vegetation that obscures scenic vistas may be managed to facilitate viewing.

F. **Natural Surroundings**. As much as feasible, natural resource extraction and other development activities, including related facilities on borough land should be located and designed to blend in with the natural surroundings. Specific stipulations (case-by-case basis) to accomplish this guideline should be part of a development plan, specific land use plan or plan of operations. These plans should addresses location, size, materials, requirements for vegetative or topographic screening, or other measures as appropriate. The plan and any other conditions deemed appropriate should be part of and attached to any contract or other authorization.

G. **Trails. Trails Into and Through Natural Resource Management Units.** Trails that interconnect and provide access to other areas are important both to adjoining communities and people from outside the area. Activities on these trails include snowmobiling, cross-country skiing, hiking, hunting, and dog mushing. All trails in the borough's *Recreational Trails Plan* shall be protected along with an appropriate buffer. If additional trails are identified, they should be considered to be added to the *Recreational Trails Plan*.

H. **Other Guidelines Affecting Public Recreation and Tourism.** A number of other guidelines may affect public recreation. For details of the guidelines, see the following sections of this chapter:

- Buffers
- Cultural Resources and Historic Sites
- Fish and Wildlife Habitat
- Green Infrastructure
- Rock, Sand and Gravel
- Special Management Zones
- Trails and Access
- Transportation
- Water Quality and Quantity, Wetlands and Riparian Areas

Also see Volume I, Chapter 3: *Forest Management.*

Public Recreation and Tourism Management Summary

Many of the areas where natural resource extraction and other development activities may occur are located or in close proximity to some of the more popular recreation destinations in the borough. Activities in those areas include sightseeing, fishing, camping, hunting, snowmobiling, all-terrain vehicle use, hiking, snowshoeing, dog mushing, and cross-country skiing. The same categories of recreation occur in some of the more remote areas where forest management and timber harvest may occur, but at a much lower level due to poor access. As access is developed these uses are expected to increase.

As a primary designation public recreation areas are usually classified as Public Recreation. Public recreation can also be designated as either a primary or secondary activity on land classified as forest management, general purpose, land bank, reserve use, watershed, resource management and wetland bank lands. In many cases, these same land use classifications, coupled with management intent or management guidelines for specific land parcels or Natural Resource Plan

** Rock, Sand and Gravel **

Resource Goals

In the case of a conflict between borough code (currently MSB 17.28 and 17.30, which is likely to be moved into MSB 28.30), the following goals and management guidelines, and management intent for specific Natural Resource Management Units, the more stringent or restrictive shall apply.

Specific goals include:

Development of Material Resources. Develop material (principally rock, sand and gravel) resources to contribute to the material needs of the community.

Economy. Contribute to the local and borough economy by developing material sources which will provide stable job opportunities and stimulate growth of primary and other secondary industries.

Environment. Protect the integrity of the environment and affected communities when developing material resources.

Infrastructure. Utilize material resources that will aid in the construction of roads and trails related to development of infrastructure throughout the borough.

Management Guidelines

A. **Interim Mining Districts and Conditional Use Permits.** Besides these guidelines, borough code (MSB 17.28) establishes various mining (sand and gravel

extraction) districts throughout the borough. Borough code (MSB 17.30) further requires that a conditional use permit is required for certain mining activities. These ordinances, among other items, require air and water quality standards, visual screening, lighting, dust, and noise screening be approved and in place before mining operations may take place,

These same requirements are found in MSB 28.60 dealing with forest management activities. Because of these similar requirements, timber harvest activities on land that will eventually be mined and possibly later converted to a third use (settlement, public recreation, etc.) should be encouraged.

B. Consolidation of Material and Timber Access. Where feasible and appropriate, consolidate timber and material (rock, sand and gravel) access routes. Consolidation should lower costs to all users and avoid unnecessary impacts to other resources by minimizing roads and stream crossings.

C. Operation Areas. Mining operations and timber harvest operation areas should be combined where feasible to lessen the impact and size of such activities. Consolidation should lower costs to all users and avoid unnecessary impacts to other resources.

D. Buffers and Special Management Zones. Like timber operational areas, material sites shall be buffered from all streams, primary and permanent secondary roads. Special Management Zones should be used if necessary to allow some limited timber harvest, create additional scenic/visual and noise safeguards.

E. Materials used for Temporary Roads. Materials used for temporary roads do not require compliance with 17.30 but shall be contoured and stabilized.

F. Other Guidelines Affecting Sand and Gravel Resources. A number of other guidelines may affect sand and gravel. For details of the guidelines, see the following sections of this chapter:

- Buffers
- Cultural Resources and Historic Sites
- Fish and Wildlife Habitat
- Green Infrastructure
- Public Recreation and Tourism
- Special Management Zones
- Trails
- Transportation

- Water Quality and Quantity, Wetlands and Riparian Areas

Also, see Volume I, Chapter 3: *Forest Management.*

Rock, Sand and Gravel Resource Summary

The use of material, principally sand and gravel resources is necessary and important for providing access to and within Natural Resource Management Units for a variety of activities including public recreation, forest management and timber harvest. Material sites for rock, sand and gravel extraction needs to be identified prior to any development or timber or other resource extraction activities.

Material sites shall be developed according to the requirements of borough code and developed material sites should be combined with timber harvest operational areas where feasible.

Materials used for temporary roads are not subject to MSB 17.30 but shall be contoured and stabilized. Also, see the section on *Transportation & Utilities* later in this chapter.

Sand and gravel as a primary use are classified as material and may be converted to another use when sand and gravel operations are completed, or be reclaimed. Gravel as a secondary resource may be classified as forest management, general purpose, or resource management lands.

** Settlement **

Goals and Guidelines

Settlement Generally. The sale or lease of borough land may be reasonably necessary for achievement of other goals in the Natural Resource Management Unit Plan, including energy, economic development and private property goals.

Sales and Leases. No sales or leases for settlement land shall occur within Natural Resource Management Units unless specifically approved on a case-by-case basis by the Borough Assembly. This includes commercial, homestead, industrial, private recreation, or residential lands. Specific sales are subject to additional public notice under MSB 23.05.025.

Exclusion from Natural Resource Management Unit. If sales are authorized by the Borough Assembly, the area shall be excluded from the specific Natural Resource Management Unit and not be subject to this plan.

* *Special Management Zones* *

Special Management Zones can be used for a wide variety of purposes. Special Management Zones, by their nature, need to be flexible in their geographic coverage and application. These are often, but not always, determined through the use of Best Management Practices.

Special Management Zones may be used for special types of lands within a natural resource management unit or sub-unit to provide protection for a specific reason, yet allowing some activities to occur, with conditions or restrictions. They may also be used to specify what kind of natural resource extraction or other development activities can occur within in a specified area with special conditions or management methods and means.

For example, Special Management Zones can be used for wetland protection (allowing some uses when adequate snow cover exists), seasonal wildlife concentration areas, seasonal trumpeter swan and migratory waterfowl staging, nesting, or rearing areas, bear denning areas, protecting important cultural and historic sites, designating single-tree harvesting areas, or select cut areas. Resource extraction and use activities can occur in these zones, under certain conditions, such as seasonal restrictions or methods and means.

Management Goals

Buffers. Special Management Zones may be used in place of non-mandatory buffers, or to supplement mandatory buffers to provide additional protection for a specific reason, yet allowing some activities to occur, with special conditions or restrictions.

Cultural Resources and Historic Sites. Ensure protection of cultural resources and historic sites.

Endangered and Threatened Species. Establish additional protection in addition to mandatory buffers to protect areas used by endangered and threatened species as identified by the U.S. Fish & Wildlife Service and the Alaska Department of Fish and Game.

Ensure Access to Public Lands and Waters. Maintain or enhance low impact public use and recreational opportunities.

Private Property. Establish additional protection in addition to mandatory buffers to minimize visual, noise and light pollution and other adverse impacts to private land.

Watersheds and Wetlands. Utilize limited use Special Management Zones to protect important watershed and wetland areas.

Management Guidelines

A. **Creation, Amendment or Elimination.** Special Management Zones may be created, amended or eliminated in three ways:

1. The Assembly may adopt, amend or eliminate permanent Special Management Zones. Adoption, amendment or elimination of a permanent Special Management Zone shall be considered as a plan amendment. (See Volume I, Chapter 4; *Procedures for Changes to the Plan, Goals and Guideline*), or through the adoption process of the Five-Year Timber Harvest Schedule, material sale or other similar means.

2. The Borough Manager may adopt, amend or eliminate seasonal or temporary Special Management Zones. Adoption, amendment or elimination of a temporary Special Management Zone shall be considered as a Special Exception. (See Volume I, Chapter 4; *Procedures for Changes to the Plan, Goals and Guidelines.*)

3. It is recognized that events happen in the field (discovery or an historic or archeological site, bear den, etc.) while field operations, such as a gravel extraction or timber harvest, are underway. In these situations the Community Development Director may immediately adopt or amend in writing a seasonal or temporary Special Management Zone. This action shall be in writing and state the reason(s) for the action and the length of time for the action. In such cases the temporary adoption shall only be effective for no more than 180 calendar days. The Borough Manager shall be immediately informed of the action and the Borough Assembly shall be notified with an Informational Memorandum at the next regularly scheduled meeting. If the period of time is to exceed more than 180 days or become permanent, the process described in 1 or 2 of this paragraph shall be followed.

B. **Management.** When creating a Special Management Zone, the management intent and management guidelines for the zone must be clearly defined.

C. **Public Use and Recreation Areas.** Special Management Zones may be used to for protection and management within important public use and concentrated recreation areas. Natural resource extraction and development activities within Special Management Zones will consider existing public use in the zone. Timber harvesting, gravel extraction or other similar activities may occur in the Special Management Zone if it can be demonstrated that environmental quality and existing public uses including sport fishing and hunting, trapping, fish and wildlife viewing, hiking, and camping will be maintained or enhanced.

D. **Scenic Values.** Natural resource extraction and other development activities will consider scenic values. To protect important scenic values, Special Management Zones may be created to ensure that timber harvests, sand and gravel extraction and other similar uses including access in these zones are designed to minimize adverse impacts on views. Design will vary based on topography and vegetation. For example,

dense vegetation or high bluffs may hide harvesting or extraction activities beyond a mandatory no-cut buffer in some areas, but sparse cover and gradual slopes may reveal impacts over a wider area.

E. Waterbodies, Watersheds, and Wetlands

1. Lakes, Rivers and Streams. The mandatory and augmented buffers required by the *Alaska Forest Resources and Practices Act* for rivers and streams shall be followed. Buffers are also required for lakes that are part of a flowing water system that are connected to creeks, streams and rivers (see volume I, Chapter 2, *Buffers*. Additional Special Management Zones are usually not needed or appropriate for these areas.

2. Watersheds. The mandatory and augmented buffers required by the *Alaska Forest Resources and Practices Act* provide adequate protection along rivers lakes and streams. Special Management Zones may be used to provide additional protection in other important areas that require watershed protection. These areas should be identified in conjunction with the Alaska Department of Environmental Conservation and the Corps of Engineers, as appropriate prior to any planned natural resource extraction or other development activity.

3. Wetlands. If not all ready covered by a mandatory buffer under the Alaska Forest Resources and Practice Act, a Special Management Zone of 100 feet shall be placed on and around all Important Wetlands (see Definitions/Glossary at the end of this volume or in Volume III). No resource extraction or motorized uses can occur in this zone until sufficient snow cover exists. Motorized uses may occur within the zone when there is insufficient snow cover to protect the vegetation only on established and dedicated easements, roads and trails.

Individual tree selection harvesting may be allowed within this zone except when other harvesting techniques are necessary to prevent or control outbreaks of insects, disease, wildfire, or hazards to public safety. These activities should occur only in the winter when sufficient snow cover is present.

F. Wildlife.

1. Brown Bear Habitat. Forest cover types which satisfy important brown bear habitat requirements occur throughout the borough. However, the extent and number of areas that are important brown bear habitats are limited. Important brown bear habitat types include denning areas, activity centers, moderately moist habitat types where soil disturbance from forest operations could be high, and slopes greater than 35%. These habitat types are rare in the lowlands where most borough-owned timber is located.

The Alaska Department of Fish and Game shall be requested to identify important brown bear habitat during the timber harvest design and notification process. These important areas shall be protected by placing them in a Special Management Zone, where special conditions can be established. For example, scheduling harvesting to avoid brown bear

concentration or denning areas during the season when they are actively used.

2. Moose Concentration Areas. The Alaska Department of Fish and Game shall be requested to identify winter moose concentration areas and provide recommendations on timber harvest scheduling in these areas. These areas should be protected by placing them in a Special Management Zone where special conditions can be established. For example, small operations with little equipment may provide little browse and with little disturbance to moose. Similarly, large cuts (i.e., 100 acres) in areas that receive high snowfall and have difficult conditions for travel, provide travel corridors and additional browse. In addition, these type cuts when located at least one-mile from roads and the Alaska Railroad reduce the amount moose mortality caused by of winter vehicle collisions.

3. Trumpeter Swan Nesting and Rearing Areas. A Special Management Zone shall be established within ¼ mile of waterbodies that have identified trumpeter swan nesting sites or staging areas. Activities that may damage trumpeter swan nesting habitat or cause visual or noise disturbance shall be prohibited in the zone between April 1 through August 31.

The area to which season restrictions apply may be increased or decreased if the potential level of damage or disturbance warrants change as determined by the Alaska Department of Fish and Game. The Alaska Department of Fish and Game should consult with the U.S. Fish & Wildlife Service before making a recommendation. If a water body that has been used for nesting is not occupied by trumpeter swans by June 15, forestry activities may be allowed between June 15 and August 31 within the ¼ mile zone.

Site-specific buffers may also be established to minimize visual disturbance to identified trumpeter swan nesting sites as determined by the Alaska Department of Fish and Game at the time individual timber harvests are designed. The Alaska Department of Fish and Game should consult with the U.S. Fish & Wildlife Service before making a recommendation.

4. Other Special Wildlife Considerations. Following the public review period for a proposed natural resource extraction or other activity within a Natural Resource Management Unit where significant wildlife[23] concerns are identified, the borough shall consult with the Alaska Department of Fish and Game to identify and establish other Special Management Zones for other wildlife species.

F. Education and Research Areas. Either temporary or permanent education and research/study areas may be established in conjunction with the Forest Education and Improvement Study Area(s) (see Volume 1, Chapter 3: *Forest Education and Improvement Study Area(s).)* These areas should be identified and protected to preserve the integrity of the research being conducted and/or the natural resource education values. Other uses may occur in these areas such as timber harvest and public recreation as long as the uses either compliment or do not

[23] Wildlife includes birds. See Volume III, Appendix A, *Definitions/Glossary,* Fish and Wildlife.

significantly detract from the reason for the on-going research or education purposes(s).

G. Other Guidelines Affecting Special Management Zones. A number of other guidelines may affect Special Management Zones. For details of the guidelines, see the following sections of this chapter:

- Buffers
- Cultural Resources and Historic Sites
- Fish and Wildlife Habitat
- Green Infrastructure
- Private Property
- Public Recreation and Tourism
- Rock, Sand and Gravel
- Trails
- Transportation
- Water Quality and Quantity, Wetlands and Riparian Areas

Also, see Volume I, Chapter 3: *Forest Management.*

Special Management Zones Management Summary

Providing buffers and Special Management Zones provides an extra level of protection for specific wildlife, resources, and public use areas including important viewsheds. At the same time activities, such as timber harvest, sand and gravel extraction and other similar activities may be allowed to occur on a site specific or area specific basis within Special Management Zones, but under certain conditions.

** Trails **

Resource Goals

The borough's *Recreational Trails Plan* provides the overall borough policy for creating, managing, and protecting recreational trails throughout the borough.

In the case of a conflict between the *Recreational Trails Plan*, the following area-wide goals and management guidelines, and management intent for specific Natural Resource Management Units, the more stringent or restrictive shall apply.

Specific goals include:

Access. Maintain, enhance, or provide adequate access to publicly owned land and resources.

Environmental Protection. Locate trails so that their use will allow for recreation use while protecting water quality in streams, lakes, riparian areas and wetlands.

Local Trails. Evaluate local trail systems that provide access to community or regional recreation areas for possible addition to the boroughs *Recreational Trails Plan.*

Private Lands. Locate or relocate trails so as to avoid trespass activities on adjacent private lands.

Trail Corridors. Protect or establish trail corridors to meet projected future use requirements and protect current uses.

Management Guidelines

A. **Public Use Opportunities**. The borough shall improve or maintain public access to Natural Resource Management Units by retaining access sites and trails in public ownership, reserving rights of access if borough land or resources are sold or leased within or adjacent to a Natural Resource Management Unit .

If a land use authorization is issued that will permanently disrupt use of or make a trail unusable, an alternate route that provides equal access and opportunities shall be identified and established before activities under an authorization prevent use of the original trail.

B. **Regional and Locally Significant Trails.** If a trail is of regional or local significance it should be identified and protected and shall be protected in all Natural Resource Management Units.

Regionally significant are those trails that are included in the boroughs *Recreational Trails Plan*. Locally significant trails are trails included in a local comprehensive, land use, or management plan.

C. **Trails Across Important Wetlands and Riparian Areas.** In cases where a feasible and reasonable alternative does not exist, trails may be authorized on or near important wetlands or within riparian areas if the proposed activity and season of use will not cause adverse impact to fish and wildlife habitat and ecological values and it is determined to be in the best interest of the borough.

A trail across an important wetland or riparian area shall be restricted to winter use only when the snow cover and frost level is adequate to protect the underlying vegetation.

Trails used by motorized vehicles in the spring, summer, and fall, that will not use fill, shall follow well-drained routes and be located away from riparian zones and important wetlands.

The Alaska Department of Fish & Game and Corps of Engineers should be consulted to provide recommendations on easement alignment to avoid important wetlands or within riparian areas and sensitive wildlife habitats.

The intent of this guideline is to avoid motorized vehicle use within or immediately adjacent to important wetland and riparian areas during seasons where such use could result in damage to these resources.

D. Off-Road Transportation. Authorization for cross-country travel will be directed toward appropriate existing hardened trails and roads. Appropriate roads and trails are defined as having a durable surface and similar widths to the proposed mode of transportation. If no hardened roads or trails exist, the borough shall authorize transport only in winter when there is adequate ground frost, snow cover or both. This kind of authorization is usually for one-time use only, i.e., for moving machinery. If the authorization is for one-time use, additional clearing that will result in larger vehicle use on the road or trail shall be discouraged.

This guideline does not restrict snowmobile use on wetlands in winter once adequate snow cover exists to protect the vegetation.

E. Trail Widths and Buffers. Trails listed in the boroughs *Recreational Trails Plan* within Natural Resource Management Units shall be protected with a dedicated easement, right-of-way or some similar protection. Widths may vary from 10 to 60 foot in width depending on type of use. A buffer shall also be used. See the section on *Buffers* and *Special Management Zones* in this chapter.

Trail and buffer widths should be reviewed by the Alaska Department of Fish and Game, and shall be reviewed by the boroughs Parks, Recreation and Trails Advisory Board.

F. Management of Expanded Trail Use. If timber management, timber harvests, rock, sand, and gravel extraction or another natural resource activity creates new access options, as is likely to be the case, the borough shall develop access management strategies to ensure this new access does not lead to adverse impacts on resources, such as damage to wetlands or streams. Examples of such strategies include careful selection of the location of trails, maintaining trails, and closing access to trail use, such as four-wheelers.

G. Identification of Trails. Trails that are not identified in the boroughs *Recreational Trails Plan* or local comprehensive plan that merit consideration for protection shall be identified for possible protection. In addition, any agency, organization or individual may identify public trails to be considered for protection.

H. Access for Development. When a road is constructed for resource development, existing public trails will not be displaced or rendered unusable by new construction.

Land use activities (for example, permits, timber harvests and material sales) within a trail corridor (right-of-way and buffer) should be managed so as to not adversely affect trail use over the long term or the aesthetic character of the trail. This does not preclude trail crossings or rerouting of trails as described below.

I. Rerouting Trails. Rerouting of trails for a short distance may be permitted to minimize land use conflicts or to facilitate use of a trail if alternate routes provide equal access and opportunities similar to the original, and where alternatives to resolving the conflict other than rerouting are impractical, or inappropriate, or less effective. If trails are rerouted, provisions shall be made, subject to available funding or by other means (i.e., use of volunteers), for construction of new trail segments if warranted by type of use. Historic trails which follow well-established routes should not be rerouted unless necessary to maintain trail use. The sections of trails that have been re-routed and are no longer intended for use should be blocked off and rehabilitated to minimize erosion and promote re-growth of natural vegetation.

J. Trailhead Reservations and Information Signs. Sufficient acreage for trailheads should be retained in public ownership to accommodate public access need, safety requirements, and provide for expected increases in recreational use. The size and location of trailheads should be determined in consultation with the Alaska Department of Fish and Game and the borough Parks, Recreation and Trails Advisory Board,

Trailheads should be marked, especially the ones adjacent to or near private property to prevent trespass problems and to encourage public use of the trailheads instead of creating new ones or parking along road and trail systems.

All trails and trailheads should use standardized signage as adopted by the borough.

K. Limiting Access. Access within Natural Resource Management Units may be curtailed at certain times to protect public safety, allow special uses, and prevent harm to the environment. Examples of conditions that may justify limiting public access are fire management, timber harvest operations, sand and gravel extraction activities and high soil moisture content when various uses may cause extensive damage to roads and trails[24].

L. Other Guidelines Affecting Trails. A number of other guidelines may affect trails. For details of the guidelines, see the following sections of this chapter:

- Buffers
- Cultural Resources and Historic Sites
- Fish and wildlife Habitat

[24] [24] See MSB 2.85.020

- Green Infrastructure
- Private Property
- Public Recreation and Tourism
- Rock, Sand and Gravel
- Special Management Zones
- Transportation
- Water Quality and Quantity, Wetlands and Riparian Areas

Also, see Volume I, Chapter 3: *Forest Management*

Trails Management Summary

Within the borough there exists numerous recreational opportunities and many require trails for access and enhanced enjoyment. It is the desire of the borough to provide trail opportunities for visitors and residents alike. Management action will protect recreational values, cultural resources, important fish and game habitat, and environmentally sensitive areas such as streams, riparian areas and wetlands, while at the same time allowing forest management and timber harvest to occur.

The borough has an established a system to identify regionally significant and locally important trails throughout the borough to ensure future preservation of trails.

Regionally significant trails identified for protection in the boroughs *Recreational Trails Management Plan* are usually dedicated as public rights-of-way or an easement is reserved. Locally important trails are recognized in local comprehensive land use and management plans and can be dedicated as public rights-of-way or an easement reserved.

** Transportation and Utilities **

Management Goals

Ensure Public Safety. Design, maintain and operate roads with a high standard of public safety.

Energy Development. Strive to achieve energy goals of the borough through the timely planning and development of necessary utility rights-of-way.

Environmental Values. Design, construct and maintain all roads with consideration of environmental values.

Maintenance. Maintain borough-owned primary and permanent secondary access roads and bridges for public access without putting an unforeseen financial burden on the borough or local road service districts; subject to safety concerns and environmental conditions.

Minimize Adverse Effects. Design a transportation system and authorize vehicle uses in a manner that has minimal adverse impacts on local residents, the environment, fish and wildlife resources and movement corridors, and cultural features.

Minimize Costs. Design a transportation system that, when appropriate, has the lowest possible long-range costs, including construction, operation, and maintenance. Avoid unnecessary duplication of transportation facilities.

Promote Efficiency. Design transportation systems that use land and energy resources efficiently and encourage compact, efficient resource uses and development patterns.

Support Plan Designations. Through coordination with the State Department's of Natural Resources, and Transportation and Public Facilities, develop a transportation system needed to implement Natural Resource Management Unit Plans and integrate it with other borough-wide transportation needs. Transportation systems should also be integrated with other area-wide and local transportation needs.

Management Guidelines

All requirements of borough code and policies, including the *Subdivision Manual,* shall be followed. Also, as required by MSB 23.20.190, the requirements of the *Alaska Alaska Forest Resources and Practices Act*[25], the *Alaska Forest Resources and Practices Regulations*[26] shall be followed. In addition, the publication, *"Implementing Best Management Practices for Timber Harvest Operations from the Alaska Forest Resources and Practices Regulations"*[27] provide additional guidance and should be followed where applicable and appropriate.

In the case of a conflict, between the borough code including the *Subdivision Manual*, the *Alaska Forest Resources and Practices Act*, the *Alaska Forest Resources and Practices Regulations*, and the following guidelines, the more restrictive shall be used.

A. **Permanent Roads.** Unless specifically authorized by the Borough Assembly, no new permanent primary or secondary roads shall be designed, platted or constructed solely to or within any Natural Resource Management Units. Any proposed roads must receive public notice either separately or part of any planned natural resource extraction or development proposal. The expected

[25] Transportation facilities are generally found in AS 41.080(a)(1) and 41.05.098(d).
[26] Standards for road construction, associated facilities, and maintenance are found in 11 AAC 95.285-335.
[27] Division of Forestry, Department of Natural Resources, January 2005. Bruce Johnson

cost, environmental impacts and long-range maintenance costs shall be part of the public notice and review process.

B. **Temporary Roads.** Temporary seasonal or all season-roads may be constructed, if part of the Five-year or Periodic Timber Harvest Plan or approved Plan of Operations, or similar documents for other resource extraction activity(s). The construction, maintenance and permanent removal of the road shall be the responsibility of the contract holder and/or operator.

C. Road Location and Design

1. Rivers, lakes, wetlands, riparian areas, and terrain influence the type of access that exists, and the type of access that can be constructed. Within Natural Resource Management Units, most of the borough owned areas suitable for resource extraction activities are accessible only by winter because of these limitations. The location, design and development of roads shall consider multiple use values of borough lands, and reflect the management intent and primary uses for each affected area.

2. Descriptions of existing access routes and/or corridors and type of access shall be included in each Natural Resource Management Unit's plan.

3. Information on possible temporary and all-season access routes and the type of access shall also be included in any public notice concerning the planned natural resource activity, such as a timber harvest or sand and gravel extraction.

4. Joint use and consolidation of surface access routes and facilities is encouraged wherever it is feasible and prudent to do so.

Surface access should be sited and designed to accommodate future development and avoid unnecessary duplication. Access plans should be coordinated with adjacent landowners to promote joint use and efficiency. The access needs of other users should also be considered. The feasibility of using an existing route or facility shall be evaluated before the use of a new route or facility is authorized.

5. Temporary or non-permanent access shall be routed to avoid important wetlands. If important wetlands are proposed to be crossed because no other alternative exists, a plan and/or guideline amendment shall be required (see Volume I, Chapter 4; "Procedures for Changes to the Plan, Goals and Guidelines") and Corp of Engineers review and approval may be necessary.

6. Roads shall be aligned to minimize impacts on sensitive vegetative cover types such as riparian zones, aquatic feeding sites, and naturally occurring forest openings. Roads in these areas should be designed in consultation with the Alaska Department of Fish and Game.

7. Transportation facilities shall be located to avoid effects on quality or quantity of adjacent surface water resources, or detract from recreational use of the waterway, or adequate mitigation measures shall be taken.

(a) Construction and maintenance of transportation improvements in 100-year flood zones in the Matanuska-Susitna Borough require a permit from the Borough[28].

(b) During winter, snow ramps, ice bridges, or other methods shall be used to provide access across frozen river, lakes, and streams to avoid the cutting, eroding, or degrading of banks. Operationally, cutting of the banks may be required by site-specific conditions. Any crossing of anadromous or high value resident fish-bearing waters must be approved via the Alaska Statutes Title 16 process. These facilities shall be removed, and rehabilitated if necessary immediately after final use.

(c) All transportation facility construction and maintenance shall comply with water quality standards of the State Department of Environmental Conservation.

8. Utilities and other support facilities, including but not limited to power generation and transmission structures or cables, shall be sited to minimize adverse impacts to other valuable resources or uses.

9. Standard Road Corridor Widths.

(a) Primary and secondary roads that that have been approved by the Assembly to become permanent, shall be designed and built to borough road construction standards as specified in the borough Subdivision Manual. The road design, construction and maintenance shall be administered by the borough Public Works Department.

(b) Secondary non-permanent and spur roads shall be constructed to minimum standards to discourage high volume vehicle use but maintain safety and environmental conditions and meet management objectives for the land parcel or natural resource management unit. These will generally be slow speed roads without large cuts and fills.

10. Road buffers shall be established and Special Management Zones may be used to maintain and protect the quality of the visual experience of the user and to minimize negative effects such as noise and dust to adjacent land for all roads authorized by the Assembly to become permanent.

[28] See MSB 17.29

(a) Primary and secondary roads authorized by the Assembly to become permanent shall have a minimum buffer of 100 feet each side of the right-of-way width.

(b) Non-permanent secondary roads shall have a minimum buffer of 50 feet each side of the right-of-way width.

(c) Spur roads that directly access timber cutting units or other resource extraction uses and that will be put to bed following the timber harvest or other industrial use do not require a buffer.

(d) Buffer widths may be increased or decreased or Special Management Zones used to minimize land use and ownership conflicts, to protect the privacy of adjacent landowners, to separate motorized from non-motorized uses, to allow siting of public facilities, to allow flexibility for rerouting, or to adopt a road to provide for specific public uses or to address aesthetic or environmental concerns.

(f) Buffer widths and Special Management Zones may vary along the length of a road because of the considerations in (e) above. The width of a buffer on any portion of a road should be also based on the management intent for the immediately adjacent borough property.

Road buffers and Special Management Zones should be designed in consultation with the Alaska Department of Fish and Game, and the boroughs appropriate advisory board(s).

11. In important fish and wildlife habitat areas, such as riparian areas, anadromous or important resident fish waterbodies, nesting and rearing habitat for Trumpeter Swans and other migratory waterfowl, wildlife movement corridors, important wintering or calving areas, and threatened or endangered species habitat shall be avoided in siting transportation routes unless no other feasible alternative(s) exist. Location of routes and timing of construction and conditions of use shall be determined in consultation with the Alaska Department of Fish and Game.

(a) Roads should be planned to minimize potential increases in vulnerability of brown bears to physical displacement from important foraging and denning habitats by avoiding locations near important feeding sites. The Alaska Department of Fish and game shall be consulted during the sale or permitting process prior to any natural resource extraction or other development activity.

(b) Specific guidelines for development and management of access within one-mile of waterbodies with identified trumpeter swan nesting sites shall be developed in consultation with the Alaska Department of Fish and Game and the U.S. Fish and Wildlife Service at the time access is designed. Facilities and roads should be at least one-mile

from waterbodies used for trumpeter swan nesting. The distances between facilities, roads and these waterbodies may be increased or decreased based on site-specific environmental and economic factors by the borough with guidance from the Alaska Department of Fish and Game. While the borough cannot require the Alaska Department of Fish and Game to consult with the U.S. Fish and Wildlife Service, it is desirable to the borough that such a consultation take place prior to the Alaska Department of Fish and Game making any recommendations to the borough.

(c) Natural terrain features should be used to ensure the usability of moose forage areas, as well as other important seasonal use areas, by shielding and/or buffering forage areas from road traffic. Permanent roads generally should be located in dense timber away from natural or man-made forest openings.

12. Road crossings within riparian buffers may be allowed when such roads are a better alternative for protecting water quality or when they are the only feasible or practical access to timber and other resources, provided that adequate mitigation measures are taken.

13. Natural resource extraction and management roads shall be sited and designed to minimize impacts of recreation values and scenic qualities.

14. The boroughs Cultural Resources Division and/or Alaska State Office of History and Archaeology shall be consulted to avoid known cultural resources and historic sites during construction of transportation facilities.

15. Avoid steep cuts and fills to minimize clearing areas, reduce potential erosion and avoid blocking wildlife travel routes.

16. Log-landing areas shall minimize adverse environmental impact and the amount of road and skid trail construction.

17. To reduce impacts from road hunting and allow greater control of access in local areas, secondary resource extraction road systems should not be designed to interconnect or form loop systems.

18. Bridges over 20 feet in length shall be approved by the borough Public Works Department and/or the State Department of Transportation and Public Facilities.

D. Road Construction

1. Road construction times shall be scheduled if feasible to avoid displacing wildlife from important seasonal concentration areas.

2. Where feasible, topsoil from road construction should be stored on site for later use in restoration. Slash shall be disposed of so as not to become a fire hazard or inhibit wildlife movement.

3. For winter roads, the general standard for adequate ground protection from vehicle damage will be one foot of snow and one foot of frost. This standard may vary to allow for variation in winter conditions. For example, deep snow may prevent freezing but provide adequate ground protection. If the ground is not frozen to a depth of at least one foot, additional snow depth is required before winter travel can occur. The amount of additional snow required will depend on the type of vehicle and must be adequate to support the vehicle. For example, vehicles with higher ground pressure require more snow to support them than light ground pressure vehicles.

Prior to spring break-up each year, winter roads and skid trails must be cleared of all logging and construction debris extending over or into any body of water.

4. All timber that has merchantable value or can be utilized for personal use, including firewood, shall be salvaged where practical on roads to be cleared for construction[29].

5. Material sites used for construction and maintenance should be located as near the transportation facility as practicable. Material sites shall be screened from roads, residential areas, recreational areas, and other areas of significant human use. Rehabilitation of material sites shall meet the requirements of state statutes and/or Borough code, as applicable[30].

E. Road Management

1. The management of roads after timber harvesting, sand and gravel extraction or other similar activity and implementation of the reforestation or revegetation plan shall consider multiple use values of public lands, and reflect the management intent and primary uses for the affected area.

2. Road closures, or restrictions on types, times, or levels of use will be considered as a means of balancing resource management goals. In some locations, it may be necessary to limit use of a road or manage other resources along the road. For example, to protect wildlife, maintain recreation opportunities, ensure regeneration, or minimize timber management impacts on existing land uses.

3. Requirements for road management after forest operations, rock, sand and gravel extraction or other similar activities are completed shall be generally described in Natural Resource Management Unit plans, and

[29] See AS 41.17.083 and MSB 23.20.190.

[30] See 11 AAC 97.250, MSB 17.28 and 17.30.

specifically described in timber harvest proposals, rock, sand and gravel extraction plans or other similar activity contracts.

4. Roads may be closed temporarily or seasonally for public safety or to protect the road surface from damage. Road use may be restricted temporarily to minimize hazards that result from conflicting use, such as during periods of active industrial use, during spring break-up, periods of excessive rainfall or other conditions when the roadbed would be damaged by vehicle traffic or when necessary to protect sensitive wildlife populations or other public resources along the road.

Access restrictions for reasons other than protecting the resource or providing for public safety require a finding of incompatibility.

Road closures and restrictions shall be administered by the borough Public Works Department, in consultation with the Community Development Department pursuant to borough code[31] and policies.

5. Public Use

(a) Permanent roads authorized by the Borough Assembly will be open to public use.

(b) Non-permanent roads shall be managed on a case-by-case basis depending on the management intent for land along the route.

Planned management of the road, including road closures or motorized vehicle restrictions shall be part of the public notice process prior to construction of the road.

(c) Unless otherwise specified in a Natural Resource Management Unit Plan, non-permanent roads and spur roads will be put-to-bed, and closed to off-road vehicles, when the natural resource extraction or other development activity has been completed. In this case, "completed" includes the time period necessary to complete reclamation, reforestation, revegetation, rehabilitation, or other similar activities.

F. **Road Standards.** Also, see Appendix "G": *Resource Extraction Road Standards* for tables that describe road design, construction and maintenance standards for roads within Natural Resource Management Units. While these standards are not "rules" that must be followed, they do provide guidance for roads planned to be used for resource extraction or development activities.

[31] See MSB 2.44.050

G. Other Guidelines Affecting Transportation. A number of other guidelines may affect transportation. For details of the guidelines, see the following sections of this chapter:

- Buffers
- Cultural Resources and Historic Sites
- Fish and Wildlife Habitat
- Green Infrastructure
- Private Property
- Public Recreation
- Rock, Sand and Gravel
- Special Management Zones
- Trails
- Water Quality and Quantity, Wetlands and Riparian Areas

Also, see Volume I, Chapter 3: *Forest Management.*

Transportation Summary

Transportation is an essential element of natural resource management activities, which includes forest management, timber harvest, public recreation, sand and gravel extraction, etc. While an essential element, environmental, public health and safety, and local resident and visitors concerns and needs must also be addressed.

Because of the isolated location of the many of the various Natural Resource Management Units, the lack of existing permanent and/or dedicated road access, no new permanent roads shall be constructed within or to any of the units unless specifically authorized by the Borough Assembly.

When temporary or seasonal roads are planned, consistent and proven road design, construction, and maintenance standards must be met in order to meet the above concerns and needs.

Permanent transportation routes and rights-of-ways are usually dedicated as public rights-of-way or an easement is reserved. For potential future routes, transportation is a primary designation and is usually classified as Reserved Use – Transportation. Temporary-secondary and spur roads (roads that are to be put-to-bed) are a secondary use and are usually designated and classified the same as the adjoining lands.

* *Water Quality and Quantity, Wetlands and Riparian Areas* *

Resource Goals

Access. Provide public access to and along all navigable and public waterbodies[32].

Recreation and Tourism. Allow opportunities for a variety of recreational and tourism activities within stream corridors including remote and developed recreational activities.

Riparian Areas. Preserve and protect riparian areas, especially those determined important to the maintenance of fish and wildlife or important recreational or scenic areas.

Stream and Drainage Condition. Improve, maintain or cause minor adverse impact to existing stream and overall drainage conditions.

Vegetation. Preserve and protect stream, creek, and riverbank vegetation identified as essential to habitat functions.

Water Quality. Maintain or exceed surface and groundwater quality standards set by the State Department of Environmental Conservation.

A. Minimize the amount of point and non-point source pollution, including untreated storm water, siltation from road or construction and timber harvest or other natural resource extraction or development activities, hydrocarbon contamination or other pollution from fuel storage tanks as well as roads and highways.

B. Manage public use activities to ensure the protection of habitat areas, riparian areas and wetlands important to habitat or hydrologic functions.

Watersheds. Inventory, manage, and reserve water resources to ensure a balance between in-stream and out-of-stream uses.

Management Guidelines

A. **Water Quality.** In areas where forest management, timber harvest, rock, sand and gravel extraction, and other similar activities occur, maintain water quality, drainage patterns, wetlands, and riparian areas by deliberate design and location of roads, location and placement of culverts, and design and layout of harvest areas.

B. **Priority of Public Uses in Stream Corridors.** The borough shall place a higher priority on protecting public use values directly associated with the water body and in

[32] In Alaska the most commonly used definition for navigable and public water when describing land-use issues is found in AS 38.05.965. This same definition is found in Volume III and at the end of this Volume: *Definitions/Glossary*.

water body buffers than on providing opportunities for forest management, timber harvest, rock, sand and gravel extraction, or other similar activities.

C. **Buffers and Special Management Zones Adjacent to Streams and Wetlands.** Except as specifically provided in a Natural Resource Management Unit plan, land will be maintained through the use of buffers and Special Management Zones along streams and certain wetlands to protect fish and wildlife habitat, water quality, stream bank integrity, and public access.

D. **Wetland and Riparian Areas.** Structures, recreation facilities, and road/bridge projects should be sited, designed, and developed so that impacts to riparian areas and important wetlands essential to habitat functions within Natural Resource Management Units are minimized or, if possible, precluded.

E. **Activities in Buffer Areas.** To the extent feasible, commercial and industry uses, transportation facilities, will be located outside of all riparian buffers and important wetlands (unless the activity is water dependant) and other buffers as well. Where this is not feasible, other measures shall be implemented to meet the intent of these guidelines.

F. **Activities in Special Management Zones.** Forest management, timber harvest, commercial, industrial, and transportation facilities may be located within Special Management Zones as long as measures are taken to protect or mitigate any long-term impacts to riparian and important wetland areas.

G. **Cooperation with other Landowners.** Participate with other landowners in cooperative watershed management programs designed to maintain the water quality of local streams and rivers.

H. **Alaska Department of Fish and Game.** The Division of Habitat requires a Fish Habitat Permit application and review of any proposed project that may cause minor impacts to streams.

I. **Other Guidelines Affecting Water Quality and Quantity, Wetlands and Riparian Areas.** A number of other guidelines may affect water quality and quantity, wetlands and riparian areas. For details of the guidelines see the following sections of this chapter:

- Buffers
- Fish and Wildlife Habitat
- Green Infrastructure
- Public Recreation
- Private Property

- Rock, Sand and Gravel
- Special Management Zones
- Trails
- Transportation

Also, see Volume I, Chapter 3: *Forest Management.*

Water Quality, Quantity, Wetlands and Riparian Areas Summary

Protection of water quality and quantity, watersheds, important riparian areas and critical wetlands is one, if not the most important goal when managing public land. Various federal laws, state statutes and borough code require that these areas are protected and adequate safeguards put in place (management goals and guidelines) to ensure that the short and long-term protection of vital ecosystems for human, fish and wildlife are protected and managed appropriately.

Natural resource management extraction activities, including forest management, sand and gravel extraction, and other similar activities can occur using these same safeguards. Plans for various multiple-purposes within Natural Resource Management Units will achieve this goal on a broad scale, and specific Plans of Operations or plans for specific activities will implement the transportation goals and guidelines of a case specific basis at the time an activity is contemplated and at an on-the-ground level.

Important watershed areas, stream corridors, riparian areas and important wetlands usually receive a primary designation as water resources or wetlands and are classified as watershed lands. Wetlands suitable for the use in mitigation are classified as wetland bank.

A secondary designation for stream corridors, riparian areas, and wetlands, may be for public recreation or resource management land.

Chapter 3
Forest Management

Introduction

This chapter specifically, along with other information in this Asset Management Plan for Natural Resource Management Units, meets the Forest Management Plan requirements of MSB 23.20.060.

Polices and issues addressed in this chapter are:

- Forest Management Goals
- Interagency Coordination and Public Participation
- Economics of the Forest
- Forest Inventory
- Commercial, Operable and Merchantable Forest Analysis
- Sustained Yield and Annual Allowable Cut
- Forest Health and Protection
- Silvicultural Techniques
- Reforestation
- Forest Improvement Study Area(s)
- Harvest Unit Management and Sizes
- Administrative Forest Products Sale and Permit Processes
    - Timber Harvest Nominations
    - Five-Year Timber Harvest Schedule
    - Timber Harvest Implementation Schedule
    - Concurrent Harvests
    - Methods and Authorization of Sales
    - Contract Requirements
    - Plan of Operations
    - Monitoring and Enforcement
    - Personal Use Forest Product Harvest
    - Timber Salvage Sales and Permits
    - Non-Commercial Timber Products
    - Non-Timber Biological Products

All borough-owned Natural Resources Management Units, including those that have a forest management component, are managed for multiple uses. This chapter only applies to land classified as Forest Management or Resource Management with general or specific designations and guidelines on how the forest resources are to be managed and harvested. Many of the above processes also apply particularly to personal use, crafts (i.e. diamond willow), firewood, fence posts, etc.

Other resources and issues related to forest management within Natural Resource Management Units are located in Volume I, Chapter 2, *Natural Resource Management Unit Goals and Guidelines by Resource or Activity*.

Forest Management Goals

Goals are statements of ideal intentions for management, they often are not quantifiable, nor having a specified date of completion. Goals identify desired long-range conditions that are not always achievable. Goals for different resources may conflict. For example, it may not be possible to have significant timber harvests and maximum habitat protection at the same time. The goals, however, do describe the ideal intentions for management.

Management Intent defines near and long-term management objectives to achieve the goals and the general approach to achieve those goals and objectives. These statements have a specific geographic scope.

Guidelines are specific standards or procedures to be followed in the issuance of permits, leases, sales, or other authorizations for the use of land or resources. Guidelines range in their level of specificity, providing detailed management direction, general guidance, or the identification of factors that need to be considered in decision-making. Guidelines are consistent with both Management Goals and Management Intent.

For a more complete description and explanation of goals, management intent, land-use classifications, land-use designations, management guidelines and best management practices see Volume I, Chapter 1 of this plan. For definitions of terms commonly used in this chapter see the Definitions*/Glossary* which is at the end of this volume and in Volume III.

Goals, in alphabetic order, for managing the borough's boreal forest are:

- At a minimum, meet *Alaska Forest Resources and Practices Act* (AS 41.17), Alaska *Forest Resources and Practices Regulations* (11 AAC 95), as well as Borough code (23.20) *Forest Management*, and (28.60) *Timber Harvest.*

- Enhance the productivity of forestland through planned and managed harvests of mature and over-mature stands. Assure forest restoration and reforestation using proven and effective silvicultural techniques.

- Ensure that local resident timber needs are made available, principally for personal use firewood, before or after any other timber harvest.

- Provide for value-added wood products that contribute to local economies and provide jobs for residents of the borough.

- Manage borough forests in a way that the overall health of the ecosystem, of which the forest unit is a part, is maintained or enhanced. Also, provide for diverse recreation opportunities, important fish and wildlife habitat areas, scenic quality, and watershed resources.

- Manage for both even and uneven aged forests through accepted and effective silvicultural practices.

- Protect air, land, and water quality.

- Seek a net-benefit to the borough through the harvest and use of forest public resources that considers both direct and indirect cost benefits.

- Provide a sustained yield of forest products for commercial and personal uses. Meet the needs for value added, small-scale wood processers including non-extractive uses, and larger scale industries where appropriate.

- Study and evaluate the results and success of post-harvest reforestation methods and means to ensure that a sustained yield rotation period is maintained.

- Study and acquire growth and yield data for second-growth commercial forest stands.

Interagency Coordination and Public Participation

To assure successful resource management decisions and actions, the borough will continue to consult and coordinate with federal, state, local entities and agencies, and private landowners. These agencies will typically include the U.S. Department of Agriculture, U.S. Department of the Interior, and the Alaska Department's of Environmental Conservation, Fish and Game, and Natural Resources. This coordination will assure consistency of natural resource management practices and trends, obtain data for specific actions, and meet legal requirements and legislative intent.

Public participation shall be in accordance with MSB 23.05.025, or as deemed necessary to address and meet specific management actions. Working with local landowners, community councils, organizations and non-profits is encouraged to gather local knowledge of site-specific information.

Economics of the Forest

Many factors influence forest economics and especially the financial aspects of timber harvests, costs, and product sales. Stumpage (payments to the resource owner) and value added products, including non-extractive uses, are commonly compared and managed as forest resources with appropriate tradeoffs.

At a micro-level, the market value of the forest is often determined for stumpage purposes as a derivative of the market value of the logs or lumber, depending on the valuation method used. Decisions as to the non-timber values of a forest are usually made at macro levels that account for other products provided by the forest such as important scenic values, wildlife habitat, public recreation opportunities, water quality, etc. Forests in the borough are managed for all types of uses and values, with input from residents, borough land managers, adjacent land managers (such as the Alaska Division of Forestry) and other interest groups (such as tourism based companies, fishing and hunting guides, and others).

Some of these "micro" and "macro" values can be directly valued on a monetary basis such as the commercial value of a tree to a manufacturer of an end product. Other values such as increased recreation, improved wildlife habitat, water quality or a scenic viewshed cannot easily be directly valued. Basic questions on any forest value are: who owns the forest and what are their management objectives?

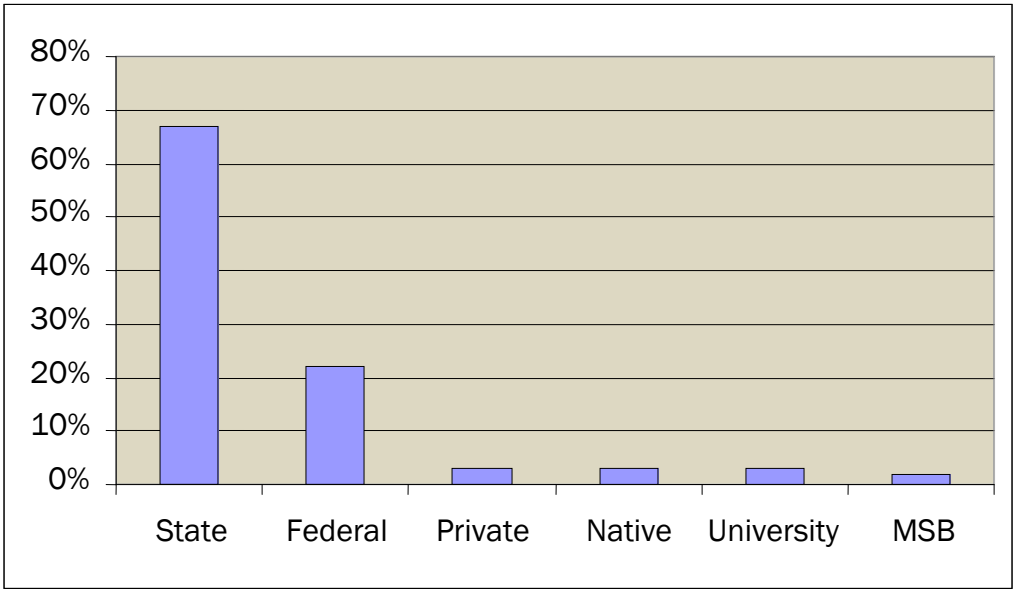
Both the "micro" and "macro" viewpoints and what they provide are important. Because of nature being nature, either viewpoint may be objective or subjective at any given point in time. Answers to these two questions make natural resource management, and in this chapter on forest management, a professional challenge. Neither the micro or macro viewpoint provide all the answers for the overall health of the borough's boreal forest resources, especially considering the variety of needs of the uses and users of Natural Resource Management Units where these multi-functional forest resources are located.

Natural resource management and planning are essential to reflect current and foreseeable conditions. While doing so, it is equally important to recognize goals, management intent and the management guidelines that combine balanced land use with science and projected future social-economics. This includes forest management and the potential for local economic benefit.

Within the borough boundaries, the borough only owns a small percentage of land suitable for timber harvest. The borough on its own cannot support a viable timber industry. But, it can provide for some timber harvests.

The chart below (Figure I-3-1) reflects current land ownership.

Figure I-3-1: Approximate Land Ownership within the Mat-Su Borough



Source: Mat-Su Borough, Information Technology Department, GIS

The majority of the lands within borough-owned Natural Resource Management Units are located in areas along or in close proximity to major road systems, and near existing communities where forest management and timber harvest may be suitable activities, but not necessarily for all future products or uses. For example, large-volume timber harvests for products such as chips, pellets or veneer products have not been successful because of such factors as changing economic conditions (fuel costs, market demand, etc.) or public dissatisfaction. Timber harvests that provide for local value-added products, such as for cabinets, flooring, house logs, birch bowls, and other similar products including firewood, have been more acceptable and successful.

Other landowners, particularly the State of Alaska, own the majority of the forested land in the borough. Combined, the two public land owners (borough and the state) should continue to work together to manage for a healthy and sustainable forest that can provide multiple-use benefits such as local and industry forest products, wildlife habitat, economic diversity, recreation opportunities, watershed protection and wildfire management that are commonly overlooked in preference to specific-use purposes. All these factors and uses combined are what make up the environmental, social and economic diversity of public forests, but only if the goal is to manage these public resources and uses properly.

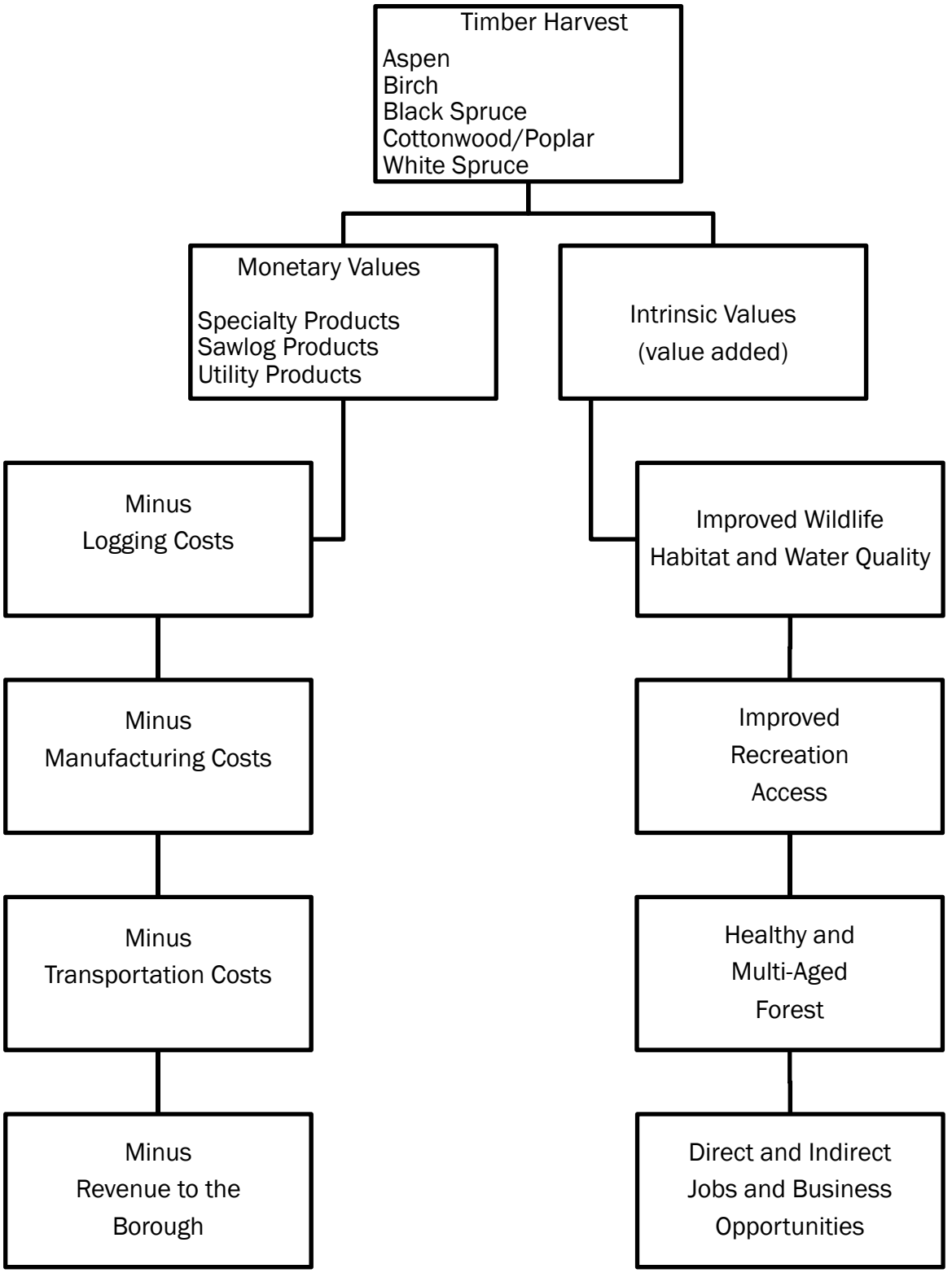
Within the Mat-Su Borough social and economic system, what economic return might be derived from active forest management only currently works for firewood and other similar utility uses, small sawmills, and small specialty industries. Market trends indicate that bio-energy futures and favorable local wood industries will offset

non-renewable energy consumption and serve community and regional demands for wood products.

Forest management based on sound silvicultural techniques, regeneration and sustained yield practices create healthy forests, higher product values and diversified economic impacts.

Professional and scientific forest management results in both direct and indirect values, such as shown on the following illustration (Figure I-3-2). This illustration does not show all costs and values that occur. However, it does show a portion of the monetary and intrinsic values that result from active forest management.

Figure I-3-2: EXAMPLE OF SOME TIMBER HARVEST COSTS AND VALUES



Stumpage Values

A common term utilized for describing the value of a tree standing in the forest is "stumpage value".

Based on the comments received during Phase I of developing this plan, it is clear that the majority of commenter's believed that the public is not receiving a fair return for the timber harvested based on the acreage sale method, and how the timber, once harvested, was or was not utilized.

For many years, the borough has appraised and sold its timber based on an acreage basis. This method does not necessarily reflect the true value of some of its forest resources. The acreage method is an easier method administratively to sell timber, especially if clear cuts are to be utilized based on large volumes in an over-mature forest. However, this method does not recognize the value of timber harvest that is aimed at a certain species and/or for a particular end value-added wood product.

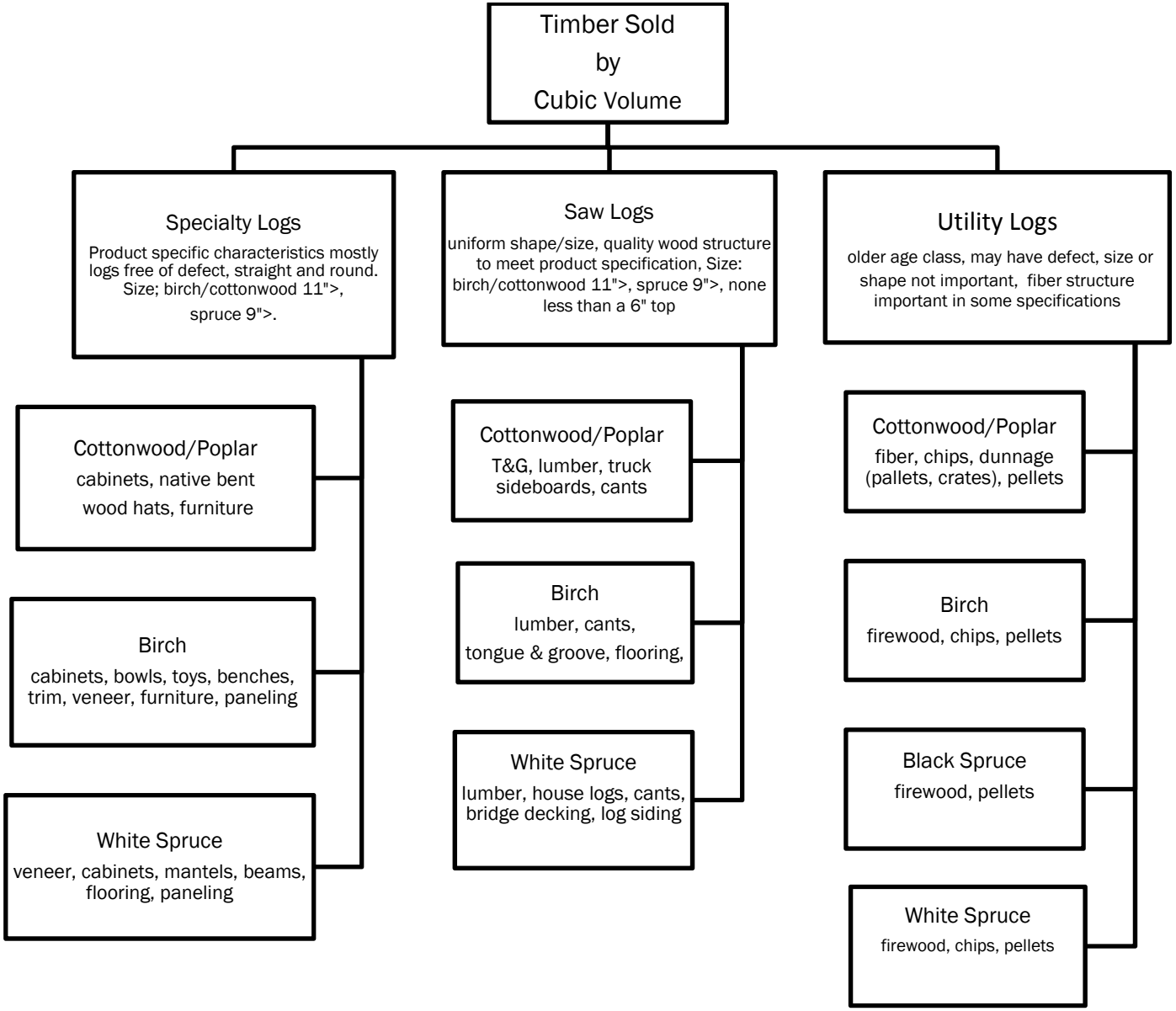
Forest resources in the majority of the borough's Natural Resource Management Units will be managed for harvests for personal use, for specialty logs (house logs, bowls, cabinets, etc.), saw logs (lumber, house logs, flooring, etc.), and utility wood (firewood). The most equitable method of calculating and selling these forest resources is based on volume rather than by acreage. Using the volume method the value of a specific tree may be realized, rather than averaging the value of all trees within a given area which was the method used in the past.

For all future borough timber harvest, timber should be sold or permits issued on a volume basis, rather than by acreage. Forest products can be sold or permits issued on the basis of standing volume (sold or permits issued based on a timber cruise), or by measurement of product (cubic foot, cord or board foot).

Appendix I, *Timber and Lumber Conversions with Examples,* provides measurement information to better understand forest and lumber volumes.

The following chart (figure I-3-3) illustrates examples of ways that timber may be utilized. Trees with the highest value per volume are to the left and the less value per volume is on the right.

Figure I-3-3, Timber Use Opportunities



Selling by volume makes it easier to specify in contracts what species, grade (specialty, saw, or utility), and size of trees can be harvested. However, selling by volume does not mean that acreage will be ignored. The geographic area or acreage where the harvesting may take place shall be clearly defined on the ground. The public notice for the Five-Year Timber Harvest Schedule and/or Timber Harvest Implementation Schedule shall include management intent for the harvest, the geographic area and the amount of acreage where harvesting will take place, the volume to be harvested, the species, tree size based on diameter at breast height (dbh), the regeneration requirements, etc.

Utilizing the volume method, persons wanting to harvest specified species and quality may do so over a larger geographic area, but may only harvest those trees that meet their needs and reduce waste. In addition, timber values can be based on the market value of the timber harvested for a particular type of end product rather than trying to harvest the highest volume per acre, including trees of low value that have been historically harvested in the past which is typical of some utility wood sales.

Using the volume method, rather than the acreage method, for timber harvests does not mean that in all cases the borough will realize a higher net dollar return for the trees being harvested. There are many factors that affect the "bottom line."

As noted in the borough's 2007 timber appraisal[33]:

Logging costs vary with the type of cutting (mechanical or by hand), distance to landings, logging road costs, species and average size of the tree (or logs).

The type of timber sold (pole, select, sawtimber, utility), type of harvest (clear cut, shelterwood, single tree etc.), cutting method (mechanical or hand), distance to yarding area, and other costs of operations, etc., all affect the net return to the borough in the form of cash.

For a simple example, figure I-3-4 illustrates how a sales value, cost and net revenue return to the borough could be calculated for a cord of birch firewood:

FIGURE I-3-4: EXAMPLE OF SALE VALUE AND COST OF BIRCH FIREWOOD

Selling Value (rounds, delivered per truck load	$225 per cord
Less Logging Cost and Profit	$157 per cord
Less Transportation Cost	$60 per cord
Stumpage or Monetary Return to the Borough	$8 per cord

Source: Northern Economics, 2009

[33] *Matanuska-Susitna Borough Market Analysis and Timber Appraisal Report.* Northern Economics Inc., 2007

Log Transportation Costs

Logs harvest on the basis of volume, can be translated to weight to accommodate the needs of truckers. Trucks loaded to highway-legal limits (about 25 tons of logs) generally haul the following volumes:

- 10 cords of firewood, or approximately 600 to 1,000 cubic feet of solid wood (no branches, roots, etc.).[34]

- 4 MBF (thousand board feet) of sawlogs, measured on a long-log basis. See Appendix "A" Definitions/Glossary at the end of this chapter or in Volume III for more information on how board feet are measured.

Transportation costs are generally quoted by the hour or running mile. For example, a truck renting for $120 per hour is equivalent to about $2.40 per running mile.

Also, see Volume III, Appendix "I": *Timber and Lumber Conversions with Examples* which illustrates an approximate comparison of timber measured by acres and various measures of volume and provides examples of the various units of measure.

Value Added

In common terms, "value-added" is usually equated to the conversion of solid wood to a more highly manufactured product. The intent of value-added "timber derived" products is to increase the overall net economic value generated locally by timber products through incremental additions per unit of raw material used.

In other words, many people prefer to see an increase in the cumulative value added to its public forest resources through an industry that applies a value, not volume, focus in its business strategies to increase local employment and economic impacts. This belief was expressed by numerous individuals and groups during the scoping and issues identification portion (Phase I) of developing this Forest Management Plan.

For the majority of the borough's Natural Resource Management Units, besides local personal use needs, these "timber derived" value-added products should be the focus of timber harvest activities. This can be accomplished through a variety of silvicultural methods.

In the broadest sense, value-added forest products can be "timber derived" as described above or "non-timber derived." The latter are commonly referred to as non-timber forest products or non-extractive uses. These include such things as decorative foliage (ferns and conks), edible plants (mushrooms and berries), and sap

[34] Measured birch logs in Anchorage from Trapper Creek area.

removal for products such as syrup and candies, or small wood products such as diamond willow and other craft products.

In some areas of the northern portion of the borough, fishing, hunting, and wildlife viewing, and tourism produce significant activity. These activities and uses are also considered as a value added, non-timber derived product. The longer term benefit of having a healthy multi-aged and successional forest that benefits recreation and tourism must be considered "when looking at the bottom line".

In some areas within Natural Resource Management Units, and some entire units, this non-timber derived value-added activities and enterprises should be the primary commercial use. In these areas, "non-timber derived" uses should be encouraged and not have to compete against "timber driven" uses.

Given the complexity of the various resources those sub-sectors offering the greatest potential value-added margins over existing timber values is an important element to be recognized when making land management decisions. A report to the borough by H.P. Cole and Associates in June 2007[35], provides some additional findings and insights into this value added "non-timber derived" product.

Forest Inventory

Forested land within Natural Resource Management Units are located within a boreal forest which is the earth's largest terrestrial ecosystem and extends unbroken (except for oceans) around the northern pole of the earth.

Boreal forest landscapes can be grouped into four broad terrain/ecosystem types:

1. Lowland/riparian ecosystems adjacent to creeks, streams, rivers, and lakes. This terrain/ecosystem type contains the highest volume stands and the most desired mix of stand types, i.e., birch and white spruce.

2. Upland forest ecosystems found on moderately to well drained soils, and on gentle to rolling topography. This terrain/ecosystem type also contains high volume stands of mixed birch and white spruce.

3. Mountainous forest ecosystems with steep, broken slopes. This terrain/ecosystem type is rare to non-existent for borough owned forested lands.

[35] *Projections of Non-Consumptive and Consumptive Demand in the Mat-Su Forest: 2006 – 2026,* H.P. Cole and Associates, June 21, 2007

4. Wetland ecosystem types found in moderately poor to poorly drained depressions in both lowland and upland terrain ecosystem types. Generally this terrain/ecosystem type has little merchantable timber.

In 2006 with additional work completed in 2009, Sanders Forestry Consulting completed two reports for the borough. The first was *Forest Inventory Report Phase II*[36] and the second was *Operable Forest Land Analysis Report Phase II*[37]. A copy of the executive summary for the *Matanuska-Susitna Borough: Forest Inventory Report Phase II* is located in Volume III, Appendix "N". The same information for the *Operable Forest Land Analysis Report Phase II* is located in Volume III, Appendix "O".

The inventory report looked at predetermined geographic areas (Natural Resource Management Units) and separated the land into two categories; commercial forestland and non-commercial forestland. The operable report further broke down the make-up of the commercial forestland into two-sub-categories; operable forestland and inoperable forestlands.

Operable Forest Lands are:

1. Those areas containing timber volumes and values that have historically been, or currently could be, harvested under commercial timber sale agreements. This requires timber stands to contain commercial timber products not less than 800 cubic feet/acre and capable of producing a growth rate of 20 cubic feet/acre/year of wood products.

2. Areas currently or potentially accessible by all-season or winter roads.

3. Capable of being harvested using ground based, mechanized timber harvest systems currently used in the region.

4. Timber stand volumes and values that currently support harvest costs (including temporary roads) in the region.

5. Available for harvest under law, regulation or ordinance.

A sub-set of the Operable Forest Lands is Merchantable Forest Lands. These are areas that could be economically harvested out of the Operable Forest Lands area within the short term (1 – 10 years). Besides personal use harvest areas, the Merchantable Forest Lands would likely be those identified in the boroughs Five-Year Timber Harvest Schedule.

[36] Sanders Forestry Consulting, 2006 and 2009. The 2009 report supplemented and replaced the 2006 report.
[37] Sanders Forestry Consulting, 2007 and 2009. The 2009 report supplemented and replaced the 2006 report.

Inoperable Forest Lands are:

1. Non-commercial forestland identified by the timber inventory.

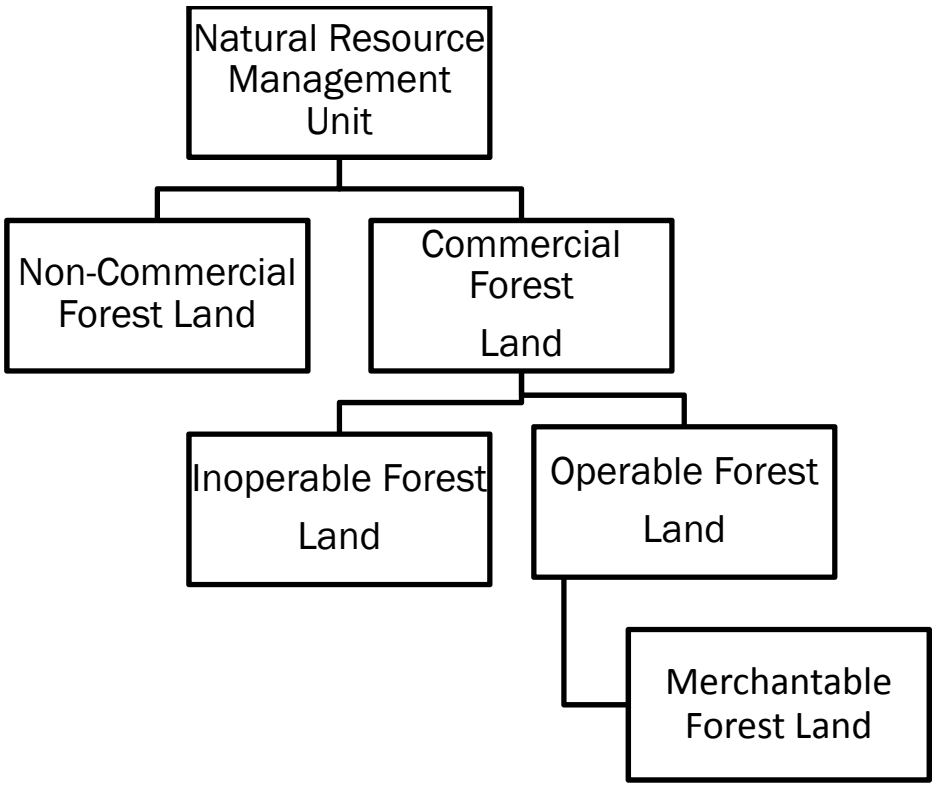
2. Commercial timber volumes/values within a Natural Resource Management Unit that is not economically or technically capable of being accessed and harvested under commercial timber harvest agreements using currently available timber harvest technology and methods. Such lands are not part of the timber base for purposes of calculation of Annual Allowable Cut and shall not be harvested under timber sale agreements unless or until they can be categorized as Operable Forest Lands.

3. Are not available under law, regulation or ordinance.

(Also see the *Definitions/ Glossary* at the end of this volume and volume III for definitions of commercial, operable and inoperable forest land).

The chart that follows (Figure I-3-5) illustrates the types of forested land within a Natural Resource Management Unit. This illustration does not show all the other resources and uses that occur within a Natural Resource Management Unit.

Figure I-3-5: Types of Forest Land in a Natural Resource Management Unit



Inventory Results Tables

The following tables are provided as an illustration only as a "snap shot in time" and are subject to change if the areas are further inventoried at a later date, or natural events such as forest fires, wind damage, etc.

Although a "snap shot in time", this information is important and is included in this chapter because it provides part of the basis for management policies and guidelines contained elsewhere in this plan, particularly in this chapter and in Volume II, *Natural Resource Management Unit Plans.*

The following table (Figure I-3-6) summarizes results for Operable Forest Land by acres and net volumes by Natural Resource Management Unit, including the Fish Creek Management Unit.

Figure I-3-6: Operational Forest Lands Summary Results in Total Acres And Net Timber Volumes by Natural Resource Management Unit

Natural Resource Management Unit	Total Acres In Unit	Total Acres Inventoried	Total Acres of Operable Forest Land	Operable Net Board Feet	Operable Net Cubic Feet (rounded)
Anderson Creek	2,510	Not Inventoried	0	0	0
Bartlett Hills	4,785	4,838	2,785	12,733,000	4,926,000
Bunco Hills	10,440	Not Inventoried	0	0	0
Chijuk Creek	24,659	24,659	14,867	62,194,000	24,334,000
Chulitna River	6,082	5,085	2,845	11,834,000	4,674,000
Deception Creek	3,118	3,118	676	3,055,000	1,173,000
Fish Creek[38]	23,376	18,053	9,025	42,529,000	16,439,000
Kashwitna	9,358	9,366	3,429	15,370,000	5,913,000
Matanuska River North	445	446	264	1,251,000	469,000
Matanuska River South	540	Not Inventoried	0	0	0
Mile 233	4,146	4,146	3,079	13,783,000	5,384,000
Moose Creek	1,228	1,229	732	3,335,000	1,302,000
Olson Creek	5,119	Not Inventoried	0	0	0
Parks Highway	10,278	10,067	1,534	6,674000	2,604,000
Point MacKenzie[38]	5,167	5,198	2,631	11,558,000	4,483,000

[38] The inventoried area and Operable Forest Land Calculations extend slightly beyond the Natural Resource Management Unit boundaries shown in Volume II of this Plan.

Natural Resource Management Unit	Total Acres In Unit	Total Acres Inventoried	Total Acres of Operable Forest Land	Operable Net Board Feet	Operable Net Cubic Feet (rounded)
Rabideux Creek	4,477	4,477	1,585	7,038,000	2,726,000
Rogers Creek	7,039	7,038	1,024	4,860,000	1,848,000
Sheep Creek	9,703	9,703	1,548	7,094,000	2,756,000
Susitna River Corridor	6,667	6,739	3,032	12,986,000	5,087,000
Whiskers Creek North	12,757	Not Inventoried	0	0	0
Whiskers Creek South	13,965	13,964	7,518	33,482,000	13,097,000
Willow	1,077	Not Inventoried	0	0	0
TOTAL	**167,066**	**128,126**	**56,574**	**249,776,000**	**97,215,000**

Source: Sanders Forestry Consulting and Alaska Map Company, 2009, RWS Consulting 2010

At this point it is not feasible to further break down the operable forest area inventory into smaller economic or management units. In reality not all operable forestland is available for immediate harvest because of annual allowable cut restrictions, access availability, areas designated for other purposes (important fish and wildlife habitat, public recreation areas, scenic areas, etc.)

Operable Forest Land within Natural Resource Management Units

The chart that follows (Figure I-3-7) illustrates the composition in acres by strata of the operable forestland within the various Natural Resource Management Units that were inventoried for the borough by Sanders Forestry Consulting and Alaska Map Company. The total data, including information by species and volumes, are not included in this chapter because of their complexity and length.

See Volume III, Appendix "K": *Forest Type Descriptions and Classifications* for descriptions and pictorial examples of the various strata.

Figure I-3-7: Operable Forest Land in Acres (approximate) by Natural Resource Management Unit and Stratum

Natural Resource Management Unit	Strata 1: (Pole timber - Closed)	Strata 2: (Pole Timber – Open)	Strata 3: (Hardwood Sawtimber – Closed)	Strata 4: (Hardwood Sawtimber – Open)	Strata 5: (Mixforest Sawtimber – Closed)	Strata 6: (Mixforest Sawtimber – Open)	Total Acres
Bartlett Hills	761		10	154	1,703	157	2,785
Chijuk Creek	898	1,923		890	8,485	2,672	14,867
Chulitna River	59	87		8	1,468	1,222	2,845
Deception Creek	383			74	154	65	676

Natural Resource Management Unit	Strata 1: (Pole timber - Closed)	Strata 2: (Pole Timber – Open)	Strata 3: (Hardwood Sawtimber – Closed)	Strata 4: (Hardwood Sawtimber – Open)	Strata 5: (Mixforest Sawtimber – Closed)	Strata 6: (Mixforest Sawtimber – Open)	Total Acres
Fish Creek	428		713	361	7,307	216	9,025
Kashwitna	1,711	203	130	32	868	485	3,429
Mat. River North	21		82	161			264
Mile 233	190			68	2,347	475	3,079
Moose Creek	1		6		657	68	732
Parks Highway	104		81	143	710	496	1,534
Point MacKenzie	507	73	30	369	1,291	361	2,631
Rabideux Creek	509	69	10	47	741	208	1,585
Rogers Creek	788	2	67	6	105	57	1,024
Sheep Creek	54	11	109	21	1,121	233	1,548
Susitna River Corridor	258	43	7	230	1,596	898	3,032
Whiskers Creek South	134	84		137	6,008	1,156	7,518
Total Acres	**6,807**	**2,494**	**1,246**	**2,701**	**34,560**	**8,767**	**56,574**

Source: Sanders Forestry Consulting and Alaska Map Company, 2009

Other Land within Natural Resource Management Units

There are approximately 172,000 acres of land within the 22 Natural Resource Management Units that are discussed in Volume II of this plan. Within the Units there are about 79,360 acres of commercial forest land or 49% of all the land within the Units. Within the commercial forest land there is about 56,574 acres of operable forest land or 34% of all the land in the Units. It is important to remember that almost all the land within Natural Resource Management Units will be managed for multiple purposes and uses. The commercial and operable forest lands are all within this multiple-use category.

Commercial, Operable and Merchantable Forest Analysis

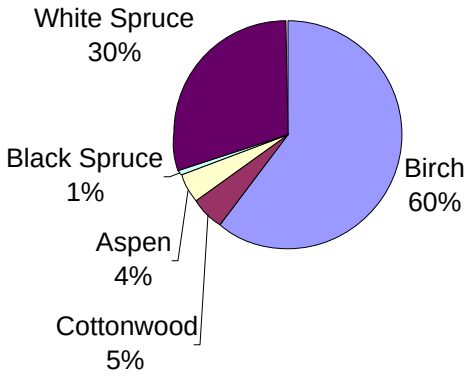
Although adopted separately from this plan, the Fish Creek inventory and operable area figures are included in all the charts and computations in the following section of this chapter. The *Fish Creek Management Plan* was adopted by the Borough Assembly in September 2009 and is considered as a Natural Resource Management Unit.

For all charts and figures in this chapter "Net Board Feet" is based on the Scribner Log Scaling, variable length rule. An explanation of the methods to calculate board feet is found in the *Definitions/Glossary* at the end of this Volume and in volume III. More detailed

results are contained in the *Forest Inventory Report Phase II.* The executive summary of this report can be found in Volume III: Appendix "N".

Figure I-3-8 shows the composition of tree species for lands that were inventoried in the *Forest Inventory Report Phase II*.

Figure I-3-8: Operable Forest Lands, Species Summary



Source: Sanders Forestry Consulting

Of the total gross volume, defects (rot, breakage, etc.) may reduce the amount of merchantable wood, depending on the end product. This is viewed as the net volume. While conducting the forest inventory, Sanders determined the average visible defect by species. This is shown in the following table (Figure I-3-9). This table does not include hidden defect or logging breakage.

Figure I-3-9: Average Visible Defect by Species

Species	Percent Defect
Aspen	32.70
Birch	25.20
Black Spruce	19.10
Cottonwood	18.20
White Spruce	8.20
All Species, weighted	**21.00**

Source: Sanders Forestry Consulting, 2009

The following chart (Figure I-3-10) shows the net volumes by species from the *Forest Lands Inventory Report Phase II*.

Figure I-3-10: Commercial Forest Lands Total Net Volumes by Species

Species	Total Net Board Feet	Net Board Feet per Acre (Variable Log Basis, Scribner Rule)	Net Cubic Feet per Acre
Aspen	16,337,000	208	77
Birch	206,225,000	2,625	1,063
Black Spruce	1,899,000	37	13
Cottonwood	17,528,000	223	73
White Spruce	103,263,000	1,314	489
Totals	**346,252,000**	**4,208**	**1,714**

Source: Sanders Forestry Consulting, 2009

Figure I-3-11 describes the timber inventory volumes by stratum and species.

Figure I-3-11: Timber Inventory, Volumes Summarized by Stratum and Species

Species	Net Board Feet per Acre	Total Net Board Feet	Net Cubic Feet per Acre	Net Cubic Feet of Solid Wood
STRATUM #1 – Pole Timber Closed 11,330 acres				
Aspen	770	8,720,000	29,800	3,379,300
Birch	2,920	33,082,000	110,100	12,478,900
Black Spruce	117	1,320,000	4,000	452,300
Cottonwood	172	1,944,000	6,000	680,800
White Spruce	742	8,408,000	29,100	3,292,700
TOTALS	**4,720**	**54,357,000**	**179,000**	**20,284,000**
STRATUM #2 – Pole Timber Open 3,415 acres				
Aspen	326	1,112,000	13,200	450,900
Birch	1,329	4,537,000	55,900	1,980,100
Black Spruce	123	422,000	4,600	158,700
Cottonwood	6	20,000	300	11,800
White Spruce	969	3,310,000	34,900	1,192,800
TOTALS	**2,752**	**9,400,000**	**109,000**	**3,722,400**
STRATUM #3 – 90+% Hardwood Sawtimber Closed 2,410 acres				
Aspen	519	1,250,000	16,300	393,700
Birch	2,496	6,015,000	97,400	2,347,700
Black Spruce	17	42,000	60,000	14,700
Cottonwood	2,638	6,358,000	9,310,000	2,242,600
White Spruce	542	1,305,000	1,910,000	460,700
TOTALS	**6,212**	**14,970,000**	**5,579,500**	**5,459,400**
STRATUM #4 – 80% – 90% Hardwood Sawtimber Open 3,962 acres				
Aspen	24	96,000	600	24,800
Birch	2,285	9,052,000	93,700	3,713,600
Black Spruce	13	51,000	500	20,500
Cottonwood	728	2,866,000	22,100	876,200
White Spruce	942	3,733,000	35,400	1,401,100
TOTALS	**3,993**	**15,819,000**	**152,400**	**6,036,200**

Species	Net Board Feet per Acre	Total Net Board Feet	Net Cubic Feet per Acre	Net Cubic Feet of Solid Wood
STRATUM #5 – Mixed Sawtimber Closed 43,427 acres				
Aspen	83	3,598,000	2,700	1,168,900
Birch	2,888	125,422,000	117,900	51,204,600
Black Spruce	24	1,041,000	800	346,100
Cottonwood	140	6,084,000	4,200	1,844,100
White Spruce	1,497	65,011,000	54,800	23,811,600
TOTALS	4,632	201,156,000	180,500	78,375,300
STRATUM #6 – Mixed Sawtimber Open 14,015 acres				
Aspen	111	1,562,000	4,400	615,700
Birch	2,006	28,117,000	84500	11,841,900
Black Spruce	2	24,000	100	8,300
Cottonwood	17	236,000	500	63,500
White Spruce	1,534	21,495,000	58,800	8,247,000
TOTALS	3,670	51,434,000	148,200	20,776,500
TOTALS FOR ALL STRATUMS	25,979	317,197,000	6,348,600	134,653,800
TOTAL ACRES IN ALL STRATUMS: 78,559				

Source: Sanders Forestry Consulting, 2009

Sustained Yield and Annual Allowable Cut

The Alaska Constitution requires that natural resources be managed on a sustained yield basis[39]. State law and borough code for forest management provide further guidance on periodic sustained yield[40], and annual allowable cut[41]. Each term has its own definition, meaning and purpose; however, sustained yield, periodic sustained yield and annual allowable cut are tied and directly linked to each other.

Sustained Yield

Sustained yield is the achievement and maintenance in perpetuity of a high-level or regular periodic output of renewable resources without significant impairment of their productivity. To maintain sustained yield, annual allowable cut is the amount of timber that may be harvested borough wide each year at a rate that closely approximates the rate of growth from initial seeding to the time of expected maturity. The period of time over which this occurs is referred to as rotation period. Borough code (MSB 23.20.030) specifies a rotation of:

- 100 years for areas managed for production of white spruce.
- 80 years for areas managed for production of birch.
- 75 years for areas managed for production of cottonwood.
- 60 years for areas managed for production of aspen.

[39] Alaska Constitution; Article VII, Section 4.
[40] See Volume III, Appendix "A", *Definitions/Glossary* and Appendix "Q", MSB 23.20.030
[41] See Volume III, Appendix "A", *Definitions/Glossary* and Appendix "Q", MSB 23.20.040

Sustained Yield and Annual Allowable Cut Guidelines

The time period to begin counting the rotation period shall begin when applicable reforestation requirements of the *Alaska Forest Resources and Practices Act* have been met as determined by the Alaska Division of Forestry. Generally this is when an average of 450 seedlings per acre have been established, they have survived 2 winters and show signs of growth and/or reached a height of approximately 12 inches, or a combination of residual trees and seedlings has been achieved as determined by the Alaska Division of Forestry.

Periodic Sustained Yield

Borough code (MSB 23.20.040(D) requires that the annual allowable cut within all borough-wide Natural Resource Management Units with a timber harvest component shall be managed on a decadal (10-year) basis. Using a decadal rather an annual basis allows for more efficient and flexible management and adjustments to changing markets and harvest conditions, etc.

For example, if the operable forest land within all Natural Resource Management Units totals a volume figure of 100,000 and the rotation period to maintain sustained yield is 100 years, the annual allowable cut would be a volume of 100 per year, or a total volume of 1,000 over a ten-year period. This ten-year volume may be either larger or smaller than the average volume of 100 per year.

Periodic sustained yield allows taking this ten-year volume (1,000) and average the annual harvest (100) each year, either larger or smaller, as long as the total volume harvest does not exceed the decadal volume level (1,000). For example:

Year	1	2	3	4	5	6	7	8	9	10	TOTAL
Volume	100	80	125	70	95	150	125	100	75	80	1,000

Periodic Sustained Yield Guidelines

A. Annual timber harvest may be higher or lower per year than the Annual Allowable Cut for each year of a 10-year period to be responsive to market conditions and fluctuations and for more efficient and flexible management. However, the total amount harvested over the 10-year period shall not exceed the authorized Annual Allowable cut times ten (10) for the same period.

B. If the total of Operable Forest Lands changes either upwards or downwards, the Annual Allowable Cut and Periodic Sustained Yield shall be adjusted to reflect the change during preparation of the next Five-Year Timber Harvest Schedule.

Annual Allowable Cut

Annual Allowable cut can be calculated by any one of three methods:

1. Area Control Method estimates is derived by dividing the total of Operable Forest Land acreage (as determined by inventory) by the rotation period. Results are expressed as the acreage available for harvest each year of the rotation, on a sustained yield basis.

2. Volume Control Method estimates is derived by dividing total of Operable Forest Land volume (cubic foot timber volume) by the rotation period. Results are expressed as the volume of timber available for harvest each year of the rotation, on a sustained yield basis.

3. The Hanzlik Formula is applicable to forests that are predominantly over-matured. The Hanzlik formula is a variation of the volume control method and accounts for timber volume produced annually by productive, young-growth timber stands. This annual increase in growth of timber is added to the volume available for harvest each year.

During at least the first rotation period the Volume Control Method shall be used to calculate Annual Allowable Cut. Use of the Volume Control Method will ensure that annual allowable cut is not exceeded in areas where volume is higher. In addition, using a volume measurement will be more conducive to make larger areas available for specialty product where single-tree or selective harvest is utilized.

According to the *Forest Inventory Report Phase II*, Sanders concluded that currently both state and borough forestlands within the boundaries of the borough are in a predominantly old-growth condition; annual volume gains are offset by volume losses due to damage and disease, and some stands are declining in usable net volume. Because intensive forest management for commercial timber production within the borough boundaries has not been undertaken, reliable growth and yield tables for commercial timber species are not currently available.

According to Sanders, based on the relative reliability of input data contained in the *Forest Inventory Report Phase II* (acres, timber volume, site productivity), estimates derived using the Area Control Method for determining the Annual Allowable Cut are considered to be the most valid; estimates using the Hanzlik's Formula are considered the least valid.

In the *Operable Forest Land Analysis Report Phase II* annual allowable cut calculations were made using each of the three methods for various rotation periods ranging from 50 to 100 years. The option to pick which of the three methods, using the variable rotation rates shown in the *Operable Forest Land Analysis Report Phase II* does not currently exist

because the rotation periods have been established in borough code (MSB 23.20.030), Borough code[42] allows adjustments to the annual allowable cut through this plan process.

Because of the location of most of the borough's Natural Resource Management Units, the type(s) of harvest will generally not be based on large volumes within relatively small harvest areas. Instead, the harvests will be over a large acreage with relatively small volumes that are more conducive for harvest such as for local mills, value added products, personal use, firewood, etc.

Using volume also aids in laying out cutting units for areas that have the potential for clear cutting. Areas can be laid out, utilizing uncut islands, that produce the needed volume(s), and discourages potential harvesters from harvesting every available tree within a small confined area to get the needed volume(s). This same practice will ensure that adequate cover, genetically strong seed trees and wildlife migration routes, etc. are maintained, and if laid out properly, minimize the amount of roads needed to access multiple cutting units.

Based on known and anticipated timber uses for value added wood products, personal use and similar markets, annual allowable cut calculations anticipate managing 70% of the forest base for birch and the remaining 30% for spruce. It is expected that operable commercial forest lands identified as Strata 1, 2, 3, and 4 in the Forest Inventory Report[43] could be managed (harvested and regenerated) on an 80-year rotation to favor birch, and operable forest lands identified as Strata 5 and 6 in the Forest *Inventory Report* could be managed (harvested and regenerated) on a 100-year rotation to favor spruce.

For example, utilizing the *Forest Inventory Report Phase II*, the results would be:

Total Net Operable Standing Timber Volume = 97,213,400 cubic/feet[44]

97,213,440 cubic/feet x 70% (birch) = 68,049,408 cubic/feet ÷ 80 year birch rotation period = 850,618 cubic/feet per year

97,213,440 cubic/feet x 30% (white spruce) = 29,164,032 ÷ 100 year white spruce rotation period = 291,640 cubic/feet per year

850,618 cubic/feet per year for Birch
+ 291,640 cubic/feet per year for White Spruce
= 1,142,258 cubic/feet per year combined Birch and White Spruce

This is equivalent to all the timber on about 600 to 700 acres.

[42] See Volume III, Appendix "Q" MSB 23.20.030.
[43] *Forest Land Inventory Report Phase II*, Sanders Forestry Consulting and Alaska Map Company, June 2009.
[44] *Operable Forest Land Analysis Report Phase II*, Sanders Forestry Consulting and Alaska Map Company, June 2009

Changes to the operable timber base may occur, for example, when operable timber is added to or withdrawn from a Natural Resource Management Unit.

Annual Allowable Cut Guidelines

A. Any change in the operable timber base, either up or down, changes the Annual Allowable Cut. The change in Annual Allowable cut will be made as soon as reasonable, but no later than the next Five-Year Timber Harvest Schedule.

B. During at least the first rotation period the Volume Control Method shall be used to calculate Annual Allowable Cut.

Rotation Period

Borough code (MSB 23.20.030 (D)) allows the rotation period to be adjusted in the forest management plan process "based on, but not limited to, location, slope, growth potential, and condition of trees". For example, rotation periods may be lengthened or shortened to reflect the success or lack thereof of forest regeneration practices as reliable growth and yield data becomes available.

One of the goals in the *Asset Management Plan for Natural Resource Management Units* is to create and maintain a mix of stand ages on borough land that will also provide a balance for other values.

Currently, borough forest lands are in a predominantly old-growth condition. Some forest stands may be actually declining in usable net volume because of damage, decay and mortality that exceed annual growth. A forest in this condition requires harvest and regeneration for restoration to a productive condition.

To restore forest health and condition (increase net volume growth), and to maximize forest potential to supply forest products as well as provide secondary benefits, timber harvests in a given area or stand could commence at either a longer or shorter rotation period for the reasons outlined below.

Lengthening the rotation period:

- Creates older timber stands that are expected to decline in mean annual increment of volume (less fiber) due to increased decay.

- Stands will produce larger spruce sawtimber trees and over additional time (150-years and greater) higher quality sawlogs (smaller knots in the first log).

- May increase habitat for wildlife that rely on old growth forests.

Shortening the rotation period:

- During the initial rotation period, an increased harvest would begin to convert existing un-managed forest to managed productive stands sooner.

- Timber stands may produce habitat for wildlife that depend on earlier stages of forest succession and development.

Achieving the goal of having a mix of forest stand ages is very difficult if not impossible to achieve on a wholesale basis on borough owned land because not all the Operable Forest Land is located in one or two forested areas. Of the 22 Natural Resource Management Units, 16 have Operable Forest Land. This ranges from a low of 260 acres of Operable Forest Land at Matanuska River North, to a high of 14,870 acres of Operable Forest Land at Chijuk Creek. Generally, adjustments to annual allowable cut and sustained yield are done with large forest management areas and where there is significantly larger annual allowable cut and sustained acreage and volume to deal with.

For the 16 Natural Resource Management Units with Operable Forest Lands each shall be managed for multiple-uses and each have different economic, environmental and social conditions to consider. These units may have a timber harvest component or designation and the management intent and guidelines provide for a conservative harvest rate; low in volume and with a relatively small amount of harvest opportunities over the short (5 to 10-years) and possibly the long term (20+ years) for the majority of the Units that contain Operable Forest Land.

Rotation Period Management Guidelines

A. Stand rotation periods shall be based on the management intent and land use designations set by the individual plan for each individual Natural Resource Management Unit. Because of the location and relative small size of the Natural Resource Management Units, other natural resources and uses, and the relatively low amount of Annual Allowable Cut, the Natural Resource Management Units with Operable Forest Land shall be managed on the standard rotation periods specified in MSB 23.20.030(B).

B. Any changes shall be made through the plan amendment process at a later date when more reliable growth and yield data is available. See Volume I, Chapter 4, *Implementation and Recommendations.*

Forest Health and Protection

To thoroughly understand the forest protection policy for borough owned timber, an understanding of the standards and guidelines contained in the *Alaska Forest Resources*

and Practices Act[45]*;* the *Alaska Forest Resources and Practices Regulations*[46] ; and the related booklet *Implementing Best Management Practices for Timber Harvest Regulations*[47] is necessary.

The *Forest Health Conditions in Alaska – 2007*[48] provides extensive information of status of insects, diseases, and invasive plants. These reports have published annually since 2002.

The *Alaska Interagency Wildland Fire Management Plan* (1998)[49] and the *Matanuska-Susitna Borough Community Wildlife Protection Plan*[50] provides policy concerning wildfires.

Forest Pest and Invasive Plant Species

White spruce trees throughout the borough have been attacked by spruce bark beetle infestation with varying degrees of infestation. The infestation began in the late 1980's – early 1990's. According to the *Forest Health Conditions in Alaska - 2007* the infested areas in the Mat-Su valley have increased 43 percent to nearly 25,000 acres, with the largest single infestation along the Iditarod Trail from Skwentna to Rainy Pass. The same report states that the infestations are evenly distributed throughout the valley suggesting that this may eventually develop into a large-scale infestation. The dead trees have lost their value as saw timber and for some utility wood uses. Some of the infected stands have been the focus of both state and borough harvest programs since shortly after the infestation began.

The management of invasive plant species is a significant concern throughout the borough. The borough shall manage its land to avoid the introduction of, and reduce the spread of, invasive non-native species, consistent with state law and regulations[51].

The Department of Natural Resources, Division of Agriculture has management authority over invasive plant species. In 2008, the Alaska Legislature created and funded an Invasive Plant Coordinator to be located within the Department of Natural Resources. The State Division of Forestry has indicated that they will work with the Coordinator to develop invasive

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[45] Alaska Alaska Forest Resources and Practices Act of 1990, as amended (FRPA), codified as AS 41.17
[46] See 11 AAC 95
[47] Implementing Best Management Practices for Timber Harvest Operations of the Alaska Forest Practices Act Regulations, 2005, State Department of Natural Resources, Division of Forestry.
[48] The *Forest Health Conditions in Alaska – 2007* (comp. 2008, Forest Health Conditions in Alaska – 2007. USDA Forest Service, Alaska Region. R10-PR-18) was issued by the US Forest Service, Region 10, in cooperation with the United States Department of Agriculture, and the State Department of Natural Resources, Division of Forestry.
[49] The *Alaska Interagency Fire Management Plan – 1998* is a cooperative agreement between the Alaska Department of Natural Resources, Alaska Department of Fish and Game, Bureau of Indian Affairs, Bureau of Land Management, U.S. Fish and Wildlife Service, U.S. Forest Service, National Park Service, Tanana Chiefs, and other Native corporations. The agreement can be viewed as a PDF document at: http://forestry.alaska.gov/fire/fireplans.htm.
[50] The *Matanuska-Susitna Borough Community Wildfire Protection Plan – 2007,* as amended in 2008 is a cooperative agreement between the Matanuska-Susitna Borough, Mat-Su Fire Chiefs Association, and the Alaska Division of Forestry. The agreement can be viewed as a PDF document at: http://forestry.alaska.gov/fire/cwpp.
[51] See AS 03.05.010(5), AS 03.05.027, and 11 AAC 34

plant monitoring programs, develop methods and means to avoid introduction, and find ways to eradicate invasive plants on forested land. The borough should work with the Division of Forestry in this effort.

The Alaska Association of Conservation Districts in concert with their member local Soil and Water Conservation District's[52] also have program's in place that concentrate on surveying areas of infestation and providing landowners with treatment options and to develop Best Management Practices in an effort to control these species.

Forest Pest and Invasive Plant Species Management Guidelines

A forest pest is defined as any insect or disease, or competing vegetation that is detrimental to the productivity of the forest.

A. Detection. A regular detection survey coordinated with the Alaska Division of Forestry should be conducted to determine current insect and disease activity. While annual detection surveys are preferred, it is recognized that budget and other limitations may limit such an activity.

B. Prevention of Pest Outbreaks. Pest management, especially in forest management areas, will emphasize prevention of pest outbreaks. The borough shall emphasize silvicultural practices that enhance natural mortality of pests and improve tree vigor to reduce the risk of outbreaks. Examples include harvesting mature trees of susceptible species, using group selection cuts, suppressing intermediate host species, using lethal trap trees around harvest areas, disposing of slash, and establishing utilization standards that minimize slash.

C. Cooperative Research. The borough should work with other agencies and landowners to develop improved control techniques for insects and diseases.

D. Methods. The primary approach to pest control in intensively managed areas shall be prevention assisted by suppression. Prevention will consist largely of stand manipulation (pre-commercial thinning, wind throw salvage, etc.) to maximize natural mortality of pests, thereby minimizing the need for suppression. However, silvicultural, or other direct control measures, may be required in areas with high commercial or aesthetic values where failure to control could result in loss of resource values.

E. Herbicides. Herbicide application can help promote establishment of desired forest species, especially conifers. However, herbicides have not been widely used for forest management in the borough. Before herbicides are used on an operational basis, herbicide effects on fish and wildlife populations and habitat shall be known. (See Volume I, Chapter 5*, Research* for study recommendations). Herbicides shall not be used on an operational basis until studies have been completed and approved

[52] Currently there are three Soil and Water Conservation Districts in the Borough: Palmer, Wasilla, and Upper Susitna.

by the state Department of Environmental Conservation and/or the Environmental Protection Agency, and any other state or federal agency the borough deems appropriate.

If herbicides are used, an evaluation of the effectiveness shall be prepared and submitted to the borough.

F. Pesticides. Pesticides shall not be used. However, there is no ban on the use of small amounts of pheromones (scents used in attracting or repelling insects) in monitoring forest insect populations, conducting research on spruce beetles or other insects, and controlling small outbreaks of forest insects.

G. Fertilization. Fertilization can improve the nutritional status of nutrient-poor soils and make sites more hospitable to seedlings. Nitrogen fertilization of mineral soils should be considered early in the post-logging period to improve seedbed.

H. Aerial Application. Aerial application of any chemicals for the control of forest pests and invasive species shall not be permitted.

I. Plan of Operations. If the use of herbicides are generally approved on an operational basis, any use of a herbicide(s) shall require a written plan of operations describing in detail the herbicides to be used, the reasons for use; potential effect on humans, wildlife and vegetation types, the expected results; the area where the chemicals will be used, the method of application, and the application rates. In addition, the plan shall describe how and when an evaluation of the effectiveness will be prepared after the application

J. Public Notice. In addition to the public notice requirements of the Alaska Department of Environmental Conservation, public notice shall also be given separately or concurrently pursuant to the requirements MSB 23.05.025 prior to the use of pesticides or herbicides, and signs must be posted in areas where pesticides or herbicides have been used.

Fire Management

Fire has been a natural force in Alaska for thousands of years. It is a key ecological and environmental factor in these cold-dominated ecosystems. Without fire, organic matter accumulates, the permafrost table rises, and ecosystem productivity declines. Vegetation communities become much less diverse and their value as wildlife habitat decreases. Even some of the plant and animal species normally associated with later successional stages will find the environment unsuitable.

Wildfires can increase forest health and productivity. Fire removes some of the insulating organic matter and results in a warming of the soil. Nutrients are added both by ash from

the fire and increased decomposition rates. Tree re-growth can occur quickly so the cycle can begin again.

Fire Management Guidelines

A. Fire Prevention. The borough will carry out preventative activities on borough land where and as needed and funding allows.

B. Fire Protection. The Alaska Division of Forestry will continue to provide wildland fire suppression throughout the borough consistent with the requirements of the Alaska Interagency Wildfire Management Plan.

C. Fire Protection Levels. The borough shall continue to work with the State Division of Forestry to identify various levels of protection for all forest resources consistent with the *Alaska Interagency Wildfire Management Plan* and the *Matanuska-Susitna Borough Community Wildfire Protection Plan*. The borough shall place the highest priority on aggressive and continued suppression of wildland fires that threaten human life, physical improvements and personal property. See Volume III, Appendix "D": *Fire Protection Designations in the Matanuska-Susitna Borough.*

D. Prescribed Burning. The borough may use prescribed fire as a management tool and apply it in a manner consistent with achieving resource management objectives. This shall include working with the Alaska Department of Fish and Game for habitat improvement. Prescribed burning may also be used to control or eradicate diseased trees and invasive plant species.

Silvicultural Techniques

Flowers, vegetables, and fruits are not unlike trees in the forest. They are all plants. The science and art of growing flowers, vegetables and fruits is called horticulture. On the other hand, the branch of forestry dealing with the science and art of growing trees in the development and care of forests is called silviculture.

The horticulturalist (farmer or gardener) and the silviculturalist (forester) make decisions about plants based on environmental needs of the plant such as soil conditions, water, topography, temperature, and sunlight. Other factors considered are reproduction processes, plant size, aesthetic values, growth cycle (e.g. annual, perennial or many decades), pests and diseases, harvest processes, and desired end product. A home gardener may be raising potatoes, flowers and apples for home uses. A farmer may be raising potatoes that will be processed into potato chips, or peonies for the florist trade, or apples for applesauce. The forester may be managing trees in the forest for timber products (lumber, poles, house logs, firewood or wood fiber); for value-added products such as

flooring, cabinets, or bowls. Silvicultural also includes timber stand improvement practices such as thinning or pruning and manipulating the stand for harvest of non-timber products such as tree sap; or for aesthetic viewing, improved recreational uses, and wildlife habitat among other things.

Nature being what it is, there are no black and white formulas or procedures for dealing with the broad variety of characteristics (silvics) of forest trees, even for a single species. Multiple species in a stand make decision processes even more complex. The silvics weigh heavily in decisions concerning rotation periods, harvest strategies and practices (logging method, size and shape of harvest blocks, season of harvest, etc.), and reproduction techniques. Other important factors to consider may include, for example, associated forest cover (shade tolerance); seed production and dispersal; reactions to competition from other trees; damaging agents such as insects, disease, decay, wind, and fire; and special impacts such as local weather conditions and animal browsing.

There are five species of trees found in the borough that have commercial values to one degree or another:

- Paper Birch (Betula papyrifera)
- Black Cottonwood (Populus trichocarpa)
- Quaking Aspen (Populus tremuloides)
- White Spruce (Picea glauca)
- Black Spruce (Picea mariana)

There is an enormous amount of silvics data available about these local tree species. An excellent "one-stop" source of this information is the *Silvics Manual*, published by the U.S. Forest Service. See Volume III, Appendix "K", *Silvics Manual* for instructions on how to access the Silvics Manual online. There is also a reprint of the chapter on Paper Birch in this appendix that serves as an illustration of the types of data available.

Application of professional judgment and experience are paramount in the decision-making process to assure social needs can be balanced with the goal of a healthy and sustainable forest. Using the *Silvics Manual*, other professional publications and exchanging information with other professionals, borough resource management professionals shall ensure that all applicable characteristics are considered to balance the needs of the forest and forest users.

Reforestation

Reforestation is part of the silvicultural process where there are no hard and fast rules that can be applied to every situation. At a minimum the reforestation requirements of the *Alaska Forest Resources and Practices Act* shall be followed. The regulations for implementing this Act require that within 7 years following harvest, harvested areas must contain an average of 450 seedlings per acre or a combination of residual trees and seedlings approved by the Alaska Division of Forestry. Seedlings must have survived at least

two winters and show signs of growth. Post-harvest stocking of commercial trees and/or seedlings is the responsibility of the landowner.

Obstacles to adequate post-harvest stocking do exist. Currently timber values may not support intensive reforestation methods such as hand planting of seedlings. Establishment of blue-joint grass following harvest commonly inhibits seedling establishment of some sites and may limit or preclude adequate stocking within required time frames. Hardwood regeneration is susceptible to damage by moose.

Monitoring and learning from past practices shall be an on-going process. The *Reforestation Handbook*[53] is a good and practical reference for the planning and evaluation of reforestation.

Currently most regeneration of harvested areas is accomplished through natural regeneration and requires a combination of scarification, residual stocking and natural regeneration (both stump and root sprouting, and seedlings).

Direct seeding and replanting of seedlings, following timber harvests is an option that needs further cost and operational analysis. Planting of seedlings immediately following a timber harvest provides more control on the species mix and density. Stump sprouting and natural in-filling by seed trees augment the planted seedlings. This method may also reduce the long lag-time between scarification and the establishment of adequate forest regrowth.

Areas that require additional stocking or areas to be managed in favor of one species (spruce for example) may require hand planting with nursery-grown white spruce seedlings in order to comply with the *Alaska Forest Resources and Practices Act Regulations* requirements.

Site preparation promotes quicker reforestation and reduces grass competition. This benefits habitat and visual quality. Where natural regeneration, artificial seeding, or planting will be used for reforestation, a bed adequate for regeneration is required after timber harvest. The site preparation method used depends on site characteristics and vegetation desired for reforestation and habitat.

The best time for scarification is when the soil can be turned over to expose mineral soils. This is best accomplished in the spring and summer when frost in the ground is not present. However, in some locations damage to the existing ground cover from scarification equipment may be more detrimental to forest revegetation than the intended benefits. In this case, after revegetation methods should be considered.

[53] *Reforestation Handbook,* State of Alaska, Alaska Department of Natural Resources, Division of Forestry, February 2008.

Reforestation Guidelines

A. Regeneration/reforestation in Natural Resource Management Units shall reestablish forests that include a mix of the species currently present (white spruce, birch, aspen, and cottonwood, and in some cases willow for ungulate habitat enhancement). The primary species on each reforested site may vary depending on site conditions, the original forest type, and management intent for the unit. Harvested areas will generally be regenerated to the original forest type and native species where possible. For example, the loss of white spruce may be a reality due to global warming. If proven over time, white spruce may have to be replaced with another warmer environment species.

B. Areas to be scarified should be done as soon as possible, to expose mineral soil and no later than two growing seasons following completion of harvest to minimize grass invasion. Scarification should be done just prior to peak annual seed fall or just prior to artificial seeding to ensure optimum seedbed receptivity. Mineral soil should be exposed uniformly over the harvested area to encourage uniform distribution of trees. Mineral soil should be exposed on at least 60% of the harvested area. Mineral soil patches should be as large as feasible.

C. The borough shall consider using the following techniques, in consultation with the Alaska, Division of Forestry, when determining site preparation strategies on a site-by-site basis:

1. Disking or other mechanical disturbance should be considered to break up soils that are compacted during harvesting. Compaction may reduce seedling growth or cause mortality.

2. On aspen sites, cleared areas should be heavily scarified or lightly burned to produce maximum sucker response.

3. On paper birch sites, scarification should mix the organic layer into the upper mineral soil layer providing optimum conditions for seed germination and seedling survival.

D. Currently, natural regeneration is the main regeneration method used on both borough and state land. Natural regeneration will continue to be used on most sites until a better regeneration method is found and proven to be cost and operational effective. Seeding or planting may be used for a specific timber harvest based on the results of a reforestation study on the harvested site.

E. Reforestation surveys shall be conducted on a regular basis. Surveys are generally performed beginning two years after scarification.

F. Only species native to the area shall be used for regeneration. Exceptions may be made at a small experimental and on a closely controlled basis as part of a

Forest Improvement Study Area project. If other species are proposed the reason shall be explained in the Five-Year and/or Timber Harvest Implementation Schedule(s), which are subject to public notice and review.

Other Guidelines Related to Reforestation

A. Borough resource professionals will coordinate and work with the State of Alaska, Division of Forestry and other landowners and the University of Alaska to develop regeneration techniques for the various sub-climate and soil conditions within the borough.

B. Timber harvest contracts shall specify target species and stocking levels, site preparation requirements, and regeneration methods.

C. Possible requirements for site preparation and recommended site preparation methods shall be included in public notices issued under the provisions of MSB 23.05.025 related to the Five-Year Timber Harvest Schedule and Timber Harvest Implementation Schedule*.*

D. During site reconnaissance of a potential timber harvest area, the borough shall assess ground cover to determine whether grass is likely to invade after timber is harvested. The borough shall develop recommendations for site preparation techniques and timing to reduce grass competition with establishment of new forest cover. These recommendations shall be included in the public notice (MSB 23.05.025) for the sale.

E. All timber harvest contracts shall have scarification and/or regeneration requirements and a separate bond or other form of security required and held by the borough until all requirements have been met which includes those required by the *Alaska Forest Resources and Practices Act.*

F. Borough resource professionals shall work with timber harvesters to ensure that regeneration requirements are met and that comply with the Alaska Alaska Forest Resources and Practices Act. Where regeneration requirements are not being met, the borough shall take those steps necessary to ensure that regeneration requirements are met as soon as possible.

G. Borough resource professionals shall monitor all timber harvests on a regular basis (annually if possible) to evaluate progress towards reaching regeneration goals within the seven-year requirement of the *Alaska Forest Resources and Practices Act.*

Harvest Unit Management and Sizes

Because of the size, location and amount of operable timber of commercial quality available in the various Natural Resource Management Units, three kinds of timber end products may be produced from borough forests:

Specialty Logs – Logs used for manufacturing products such as bowls, cabinets, veneer.

Saw Logs – Timber used for products such as lumber, house logs, and flooring,

Utility Products – Timber used for firewood, home, commercial or industrial heating, pellets, chips, dunnage (crates, pallets) etc.

General Harvest Unit Guidelines

Each of these three harvest products will require different timber harvest and harvest unit regimes. In all cases, proposed harvest types, cut and leave areas, cutting unit size and shapes, width, length, identification of Special Management Zones, buffers, access, reforestation requirements, etc. shall be identified by the borough in consultation with the Alaska Department of Fish and Game and other agencies prior to any proposed harvest.

The above items described in more detail below, and any other items pertinent to each sale shall be subject to public notice and comment prior to any timber harvest offering.

In addition, a detailed plan of operations must also be completed and approved prior to commencing any harvest activities by the harvester. (Also, see the section on *Administrative Forest Products Sale and Permit Processes* below.)

Cut and Leave Area Guidelines

A. To ensure that adequate year-round cover is available to meet wildlife species needs, harvests will be designed to leave no less than 40% of the cover habitat within each Natural Resource Management Unit intact at all times. Uncut areas and buffers set aside from harvesting are included in the cover area calculations. Vegetation left as cover habitat may contain either commercial or non-commercial forest. Visual quality and recreation needs will also be considered in determining what percentage of cover and the location of the cover in each unit.

B. Decisions for reentry timing and species composition for each timber stand shall be based on management intent for the unit, land use designations, site characteristics, markets, habitat conditions including objectives for wildlife management, recreation and visual quality within the Natural Resource Management Unit and the surrounding area.

Cutting Unit Size, Shape, Width and Orientation Guidelines

A. Cutting unit sizes, the size and shape of unharvested strips, cover location, shall be determined on a case-by-case basis depending on the type of timber harvest activity, management intent for the Natural Resource Management Unit, accepted silvicultural practices and the ability of the harvested area to regenerate.

B. Nature being what it is, with no two acres of timber being the same in type, size and quantity; timber harvest sizes must be broadly defined. On a relative basis, volume of timber to harvest is easier to define rather than area or acreage. The area to be logged will depend on the volume to be removed; the silvicultural choice for harvest (single-tree, shelter wood, clear cut, etc.); and numerous other factors such as timber harvest unit layout, topography, soils, habitat needs, etc.

All timber harvests should be based on volumes, not on acreages. For a further discussion on acreage versus volumes see the section on Stumpage Values, Annual allowable Cut and Sustained Yield in this chapter.

Generally[54]:

1. A **small-size timber harvest** could produce up to about 100 cords of firewood; or about 13,000 cubic feet of timber. This volume is comparable to what might, on average, occur on about 10 acres of land.

2. A **medium-size timber harvest** could produce up to around 500 cords, or less, of firewood; or 64,000 cubic feet, or less, of timber. This volume is comparable to what might, on an average, occur on up to about 40 acres of land.

3. A **large-size timber** harvest would generally be over 500 cords of firewood, or over 64,000 cubic feet of wood. These volumes are comparable to what might, on an average, occur on more than 40 acres of land.

C. The size and location of cutting units within Natural Resource Management Units shall be done, to the extent practical, to increase the benefit to wildlife, help ensure successful forest regeneration, minimize visual impacts, and protect and enhance other natural resources and uses including recreation values and scenic quality.

D. In general, timber stands and cuts should be designed with irregular borders to increase the amount of forage-producing edge habitat and habitat diversity with

[54] The figures used are based on Chart I-3-6 this plan which are from the *Operable Forest Land Analysis Report*, Sanders Forestry Consulting and Alaska Map Company; 2009.

shape and edge contact to optimize for wildlife needs, visual quality, and silvicultural requirements and regeneration.

E. Wildlife habitat, including escape and thermal cover, refuges from deep snow, and alternate food sources, shall be considered when designing the arrangement of cutting units and leave areas.

F. For example, the location of mature spruce stands near early winter moose concentration areas will benefit moose. Well-drained upland sites that produce abundant browse are preferred sites for clearing; poorly-drained upland sites that produce less browse are better suited for maintenance as wildlife cover in moose winter range.

G. Where practical, openings should be oriented to minimize blow-down and loss of moose and other wildlife habitat. In other areas, a variety of cutting opening orientations shall be included in timber harvest plans to cover the range of conditions that may be important to moose and other wildlife.

H. These findings and determinations shall be part of any timber harvest public notice under MSB 23.05.025 and as required by MSB 23.20.

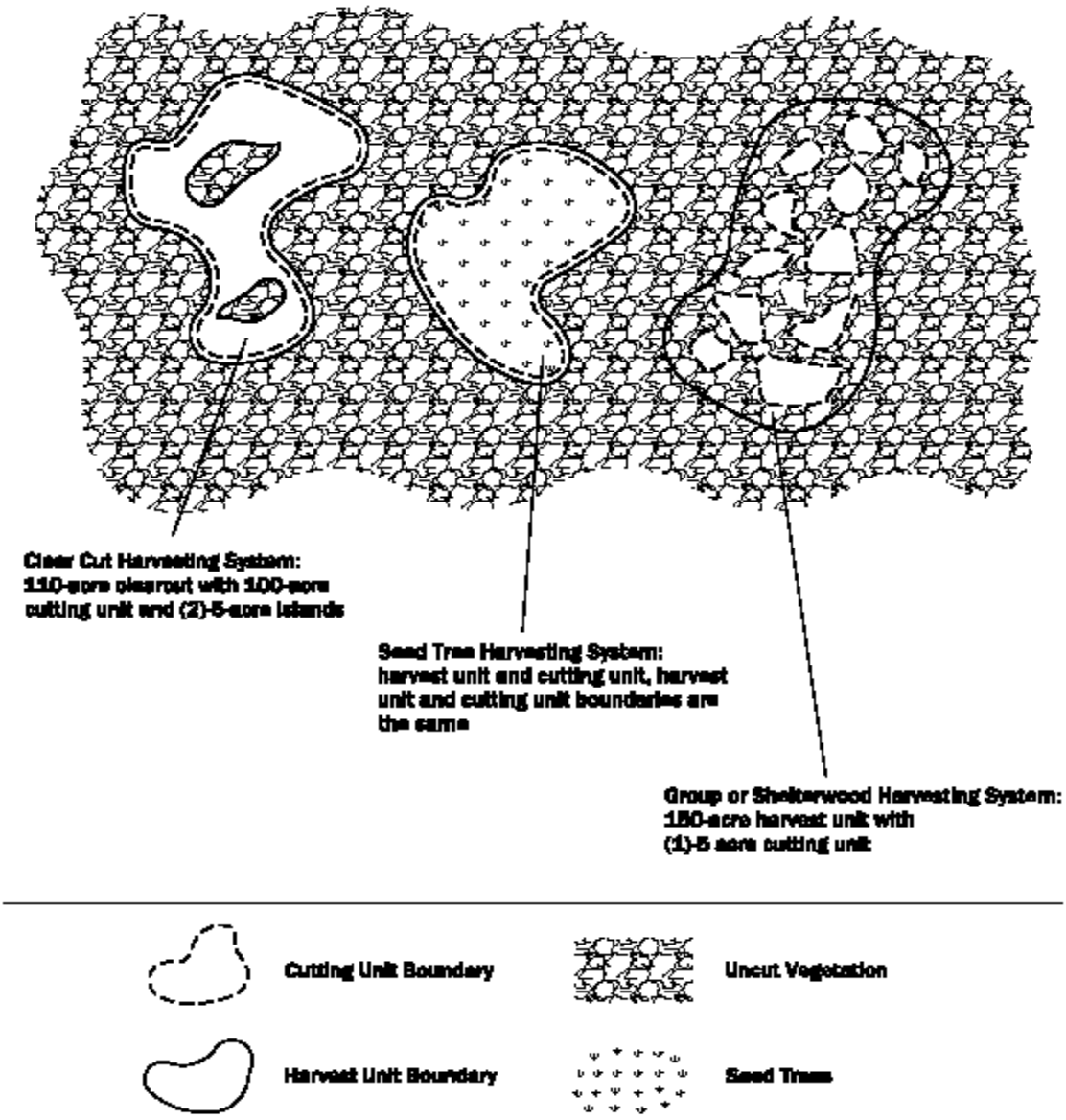
Harvesting System Guidelines

A. Birch. Where birch is the primary species harvested, seed tree harvesting (see *Definitions/Glossary* at the end of this Volume or in Volume III) where most trees are harvested but a number of healthy and genetically strong seed trees are left undisturbed is the preferred harvesting system for wildlife habitat and timber production. Seed tree harvests leave a scattering of native trees adequate to provide a natural seed source for tree regeneration, and exposed mineral soil and sunlit openings that are needed for abundant germination and growth of birch seedlings.

B. White Spruce. Where white spruce is the primary species harvested, single-tree selection is the preferred system. Single-tree selection allows harvest of spruce large enough to provide house logs and sawtimber while leaving forest cover on the site. Spruce is more tolerant of shade than birch and can grow under forest cover. Single tree selection or group selection cutting may be prescribed on sites where beneficial for wildlife, timber management, recreation, visual quality, or other considerations.

Figure I-3-12 graphically shows the three basic types of cutting and harvest units.

Figure I-3-12: Examples of Cutting and Harvest Units



Harvesting Schedule Guidelines

A. Except for specialty log harvesting, logging activities including regeneration, should be concentrated in the shortest possible time for each unit. Where timber harvests are planned to progress through a series of adjacent cutting units, harvest activity should be completed in one subunit before starting in the next. Intensive harvest activity in a single season typically causes fewer disturbances to wildlife than low-level activity over several seasons.

B. Because of the low volume over a large geographic area, specialty log harvesting can occur over a longer period of time, including several seasons.

C. The borough shall request the Alaska Department of Fish and Game, or other knowledgeable and credible sources familiar with the area, to identify wildlife concentration areas in units before timber harvests are offered. This coordination is needed for recommendations on harvest scheduling in winter wildlife concentration areas as well as harvest unit layout prior to timber harvest design process. Recommendations should reflect the size of the proposed timber operation and the likely severity of winter conditions.

D. Harvest activities should avoid critical times for wildlife migration, calving, seasonal concentration periods. No timber harvesting shall occur during the bird nesting period which is established by the U.S. Fish and Wildlife Service. Currently that period is May 1 through July 15..

E. Where possible, timber harvest schedules should be coordinated with other activities to reduce overall negative impacts.

F. Future harvesting should be concentrated in the winter when access is easier and disturbance to aquatic habitats, wetlands, and bear activity areas is the lowest. If summer harvesting is to be used, it shall be directed to well-drained sites where summer harvests can aid site preparation. Schedules for harvesting may be specified in individual sales and sale contracts based on considerations of access, site preparation, and forest regeneration. Potential contractors shall be advised of season harvesting requirements before a contract is issued.

Slash Management Guidelines

A. Slash management benefits reforestation, helps avoid insect and disease outbreaks, reduces the amount of fuel available for wildfires, and improves habitat and, aids movement through cutover areas. Slash disposal can also be designed to benefit visual quality, and aid recreational use of cutover areas. Logging and road construction slash should be disposed to avoid hindering wildlife from using cutover areas. Disposal can be accomplished either mechanically, or by burning, or by a combination of both methods. Slash that falls on uncut lands adjacent to harvest

areas should be cleaned up or removed to facilitate moose and other wildlife cover and feeding areas.

B. Appropriate methods to deal with slash include:

1. One method of slash disposal is to mix, chip or bury the tree waste with the mineral soil and organic matter. This minimizes the amount of piled material that could hinder public access through the site and degrade visual quality. The borough shall work with the Alaska Division of Forestry, the Alaska Department of Fish and Game and other institutions, such as the University of Alaska, on experiments to determine the best techniques for mixing the mineral soil and organic matter.

2. 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. Controlled burning is recommend when climate, soil, and fuel load conditions are conducive to safely removing slash, maintaining forest openings, and improving the quality and quantity of moose and other wildlife forage and habitat. If controlled burning is to be used, the following also applies:

a. Permits. Permits are required for all open burning used for forest management. All open fires must comply with Alaska Department of Environmental regulations for open burning. Applicants should contact the Alaska Department of Environmental Conservation before stacking slash and to design their burning program. In addition, the Alaska Division of Forestry requires burning permits.

b. Fire Prescriptions. If burning is proposed for slash disposal, the Plan of Operations will state whether broadcast burning or piling and burning will be used. Fire prescriptions and a burn plan specific to the residue and topography of the site shall be prepared. No broadcast burning will be conducted outside the area described in the burning prescription.

c. Private Property. No broadcast burning operation will be conducted within one-quarter mile of privately owned buildings or improvements, or within one-eighth mile of undeveloped private land.

C. If extensive windrows are built, openings shall be cut through the windrows to allow wildlife passage, especially on wildlife and other trails. In areas where the Alaska Department of Fish and Game has identified or otherwise confirmed that important furbearer populations (especially martin), slash piles and other logging debris that protrude through the snow should be retained to provide access to prey beneath the snow and to improve denning and cover habitat.

D. Prior to spring break-up each year, winter roads and skid trails must be cleared of all logging debris and slash in the areas over and within 100 feet of all waterbodies in and adjoining the harvest unit in order to keep the debris and slash from entering water bodies. Also, see section on Transportation in Volume I, Chapter 2.

E. Non-wood solid waste shall be removed from the site of forest operations and properly disposed of in a permitted landfill facility.

Specialty Timber Guidelines

A. Cutting or harvest unit size, shape and width for specialty timber harvests shall be tailored for the desired end product(s) for each harvest. Areas may be large in geographic size (40 acres or more) but volumes per acre harvested shall be small to medium (see *Definitions/Glossary* in Volume III). Select cut and/or single-tree harvesting will be based on type, size and quality of the tree.

B. Cutting units for specialty timber should be rotated so that one unit or area is not harvested on a regular or on-going basis. The intent to ensure that the unit or area continues to have a diversity of tree species and sizes.

C. Since each harvest area will be different based on location, type of species, tree size, terrain, slope, accessibility, cutting unit size, width, arrangement of cutting units and leave areas, no special guidelines, other than those listed elsewhere in this chapter, are established that would apply in all cases.

D. Agencies, particularly the Alaska Department of Fish and Game, and the public shall be given an opportunity to comment of these issues during the interagency review and public notice process.

E. For specialty log harvests, single-tree selection harvesting will be used, stands will be managed to retain forest cover, maintain a variety of tree ages, and keep openings small.

Saw Timber Guidelines

A. Cutting or harvest unit size, shape and width for saw log sales should be generally be medium to large in size (see *Definitions/Glossary* in Volume III) depending on the desired final products and/or forest management intent. Select cut and/or single tree, shelter wood, or clear cut harvesting based on type, size and quality of the tree may be used. Timber stands will be managed to maintain a variety of tree ages and species. Depending on the type of harvesting method used and acreage harvested, reforestation may be required based on the requirements of the *Alaska Forest Resources and Practices Act* and the Act's regulations for Region II.

B. Since each harvest area will be different, based on location, type of species, tree size, terrain, slope, accessibility, cutting unit size, width, arrangement of cutting units and leave areas, no special guidelines, other than those listed elsewhere in this chapter, are established that would apply in all cases.

C. Agencies, particularly the Alaska Department of Fish and Game, and the public shall be given an opportunity to comment of these issues during the interagency review and public notice process.

Utility Timber Guidelines

A. Except for small to medium fire wood harvests, large-scale (see *Definitions/Glossary* in Volume III) utility product harvests shall be limited to the Chijuk Creek Natural Resource Management Unit.

B. Since each harvest area will be different based on factors such as location, type of species, tree size, terrain, slope, accessibility, cutting unit size, width, arrangement of cutting units and leave areas, no special guidelines, other than those listed elsewhere in this chapter, are established that would apply in all cases.

C. With the possible exception of small to moderate firewood harvests, clear cutting of utility timber is encouraged in most cases to provide disturbance of the organic soil for site regeneration and to achieve maximum wood utilization from harvested areas.

D. For firewood sales, group selection is encouraged, spread over a large acreage and over a multiple years. Other logging systems may be used where appropriate because of topography, economic factors, or management of other resources.

E. Regeneration may be required based on the requirements of the *Alaska Forest Resources and Practices Act* and the Act's regulations for Region II.

F. Agencies, particularly the Alaska Department of Fish and Game, and the public shall be given an opportunity to comment of these issues during the agency review and public notice process.

Forest Education and Improvement Study Area(s)

During Phase I of developing this plan, numerous public comments were received on the need to conduct additional research and to study various elements of forest health and timber harvest practices throughout the borough. The state, with its much larger land and

timber base has established several research study areas and experimental forest areas (See Appendix "H": *Forest Research and Study Areas)*.

The borough does not have the land and forest base, staff or funding to conduct such studies itself, nor is there is a need for the borough to duplicate the existing research areas that have been established by the state, University of Alaska or federal agencies. In addition the State Division of Forestry is considering recommending to the Alaska Legislative the establishment of a Susitna State Forest. Combined, these areas, plus any others established or utilized by other federal or state agencies or the University of Alaska should meet the needs for studies and research on a large scale basis. Also, see Volume I, Chapter 4, *Implementation and Recommendations.*

What are missing are study areas at a small scale (i.e. 5 to 100 acre) studies. The majority of the timber harvests and harvesting that will occur in the various Natural Resource Management Units fall into this category and be located relatively close to existing communities. The borough should work with state or federal agencies, the University of Alaska to develop studies, and with local community organizations, non-profits and schools to conduct research and both short and long-term studies on the effects of small scale logging efforts.

Silvicultural, ecological and environmental education areas can also be established that could be integrated with school education programming. These areas would develop; students' awareness, appreciation, skills, and commitment to address environmental issues; to provide a framework for students to apply scientific process and thinking skills to resolve environmental problems; to help students acquire an appreciation and tolerance of diverse viewpoints on environmental issues and develop attitudes and actions based on analysis and evaluation of the available information.

<u>Possible Research and Study Projects</u>

A. Timber Stand Improvement – manipulation of the stand to improve tree growth, log (product) quality; change dominant or more valuable natural species.

1. Thinning to desirable number of stems per acre by girdling or cutting down undesirable stems and selling as firewood or other products where economically feasible.

2. Fertilizer treatment to increase the rate of initial growth or other management objectives

3. Pruning branches to a given height (e.g., 16 – 20 feet) to allow knot free growth, which is desirable for many value added products.

4. Remove trees of less desirable species (cut out spruce to release birch, or cutout birch to get better spruce stand or poles/house logs).

B. Harvest Practices – Study most feasible methods of minimizing damage to residual stands after utility or small timber harvests.

1. Logging method(s) such as rubber tired skidder, tracked skidding, "horse" or similar logging.

2. Sales method. Firewood cut in a limited area (e.g., 5 acres) per year, logged by one individual or small group/organization and who will sell firewood to individuals or deliver stems to a suitable landing.

3. Harvest trees pre-marked to meet timber stand improvement goals.

C. Wildlife Enhancement – Cutting practices that will enhance small mammal and bird habitat.

1. Stacking small discreet piles of brush and slash.

2. Leaving nest trees (rotten and/or hollow).

Possible Educational Programs and Funding Sources

The U.S. Forest Service has several educational and grant programs that uses the forest as a "window" to the world to increase students' understanding of forest ecology and our environment; stimulate students' critical and creative thinking; develop students' ability to make informed decisions on environmental issues; and instill in students the commitment to take responsible action on behalf of the environment. Two of these are: *Project Learning Tree* and *Discover the Forest* which provides curriculum for both teachers and students.

The American Forest Foundation, is a nonprofit 501(c)(3) organization that is recognized for its commitment to sustainable forestry, quality environmental education, and wildlife habitat and watershed protection. There programs include *Project Learning Tree,* and *Forests for Watersheds and Wildlife.*

Forest Improvement Area Guidelines

A. Local volunteers, schools, community organizations, and non-profit organizations, university students (especially graduate students) may be utilized for specific study or research projects. Most projects will need to be short term because of the time commitment and possible expense.

B. Educational programs should be coordinated and conducted in cooperation with the Mat-Su School District with curriculum based on national education standards.

C. Research studies shall be scientifically sound in design and properly conducted.

D. Studies will need to be approved in advance by the borough and receive borough oversight on goals, area, techniques, timing, etc.

E. Signed agreements shall be in place before any research or studies begin. It must be clear between the parties on what is expected of each other, costs to be borne by each party, and what the end product will produce.

F. The agreements, studies and research shall not assign management of any borough land to a third party without approval of the borough Assembly.

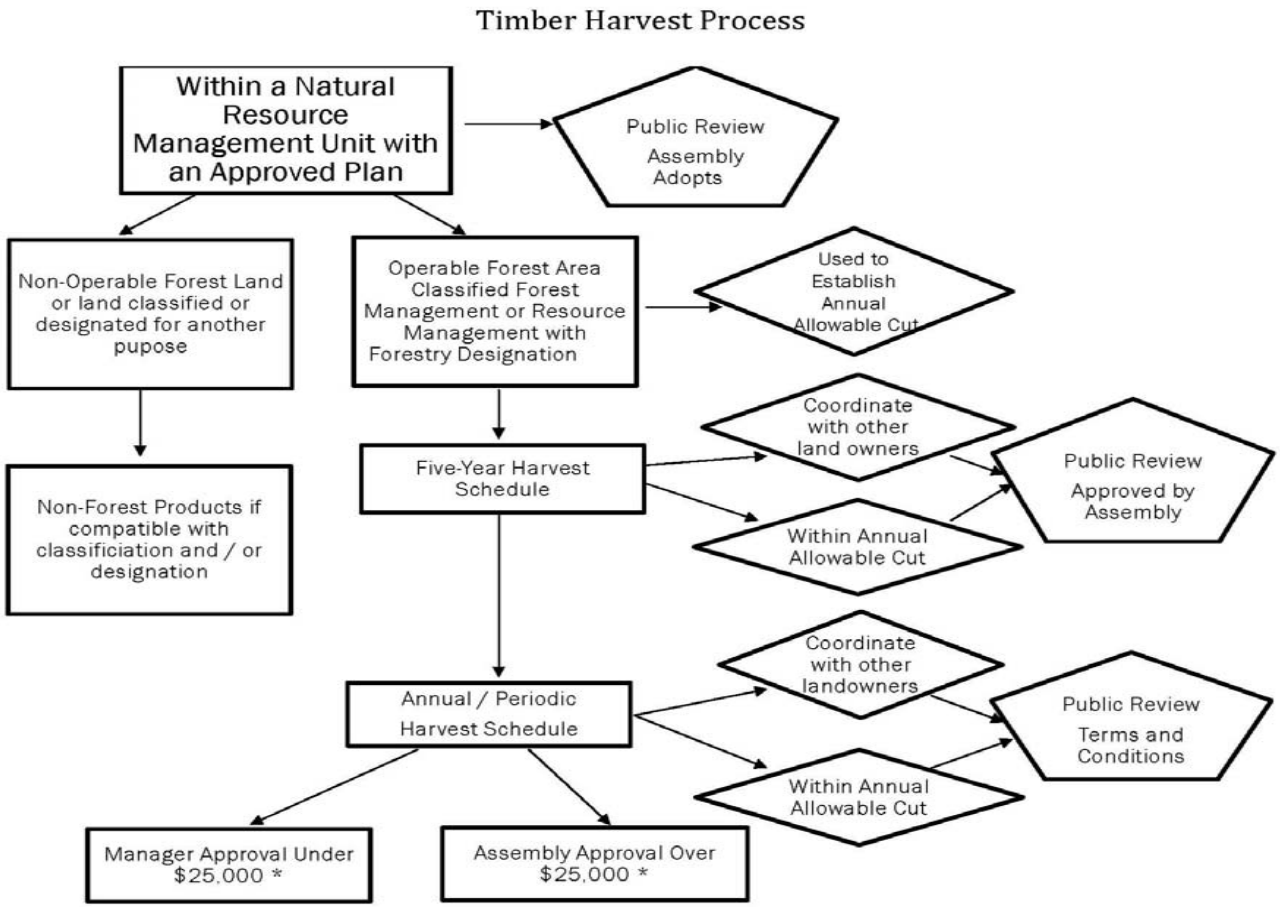
Administrative Forest Products Sale and Permit Processes

One of the goals of the timber harvest program is to make forest products available, within the prescribed annual allowable cut, for local residents personal use needs, to timber harvesting and processing businesses, and to optimize local employment and economic return. Timber harvest must also be compatible with other uses within the Natural Resource Management Units.

This section generally supplements the basic steps that must be taken to make forest products available. At minimum, all forest product disposals must be performed in accordance with MSB 23.05, MSB 23.10, and MSB 23.20.

The following chart (figure I-3-13) shows the sequence and steps involved in the sale process.

Figure I-3-13:


Timber Harvest Process
Within a Natural Resource Management Unit with an Approved Plan
Public Review Assembly Adopts
Non-Operable Forest Land or land classified or designated for another pupose
Operable Forest Area Classified Forest Management or Resource Management with Forestry Designation
Used to Establish Annual Allowable Cut
Non-Forest Products if compatible with classificiation and / or designation
Five-Year Harvest Schedule
Coordinate with other land owners
Within Annual Allowable Cut
Public Review Approved by Assembly
Annual / Periodic Harvest Schedule
Coordinate with other landowners
Within Annual Allowable Cut
Public Review Terms and Conditions
Manager Approval Under $25,000 *
Assembly Approval Over $25,000 *

The asterisks "*" in Figure I-3-13 indicate what current borough code (MSB 23 20.130 (B) and (C)) states for the approval of forest resource sales. At current per acre values of around $80.00 per acre, a sale of $25,000 equates to a sale of about 300 acres. It is recommended (see Volume I, Chapter 4, *Recommended Ordinance Changes*) that the current monetary values be changed to volume values for all timber harvests to be consistent with the rest of this plan which states that volume, other than acreage, measurements be used for all timber harvests.

The change recommended would be for timber harvests less than 68,000 cubic feet or less than 500 cords of wood may be approved by the borough manager. For timber harvests of 68,000 cubic feet or more or 500 cords or over borough Assembly approval would be required. This equates for timber harvests of about 39 acres or under could be approved by the borough Manager. Timber harvests of about 40 acres or more would require Assembly approval.

Timber Harvest Nominations

Management Guidelines

A. Public Notice. A general public notice (does not have to comply with MSB 23.05.025) and/or display ad in at least one newspaper of general circulation in the borough shall be provided at least every two years notifying the public and known persons and industries interested in timber products that nominations for either the Five-year Harvest Schedule or annual/periodic Timber Harvest Implementation Schedule are being accepted.

A similar notice shall also be sent to all Community Councils and borough libraries. Notice shall also be posted on the borough web site.

B. Nomination Areas. Only those lands within Natural Resource Management Units that are classified as Forest Management or Resource Management and that have either a primary or secondary land use designation for forest management may be nominated for a timber harvest.

C. Nominations. Nominations shall be solicited for personal and/or community use as well as areas for commercial timber harvest.

D. Acceptance of Nominations. Nominations for timber harvest may be accepted at any time, but shall only be processed through the regular Five-year Timber Harvest Schedule or annual Timber Harvest Implementation Schedule.

E. Compliance with Borough Code. Nominations for the harvesting of borough owned timber shall be comply with the requirements of MSB 23.20.080 (see Volume III, Appendix "P": *MSB 23.20; Forest Management*).

Five-Year Timber Harvest Schedule

The Five-Year and Timber Harvest Implementation Schedule's are one of the key components to the implementation of this Natural Resource Management Unit Plan, and particularly this chapter on Forest Management.

It is at this stage where the public actually begins to see how the Plan will be implemented. The Five-Year Harvest Schedule has many requirements in code (MSB 23.20.100) that are much more detailed than that required by the State Division of Forestry's five-year timber sale schedule.

Such things as; harvest size(s), access, other forest uses, surrounding land use, public waterbodies and related buffer sizes, cost/revenue analysis, contract performance requirements, and methods and means of proposed harvests, will aid the public in helping the public better understand well in advance on how their public resources are being managed and to make meaningful comments on proposed timber harvests.

Also, unlike the State, Division of Forestry schedules, the borough's Five-Year Timber Harvest Schedule, the boroughs Five-Year Timber Harvest Schedule must be approved by a legislative body (Borough Assembly) prior to being implemented.

Management Guidelines

A. The Five-Year Timber Harvest Schedule shall include areas for personal and/or community use as well as a variety of commercial sales.

B. The total Annual Allowable Cut for any given year or decadal time period shall not be located in one Natural Resource Management Unit.

C. Coordination with Other Landowners. The borough will coordinate its timber harvest offerings with timber harvest offerings of other landowners, especially the Alaska Division of Forestry. The intent is to increase the viability of the offerings or provide other public benefits.

D. Harvests by Volume. All timber harvests should be based on timber volume (cubic feet, board feet, or cords). Harvest areas shall be described by legal description and/or geographic area with the volume, harvest density, species and size based on diameter at breast height (dbh). The average number of trees to be harvested per acre should also be given if possible to aid the public in "visualizing" the harvest.

E. Public Notice. All proposed timber harvests shall receive public notice pursuant to MSB 23.05.025. The public notice shall provide all the information and meet the requirements of MSB 23.20.100.

F. Compliance with Borough Code. The borough shall develop Five-Year Timber Harvest Schedules for a regular predictable series of personal use and/or community use as well as commercial sale offerings pursuant to the requirements of MSB 23.20.090 and .100 (see Volume III, Appendix "P": MSB 23.20; Forest Management).

Timber Harvest Implementation Schedule

The Five-Year and Timber Harvest Implementation Schedule's are key components to the implementation of this Natural Resource Management Unit Plan, and particularly this chapter on Forest Management.

Management Guidelines

A. Implementation Schedule. The harvest schedule should be updated on an annual basis. The Timber Harvest Implementation Schedule shall be based on, but not limited to, reasonable current local and/or community needs, current market demand, market conditions, and availability of needed timber products. In order to be included in the Implementation Schedule, a proposed harvest must first have been included in the Five-Year Timber Harvest Schedule.

B. Personal Use. The Implementation Schedule shall make reasonable attempts to ensure that local resident and/or community firewood needs are included in areas and volumes to meet reasonable local needs before or during any other timber harvest activity.

A. The total Annual Allowable Cut for any given year or decadal time period shall not be located in one Natural Resource Management Unit.

B. Coordination with Other Landowners. The borough shall coordinate its timber harvest offerings with timber harvest offerings of other landowners, especially the Alaska Division of Forestry. The intent is to increase the viability of the offerings, avoid duplicate types of sales in the same area, or provide other public benefits.

C. Public Notice. All proposed sales shall receive public notice pursuant to MSB 23.05.025 which shall include the type of harvest, schedule, terms and conditions of the proposed harvest. The notice should also include the approximate number of trees to be harvested per acre to aid the public in visualizing the proposed sale.

D. Compliance with Borough Code. For those areas covered under an approved five-year schedule the borough shall develop a schedule for implementing approved timber harvests pursuant to the requirements of MSB 23.20.090, .100 and .140 (see Volume III, Appendix "P": *MSB 23.20; Forest Management*).

Concurrent Harvests

Management Guidelines

A. Concurrent Harvests. To meet silvicultural or other needs, concurrent personal use harvests and sales for different products within the same cutting unit and/or area are encouraged. For example, a personal use harvest concurrently with a select or specialty log sale for a specific value-added product (log, bowls, cabinets or veneer). This could be followed by another select cut sale (for example saw logs) for a different value-added product (lumber, house logs, flooring). The impacts and effects of concurrent sales shall be aggregated as if it were one sale for purposes of methods and means, forest regeneration, compliance with the *Alaska Forest Resources and Practices Act*, and other management requirements.

B. Compliance with Borough Code. All the requirements of, MSB 23.20.120 shall be followed. (see Volume III, Appendix "P": *MSB 23.20; Forest Management*).

Methods and Authorizations for Sales

Management Guidelines

A. Sale Schedule. No timber products shall be offered for sale unless the area is on the approved five-year and timber harvest implementation schedules.

B. Commercial Timber and Non-Timber Product Sales.

1. Commercial firewood sales for less than 500 cords and timber sales for less than 64,000 cubic feet may be sold over-the-counter without a competitive bid.

2. Commercial firewood sales for more than 500 cords and timber sales for more than 64,000 cubic feet shall first be offered by competitive sale. If no bids are received or accepted, they may be sold over the counter for a period not to exceed two-years at the same terms and conditions as the competitive sale.

3. Non-timber products with a total gross value of less than $25,000 may be sold over-the-counter without a competitive bid.

4. Non-timber products with a total gross value of more than $25,000 shall first be offered by competitive sale. If no bids are received or accepted,

they may be sold over the counter for a period not to exceed two-years at the same terms and conditions as the competitive sale.

C. Sales by Volume. All timber sales should be based on timber volume (cubic feet, board feet, cords, etc). Sale areas shall be described by legal description and/or geographic area with the volume, harvest density, and size based on diameter at breast height (dbh).

D. Public Notice. All proposed competitive and non-competitive sales shall receive public notice pursuant to MSB 23.05.025. The notice shall contain the sale schedule, sale type, and terms and conditions of the sale.

E. Compliance with Borough Code. All the requirements of MSB 23.20.130 shall be followed (See Volume III, Appendix "P": *MSB 23.20; Forest Management*).

Contract Provisions

Management Guidelines

A. Terms and Conditions. All the terms and conditions specified in MSB 23.20.140 shall be included in all contracts.

B. Additional Terms and Conditions. The borough may add additional terms and conditions to any sale, lease or permit beyond what is required by MSB 23.20.240 depending on the type, location and other considerations.

C. Compliance with Borough Code. All the terms and conditions specified in MSB 23.20.140 and .150 shall be followed. (See Volume III, Appendix Q, *MSB 23.20; Forest Management*).

Plan of Operations

Management Guidelines

A. Compliance with Borough Code. All the terms and conditions specified in MSB 23.20.160 shall be followed (see Volume III, Appendix "P": *MSB 23.20; Forest Management*). This includes providing a copy of the State of Alaska, Division of Forestry, Detailed Plan of Operations, where the requirements of the Alaska Alaska Forest Resources and Practices Act must be followed (see Volume III, Appendix "M" for a copy of the *Detailed Plan of Operations Summary* as used as the date of this plan), and compliance with MSB 28.60: *Forest Harvest, Timber Transport Permit.*

B. Additional Requirements. Besides the requirements of paragraph A above, the borough's Plan of Operations may require other information depending on the

type, size and other conditions of the individual sale and contract terms. In the case where a State of Alaska, Division of Forestry Detailed Plan of Operations is not required (sale of less than 10,000 board feet or 830 cubic/feet), the borough shall require a plan of operations that meets the requirements of MSB 23.20.160.

Monitoring and Enforcement

Management Guidelines

A. Monitoring and Enforcement. In accordance with public input, monitoring and enforcement of timber harvest contracts, personal use permits, fire wood harvests, and etc., will require a field presence by borough staff to ensure that contract and/or harvest terms are followed, reforestation conditions are being met (where applicable), and forest management goals are being achieved. This issue is addressed in more detail in Volume I, Chapter 4: *Implementation and Recommendations.*

B. Timber harvests, Leases or Permits. Timber harvests, leases or permits shall not be offered in excess of what the borough can adequately administer and enforce.

C. Contracts. Only realistic and enforceable terms and conditions should be included in contract terms and conditions.

D. Bonds or Other Form of Surety. Performance and reforestation or scarification bonds or other acceptable form of surety shall be established and held to ensure that contract terms and conditions are met. All bonds or other acceptable form or surety shall be of sufficient monetary size and time duration to ensure that the borough, as the land owner, does not end up bearing the financial burden of meeting the *Alaska Forest Resources and Practices Act* requirements or other performance requirements.

E. Legal Action. Prompt legal action shall be taken where necessary to address timber trespass, failure to meet contract terms and conditions, or other actions that are not authorized in a sale, lease contract, or permit.

Personal Use Forest Product Harvest

Firewood, timber, and other non-commercial forest products may be sold using non-competitive permits or permits for free.

Illustration (figure I-3-14) shows the general process used to determine if a permit can be issued.

Management Guidelines

A. Locations within Natural Resource Management Units.

1. Areas Classified as Forest Management. Personal Use timber products may be made available in areas classified forest management and designated either primarily or secondarily for forest management.

2. Areas or Classified as Resource Management with a Secondary Land Use Designation for Forest Management. If classified resource management the personal use permit must be consistent with the management unit for the area and compatible with any other secondary designations.

B. Locations outside of Natural Resource Management Units. Areas outside of Natural Resource Management Units may be made available for personal use timber harvest provided the proposed harvest is consistent with the land use classification and management intent for the area.

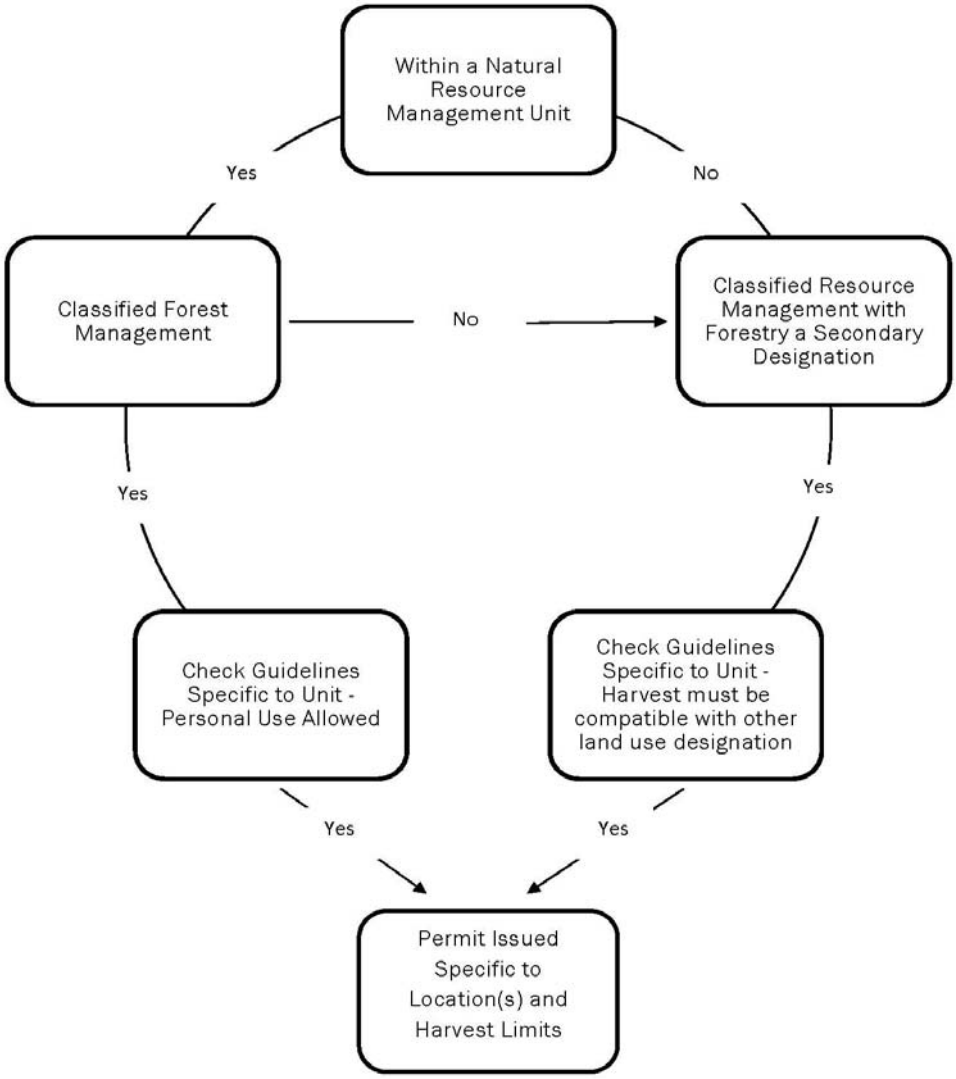
C. Marking of Areas. All personal use timber harvest areas shall be identified and marked on the ground.

D. Quantities. Quantities for personal use shall be limited as specified in borough code (See MSB 23.20.170(D).

E. Compliance with Borough Code. All the terms and conditions specified in MSB 23.20.170 and .150 shall be followed. (See Volume III, Appendix "P": *MSB 23.20; Forest Management*).

Figure I-3-14:

Personal Use Timber by Permit



Timber Salvage Sales and Permits

Management Guidelines

A. Forest Product Salvage. All forest products with a commercial value that exist on any borough owned land where the timber will be removed because of a conversion of land use to non-forest (e.g., construction of trails, roads, or a public facility such as a recreation site, school, or emergency services facility, etc.) or following a natural disaster such as a wind storm, wildfire, or insect infestation shall be salvaged to reduce waste.

B. Location. All timber with a commercial value or that can be used for personal use, no matter what the land classification or land use designation shall be salvaged and utilized prior to a conversion of land use. All areas shall be clearly identified and marked on the ground.

C. Annual Allowable Cut. Timber harvested or salvaged prior to a conversion of land use, unless classified forest management or resource management and with a timber harvest designation, shall not count against the Annual Allowable Cut computations. Timber harvested or salvaged prior to a conversion of land use that is classified as forest management or resource management and with a timber harvest designation, shall count against the Annual allowable Cut and Periodic Sustained Yield computations.

D. Five Year Timber Harvest and Timber Harvest Implementation Schedules. Timber harvested or salvaged prior to a conversion of land use does not have to appear on the Five-Year Timber Harvest Schedule or Timber Harvest Implementation Schedule. However, any salvage harvests shall be considered when placing other land on the Five-year Timber Harvest Timber Harvest Implementation schedules when meeting local or industry needs.

E. Conversion of Land Use. In order to be considered as a conversion of land use and subject to a salvage sale or permit, the project must be approved and funded prior to timber salvage operations commencing.

F. Sale or Permit. The decision or whether the timber salvage operation(s) should be considered as a sale or permit shall be made by the borough manager based on such factors as location, size of the area, and time to harvest the timber. If a sale is used, all normal contract provisions when conducting a timber harvest shall be followed.

G. Compliance with Borough Code. All the terms and conditions specified in MSB 23.20.130, .140, .160, .165 and .170 shall be followed. (See Volume III, Appendix "P": MSB 23.20; Forest Management).

Non-Commercial Timber Products

Non-commercial timber products through the use of non-competitive permits, or use by a permit for free. These products include, but are not limited to:

- Firewood
- Timber Salvage (Personal)
- Timber (Personal Use)

Management Guidelines

A. Area Identification. Areas for non-commercial uses shall be identified and marked on the ground.

B. Areas Outside of Natural Resource Management Units. Areas outside of Natural Resource Management Units may be made available as long as the use is not inconsistent with the underlying management intent of the parcel of borough land.

C. Compliance with Borough Code. The requirements of MSB 23.20.170 shall be followed (See Volume III, Appendix "P": *MSB 23.20; Forest Management*).

Non-Timber Biological Products

Non-timber biological products may be harvested with competitive or non-competitive permits for commercial harvesting, or free for personal use. These products include, but are not limited to:

- Berries
- Boughs
- Burls
- Cones
- Conks
- Diamond Willow
- Ferns
- Flowers
- Fruits
- Landscaping transplants
- Leaves
- Mushrooms
- Roots
- Sap

Management Guidelines

A. Commercial Use

1. Areas shall be identified in advance of any harvest activities.

2. Areas outside of Natural Resource Management Units may be made available as long as the use is not in-consistent with the underlying management intent of the parcel of borough land.

3. Commercial non-forest products may only be made available under a competitive or non-competitive permit issued annually on a calendar year basis.

4. Compensation to the borough shall be for a minimum set fee per acre, with the option at the borough's discretion for a percentage of the gross product(s) monetary value taken or utilized.

5. Bonding or Other Form of Surety may be required based on the size (acreage and/or volume) and type of activity.

6. A report shall be required following expiration or termination of the permit indicating:

a. harvest areas

b. dates and quantities harvested (by type or species) for each area

B. Non-Commercial Personal Use. Harvesting of non-commercial biological products may occur anywhere on borough land as long as the use is not in-consistent with the management intent of the parcel.

Chapter 4
Implementation

Introduction

This chapter includes information and recommendations necessary to implement the plans goals, management intent, and guidelines. Included is information about:

- Coordination with Other State and Borough Plans and Procedures
- Changes to the Plan
- Guideline Modifications
- Forest Research
- Other Research
- Funding and Enforcement
- Recommended Ordinance Changes
- Land Ownership and Exchanges

Coordination with State Plans and Procedures

Susitna Forestry Guidelines

The 1991 *Susitna Forestry Guidelines* do not apply to borough land.

The borough recognizes that much of what is contained in the 1991 *Susitna Forest Guidelines* was developed through a technical review of forest management practices and an extensive public process. Several comments were received during the "Scoping" process for this plan (Spring 2008) stating that the *Susitna Forest Guidelines* should be used by the borough.

It has been approximately 18-years since that plan was adopted and many economic, social, environmental, and regulatory changes have occurred over that time. The Alaska Division of Forestry has stated they will be updating or revising that plan following adoption of the *Susitna-Matanuska Area Plan*.

This Natural Resource Management Unit Plan, specifically Chapters 2 and 3, does incorporate portions of what is in the *Susitna Forest Guidelines* that are still pertinent today. The borough should work with the State Division of Forestry to make the updated or revised version of the *Susitna Forest Guidelines* (or other similar plan) and this Natural Resource Management Unit Plan as consistent as possible, recognizing that there are some differences between state laws, borough ordinances, and policies.

Susitna Area Plan

The 1985 *Susitna Area Plan* generally applies to borough land, and was adopted by ordinance into the *Matanuska-Susitna Borough Comprehensive Plan*. However, both the borough and the State Department of Natural Resources recognize that countless amendments have been made to this plan since it was adopted, and neither entity has kept accurate track of all the various changes of policies and land use designations made to the original plan.

The Department of Natural Resources is currently in the process of re-writing this plan (to be called the *Susitna-Matanuska Area Plan*). When the *Susitna-Matanuska Area Plan* is adopted, the original *Susitna Area Plan* (and all its amendments) will replaced by the new plan.

The *Susitna-Matanuska Area Plan* will not apply to borough owned land.

Willow Sub-Basin Area Plan and *Southeast Susitna Area Plan*

The 1982 *Willow Sub-Basin Area Plan* also applies to borough land and was also included into the *Matanuska-Susitna Borough Comprehensive Plan* by ordinance.

The State, Department of Natural Resources in 2009 completed a new *Southeast Susitna Area Plan* which replaced the entire *Willow Sub-Basin Area Plan* and portions of the *Susitna Area Plan*. The *Southeast Susitna Area Plan* does not apply to borough owned land.

Hatcher Pass Management Plan

None of the area covered by the 1986 *Hatcher Pass Management Plan* or any subsequent amendments overlap land involved in this *Natural Resource Management Unit Plan.* The Alaska Department of Natural Resources is in the process of revising that plan. Other than the Government Peak Subunit, there is no borough owned land in the *Hatcher Pass Management Plan* area.

Alaska Coastal Management Program

The Matanuska Susitna Borough Coastal Management Program is implemented by the Alaska Coastal Management Program (ACMP) through the coastal consistency review process described under Title 46 of the Alaska Statutes and associated regulations. State and borough actions within the coastal zone must be consistent with the provisions of the *Alaska Coastal Management Program* and the *Matanuska- Susitna Borough Coastal Management Plan.*

Mineral Orders

Alaska law, AS 38.05.185, requires that the State Department of Natural Resources Commissioner determine that mineral (sub-surface) entry and location is incompatible with

significant surface uses in order to close state-owned mineral rights to mineral entry. If not specifically closed or subject to leasehold location, borough land is available to mineral entry under state law.

None of the Natural Resource Management Units included in this Plan contain any land with known mineral values. The borough should not request the Alaska Department of Natural Resources to close these areas to mineral entry because the Alaska Legislature would also have to approve the closure because of acreage limitations contained in AS 38.05.300.

Oil and Gas Leasing

This plan and other borough land use plans do not make decisions concerning leasing for oil and gas on state or federal mineral estates. Those decisions are made under separate processes under state and federal law and regulations.

Also, see Volume I, Chapter 1; *Relationship of this Natural Resource Management Unit Plan to other Borough Land.*

Procedures for Changes to the Plan, Goals and Guidelines

Polices, implementation actions, and management guidelines of this plan may be changed if conditions warrant. For example, changes may be needed as new data and new technology become available. Changes in social, economic, and environmental conditions will place different demands on borough land.

Periodic Review

As required by MSB 23.20.060(E), this Plan, specifically Volume I, Chapter 3: *Forest Management*, must be reviewed on a regular basis (approximately once every five years), to determine if revisions are necessary.

Other portions of this Plan should also be reviewed at the same time to determine if updates or revisions are necessary.

The review should be conducted by borough staff and the Real Property Asset Management Board. Following that review, the public should be informed about the results of that review and be provided an opportunity to comment.

Changes to the Plan or Guidelines

The method for changing the plan depends on the type of change required. There are three types of changes possible to a plan: amendments, special exceptions, and minor changes. Amendments are considered as plan revisions which require a full public review and comment process, as well as adoption by the Borough Assembly. Minor changes and special exceptions are administrative decisions. In the case of Special Exceptions, a Best Interest Finding and public notice under MSB 23.05.025 is required.

Changes to the plan or guidelines may be proposed by agencies or members of the public. Proposed changes are to be submitted to the boroughs' Community Development Director, who, in consultation with the Planning and Land Use Director, will determine if a proposed change constitutes an amendment, a special exception, or a minor change.

Plan Amendments

An amendment permanently changes the plan, which includes the guidelines by adding to or modifying the basic management intent. For example, an amendment might change the guidelines for the type and/or size of a buffer or the size of a timber-cutting unit. Only the Borough Assembly may change the plan, add, amend or delete a guideline and change a land use classification.

Procedures for Plan, Including Guideline, Amendments

1. The Community Development Director shall prepare a written Best Interest Finding (see Volume III, Appendix "C", *Best Interest Finding General Format)* that specifies:

   - the reasons for the amendment such as changed environmental, social or economic conditions;
   - the alternative courses of action (what the plan, guidelines or classification are being proposed to be changed to), including a no change or action alternative; and
   - why the amendment is in the public's best interest.

2. A public notice of the proposed decision shall be provided pursuant to the requirements of MSB 23.05.025.

3. Following the public notice and comment period, and before making a final recommendation on the amendment, the Community Development Director shall provide the Real Property Asset Management Board the opportunity to review and make a recommendation.

4. The Community Development Director shall submit a recommendation along with the public comments and recommendations of the Real Property Asset Management Board to the Borough Manager for placing on the agenda for the Borough Assembly's consideration.

Special Exceptions

A special exception does not permanently change the provisions of the guidelines. Instead, it allows a one-time, limited purpose variance of the guidelines, without changing their general intent.

Special exceptions may apply to prohibited uses or guidelines. For example, a special exception might be used to allow a specific timber harvest in a buffer closed to timber harvesting if the Alaska Department of Fish and Game requested the harvest to benefit wildlife habitat or to manage a timber disease.

A special exception might also be made if complying with the guidelines would be excessively burdensome or impractical or if compliance would be inequitable to a third-party, and if the purposes and spirit of the guidelines can be achieved despite the exception.

A special exception might also be used to put a seasonal or temporary Special Management Zone in place to protect wetlands, wildlife congregation areas or a bear den during periods of timber harvesting, material extraction, or for other similar reasons.

Special Exceptions to Guidelines Modified by "Will" or "Shall"

Special exceptions to guidelines modified by the word "will" or "shall" may be allowed for individual actions. The decision not to follow a pertinent guideline modified by the term "shall" or "will" must comply with the procedures for special exceptions.

Procedure for Special Exceptions

1. The Community Development Director will prepare a written Best Interest Finding (see Volume III, Appendix "C", *Best Interest Finding General Format)* that specifies:

- the reasons for the special exception (i.e., why a variance of the guidelines is needed, including reasons why the guideline is burdensome, impractical or why compliance would be inequitable to a third-party);
- the alternative action or course of action to be followed;
- why the special exception is in the best interest of the public.

2. A public notice of the proposed special exception shall be provided pursuant to the requirements of MSB 23.05.025.

3. Following public notice and before making a final recommendation on the proposed special exception, the Community Development Director shall provide the Real Property Asset Management Board the opportunity to review and make a recommendation.

4. The Community Development Director shall submit a recommendation, along with the public comments and recommendation of the Real Property Asset Management Board, to the Borough Manager for a final decision.

Minor Change

A minor change is not considered a plan or guideline revision. A minor change is a change that does not modify or add to the guideline's basic intent, and that serves only to clarify the guideline's, make them consistent, facilitate their implementation, or make technical corrections.

Procedure for Minor Changes

Minor changes are made at the discretion of the Community Development Director, after consulting with the Planning and Land Use or Public Works Director, as appropriate.

A minor change does not require public review under MSB 23.05.025. However, affected individuals and groups may be notified and have an opportunity to comment. The Real Property Asset Management Board shall be given the opportunity to review and make a recommendation.

The Community Development Director's decision shall be prepared as a Best Interest Finding (see Volume III, Appendix "B": *Best Interest Finding General Format)* which may be appealed to the Borough Manager.

Discretion Within The Guidelines

Some guidelines, like those modified by the term "should", are written to allow for exceptions if the conditions generally described in the management intent and the guidelines for the unit are met.

For example, if a guideline says timber should only be sold on a volume basis within a firewood cutting area and the intent of the harvest to not only provide firewood but to also clear cut an area to create a moose grazing area to draw moose away from a transportation corridor, a sale using the acreage basis would best accomplish both goals.

Allowing exceptions, following the procedures below, are neither revisions nor changes to the guidelines.

Procedure for Using Discretion Within The Guidelines

Exception to guidelines with discretionary terms, such as those modified by the word "should" can be made by the Community Development Director, after consulting with the Planning and Land Use or Public Works Director's, as appropriate.

Each discretionary guideline does state an intent that should (each guideline is specific as to shall, will or should) be met, using the best managerial and professional practices for the given situation. These exceptions require a written "Best Interest Finding" (see Volume III, Appendix "B*": Best Interest Finding General Format)* in the administrative record.

The justification shall describe how the action meets the intent of the guideline or why particular circumstances justify deviation from the intended action or conditions.

Unless timing is critical for a decision, (for example, a decision made in the field to establish a Special Management Zone to protect a bear den or historical site found during a timber harvest or material extraction) the Real Property Asset Management Board shall be given an opportunity to review and comment on the proposed action. The Real Property Asset Management Board shall receive a copy of the Best Interest Finding if a decision is made prior to the Real Property Asset Management Board having an opportunity to review and comment on the action.

Forest Research

Site specific information on forest management throughout the borough is relatively limited. Some information and research that has been done is shown in Volume III, Appendix "H": *Forest Research and Study Areas.* Both borough and state forest managers recognize that, with available funding, additional research is desirable to tailor forest management to the soils, vegetation, fish and wildlife, and other resources and uses. The borough should partner with the Alaska, Division of Forestry and the Alaska Department of Fish and Game and other interested researchers (University of Alaska, U.S.D.A., Soil Conservation Service, etc.) to share information about the following subjects:

<u>Applied Forest Research</u>

Borough owned forest land are predominantly un-managed and over-mature. Consequently, reliable site index, and growth and yield tables for second growth commercial timber stands does not exist. As the forest is converted to second growth through natural stand replacement processes (including wildfire) or through timber harvest and regeneration, site index, and growth and yield data should be developed.

Research to provide this information should be located throughout the borough (state and borough land) and across all types of growing sites. Permanent sample plots associated with on-going, long-term forest growth and yield research conducted by the University of Alaska research foresters needs to be mapped so these areas can be protected and preserved.

<u>Forest Succession and Wildlife</u>

Little information exists on forest succession in the Matanuska and Susitna valleys. Information that would contribute to professional management of these forests includes studies of forest succession patterns, and historic frequency of fire, windthrow, disease, and other disturbances and how these various successions affect wildlife.

Regeneration

Grass competition, browsing, and wet soils can hinder both natural regeneration and planting. Additional research is desirable on appropriate methods of site preparation and reforestation. These studies include:

- Effects of fertilization of scarified soil on forest regeneration
- Effects of fertilization on seedling establishment and vegetative competition
- Escapement of hardwood seedlings in moose browse areas
- Post-harvest impacts on wildlife habitat (particularly moose grazing), recreation and other public uses on forest regeneration
- Success of scarification methods in regenerating
- Cost effectiveness and forest succession using seedlings versus natural regeneration

Rotation Ages

Rotations are based on site indices tailored to individual site or local geographic and/or physiographic conditions. Estimates of appropriate rotations based on site indices should be developed when updated information for the Matanuska and Susitna valleys becomes available. The borough and state should jointly determine whether these rotations should replace existing rotations and then recommend appropriate changes to sustained yield by species and location. Any changes could also affect annual allowable cut.

Shoreline Management

The *Alaska Forest Resources and Practices Act* and the implementing Regulations are intended to help protect streams and lakes and the fish, wildlife, recreation, and scenic resources associated with them. However, information of the effectiveness of existing shoreline management techniques in boreal forests is scarce, and very little is specific to south-central Alaska. Analysis of the effects of existing shoreline management techniques and determination of the most appropriate techniques for the Matanuska and Susitna valleys are high priorities for research.

Winter Roads

Little information on winter road construction exists for southcentral Alaska. Snow depths and soil temperatures vary significantly from conditions in the interior Alaska and North Slope areas of Alaska and Canada where most research has been conducted.

More studies are needed for:

- Long-term impacts of winter roads in forested and muskeg regions in the Matanuska and Susitna Valleys.

- Review of standards for winter road construction in this plan and the Susitna Forestry Guidelines area including ground, snow, or frost conditions.
- Appropriate standards for ice bridge construction in various geographic locations and climatic locations in the Matanuska and Susitna Valleys.

Experimental Forests and Forest Improvement Study Areas

There is no comprehensive inventory of candidate sites for experimental forests and Forest Improvement Study areas on either borough or state land within the borough. Several areas have been proposed, such as research and educational forest related to the possible use of a wood burning facility to heat the Su Valley Middle/High School. A joint comprehensive review of both borough and state land for candidate sites is needed.

Herbicides

A complete literature review and possible field study of herbicide effects on fish and wildlife and habitat shall be conducted prior to any operational herbicide use. Because the use of herbicides and other chemicals is regulated and controlled by the Alaska Department of Environmental Conservation, and the effects of fish and wildlife is regulated and controlled by the Alaska Department of Fish and Game this work should be completed by the state. The data should address:

- Cold weather studies that approximate the Matanuska and Susitna valley's climate conditions. These studies include analysis of inert ingredients, surfactants, etc.
- Direct adverse effects of herbicides on non-target fish and wildlife species, and a contingency plan for mitigating impacts on fish and wildlife.
- Effects of shrub competition on growth and survival of spruce and birch regeneration; identification of what amount and duration of competition suppresses tree growth.
- Effects of herbicides on riparian habitat; identification of the size of buffer needed to prevent contamination of aquatic habitats.
- Effects of herbicide on the amount of browse.
- Persistence of herbicide residues in soil and methods for monitoring herbicide persistence.

Invasive Plant Species

Related to, and like regeneration and herbicides, more research is desirable regarding invasive plant species and their control during timber harvest operations. In 2008, the Alaska Legislature authorized and funded an Invasive Plant Coordinator to be located within the Alaska Department of Natural Resources.

Working together with the University of Alaska, U.S.D.A., Soil and Water Conservation Service, the Alaska Department of Natural Resources Invasive Plant Coordinator, the Alaska

Association of Conservation Districts, the borough and the State Division of Forestry should develop an invasive plant monitoring, and if needed, control program that occur prior, during and following timber harvesting operations.

Other Research

ATV Use and Management

During the development of this plan, numerous comments were received dealing with off-road vehicle use and management, particularly ATV's. It is beyond the scope of this plan to deal with this far reaching and complex issue; in fact it is one that needs to be addressed at a regional and/or statewide basis.

It is recommended that the borough work with state and federal agencies to address this issue on a comprehensive basis.

Bonding Costs

Also during the development of this plan, numerous comments were made about the high cost of posting performance and reforestation bonds, especially for small "Mom and Pop," "start up" and "part time" operations. The comments made it clear that these small operations are all that are needed in the smaller communities or areas because the current demand for forest products, including firewood, is low in volume.

Having to post high bonding amounts, tying up their funds for long-periods of time (reforestation could last several years), added to the sale costs and insurance are forcing small operators out of business because they do not have the funds to pay for these expenses up front. If they do pay for bonds and provide the required insurance, the low volume of potential sales (currently only firewood) drives the end cost to the consumer substantially higher than larger operators who either serve a larger geographic area and/or utilize what they harvest for more than one end product or market.

This issue is outside the scope of this Plan. However, the borough Community Development and Finance Department's could, with the involvement of the Real Property Asset Management Board and small operators explore costs and alternatives.

A starting point may be to explore the use of a reforestation or similar fund. The state, Department of Natural Resources, Division of Forestry administers a reforestation fund that was established in the *Alaska Forest Resources and Practices Act*. This fund (see AS 41.17.300 - .330) may only be used for the reforestation of state land, including site preparation, seed and seeding acquisition and cultivation, planting and other reforestation measures, timber stand improvement, and the development of materials and techniques for the reforestation of state land.

The end goal should be to encourage small business development, but not at the cost of foregoing effective forest management and successful regeneration.

Personal Use Permit Costs

Like bonding costs, many comments during the public review of the plan were made about the cost for personal use timber harvest. This issue is also outside the scope of this Plan. As would be expected, most commenter's felt the cost was too high. Very few of the comments received recognized that there is a cost to administer all timber harvests or that the timber is owned by all borough residents. Abuses can occur in both large and small timber harvests that need to be monitored and permit and sale terms enforced.

Reforestation must also occur even for personal use harvest areas. Some of the associated costs can be reduced by harvest unit layout and harvesting techniques which encourage natural regeneration.

A review of past personal use timber harvest management shows that administration, enforcement and reforestation costs exceed permit revenues. Personal use harvest, especially for firewood, is an integral part of many borough residents daily life. Setting permit fees at a level to offset costs would likely result in people harvesting the trees without obtaining permits, which in turn raises the cost for monitoring and enforcing timber trespass.

Permit costs should be evaluated on a regular basis with the Assembly being informed of revenue raised versus operational expenses. The Assembly needs to make the final decision on what level of the costs should be offset by permit fees and where the additional funds should come from to continue the personal use timber harvest program.

The public needs to be informed on the costs associated with providing for personal use timber harvests.

Funding, Education and Enforcement

Adequate staff for field research, forest management, timber harvest and road design, monitoring, and enforcement are essential to implement the Forest Management Plan and manage natural resource management units. Staff and funding levels should be reviewed on an annual basis.

Information about the proper use and enjoyment of borough public land for all uses and users is best done through education. Educational programs in schools, interacting with Community Councils, special interest groups, etc., and use of various written and electronic mediums (i.e., web site) should be encouraged and funded.

While education is preferred to enforcement, reality is that education does not work effectively unless enforcement is available as a "last resort" management tool. It is recommended that the Borough Assembly give designated borough staff limited authority (similar to animal control or code enforcement) to enforce trespass, theft of public resources, activities that exceed those allowed in various land-use authorizations, vandalism, damage to public land and water resources, and unauthorized uses of borough land.

Recommended Ordinance Changes

In order to implement this plan and to make the plan work effectively and efficiently, some changes and additions to borough code are recommended[55] .

<u>MSB 23.05.100 Classifications</u>

- Change the definition of "Forest management lands" to read:

  "Forest management lands" are those lands which, because of physical, climatic, and vegetative conditions, are presently or potentially valuable for the production of timber and other forest products. [FOREST MANAGEMENT SHALL EMPHASIZE THE MULTIPLE USE CONCEPT.]

This revised definition applies only to land determined by a Forest Inventory to be Operable Forest Land, Merchantable Forest Land, or both. This type of land will only be located within a Natural Resource Management Unit, and where forest management is a primary or secondary activity. Other activities can still occur as long as the guidelines for those activities are followed.

The sentence "forest management shall emphasize the multiple use concept" is a management intent statement that is not appropriate in a definition. Forest Management lands will all be located in Natural Resource Management Units which will be defined (see definitions below) to require multiple-use management.

- Change the definition of "Resource management lands" to read: "

  Resource management lands are lands which, because of surface or subsurface resources contained within the land or in connection with adjacent lands, are presently or potentially valuable <u>**for**</u> [TO] multiple-use management. [SUCH MANAGEMENT MAY BE ACCOMPLISHED IN WHOLE OR IN PART PURSUANT TO AN INTERAGENCY AGREEMENT].

[55] These recommended changes and additions were adopted though ordinance serial number 10-084 (am).

Many areas within Natural Resource Management Units will be classified as Resource Management Lands because of their multiple-use values. Any resource, such as forestry, public recreation, important wildlife habitat, etc. can occur at the same time and in the same place. Management intent for the unit or sub-unit will specify which uses are primary and which are secondary uses.

The sentence dealing with interagency agreements is unnecessary because all borough owned land can be managed via an interagency agreement, consignment, or other agreement to be managed by a third-party, with Assembly approval.

MSB 23.05.150 Definitions

- Add a definition for Natural Resource Management Unit to read:

  An Assembly designated geographic area of borough owned land that has and is managed for multiple-use values. This includes, land classified or with management intent for; important fish and wildlife habitat, forest management, material, mineral, public recreation, watershed, and important wetlands. These units shall not include non-borough owned land, or land classified for agricultural, commercial, industrial, private recreation, or residential land.

This definition is needed to clearly define what a Natural Resource Management Unit is and what types of land uses, land designations and land use classifications can, and cannot occur within the unit. This is a new type of land and natural resource management category which replaces and clarifies what multiple use actives can occur within what were formally called Forest Management Units.

- Add a new definition for a Special Management Zone to read:

  Land within a natural resource management unit or sub-unit where special resource protections are put in place for a specific reason yet allowing some activities to occur with restrictions. For example special management zones can be used for wetland protection (allowing some uses to occur when adequate snow cover exists), seasonal wildlife concentration areas, seasonal trumpeter swan staging areas, brown bear denning areas, protecting cultural resources and historical sites, or designating specific areas for certain timber harvest methods and means. Resource extraction and use activities, such as timber harvesting can occur in these zones, conditionally, such as imposing seasonal restrictions or requiring specific operational methods and means. When creating a special management zone, the management intent and management guidelines for the zone must be clearly defined.

This is a new category of land that can be used to extend a protection area beyond a buffered area, yet allow some limited activities to occur, such as certain types of public recreation. It may also be used to provide seasonal protections for such things as wildlife congregation or calving areas, bear denning locations, or bird breeding areas. They can also

be used to protect important cultural resources and historical sites, or educational and research areas.

The guidelines for Special Management Zones (Volume I, Chapter 2, *Special Management Zones*) specify how permanent, temporary or seasonal Special Management Zones can be created, modified or eliminated.

MSB 23.20 Forest Management

- Amend MSB 23.20.040 (Annual Allowable Cut) to read:

> (A) The allowable cut on borough land is the amount of [ACREAGE OR] volume**, not acreage,** of commercial forest land that may be harvested periodically.
> (B) Annual allowable cut equals the total **volume, not acreage** [AMOUNT] of operable forest land [ACREAGE] in all borough [FOREST MANAGEMENT] **Natural Resource Management** units **classified as "forest management lands", or "resource management lands" and has a primary or secondary land use designation for forest management** divided by the rotation period of the dominant timber stand type established in MSB 23.20.020.
> (C) The total commercial and operable forest land **by volume** [ACREAGE] in all borough forest management units will be determined by the forest inventory in MSB 23.20.020.
> (D) An annual allowable cut on **available** borough commercial forest land within all [FOREST MANAGEMENT] **Natural Resource Management** Units shall be managed on a decadal (10-year) basis. Harvest volumes in an individual forest management unit may be above or below the annual allowable cut to allow for efficient management, **silvicultural needs**, and responsiveness to market fluctuations.
> (E) Timber harvest volumes sold, leased, or permitted **and harvested** under Personal Use of Timber resources (MSB 23.20.170) shall not count against annual allowable cut limitations established in this section.
> **(F) Land that is classified as "forest management lands" or "resource management lands" and that has a primary or secondary land use designation for forest management and that will undergo a conversion of use from forest management to another primary use within 5-years of a timber harvest, shall not be considered as operable forest land acreage for determining annual allowable cut. The annual allowable cut shall be recomputed to reflect the reduction in the operable forest land acreage base to ensure that timber harvests are conducted on a sustained yield basis. Land that is converted to another use shall be reclassified to the most appropriate use prior to the conversion of use.**

Changes to Sections A and C reflect that appropriate volume (i.e., board feet, cubic feet, weight, etc., but not acreage) shall be used to determine annual allowable cut. Prior to this

point, only acreage was used which was and is inconsistent with forest management practices and industry standards.

This change will ensure that annual allowable cut is not exceeded in areas where volume is higher in some locations (different units or within the same unit). In addition, using a volume measurement, is more conducive for making larger areas available for specialty products where select or selective harvest is utilized (house logs, bowls, cabinets, flooring). In these situations the harvest is very low per acre and usually spread out over a large area. In other cases, such as firewood harvest or to create wildlife habitat, acreage is the preferred harvest method to strictly define a harvest area and the means and methods of harvest.

In all cases, Annual Allowable Cut and Sustained Yield will be based on a volume measurement, which shall not include acreage as a volume measurement.

See Chapter 3, *Forest Management, Sustained Yield and Annual Allowable Cut,* for a more complete discussion on volume versus acreage.

Changes to Section B ensure that only operable timber areas that could be made available for timber harvest are used to compute the Annual Allowable Cut, not all areas that may have operable timber. Areas available for timber harvest must be classified as Forest Management Lands, or Resource Management and be available (areas with either a primary or secondary designation) for timber harvest. In other words, some areas may have been inventoried and have operable timber, but through the land use planning process the land has been classified as Public Recreation Lands. These lands are not available for timber harvest and the operable timber area cannot not be used to determine annual allowable cut.

Section E makes it clear that all personal use timber harvest volumes sold, leased, permitted and harvested shall not count towards the Annual Allowable cut limitation. Also, see proposed changes to MSB 23.20.170 which lowers the current volumes that can be harvested for Non-commercial Personal Use of Forest Products. These two proposed ordinance changes should be adopted together.

If MSB 23.20.170 is not adopted, then Section E of this section should be changed to have personal use harvest count against the Annual Allowable Cut in order to ensure that sustained yield for timber resources is maintained.

New Section F ensures that annual allowable cut and sustained yield is based on operable forest land that will remain as forested land where regeneration will occur. Conversion of such lands to other uses within Natural Resource Management Units is expected to be rare, and shall only be done to serve a compelling public purpose and only with the authority of the Assembly. Land that will be converted to another use within 5-years cannot be used to retain a higher annual allowable cut. In order to ensure that timber is harvested at a continued sustainable rate, the subject operable forest land shall be removed from the operable timber base, and the Annual Allowable Cut recomputed and put into immediate

effect. Land that is converted to another use shall also be reclassified to reflect the conversion of use prior to the conversion of use.

For example, operable forest land designated as forest management land, is used to calculate the annual allowable cut and sustained yield. However, if it is proposed that the land will be converted to agricultural use within 5-years after the timber harvest, the land must be reclassified and the amount of operable timber land subtracted from the base figure for figuring annual allowable cut and sustained yield. However, if the conversion of use to agricultural use (or any other use) does not occur within five-years, the area may remain as operable forest land and the land shall continue to be managed for forest management purposes until such time a conversion of use does occur, if ever.

Other changes to this section are to make it consistent with other proposed changes to MSB 23.20 as described in this chapter.

- Amend MSB 23.20.050 (Forest Management Units) to read:

  Natural Resource Management Units [FOREST MANAGEMENT UNITS]

  (A) Land classified as Forest Management Lands shall be placed into Natural Resource Management Units [FOREST MANAGEMENT UNITS] and be subject to a Natural Resource Management Unit Plan [FOREST MANAGEMENT PLAN].

  (B) Unclassified land and land classified for another purpose may also be placed in Natural Resource Management Units [FOREST MANAGEMENT UNITS] in order to facilitate overall management of all land and resources within the Natural Resource Management Unit [FOREST MANAGEMENT UNIT].

This change is needed to make this section consistent with other changes to this title. Natural Resource Management Units are being substituted for Forest Management Units and plans for forest management will be included in plans for Natural Resource Management Units instead of a stand-alone Forest Management Plan. This change emphasizes the multiple-use concept for all resources and uses within Natural Resource Management Units.

- Amend MSB 23.20.060 (Forest Management Plan) to read:

  (A) The Borough shall maintain a natural resource management plan for natural resource management units which shall include a [F]forest [M]management [P]plan that provides for the planning and management of land and resources within and among the natural resource management [FOREST MANAGEMENT] units.

  (B) A natural resource management plan [FOREST MANAGEMENT PLAN] may cover more than one natural resource management unit [FOREST MANAGEMENT UNIT], and conversely, more than one natural resource management plan [FOREST MANAGEMENT PLAN] may be adopted to cover the various natural resource

management [FOREST MANAGEMENT] units.

(C) Natural resource management plans [FOREST MANAGEMENT PLANS] shall be consistent with borough adopted land use and management plans.

(D) The plans shall contain, at a minimum, the following elements:

(1) an analysis and determination of commercial forest land, operable commercial forest land, potential timber harvests, access, and market demand;

(2) commercial timber harvests for forest products that include such things as firewood (cordwood), fence posts (posts), house logs and saw logs (logs), or wood fiber (chips);

(3) permits, leases, and sales for the harvest of non-timber forest products;

(4) forest management guidelines for non- extractive uses shall address:

(a) important areas for fish and wildlife habitat;

(b) local business enterprises;

(c) scenic quality;

(d) substantial areas important to tourism and recreation;

(e) environmentally sensitive areas;

(f) water quality; and

(g) soils.

(E) Natural Resource Management Plans [FOREST MANAGEMENT PLANS] shall be reviewed on a regular basis, undergo full public review and comment under MSB 23.05.025, and any proposed changes to the plan shall be approved by the Assembly.

This change is consistent with other changes suggested for this chapter. Natural Resource Management Plans are being substituted for Forest Management Plans. This change emphasizes the multiple-use concept for all resources and uses within Natural Resource Management Units.

- Amend MSB 23.20.090 (Five-year Sale Schedule) to read:

23.20.090 Five-Year [SALE] Timber Harvest Schedule

(A) Only land that is classified as "Forest Management Lands," or "Resource Management Lands" and has been determined to be to operable timber land and has a primary or secondary land use designation for forest management and is located within a natural resource management unit [FOREST MANAGEMENT UNIT], and is subject to [HAS] an adopted natural resource asset management [Forest Management P] plan may be included in the five-year [SALE]

timber harvest schedule.

(B) Land that is not classified as "Forest Management Land" may be utilized [SOLD, LEASED, OR PERMITTED] for firewood sales, salvage sales, personal use, or for non-forest products. This land does not have to be located within a natural resource management [FOREST MANAGEMENT U]unit[;] and does not need to be subject to an adopted natural resource asset management [FOREST MANAGEMENT P]plan[; AND DOES NOT NEED TO BE]. However, firewood and personal use harvests shall be included in the five-year [SALE] timber harvest schedule.

(C) At least every two years, the director shall prepare a five-year schedule of timber [SALES] harvests planned on forest land owned by the borough.

(D) The amount proposed for [SALE] timber harvest per year must be within the requirements of MSB 23.20.040.

[(E) TO THE EXTENT POSSIBLE, THE FIVE-YEAR SALE PROCESS SHOULD BE COORDINATED WITH THE ALASKA, STATE DEPARTMENT OF NATURAL RESOURCES, DIVISION OF FORESTRY'S FIVE-YEAR TIMBER SALE PROCESS.] *Repealed and reenacted as (I).*

[(F) THE FIVE-YEAR SALE SCHEDULE SHALL BE SUBJECT TO PUBLIC REVIEW AND COMMENT AS PROVIDED BY MSB 23.05.025.] *Repealed and reenacted as (J).*

[(G) THE ASSEMBLY SHALL APPROVE THE FIVE-YEAR SALE SCHEDULE.] *Repealed and reenacted as (K).*

(H) To the extent possible, ensure that local resident timber needs are made available, principally for personal use firewood, before or during any other timber harvest activity.

(I) To the extent possible, the five-year timber harvest schedule process should be coordinated with the Alaska, State Department of Natural Resources, Division of Forestry's five-year timber sale process.

(J) The five-year schedule shall be subject to public review and comment as provided by MSB 23.05.025.

(K) The Assembly shall approve the five-year timber harvest schedule.

Existing sections E, F, and G are being repealed and renumbered as sections I, J, and K in keeping with the general order of the information presented to the Assembly. The order does not indicate any priority order. Section H is new to ensure that local resident needs for personal use timber (firewood) are on the five-year timber harvest schedule.

The other changes are necessary to delete the reference to "sales" and change it to "timber harvests" in the five-year schedule. This change will reflect that all timber harvests, including personal use and community use, not just commercial sales will be nominated and made available for public comment and Assembly approval. This section also states that timber harvests on the Five-Year Timber Harvest Schedule must be on land within Natural

Resource Management Units and be classified and designated for timber harvest. Amend MSB 23.20.100 (Contents of Five-year Sale Schedule) to read:

23.20.100 Contents of Five-Year [SALE] Timber Harvest Schedule

(A) Timber [SALES] harvests should be offered in a range of volumes, timber types, products and duration to accommodate different sectors of [THE] forest products [industry].

(B) Proposed [SALE] harvest offerings shall consider:

(1) location and access;
(2) markets;
(3) volumes;
(4) limits of the annual allowable cut;
(5) personal and community needs;
(6) other forest uses, and;
(7) public comments.

(C) For each proposed [SALE] harvest at least the following information shall be included in order to provide the public, communities and the forest product industry with a basis on which to comment on the proposed [SALE] harvest(s):

(1) acreage of the total area and operable area:
(2) timber species, volume, and size category (sapling, pole timber, saw timber);
(3) current land/resource uses;
(4) existing infrastructure (including road and trail access);
(5) existing land use plans;
(6) development patterns and surrounding land use;
(7) zoning, or other land use restrictions;
(8) public health, safety, welfare concerns;
(9) public water bodies (including buffers);
(10) soils and terrain;
(11) cost/revenue analysis of the proposed [SALE] harvest;
(12) estimated minimum price based on current market value as determined b MSB 23.20.150; [AND]
(13) contract or permit performance standard; and
(14) type(s) of harvest (personal use, firewood, specialty, sawlog, utility.

The primary change is to ensure that personal/community needs are specifically addressed in the contents of the Five-Year Timber Harvest Schedule. In order to maintain a logical order for information that must be provided, Section (B) sections 2 through 6 are being repealed and renumbered as 8 through 12.

Other changes reflect the change from “sale” to “harvest” in the contents of the Five-Year Timber Harvest Schedule so it is consistent with the Five-Year Timber Harvest Schedule (23.20.090).

- Amend MSB 23.20.110 (Sale Implementation Schedule) to read:

23.20.110 [SALE] Periodic Timber Harvest Implementation Schedule

(A) For those areas covered under an approved five-year [SALE] timber harvest schedule, the director shall prepare a schedule to implement approved timber [SALES] harvests.

(B) The schedule may not propose more [SALE} timber harvest volume than that allowed under MSB 23.20.040.

[(C)] [THE IMPLEMENTATION SCHEDULE SHALL BE SUBJECT TO PUBLIC REVIEW AND COMMENT AS PROVIDED BY MSB 23.05.025. REVIEW AND COMMENTS SHALL BE LIMITED TO THE SALE SCHEDULE AND TERMS AND CONDITIONS OF THE SALE.]

(D) The schedule shall reasonable ensure that local resident timber needs are made available, primarily for personal use firewood, before or during any other timber harvest activity.

(E) The [SALE] periodic timber harvest implementation schedule shall be subject to public review and comment as provided by MSB 23.05.025. Review and comments shall be limited to the [SALE] timber harvest schedule and terms and conditions of the [SALE] timber harvest.

This change reflects the change from "sale" to "timber harvest" in the Timber Harvest Implementation Schedule to make it consistent with the Five-Year Timber Harvest Schedule (23.20.100).

Section C is being repealed and moved to Section E in order to keep the order for the Periodic Timber Harvest Implementation Schedule is a logical sequence.

Section D has been added to reasonably ensure that local personal use needs are met prior to, or at the same time, commercial harvests are made available.

- Amend MSB 23.20.120 (Multiple Sales Within the Same Sale Unit) to read:

(A) Multiple [SALES] types of timber harvests for different forest products within the same site or cutting area are encouraged (i.e., a select cut sale for a specific value-added product followed by, or in conjunction with, another select cut sale for a different value-added product or a sale for wood fiber products).

(B) [MULTIPLE SALES ON THE SAME SITE OR CUTTING AREA SHALL ONLY BE COUNTED ONE TIME AGAINST THE ANNUAL ALLOWABLE CUT AS DETERMINED BY MSB 23.20.040 EVEN THOUGH THE SUCCESSIVE SALE MAY OCCUR IN A DIFFERENT YEAR.]

(C)

The deletion of paragraph B is needed to ensure that annual allowable cut and sustained yield rotation periods are not exceeded. Paragraph B was written based on an acreage calculation rather than a volume calculation. This plan, and the previous recommended

ordinance changes, requires that a volume measurement (excluding acreage as a volume measurement) be used. Multiple sales on the same site will be computed by the total volume harvested in the multiple sales, not on the acreage harvested.

- Amend MSB 23.20.130 (Methods and Authorization for Sale, Lease or Permitting of Forest Products) to read:

> (A) Commercial or non-timber forest product sales, **except as provided in (D) of this section,** shall first be offered by competitive bid. Any proposed competitive timber or non-timber product sale that do not receive a competitive bid or that the bid is not accepted shall be made available to the next available qualified bidder. If no acceptable bids are received or accepted, the timber or non-timber products sale may be made available through an over-the-counter sale for a period of time not to exceed two (2) years under the same terms and conditions as the competitive sale offering.
>
> (B) Forest resource [SALES] **harvests** in excess of [$25,000] **64,000 cubic feet or 500 cords of wood** per transaction shall be approved by the assembly prior to contract execution.
>
> (C) Forest resource [SALES] harvests for under [$25,000] **64,000 cubic feet or 500 cords of wood** per transaction may be approved by the manager.
>
> (D) Firewood sales, **timber sales,** salvage sales, and non-timber product sales, leases, or permits [BETWEEN ONE (1) AND] **for less than** five (5) years in duration and **for** less than **12,800 cubic feet of timber or 100 cords firewood for timber, firewood and salvage sales, or $25,000 for non-timber-product sales** may, after public notice pursuant to MSB 23.05.025, be **offered over-the-counter** [NEGOTIATED] by the manager without competitive bid.
>
> [(E) FIREWOOD SALES, SALVAGE SALES, AND NON-TIMBER PRODUCT SALES, LEASES OR PERMITS FOR LESS THAN (1) YEAR MAY BE NEGOTIATED BY THE DIRECTOR WITHOUT COMPETITIVE BID.]

The current code uses a monetary value to decide whether a timber harvest sale needs to be approved by the Assembly or may be approved by the borough manager. The current dollar figure is $25,000. At current market values the $25,000 equates roughly to 300 acres of timber based on an average volume of 1,700 cubic feet or 13 cords of firewood per acre. Public comments received during the plan review process felt that, because the per acre value (around $80 per acre) was so low, that a different measurement should be used.

The proposed change uses a volume measurement of 64,000 cubic feet or 500 cords of firewood which equates to about 40 acres of forest wood product. Anything above that amount must be approved by the Assembly.

A new limit for non-competitive sales threshold is also recommended for firewood, timber and salvage sales. An upper limit of 13,000 cubic feet or 100 cords of firewood equates to between 5 and 10 acres of timber harvest area. This size should aid the smaller mill and

firewood providers to obtain forest products without having to compete with larger sales and/or commercial harvesters, or purchase more timber than they need for their operations.

Existing paragraph E dealing with harvests, including non-timber products, for less than one-year that could be negotiated by the (Community Development) Director is being deleted. Paragraph D covers these types of harvests making the existing paragraph E moot.

- Add a new section, .165, to MSB 23.20 to read:

23.20.165 Timber Salvage on Borough Land.

(A) If feasible, all timber with a commercial value or that can be used for personal use that exists on borough land where the timber will be removed because of a conversion of land use to another public non-forest use shall be either:

1. Sold by the borough prior to conversion of use, or
2. Made available under MSB 23.20.170 for non-commercial personal use, or
3. Removed by the contractor and either sold or used for a commercial purpose, or
4. Removed or otherwise made available to the public for non-commercial personal use.

(B) In order to be considered as a conversion of land use and subject to a salvage sale or permit, the project must be approved and funded prior to timber salvage operations commencing .

(C) The decision or whether the timber salvage operations should be considered as a sale or permit shall be made by the borough manager based on such factors as location, size of the area, and time to harvest the timber. If a sale is used, all normal contract provisions when conducting a timber sale shall be followed.

(D) Timber removed because of conversion to land use, unless within a natural resource management unit and on operable forest land, does not apply to annual allowable cut or sustained yield requirements under MSB 23.20.030 and MSB 23.20.040.

(E) The provisions of this section do not apply to land being sold, exchanged or otherwise being conveyed to a third-party unless explicitly stated otherwise in the sale contract, exchange or conveyance documents.

(F) The provisions of this section may apply to land that is going to be sold, exchanged or otherwise being conveyed to a third-party if a covenant or other restriction is going to be explicitly stated in the sale, exchange or conveyance documents limiting the lands use to a specific use, such as for agricultural rights only.

This new section codifies an existing borough policy. On borough land where timber, whether within a Natural Resource Management Unit or not and with either a commercial or personal use value is present, shall be either sold or made available to the public by either

the borough prior to construction, or by the contractor after a contract is issued where the land is going to be used for a public facility (construction of trails, roads, recreation site, school, or emergency services facility, etc). These same provisions may be applied when land will be converted to another use and not all interests in the property are being conveyed to a third party, such as a restrictive covenant for agricultural purposes only.

Burning or burying forest products is not allowed unless no other feasible alternative exists. These types of areas generally do not exist within Natural Resource Management Units and because of their location and relatively small size are usually not categorized as Operable Forest Land and not subject to the requirements for annual allowable cut and sustained yield. If an area is located on Operable Forest Land the timber salvage shall apply to the annual allowable cut and sustained yield requirements, which is consistent with the recommendation earlier in this section related to the amendment of MSB 23.20.040.

- Amend MSB 23.20.170 (Non-Commercial Personal Use of Forest Products) to read:

23.20.170 Non-commercial Personal Use of Forest Products.

(A) Firewood, salvage, timber, and other non-commercial forest products may be sold through the use of non-competitive permits, or use allowed by permit for free from areas designated by the manager.

(B) Firewood, salvage, timber, and other non-commercial timber resource areas shall be identified and marked on the ground.

(C) The manager may designate additional non-commercial personal use areas outside of <u>Natural Resource Management Units</u> [FOREST MANAGEMENT UNITS] in remote locations upon the request by local property owners.

(D) Quantities for personal use shall be limited to:

(1) [10] <u>3</u> cords per year for firewood; and

(2) six-hundred (600) lineal feet for saw or house logs.

From past experience, people who have obtained personal use permits rarely harvested more than 1 or 2 cords of firewood per year for a variety of reasons. The change from 10 to 3 cords (one cord is equivalent to two large pick-up loads) reflects current and historic personal use harvest amounts. Because all proposed and actual timber harvests on operable forest lands, except for personal use harvests, must be used as part of the calculation on annual allowable cut, combined with the historic low volumes that are actually harvested, a lower personal use limit is recommended.

If MSB 23.20.170 is not adopted, then Section E of MSB 23.20.040 (Annual Allowable Cut) should be changed to have the personal use harvest count against the Annual Allow Cut in order to ensure that sustained yield for timber resources is maintained.

Some members of the public also felt that a large amount of a public resource (wood

products) should not be provided at little or no cost as other heating or commercial alternatives are available. For example, current commercial firewood sales are for about $200 per cord.

- Amend MSB 23.20.180 (Real Property Asset Management Board Review) to read:

> (A) The board shall review <u>asset management plans for natural resource management units, including forest management,</u> sustained yield, and harvest goals and levels, [FOREST MANAGEMENT], five-year [SALE] <u>timber harvest and timber harvest implementation</u> [PLANS AND] schedules of sales and leases, and permits and make recommendations to the director, manager, and assembly for:
>
> (1) adherence to borough code;
> (2) forest plan recommendations and requirements; and
> (3) to ensure public and forest land needs are being met.

This change reflects the use of asset management plans for managing Natural Resource Management Units and the need for the Real Property Asset Management Board to have the responsibility for reviewing and making recommendations on those plans and their implementation.

Land Ownership and Exchanges

During Phase I (Scoping) and subsequent public involvement steps of developing this Plan, many members of the public felt that borough ownership of all, or portions of the Bunco Hills, Whiskers Creek North and Whiskers Creek South Natural Resource Management Units should be owned by the State of Alaska, not the Matanuska-Susitna Borough.

More specifically, the commenter's thought all or portions of these units should be added to the Alaska State Park system. The reasons varied, but the majority of commenter's believed that adding the areas to the state park system would ensure that the areas stay the way they are today and are not developed or used for other purposes.

Borough management of the Bunco Hills, Whiskers Creek North and Whiskers Creek South Natural Resource Management Units is described in Volume II, *Natural Resource Management Units.*

Inquires have taken place with the Alaska Division's on Mining, Land and Water, and Parks and Outdoor Recreation regarding whether they would be interested in pursuing a land exchange for all or a portion of these units. While there was some interest expressed by Division of Parks and Outdoor Recreation, especially for the Whiskers Creek North Natural Resource Management Unit, there was no interest of pursuing a land exchange by the

Division of Mining Land and Water Management.

A land exchange for all or portions of these units may require state legislative approval. Adding them to the Alaska State Park system would require legislative action.

While the state owns a significant amount of land within the Matanuska-Susitna Borough, little if any has any present or future revenue producing value to the borough. The only exception might by the land owned by the state in the Fish Creek Management Area that is adjacent to where the borough already owns land.

The borough may, at some point in the future, want to pursue a land exchange with the state under AS 29.65.090 (Municipal Land Exchanges) if suitable other state land can be identified.

Matanuska-Susitna Borough

Asset Management Plan:
Natural Resource Management Units

Volume II

Natural Resource Management Unit Plans

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Contributions by:	Alaska Map Company
	Matanuska-Susitna Borough Staff
	Northern Economics
	Sanders Forestry Consulting
	State of Alaska, Division of Forestry
Funded by:	Matanuska-Susitna Borough

Adopted: September 21, 2010

Asset Management Plan:
Natural Resource Management Units

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Asset Management Plan:
Natural Resource Management Units

Volume II

Introduction

This volume contains individual asset management plans for twenty-one of the twenty-two Natural Resource Management Units. The Fish Creek Management Plan was adopted separately from this Plan and is also a Natural Resource Management Unit.

Other background information is also provided to help the reader better understand:

- Natural Resource Management Units
- Management Intent, Land Use Designations and Guidelines
- Relationship of Land Use Designations to Land Classifications
- Land Use Designations and Classifications Used Within Each Natural Resource Management Unit
- Natural Resource Management Units With Operable Timber Available for Timber Harvest and For Computing Annual Allowable Cut
- Role of Agencies, Community Councils and the Public in Natural Resource Management Unit Management Decisions

Natural Resource Management Units

From a management standpoint, it is often desirable to divide large areas of land into smaller units, and sometime sub-units, as a reference for future actions. In some areas of the country, units are designated based on counties, watersheds, long-term sales, or other useful means.

Originally, many of the Units in this plan were placed into Forest Management Units. During the first phase of developing this plan, the public expressed that Forest Management Units, at least implied that land placed in the units were to be primarily managed for forest and timber harvest purposes. That is not the case in this plan. This plan does not use or place land in Forest Management Units. Instead, this plan designates blocks of land to be placed into individual "Natural Resource Management Units."

The new Natural Resource Management Units will be managed for multiple-uses that reflect changing values and economics. This new designation better reflects the multiple-use values, and does not imply one resource use has a higher priority over another resource.

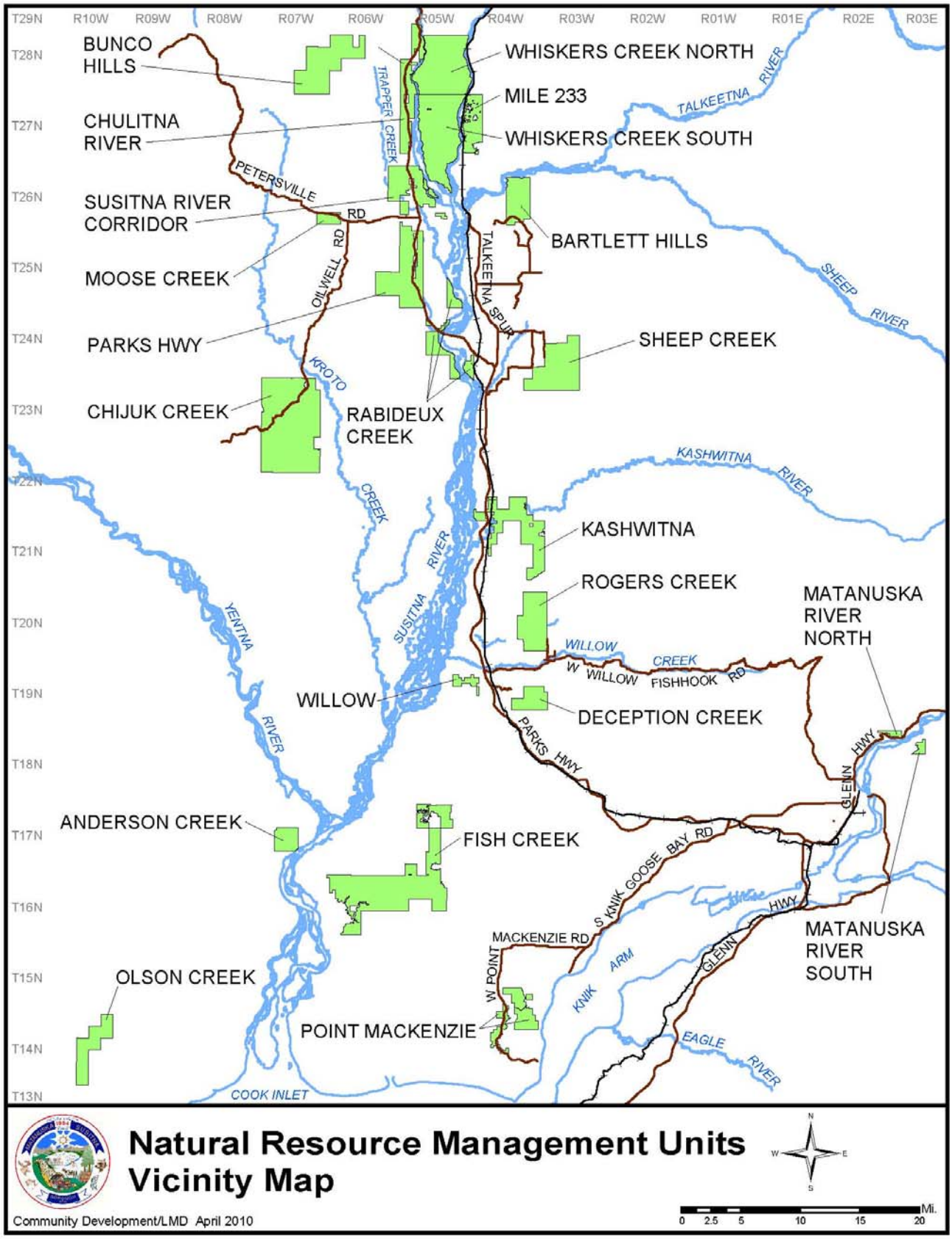
For more information on Natural Resource Management Units, see Volume I, Chapter 1; *Natural Resource Management Units.*

There are approximately 144,000 acres within the twenty-one Natural Resource Management Units included in this plan. Including Fish Creek, Natural Resource Management Units total about 167,000 acres.

The Natural Resource Management Units are:

- Anderson Creek
- Bartlett Hills
- Bunco Hills
- Chijuk Creek
- Chulitna River
- Deception Creek
- Fish Creek
- Kashwitna
- Matanuska River North
- Matanuska River South
- Mile 233
- Moose Creek (Petersville Area)
- Olson Creek
- Parks Highway
- Point MacKenzie
- Rabideux
- Rogers Creek
- Sheep Creek
- Susitna River Corridor
- Whiskers Creek North
- Whiskers Creek South
- Willow

The map on the following page shows the general location of these units in the borough.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CHULITNA RIVER
SUSITNA RIVER CORRIDOR
MOOSE CREEK
PARKS HWY
CHIJUK CREEK
WHISKERS CREEK NORTH
MILE 233
WHISKERS CREEK SOUTH
BARTLETT HILLS
SHEEP CREEK
RABIDEUX CREEK
KASHWITNA
ROGERS CREEK
MATANUSKA RIVER NORTH
WILLOW
DECEPTION CREEK
ANDERSON CREEK
FISH CREEK
MATANUSKA RIVER SOUTH
OLSON CREEK
POINT MACKENZIE
TRAPPER CREEK
PETERSVILLE RD
OILWELL RD
TALKEETNA SPUR
KROTO CREEK
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TALKEETNA RIVER
SHEEP RIVER
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WILLOW CREEK
W WILLOW FISHHOOK RD
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GLENN HWY
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COOK INLET
Natural Resource Management Units
Vicinity Map
Community Development/LMD April 2010
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Management Intent, Land Use Designations and Guidelines

Management Intent defines short and long-term management objectives and the general approach to achieve those objectives. These statements have a specific geographic scope. They pertain to specific management units, subunits or specific areas within the units or subunits.

Management intent is signified by land use designations. These land use designations are listed in volume III, Appendix B, *Land Use Classifications and Designations.*

Management Guidelines are specific standards or procedures to be followed in the issuance of permits, leases, sales, or other authorizations for the use of land or resources. Guidelines range in their level of specificity, providing detailed management direction, general guidance, or the identification of factors that need to be considered in decision making.

General guidelines for the various natural resources and uses found within the Natural Resource Management Units are found in Volume I, Chapters 2 and 3 of this plan. They are often referred to in the specific plans for each unit. Factors that are specific to any unit are addressed in the plan for that unit.

Also See Volume I, Chapter I; *Introduction* for a more complete description and explanation of the relationship of goals, management intent, land-use classifications, land-use designations, guidelines and best management practices.

Relationship of Land Use Designations to Land Classifications

To implement this plan, the borough must classify borough land in the categories of land classification set out in borough code (MSB 23.05.100). The borough classifies, manages and disposes land per MSB Code (Title 23) and the Land and Resource Management Division Policy and Procedure Manual (adopted by Ordinance Serial # 94-069) which identifies steps to carry out those actions.

All lands must be classified prior to disposal, such as for agriculture, settlement, timber, etc. Lands are also classified to identify them for a special purpose such as watershed protection, use for a public facility, public recreation, etc. Other uses may occur on lands classified or designated for a primary or secondary purpose, as long as the use does not significantly reduce the primary or secondary use(s).

These classifications are the formal record of uses and resources on how borough land will be managed. Another way of saying this is the classifications establish the inventory (or portfolio) of borough land. The classifications are based on a public process that includes Assembly approval. Land classifications are often noted on the boroughs' tax maps with a reference to the final plan. Many units have more than one classification.

While the classifications are the formal record and are required by ordinance, they contain no specific land management directives; those directives are expressed through the use of

land use designations in the plan, described in detail for individual management units. There are both primary and secondary designations. Classifications only reflect the primary designation. The secondary designations are still important and a way to convey the management intent. Borough personnel must use the primary and secondary designations, along with the management intent and guidelines when making decisions about uses of the land.

For the purpose of borough land records, the land use designations used in this plan are converted to classifications as shown in the Figure II-1 below. For a complete list of land use designations and classifications and a description of them, see Volume III, Appendix B, *Land Use Classifications and Designations.*

Figure II-1: Conversion of Land Use Designations to Land Classifications

Land Use Designation	Classification
Agriculture	Agricultural Lands
Commercial Use	Commercial Lands
Forestry	Forest Management or Resource Management Lands
Grazing	Grazing or Resource Management Lands
Habitat	Public Recreation or Watershed Lands
Industrial Use	Industrial Lands
Materials	Material or Resource Management Lands
Mineral	Mineral Lands
Public Facilities	Reserved Use Lands
Public Recreation - Concentrated	Public Recreation Lands
Public Recreation - Developed	Reserved Use or Public Recreation Lands
Public Recreation - Dispersed	Public Recreation Lands
Private Recreation	Private Recreation Lands
Resource Management	General Purpose, Land Bank or Resource Management Lands
Settlement	Homestead, or Residential Lands
Water Resources	Watershed Lands
Wetlands	Watershed Lands or Wetland Bank Lands

Land Use Designations and Classifications Used Within Each Natural Resource Management Unit

Figure II-2 shows the land use designations and appropriate land use classifications that apply to each Natural Resource Management Unit. Land use designations are also shown on the "Land Use Designation" map for each individual unit. The "Land Use Designation" narrative for each unit also lists the appropriate land use classification. The same narrative also contains the management intent for each designated area.

Figure II-2: Overview of Land Use Designations and Classifications Used Within Each Natural Resource Management Unit

Land Use Designations. **P= Primary Designation(s) or** **S=Secondary Designation(s).** See Land Designation Map and Land Use Designation Chart for each individual unit for location and management intent. At the end of this chart are the classification abbreviations.		Agriculture	Commercial	Forestry	Grazing	Habitat	Industrial Use	Materials	Minerals	Public Facilities	Public Recreation – Concentrated	Public Recreation – Developed	Public Recreation– Dispersed	Private Recreation	Resource Management	Settlement	Water Resources	Wetlands
Anderson Creek	Designations														P		P	
	Classifications*														RM		WsL	
Bartlett Hills	Designations					S							P				P	
	Classifications*					PbR							PbR				WsL	
Bunco Hills	Designations					S							P				P	
	Classifications*					PbR							PbR				WsL	
Chijuk Creek	Designations			P								S			P		P	
	Classifications*			For								For ReM			ReM		WsL	
Chulitna River/Jigsaw Puzzle Lakes	Designations					P							P S				P	
	Classifications*					PbR							PbR				WsL	
Chulitna River South	Designations														P		P	
	Classifications*														ReM		WsL	
Deception Creek	Designations														P		P	
	Classifications*														ReM		WsL	
Fish Creek	See Fish Creek Management Plan																	

Land Use Designations. **P= Primary Designation(s) or** **S=Secondary Designation(s).** See Land Designation Map and Land Use Designation Chart for each individual unit for location and management intent. At the end of this chart are the classification abbreviations.		Agriculture	Commercial	Forestry	Grazing	Habitat	Industrial Use	Materials	Minerals	Public Facilities	Public Recreation – Concentrated	Public Recreation – Developed	Public Recreation– Dispersed	Private Recreation	Resource Management	Settlement	Water Resources	Wetlands
Kashwitna East	Designations												P				P	
	Classifications*												PbR				WsL	
Kashwitna West	Designations														P		P	
	Classifications*														ReM		WsL	
Matanuska River North	Designations														P		P	
	Classifications*														ReM		WsL	
Matanuska River South	Designations*												P		P		P	
	Classifications*												PbR		ReM		WsL	
Mile 233	Designations														P		P	
	Classifications*														ReM		WsL	
Moose Creek	Designations							P							P		P	
	Classifications*							Mat							ReM		WsL	
Olson Creek	Designations														P		P	
	Classifications*														ReM		WsL	
Parks Highway	Designations														P		P	
	Classifications*														ReM		WsL	

Land Use Designations. **P= Primary Designation(s) or** **S=Secondary Designation(s).** See Land Designation Map and Land Use Designation Chart for each individual unit for location and management intent. At the end of this chart are the classification abbreviations.		Agriculture	Commercial	Forestry	Grazing	Habitat	Industrial Use	Materials	Minerals	Public Facilities	Public Recreation – Concentrated	Public Recreation – Developed	Public Recreation– Dispersed	Private Recreation	Resource Management	Settlement	Water Resources	Wetlands
Pt. MacKenzie Alsop Road	Designations					P									P		P	
	Classifications*					WsL									ReM		WsL	
Pt. MacKenzie Mule Creek	Designations														P		P	
	Classifications*														ReM		WsL	
Pt. MacKenzie Pt. MacKenzie Road	Designations*					P		P							P		P	
	Classifications*					WsL		Mat							ReM		WsL	
Rabideux	Designations														P		P	
	Classifications*														ReM		WsL	
Rogers Creek	Designations														P		P	
	Classifications*														ReM		WsL	
Sheep Creek	Designations														P		P	
	Classifications*														ReM		WsL	
Susitna River Corridor	Designations														P		P	
	Classifications*														ReM		WsL	

Land Use Designations. **P= Primary Designation(s) or** **S=Secondary Designation(s).** See Land Designation Map and Land Use Designation Chart for each individual unit for location and management intent. At the end of this chart are the classification abbreviations.		Agriculture	Commercial	Forestry	Grazing	Habitat	Industrial Use	Materials	Minerals	Public Facilities	Public Recreation – Concentrated	Public Recreation – Developed	Public Recreation– Dispersed	Private Recreation	Resource Management	Settlement	Water Resources	Wetlands
Whiskers Creek North	Designations					S							P				P	
	Classifications*					PbR							PbR				WsL	
Whiskers Creek South	Designations														P		P	
	Classifications*														ReM		WsL	
Willow	Designations												P		P		P	
	Classifications												PbR		ReM		WsL	

*The following are the abbreviations for each classification shown in Figure II-2:

Agricultural Lands	Ag	Mineral Lands	Min
Commercial Lands	Com	Private Recreation Lands	PriR
Forest Management Lands	For	Public Recreation Lands	PbR
General Purpose Lands	GnP	Reserve Use Lands	RsU
Grazing Lands	Grz	Residential Lands	Rsd
Homestead Lands	Hom	Resource Management Lands	ReM
Industrial Lands	Ind	Watershed Lands	WsL
Land Bank Lands	LnB	Wetland Bank Lands	WtB
Material Lands	Mat		

Natural Resource Management Units With Operable Timber Available for Timber Harvest and For Computing Annual Allowable Cut

Figure II-3 shows all the Natural Resource Management Units and the volume of timber that were included in the *Matanuska-Susitna Borough: Operable Forest Land Analysis Report Phase II*[1]. The figure also shows the amount of operable timber that is available for timber harvest based on the land use classifications and designations described above.

Not all Operable Forest Land is available for timber harvest. To be available the land must be either; 1) classified as Forest Management Lands; or 2) classified as Resource Management Lands and have either a primary or secondary land use designation for forest management. Not all lands classified as Resource Management Lands are available for timber harvest.

The types and/or sizes of timber harvest may be limited by this Plan for those lands that are available for timber harvest. The management intent statements and forest management guidelines for each specific unit need to be referred to for any limitations or special guidelines.

The total of available Operable Forest Land is what is used to calculate Annual Allowable Cut. See Volume I, Chapter 3; *Sustained Yield and Annual Allowable Cut* on how Annual Allowable Cut is calculated.

The numeric figures are not the same as found in the *Forest Inventory Report Phase II*[2] and the *Operable Forest Land Analysis Report Phase II*[2] because some areas were inventoried that are not included in the Natural Resource Management Units in this Plan. The figures have been adjusted to reflect only the operable volumes and acreages within the units.

<u>This chart (Figure II-3) is only accurate at the time of adoption of this Plan. The volumes and/or areas determined to be Operable Forest Land could change. For example, an updated inventory and operable forest analysis could be completed, areas could be removed from the Operable Forest Land base as the result of a reclassification, a wildfire, or conversion to another use, etc. In such cases, the figures must be revised at the time of the next Five-Year Timber Harvest Schedule is adopted.</u>

[1] Sanders Forestry consulting and Alaska Map Company, 2009

Figure II – 3: Units with Operable Forest Land Available For Timber Harvest and For Calculating Annual Allowable Cut

Unit Name	Operable Net Cubic Feet (rounded)	Operable Acres[2]		Operable Net Cubic Feet Available For Harvest (rounded)	Operable Acres Available For Harvest[2]
Anderson Creek	0	0		0	0
Bartlett Hills	4,926,000	2,785		0	0
Bunco Hills	0	0		0	0
Chijuk Creek	24,334,000	14,867		24,334,000	14,867
Chulitna River (Jigsaw Puzzle Lakes Subunit)		347		0	0
Chulitna River (South Subunit)	4,104,000	2,498		4,104,000	2,498
Deception Creek	1,173,000	676		1,173,000	676
Fish Creek[3]	16,439,000	9,025		16,439,000	
Kashwitna (East)	0	0		0	0
Kashwitna (West)	5,913,000	3,429		5,913,000	3,429
Matanuska River (North)	469,000	264		469,000	264
Matanuska River (South)	0	0		0	0
Mile 233	5,384,000	3,079		5,384,000	3,079
Moose Creek	1,302,000	732		1,302,000	732
Olson Creek	0	0		0	0
Parks Highway	2,604,000	1,534		2,604,000	1,534
Pt. MacKenzie (Alsop Road Subunit)[3]	1,764,000	1,035		1,764,000	1,035
Pt. MacKenzie (Mule Creek Subunit)	1,348,000	791		1,348,000	791
Pt. MacKenzie (Pt. MacKenzie Road Subunit)	1,333,000	782		1,333,000	782
Rabideux	2,726,000	1,585		2,726,000	1,585
Rogers Creek	1,848,000	1,024		1,848,000	1,024
Sheep Creek	2,756,000	1,548		2,756,000	1,548
Susitna River Corridor	5,087,000	3,032		5,087,000	3,032
Whiskers Creek North	0	0		0	0
Whiskers Creek South	13,097,000	7,518		13,097,000	7,518
Willow	0	0		0	0
TOTAL	96,607,000	56,551		91,681,000	53,419

Source: Sanders Forestry Consulting, Alaska Map Company (2009), and RWS Consulting 2010

[2] Acreages are approximate and are provided as a "visual" reference. Timber harvest schedules, harvests, and Annual Allowable Cut should be based on volume, not acreage.

[3] The 2009 "Timber Inventory" and "Operable Forest" analysis extended beyond the unit boundary in this Plan. The "Operable Forest Area" has been changed to reflect that portion of the "Operable Forest Area" that is located within the unit boundary in this Plan.

Role of Agencies, Community Councils and the Public in Natural Resource Management Unit Management Decisions

A complete description; *How the Plan was Developed* can be found in Volume I, Chapter 1. Volume IV; *Public and Agency Participation* has a detailed description and documentation of public and agency involvement in developing the plan. It is important to note that the majority of interest and comments received during each portion of the public involvement process as this plan was developed dealt with the actual Natural Resource Management Units.
All the comments received affected the plan in one way or another. While not every concern or suggestion could be used or followed, the end result of all the comments was the majority of the comments were used to better address concerns and comments, and to make the individual unit plans better.

Agency input was also invaluable for establishing resource and use information and for developing management intent and management guidelines. Knowledgeable members of the public were also instrumental in providing resource and use information about the units. Much of this information was not available from more traditional sources such as from staff of agencies or published materials.

This continued involvement by agencies, affected Community Councils, affected industries and businesses, and the public is important for plan implementation, providing information on various natural resources, economies and uses, and having an opportunity to comment on proposed management decisions.

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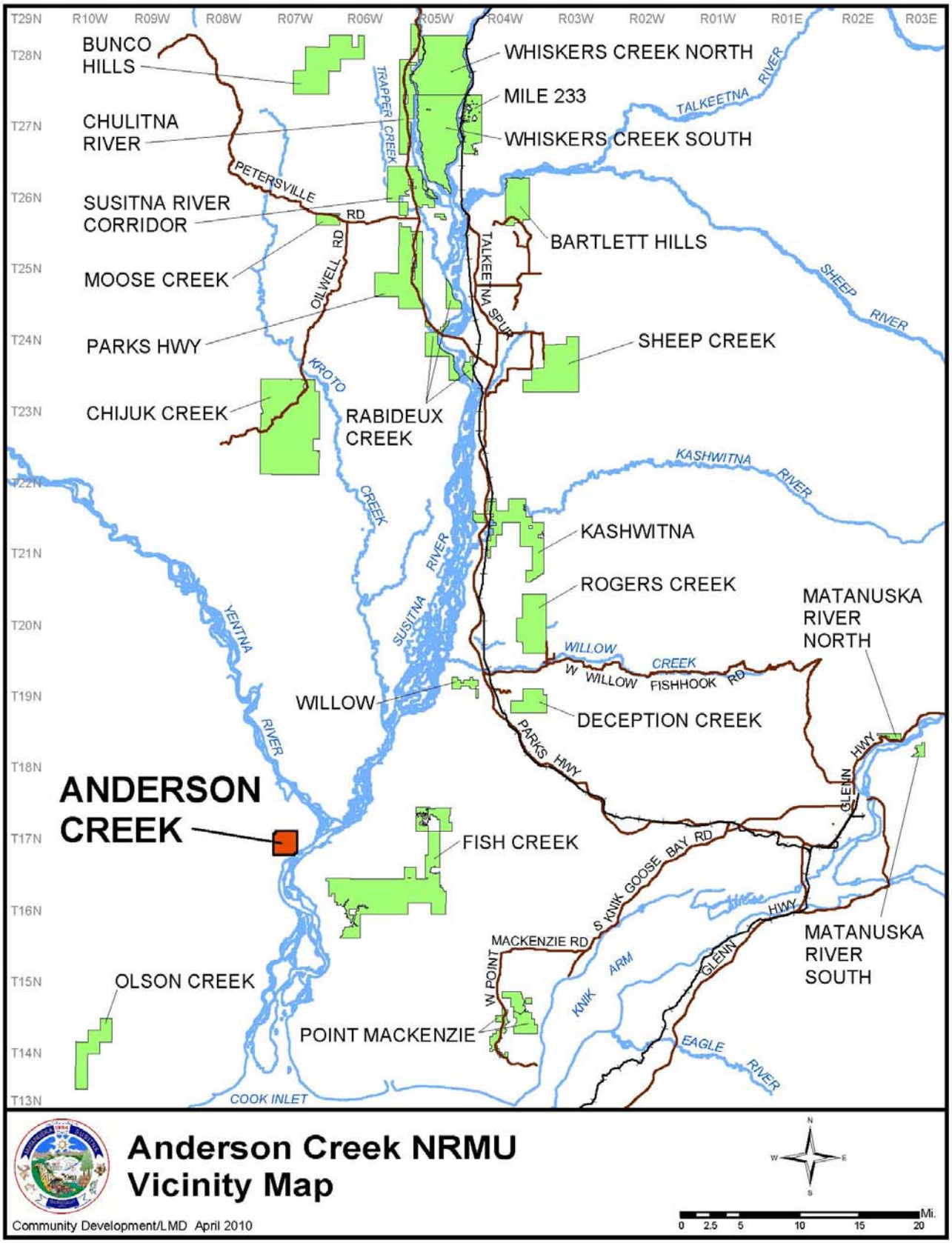
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CHULITNA RIVER
SUSITNA RIVER CORRIDOR
MOOSE CREEK
PARKS HWY
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Anderson Creek NRMU
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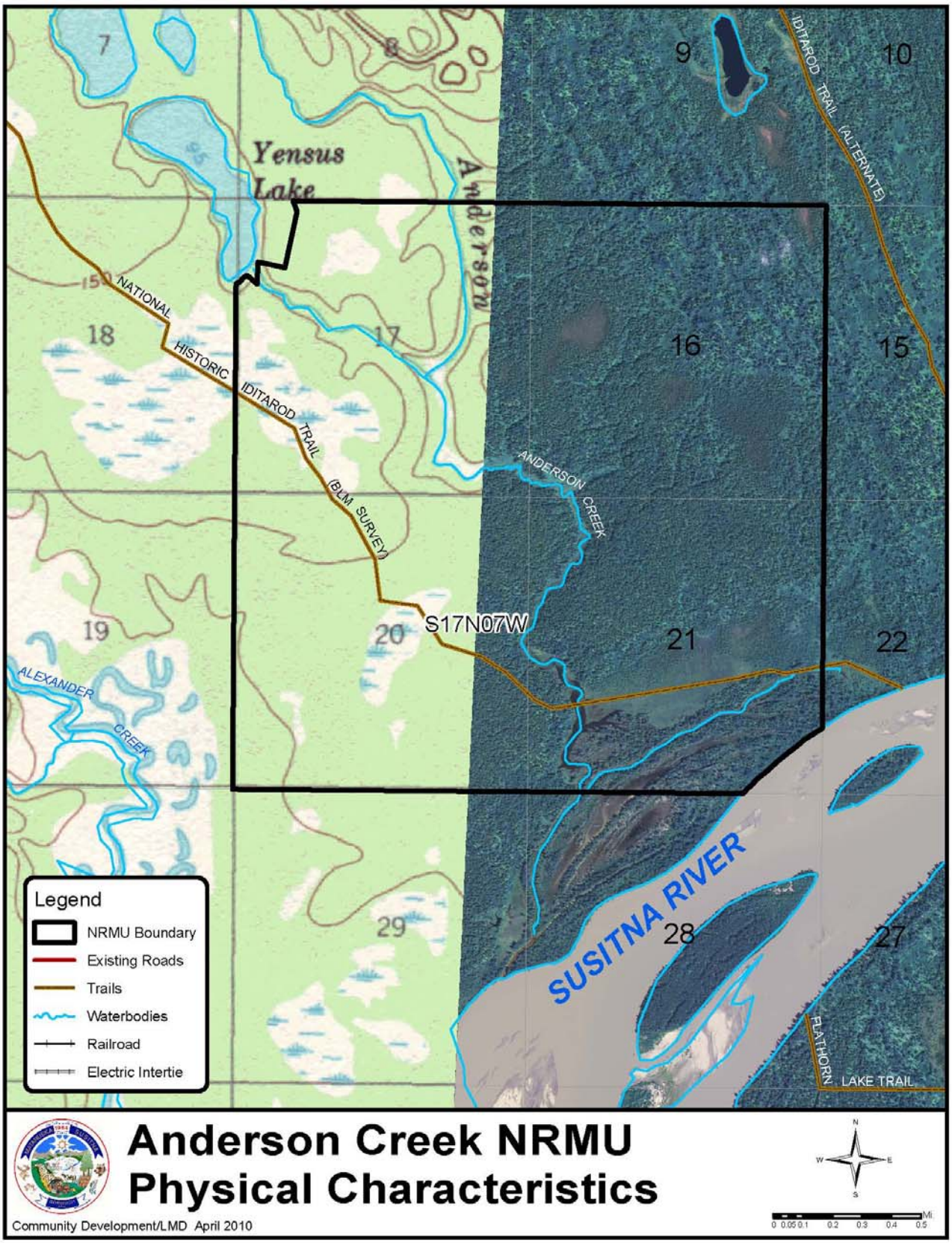
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IDITAROD TRAIL (ALTERNATE)
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ALEXANDER CREEK
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SUSITNA RIVER
FLATHORN LAKE TRAIL
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Waterbodies
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Anderson Creek NRMU
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Community Development/LMD April 2010
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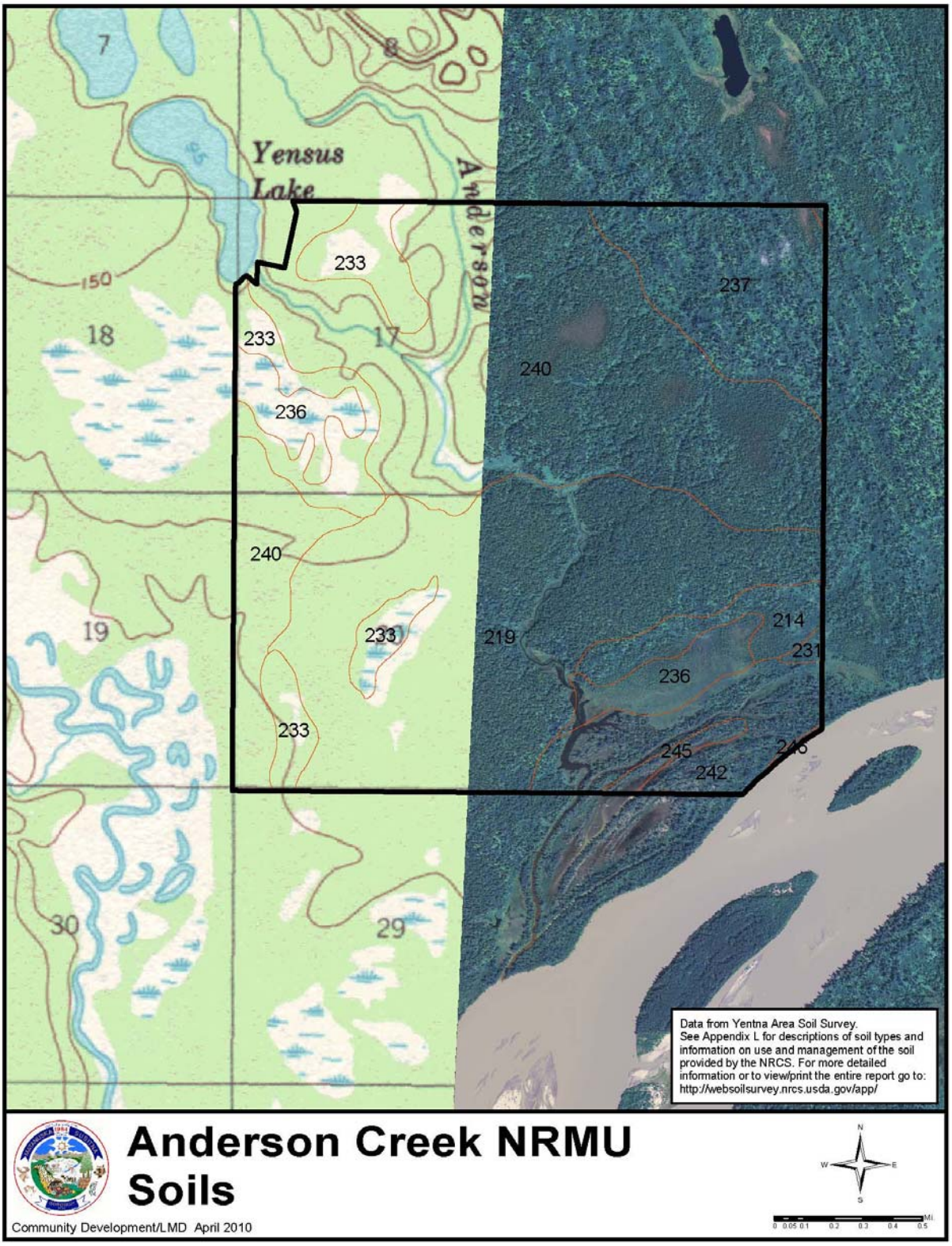
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Data from Yentna Area Soil Survey.
See Appendix L for descriptions of soil types and information on use and management of the soil provided by the NRCS. For more detailed information or to view/print the entire report go to: http://websoilsurvey.nrcs.usda.gov/app/
Anderson Creek NRMU
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Community Development/LMD April 2010
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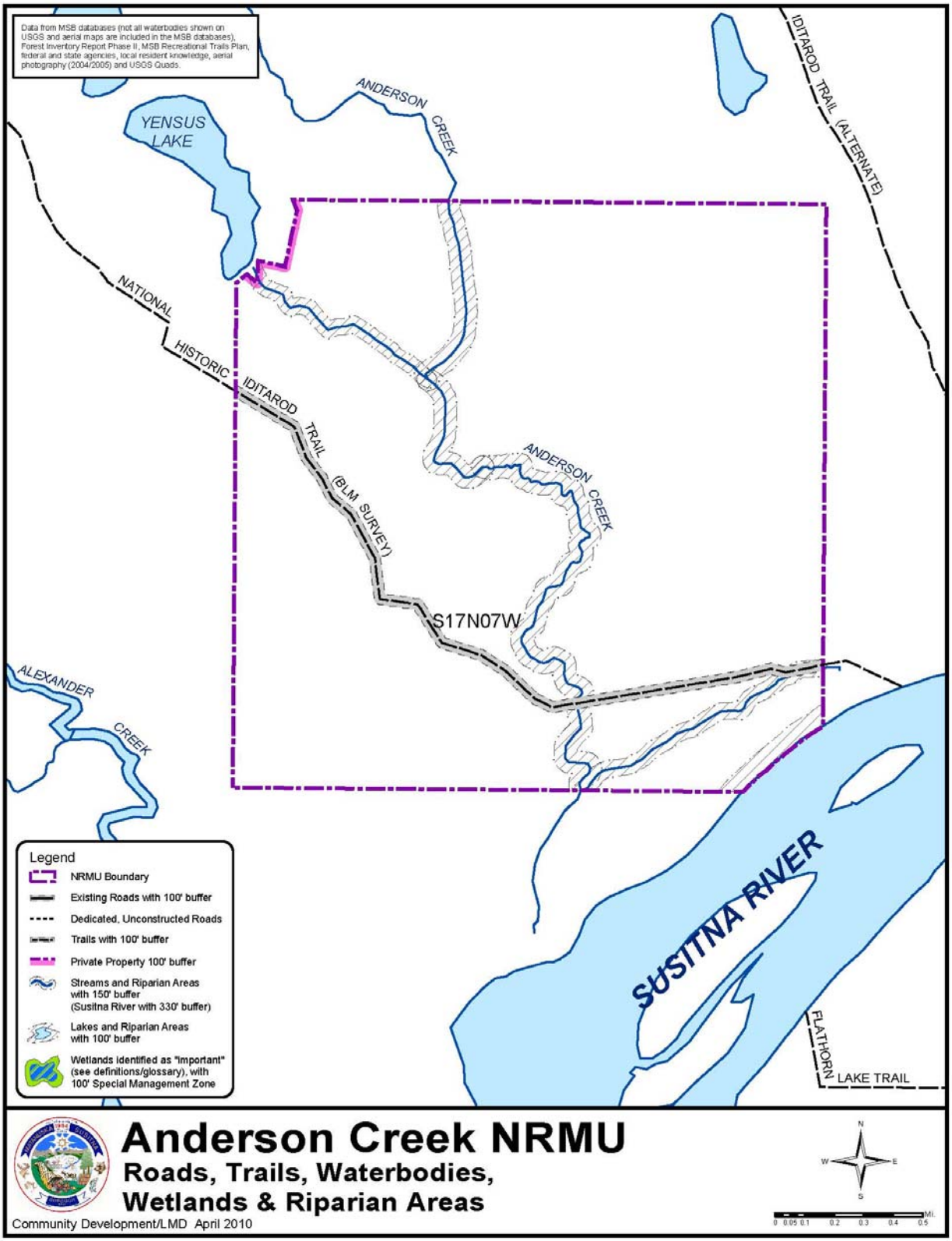
Data from MSB databases (not all waterbodies shown on USGS and aerial maps are included in the MSB databases), Forest Inventory Report Phase II, MSB Recreational Trails Plan, federal and state agencies, local resident knowledge, aerial photography (2004/2005) and USGS Quads.
YENSUS LAKE
ANDERSON CREEK
IDITAROD TRAIL (ALTERNATE)
NATIONAL HISTORIC IDITAROD TRAIL (BLM SURVEY)
ANDERSON CREEK
S17N07W
ALEXANDER CREEK
SUSITNA RIVER
FLATHORN LAKE TRAIL
Legend
NRMU Boundary
Existing Roads with 100' buffer
Dedicated, Unconstructed Roads
Trails with 100' buffer
Private Property 100' buffer
Streams and Riparian Areas with 150' buffer (Susitna River with 330' buffer)
Lakes and Riparian Areas with 100' buffer
Wetlands identified as "important" (see definitions/glossary), with 100' Special Management Zone
Anderson Creek NRMU
Roads, Trails, Waterbodies, Wetlands & Riparian Areas
Community Development/LMD April 2010
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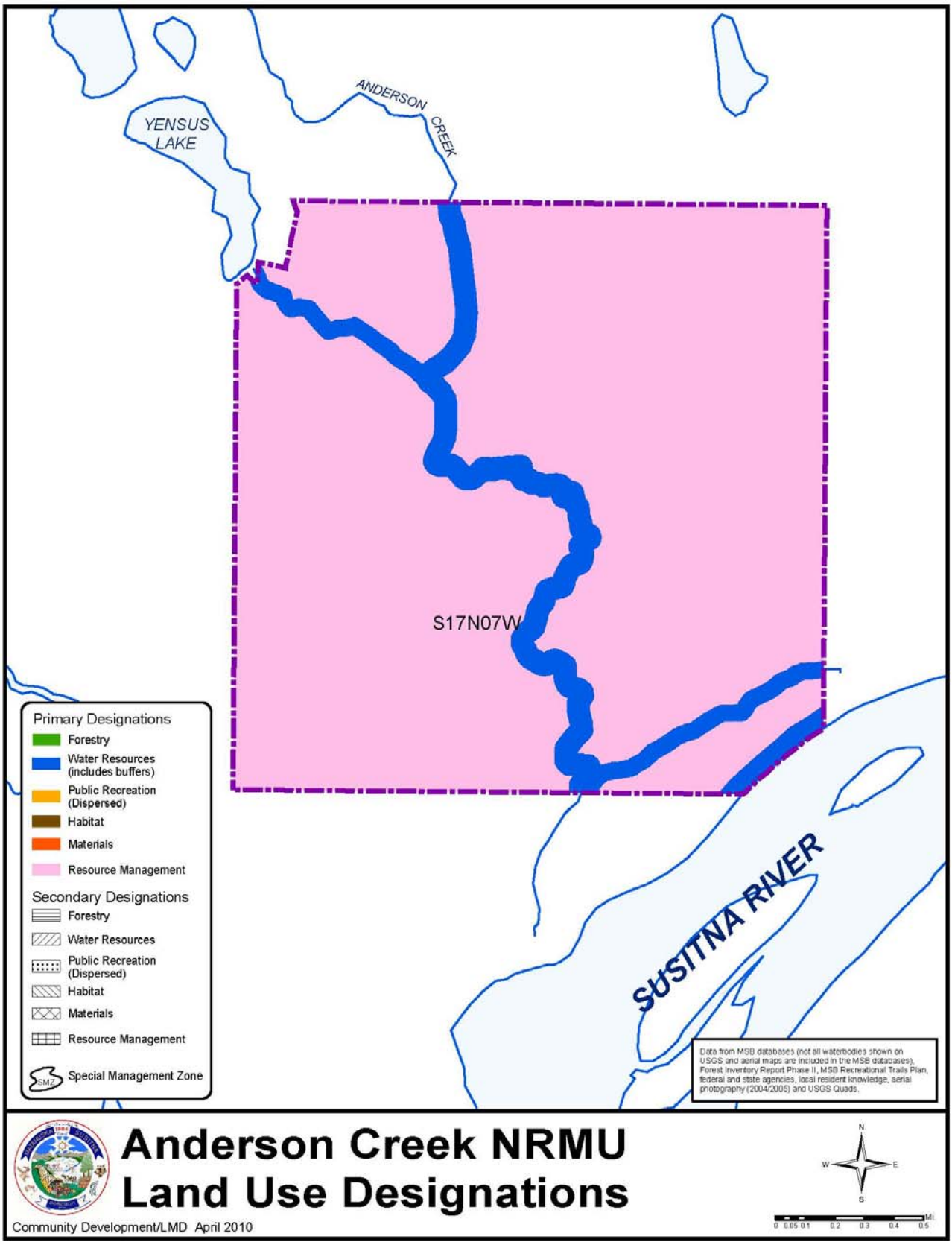
YENSUS LAKE
ANDERSON CREEK
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SUSITNA RIVER
Primary Designations
Forestry
Water Resources (includes buffers)
Public Recreation (Dispersed)
Habitat
Materials
Resource Management
Secondary Designations
Forestry
Water Resources
Public Recreation (Dispersed)
Habitat
Materials
Resource Management
Special Management Zone
Data from MSB databases (not all waterbodies shown on USGS and aerial maps are included in the MSB databases), Forest Inventory Report Phase II, MSB Recreational Trails Plan, federal and state agencies, local resident knowledge, aerial photography (2004/2005) and USGS Quads.
Anderson Creek NRMU
Land Use Designations
Community Development/LMD April 2010
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ANDERSON CREEK
Natural Resource Management Unit

General Information

The Anderson Creek Natural Resource Management Unit consists of about 2,510 acres. The unit is located along and on the north side of the Susitna River approximately 1- mile east of Alexander Creek.

The unit is within the Susitna Lowlands, generally characterized with flat terrain with elevations around 220 to 250 feet. The unit generally has poorly drained soils.

The unit has limited access by boat or aircraft with floats or skis.

Borough Tax Maps
Flat Horn Lake 6 and 11

Current Land Uses
A variety of dispersed public recreation activities including hunting, fishing, wildlife viewing, birding, hiking, snowmobiling, cross-country skiing and snowshoeing.

Surrounding Land Ownership and Uses
The majority of the land surrounding the unit is owned by the state where the same dispersed public recreation also takes place. There is also extensive private property (over 160 parcels), some with cabins, adjacent to, and in the vicinity of, the northwest portion of the unit.

Community Council Area
None

Existing Land Use Plans

- Alaska Department of Natural Resources, *Susitna Area Plan* (1985), Susitna Lowlands Unit, Alexander Creek Subunit (6b); values for agriculture, forestry, settlement, and wildlife habitat. The Alaska, Department of Natural Resources is currently revising this plan. The new plan will be called the *Susitna-Matanuska Area Plan* and will replace the *Susitna Area Plan* when adopted. It will not apply to borough owned land.
- Mat-Su Borough *Recreational Trails Plan* (2007).
- Mat-Su Borough *Parks, Recreation and Open Space Plan* (2001); which is currently being updated.

Existing Land Use Classifications
None

Summary of Resources and Uses

Agriculture and Grazing

A review of soil types, published by the Department of Agriculture, Natural Resources Conservation Service (http://websoilsurvey.ncrs.usda.gov/app/), indicates that there are no known lands suitable for agricultural development or grazing within the unit.

Also, see *Soils* map at the beginning of this section.

Cultural Resources and Heritage Sites

Shem Pete's Alaska; The Territory of the Upper Cook Inlet Dena'ina, (Chapter 2, Lower Susitna River) describes activity specific to the Anderson Creek area. According to the authors, a winter village was located there until perhaps 1870, and was used as a fish camp by the Susitna Station Dena'ina unti the 1930's. Shem Pete discusses a village along the east side of Anderson Creek "with lots of houses there" 120 years ago. He relates that the last large nichil (traditional Dena'ina multi-family house) on the Susitna River was located here.

Information from the borough Cultural Resources Division indicates that there is a strong likelihood that other cultural and historic sites may lay within or close to the unit.

Additional field work will be required if any natural resource extraction, other development activities take place, or current use(s) of the area changes significantly within the unit.

Fish and Wildlife Habitat and Resources

Moose, black bear and brown bear are found in the area. The Alaska Department of Fish and game estimates the black bear population to be relatively high and the brown bear population as healthy. The general area is important for wintering moose as they congregate in the area after moving from the higher elevations in the foothills of Mt. Susitna. Some moose calving occurs here as well. Moderate numbers of furbearer species occur throughout the region. There are no known seasonal wildlife concentration areas within the unit.

The ponds and wetlands to the south of Yensus Lake, a large portion of which lies within the unit, have high concentrations of birds during the seasonal migrations including substantial numbers of Trumpeter Swans, Sandhill Cranes and a large variety of ducks and other waterfowl

There are no known bear dens, swan nesting areas or eagle nests within the unit, but the habitat is such that they could exist in the unit. Local property owners and residents have reported that swans nested on the lower end of Yensus Lake (outside the unit) in the summer of 2009. There are two resident eagles which have perch trees at various sites around the lake. They feed at the lake regularly and have been around for years, but the location of their nest(s) is unknown. A Sandhill Crane family has been successfully nesting and raising young in the marsh at the southern end of Yensus Lake for the last four years.

There also are nesting common loons and grebes, and a large and diverse variety of other birds in this same general area.

Additional fieldwork will be required prior to any natural resource extraction, other development activities or significant changes to existing use patterns taking place to verify this information.

The Susitna River and its sloughs, Anderson Creek, and the stream between Yensus Lake and Anderson Creek are anadromous fish streams. Anderson Creek is important for the production of Coho and pink salmon.

Prior to any resource extraction projects, the anadromous fish distribution in any wetlands should be established, any additional anadromous or important resident fish waterbodies need to be identified and the Alaska Department of Fish and Game will need to verify the cataloged anadromous resident fish streams as described above.

The Alaska Department of Fish and Game will require Fish Habitat Permits, accompanied by detailed project plans, prior to any planned resource extraction project adjacent to anadromous or resident waterbodies.

There are no commercial lodges or fish camps in the area.

Forest Resources

No timber inventory has been conducted. A review of aerial photographs and soils data indicate that some commercial timber may exist. The area has very limited potential for any commercial forestry uses because of its remote location and the uneconomic feasibility of timber harvest and subsequent stand management.

Personal use house log and firewood sales may occur in this unit.

Private Property

There is no private property within the unit. There is extensive private property adjacent to the northwest of the unit in the Yensus Lake vicinity. The state has had three large land sales in this area resulting in over 160 privately owned parcels. The land disposals, beginning in 1972 are ASLS 72-83 (open-to entry), 79-147 (Otter Lakes Subdivision, and 81-177 (Trail Ridge Subdivision).

Public Recreation and Tourism

Random recreational activities occur in and surrounding the unit including dog mushing, snowmobiling, trapping, hunting and fishing. Recreational activity is quite heavy at times, both summer and winter, because of the private property that exists adjacent to, and in the general vicinity of the Iditarod Trail.

There is no specific resource or activity that draws tourists to this unit.

Roads and Trails

There are no dedicated roads or trails within the unit.

The “Historic Iditarod Trail” passes through the unit, in generally an east to west direction in the northern portion of the unit. However, the actual trail location that is used varies from year-to-year in general area depending on snow and other conditions.

Also, see *Roads, Trails, Waterbodies, Wetlands and Riparian Areas* map at the beginning of this section.

Rock, Sand and Gravel

A review of soil types, published by the Department of Agriculture, Natural Resources Conservation Service (http://websoilsurvey.ncrs.usda.gov/app/), indicates that there are no known lands with rock, sand or gravel resources within the unit.

Also, see *Soils* map at the beginning of this section.

Unit Management Intent

The management intent for the Anderson Creek Natural Resource Management Unit shall be for watershed protection and general multiple-uses. The unit is remote and lacks feasible access except for by boats, airplanes on floats or skis, and possibly by snowmobile or dog team in the winter.

Land Use Designations

Anderson Creek		
Designation	Classification	Management Intent
Primary		
Water Resources	Watershed Lands	All waterbodies, riparian areas, and important wetlands. Any waterbodies, riparian areas or important wetlands determined after adoption of this plan to be anadromous, important for resident fish, or important wetlands for fish and wildlife shall also be similarly designated and classified[4].
Resource Management	Resource Management Lands	Small personal use timber and fire wood sales are permitted, excluding land designated as Water Resources.
Secondary		
None		

Also, see *Land Use Designations* map at the beginning of this section.

Management Guidelines

See Volume I, Chapters 2 and 3 for area-wide guidelines for all Natural Resource Management Units. The remainder of this section presents unit-specific guidelines.

<u>Buffers and Special Management Zones</u>
All flowing waterbodies, including lakes that are part of a flowing water system that are connected to creeks, streams, and rivers and riparian areas will be protected through the use of undisturbed natural vegetation buffers.

Anderson Creek shall have a 200-foot undisturbed natural vegetation buffer.

All wetlands over 40 acres and all smaller important wetland areas (see definition in *Definitions/Glossary* at the end of this chapter or in Volume III) shall be protected with a Special Management Zone which shall include a 100-foot area around the wetland area.

[4] Such designation and classification shall be considered as a "Minor Change" to the Plan (See Volume I, Chapter 4, *Procedures for Changes to the Plan, Goals, and Guidelines.*

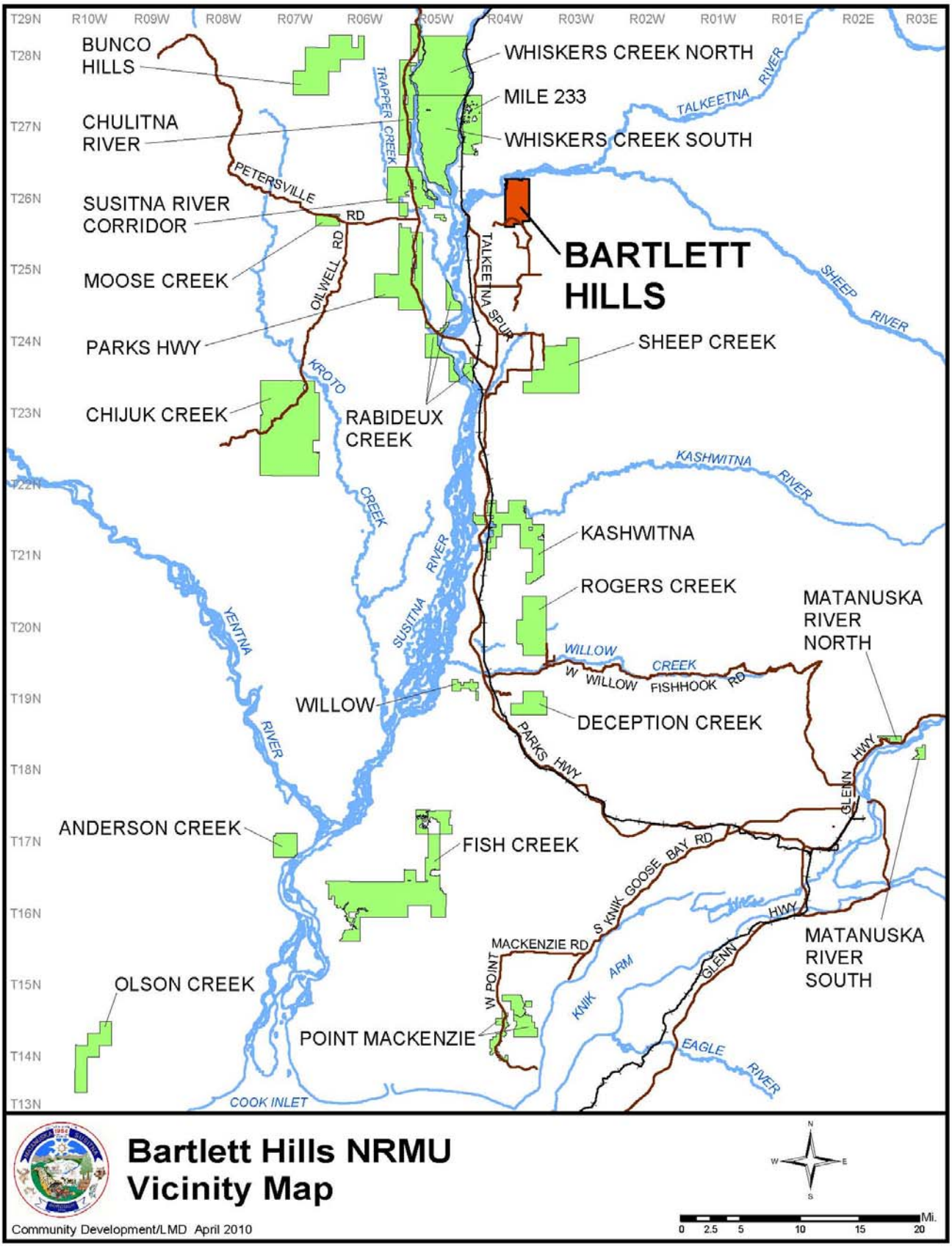
The Zone shall not allow disturbance of the wetland area, but some uses may be allowed. For example, winter time recreational use is allowed when waterfowl are not present and the ground is sufficiently frozen and snow cover exists to not harm the natural vegetation.

See *Roads, Trails, Waterbodies, Wetlands and Riparian Areas* map at the beginning of this section for waterbodies that shall have buffers and wetlands with a Special Management Zone.

Also, see Volume I, Chapter 2, *Buffers* and *Special Management Zones* for additional information.

Other Uses

No additional unit-specific guidelines are needed for this unit. See Volume I, Chapters 2 and 3 for area-wide guidelines that apply to all Natural Resource Management Units.


T29N
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T13N
BUNCO HILLS
CHULITNA RIVER
SUSITNA RIVER CORRIDOR
MOOSE CREEK
PARKS HWY
CHIJUK CREEK
WHISKERS CREEK NORTH
MILE 233
WHISKERS CREEK SOUTH
BARTLETT HILLS
SHEEP CREEK
RABIDEUX CREEK
KASHWITNA
ROGERS CREEK
MATANUSKA RIVER NORTH
WILLOW
DECEPTION CREEK
ANDERSON CREEK
FISH CREEK
MATANUSKA RIVER SOUTH
OLSON CREEK
POINT MACKENZIE
TRAPPER CREEK
PETERSVILLE RD
OILWELL RD
KROTO CREEK
TALKEETNA SPUR
TALKEETNA RIVER
SHEEP RIVER
KASHWITNA RIVER
SUSITNA RIVER
YENTNA RIVER
WILLOW CREEK
W WILLOW FISHHOOK RD
PARKS HWY
GLENN HWY
S KNIK GOOSE BAY RD
MACKENZIE RD
W POINT
KNIK ARM
EAGLE RIVER
COOK INLET
Bartlett Hills NRMU
Vicinity Map
Community Development/LMD April 2010
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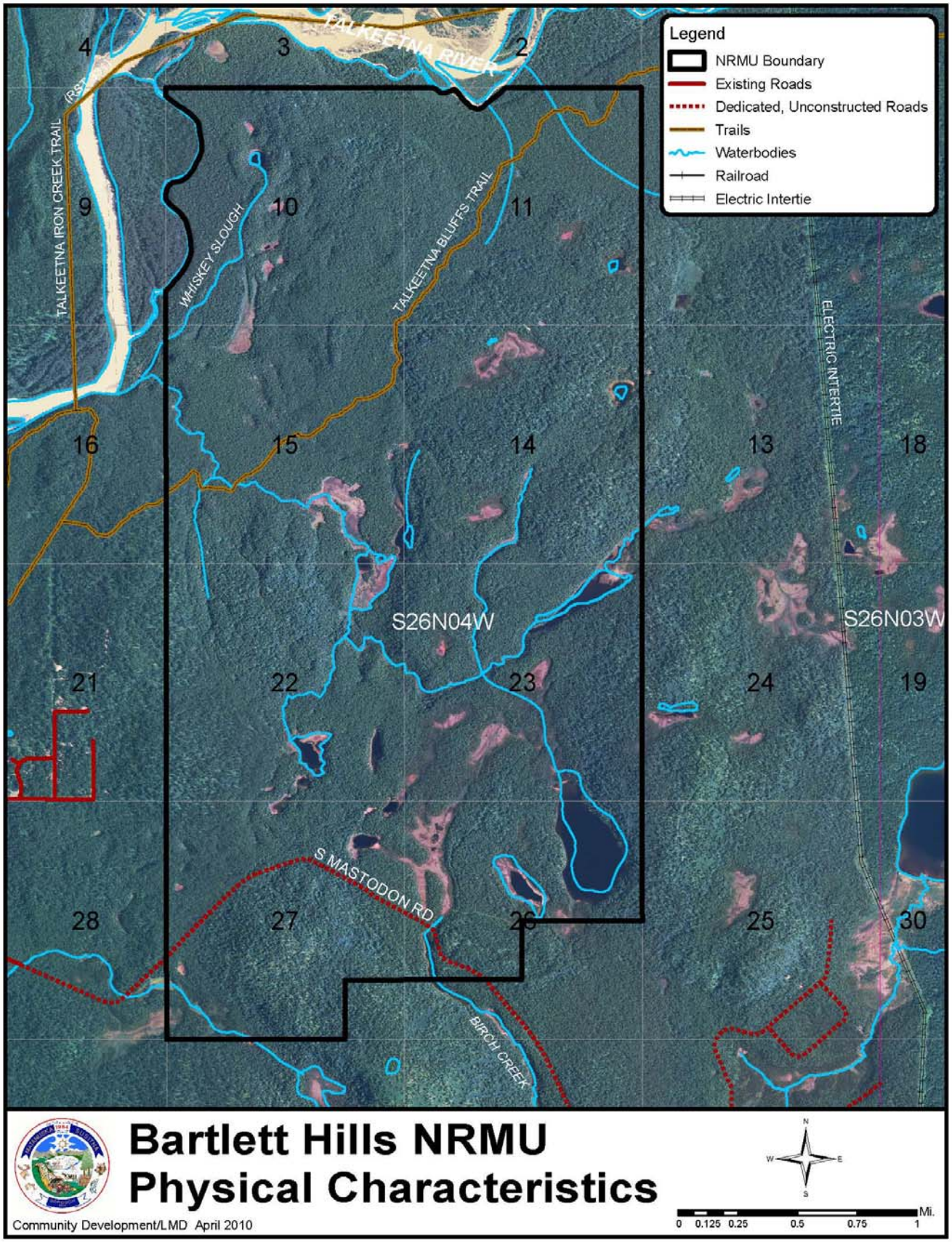
Legend
NRMU Boundary
Existing Roads
Dedicated, Unconstructed Roads
Trails
Waterbodies
Railroad
Electric Intertie
TALKEETNA RIVER
TALKEETNA IRON CREEK TRAIL
WHISKEY SLOUGH
TALKEETNA BLUFFS TRAIL
ELECTRIC INTERTIE
S26N04W
S26N03W
S MASTODON RD
BIRCH CREEK
4
3
2
9
10
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Bartlett Hills NRMU
Physical Characteristics
Community Development/LMD April 2010
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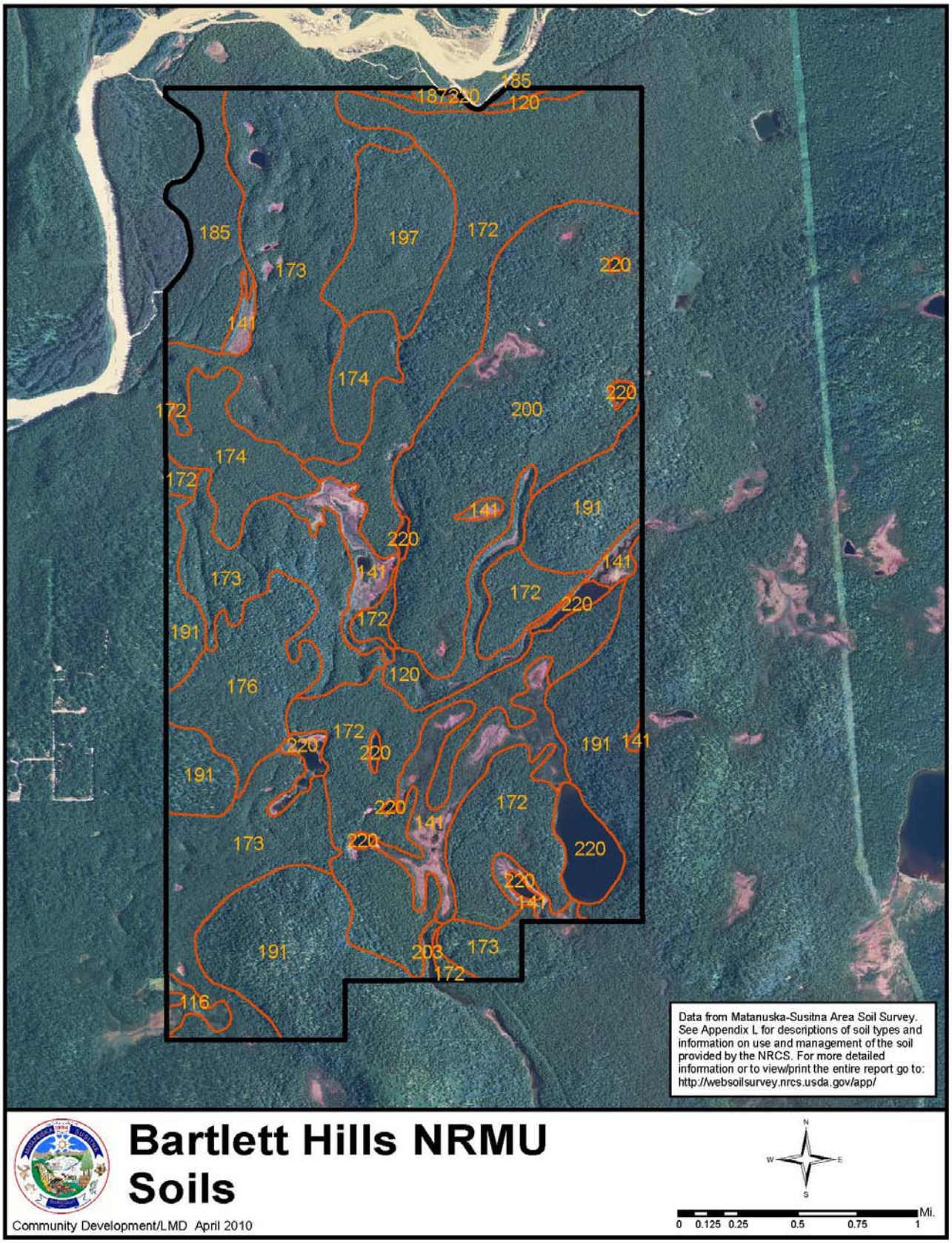
Data from Matanuska-Susitna Area Soil Survey. See Appendix L for descriptions of soil types and information on use and management of the soil provided by the NRCS. For more detailed information or to view/print the entire report go to: http://websoilsurvey.nrcs.usda.gov/app/
Bartlett Hills NRMU
Soils
Community Development/LMD April 2010
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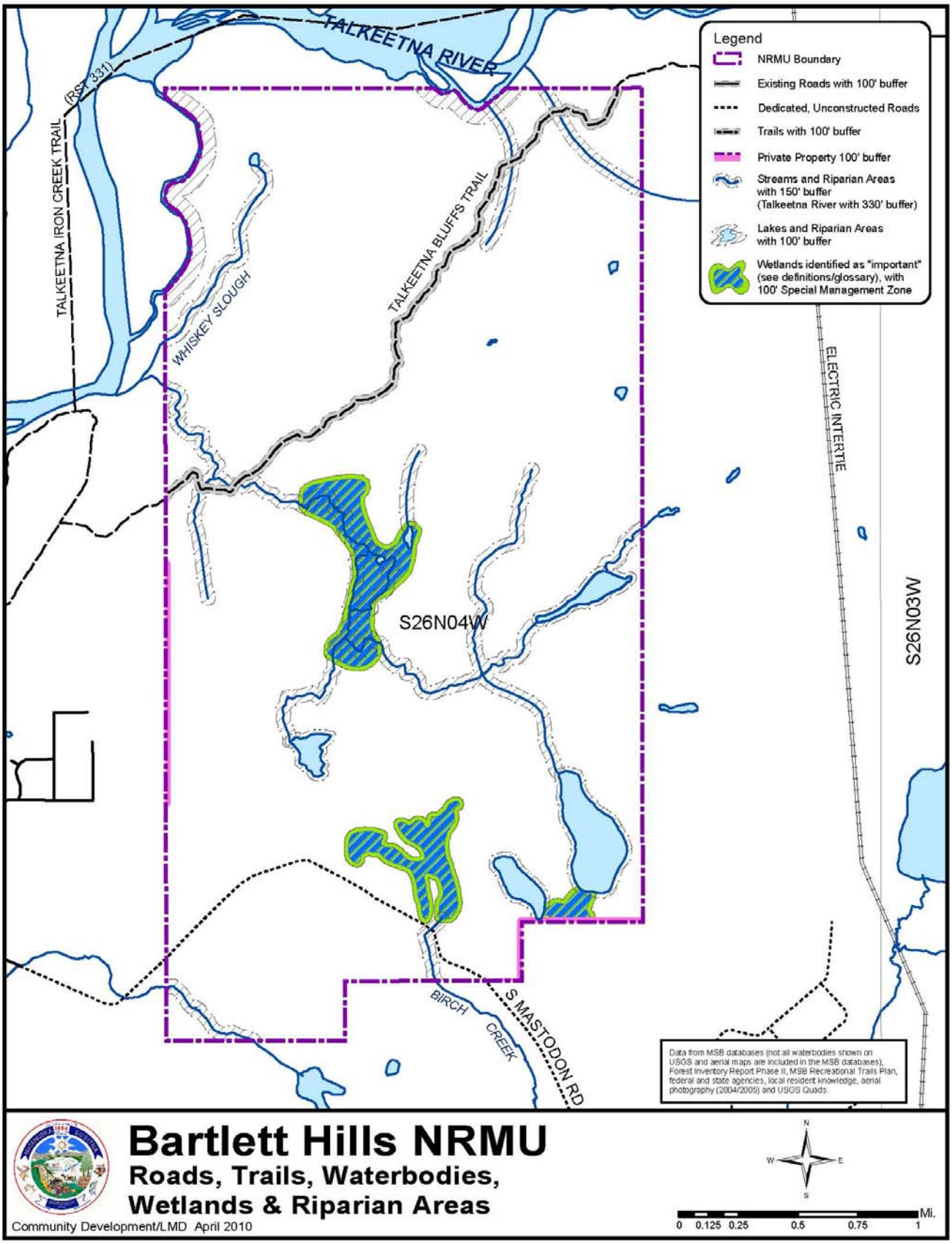
TALKEETNA RIVER
(RST 331)
TALKEETNA IRON CREEK TRAIL
WHISKEY SLOUGH
TALKEETNA BLUFFS TRAIL
ELECTRIC INTERTIE
S26N04W
S26N03W
BIRCH CREEK
S MASTODON RD
Legend
NRMU Boundary
Existing Roads with 100' buffer
Dedicated, Unconstructed Roads
Trails with 100' buffer
Private Property 100' buffer
Streams and Riparian Areas with 150' buffer (Talkeetna River with 330' buffer)
Lakes and Riparian Areas with 100' buffer
Wetlands identified as "important" (see definitions/glossary), with 100' Special Management Zone
Data from MSB databases (not all waterbodies shown on USGS and aerial maps are included in the MSB databases), Forest Inventory Report Phase II, MSB Recreational Trails Plan, federal and state agencies, local resident knowledge, aerial photography (2004/2005) and USGS Quads.
Bartlett Hills NRMU
Roads, Trails, Waterbodies, Wetlands & Riparian Areas
Community Development/LMD April 2010
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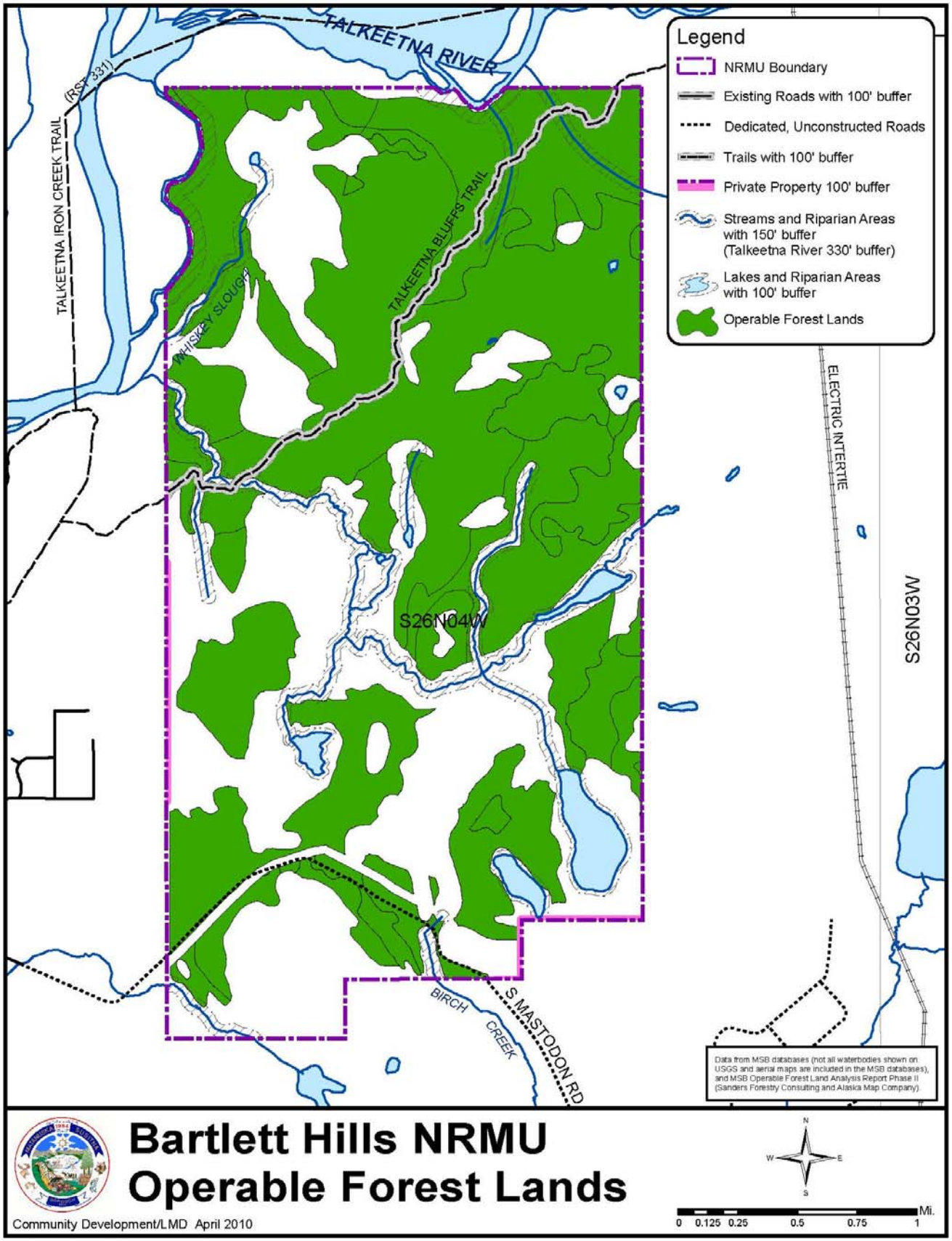
Legend
NRMU Boundary
Existing Roads with 100' buffer
Dedicated, Unconstructed Roads
Trails with 100' buffer
Private Property 100' buffer
Streams and Riparian Areas with 150' buffer (Talkeetna River 330' buffer)
Lakes and Riparian Areas with 100' buffer
Operable Forest Lands
TALKEETNA RIVER
(RST 331)
TALKEETNA IRON CREEK TRAIL
TALKEETNA BLUFFS TRAIL
WHISKEY SLOUGH
ELECTRIC INTERTIE
S26N04W
S26N03W
BIRCH CREEK
S MASTODON RD
Data from MSB databases (not all waterbodies shown on USGS and aerial maps are included in the MSB databases), and MSB Operable Forest Land Analysis Report Phase II (Sanders Forestry Consulting and Alaska Map Company).
Bartlett Hills NRMU
Operable Forest Lands
Community Development/LMD April 2010
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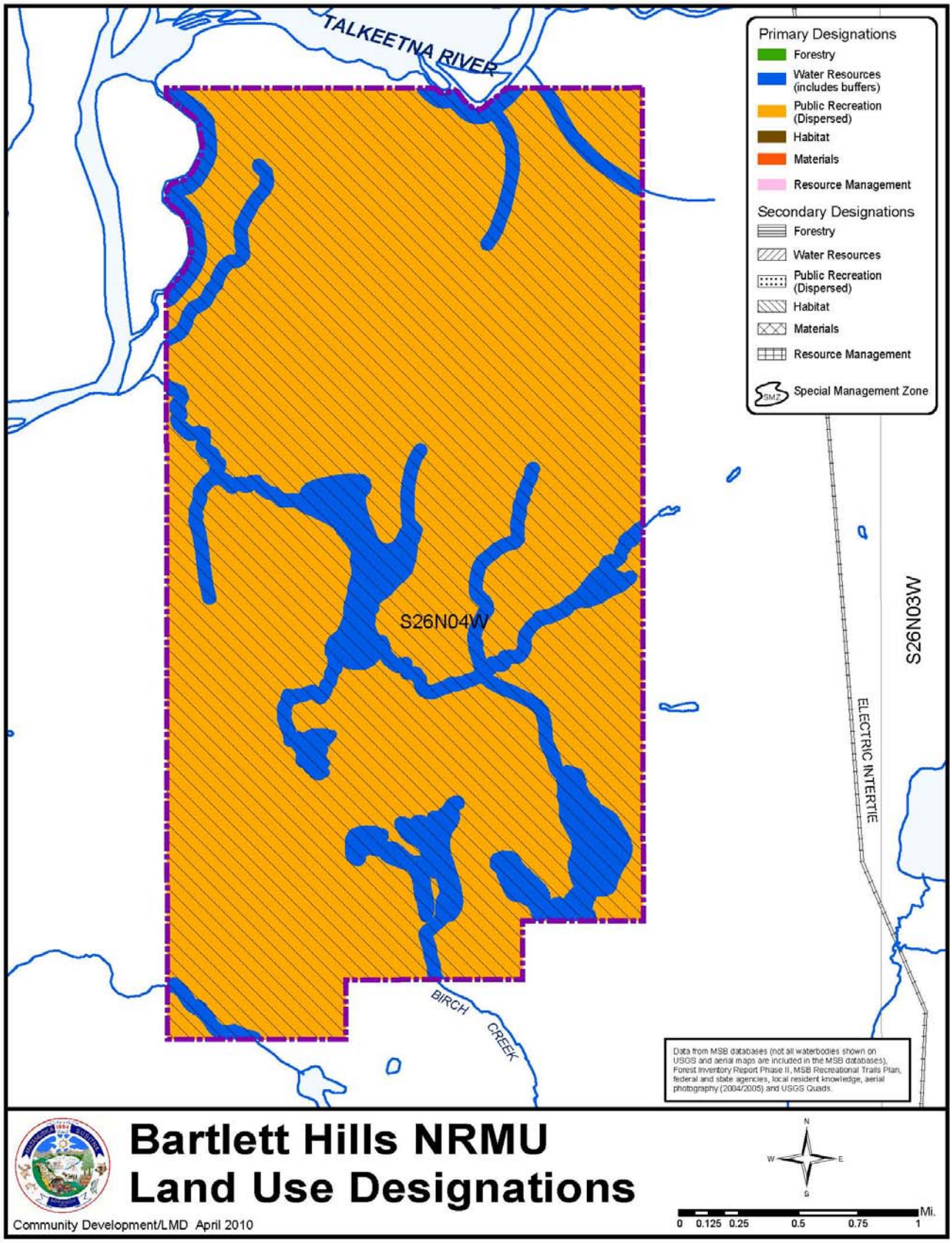
TALKEETNA RIVER
Primary Designations
Forestry
Water Resources (includes buffers)
Public Recreation (Dispersed)
Habitat
Materials
Resource Management
Secondary Designations
Forestry
Water Resources
Public Recreation (Dispersed)
Habitat
Materials
Resource Management
SMZ
Special Management Zone
S26N04W
S26N03W
ELECTRIC INTERTIE
BIRCH CREEK
Data from MSB databases (not all waterbodies shown on USGS and aerial maps are included in the MSB databases), Forest Inventory Report Phase II, MSB Recreational Trails Plan, federal and state agencies, local resident knowledge, aerial photography (2004/2005) and USGS Quads.
Bartlett Hills NRMU
Land Use Designations
Community Development/LMD April 2010
N
W
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0 0.125 0.25 0.5 0.75 1 Mi.

BARTLETT HILLS
Natural Resource Management Unit

General Description

The Bartlett Hills Natural Resource Management Unit contains about 4,800 acres. The unit is located south of the Talkeetna River, approximately 4-miles east of the town of Talkeetna. The area borders the southern boundary of the Talkeetna River Management Unit of the State's Susitna Basin Recreation Rivers Management Plan.

The unit is in the Talkeetna foothills and is characterized as having hills and ridges divided by gullies, kettles, muskegs and streams. On the ridges there are good views of the surrounding areas. There are several unnamed streams and lakes throughout the unit. The Talkeetna River, a legislatively designated water body in the Susitna River Recreational Rivers system, is adjacent to the boundary in the northern and northeast portions of the unit. However, the recreational corridor does not include any land within this unit.

Borough Tax Maps
Talkeetna 1 and 8

Current Land Use
The area has a variety of general all-season dispersed recreational uses. The majority of the use occurs in the winter when access to the area is easier.

Surrounding Land Use
State, Native and other private land surround this unit. The same general dispersed recreational uses that occur in this unit occur on the surrounding state land.

Community Council Area
None

See note on Talkeetna Comprehensive Plan under "Existing Land Use Plans" (below)

Existing Land Use Plans

- Mat-Su Borough *Multiple Use Forest Management Plan*, 1989, which shall be replaced with this plan.
- Alaska Department of Natural Resources*, Susitna Area Plan* (1985), Larson Lake Management Unit, South Parks Highway subunit (5d); the area is designated borough land bank. This plan is currently being revised by the Alaska, Department of Natural Resources as the *Susitna-Matanuska Area Plan*. The *Susitna-Matanuska Area Pl*an will replace the *Susitna Area Plan* and will not apply to borough owned land.
- Mat-Su Borough *Recreational Trails Plan* (2007).
- Mat-Su Borough *Parks, Recreation and Open Space Plan* (2001), which is currently being updated.

- Although this unit is outside of the Talkeetna Community Council boundaries, the unit is discussed in the *Talkeetna Comprehensive Plan* which recommends that; "this unit be designated a "forest trust" to be managed by a local board for sustained yield. This use should be considered prior to entering into any forest management agreement with a private party."

Existing Land Use Classifications
Forest Management Lands

Summary of Resources and Uses

Agriculture and Grazing
A review of soil types, published by the Department of Agriculture, Natural Resources Conservation Service (http://websoilsurvey.ncrs.usda.gov/app/), indicates that there are no known lands suitable for agricultural development or grazing within the unit.

Also, see *Soils* map at the beginning of this section.

Cultural Resources and Heritage Sites
There are no documented historical or heritage sites within the unit. Additional fieldwork may be required prior to any natural resource extraction or other development activities taking place in the unit.

Fish and Wildlife Habitat and Resources
Moose, black bear and brown bear are found within this unit. Wildlife populations are moderate to high. The unit has good habitat for bears and the habitat base supports the current population of moose with no evidence of over-browsing.

Moderate numbers of furbearer species occur throughout the region. River otter and beaver are fairly common, in the headwaters of Birch Creek.

Moose calving and rearing is known to take place in the area with cows with calves seen from the summertime into the fall. Some higher incidences of moose calving and rearing have been reported to take place in the unit within Sections 10 and 11 (T. 26 N., R. 4 W. S.M.).

Black bear dens have been known to exist in the southern portion of the unit in Sections 23, 23, 25 and 27 (T. 26 N., R. 4 W. S.M.).

There are no known eagle nests within the unit, but the habitat is such that eagles could be expected nest there. Raptors have been seen nesting in the high bluffs along the east side of the muskeg area in the south end of Section 15 and north end of Section 22 (T. 26 N., R. 4 W. S.M.). Trumpeter Swans have been reported to nest in the swamp and pond systems in this same area along Whiskey Slough in the southeastern portion of Section 15 (T. 26 N., R. 4 W. S.M.)

Additional fieldwork will be required prior to any natural resource extraction or other development activities taking place to verify this information and identify any other important wildlife areas.

Whiskey Sough is a cataloged anadromous fish stream within the unit. There are also several other streams that have been reported to have anadromous and/or important resident fish present by local residents. These waterbodies are shown, along with appropriate buffers on the *Roads, Trails, Waterbodies, Wetlands and Riparian Areas* map at the beginning of this section.

Prior to any resource extraction projects, the extent of anadromous fish distribution should be established. The Alaska Department of Fish and Game will need to verify the cataloged anadromous resident fish streams as described above.

The Alaska Department of Fish and Game will require Fish Habitat Permits, accompanied by detailed project plans, prior to any planned resource extraction project adjacent to anadromous or resident waterbodies.

There are no commercial lodges or fish camps in the area.

Forest Resources

The principal timber type is old growth (over 100 years) birch and spruce. Within the 4,838 acre unit, there are 4,246 acres (88% of the unit) of Commercial Forest Land, of which 2,883 acres (60% of the unit) is Operable Forest Land.

The 2009 Operable Forest Land Analysis Report found the following timber composition within the unit:

Stratum 1: Pole Timber – Closed Canopy	803 acres
Stratum 2: Pole Timber – Open Canopy	0 acres
Stratum 3: Hardwood Saw Timber – Closed Canopy	10 acres
Stratum 4: Hardwood Saw Timber – Open Canopy	154 acres
Stratum 5: Mixed Forest Saw Timber – Closed Canopy	1,748 acres
Stratum 6: Mixed Forest Saw Timber – Open Canopy	168 acres
TOTAL	2,883 acres

There has been recent interest expressed by some residents of the Talkeetna area that this unit and other local units are made available for supplying fuel wood for a potential wood-fired boiler for the new Su-Valley High School and other public facilities which are currently being evaluated for feasibility.

Also see *Operable Forest Lands* map and the beginning of this section.

Private Property

There is no private property within the unit.

Public Recreation and Tourism

The primary recreational uses include bird watching, dog mushing, skiing, snowshoeing, hiking, snowmobiling, ATV riding, trapping, hunting and fishing.

There is nothing in this unit that would attract tourists in significant numbers to the unit. However, because the unit is relatively close to Talkeetna, some flight seeing may occasionally take place even though this unit is not on the direct flight path to Denali National Park and Preserve, which is the principal attraction in the area.

Roads and Trails

Mastodon Road ends close to the boundary of the unit. Within the unit the road is dedicated, but not constructed, and generally runs east/west in the southern portion of the unit.

The Talkeetna Bluffs Trail also crosses east/west and roughly bisects the center of the unit. The Talkeetna Iron Creek Trail (RST 331) is located to the west and north outside of the unit.

Also, see *Roads, Trails, Waterbodies, Wetlands and Riparian Areas* map at the beginning of this section.

Rock, Sand and Gravel

A review of soil types, published by the Department of Agriculture, Natural Resources Conservation Service (http://websoilsurvey.ncrs.usda.gov/app/), indicates that there are no known lands with commercial quantities of rock, sand or gravel resources within the unit. There may be rock, sand or gravel resources present in enough quantity to support small projects, such as trail or seasonal road construction within the unit. The area has very limited, if any, potential for any commercial use because of its remote location.

Also, see *Soils* map at the beginning of this section.

Unit Management Intent

The management intent for the Bartlett Hills Natural Resource Management Unit shall be to manage the area for its multiple recreation and scenic values, protect important water resource and seasonally important habitat areas. The unit shall not be available for timber harvest of any kind.

Land Use Designations

Bartlett Hills		
Designation	Classification	Management Intent
Primary		
Public Recreation - Dispersed	Public Recreation Lands	All upland areas, except those designated as water resources. Recognize and manage unit for its recreational uses and habitat values. Although Operable Timber exists, there shall be no timber harvests of any kind.
Water Resources	Watershed Lands	All flowing waterbodies, riparian areas, and important wetlands. Any flowing waterbodies, riparian areas or important wetlands determined after adoption of this plan to be anadromous, important for resident fish, or important wetlands for fish and wildlife shall also be similarly designated and classified[5].
Secondary		
Habitat		Entire unit

Also, see the *Land Use Designations* map at the beginning of this section.

[5] Such designation and classification shall be considered as a "Minor Change" to the Plan (See Volume I, Chapter 4, *Procedures for Changes to the Plan, Goals, and Guidelines.*

Management Guidelines

See Volume I, Chapters 2 and 3 for area-wide guidelines for all Natural Resource Management Units. The remainder of this section presents unit-specific guidelines.

Buffers and Special Management Zones

All flowing waterbodies, including lakes that are part of a flowing water system that are connected to creeks, streams, and rivers and riparian areas will be protected through the use of undisturbed natural vegetation buffers.

All wetlands over 40 acres and all smaller important wetland areas (see definition in *Definitions/Glossary* at the end of this chapter or in Volume III) shall be protected with a Special Management Zone which shall include a 100-foot area around the wetland area. The Zone shall not allow disturbance of the wetland area, but some uses may be allowed. For example, winter time recreational use is allowed when sufficient snow and frost cover exists to not harm the natural vegetation.

At such time that new activities are contemplated or use patterns and numbers significantly change, all potentially impacted habitat areas (see *Fish and Wildlife Habitat and Resources* for this unit) shall be assessed. Depending on the assessment, the areas may need to have additional protection through the use of buffers or placed in a Special Management Zone, as appropriate. The Alaska Department of Fish and Game shall be consulted.

Mastodon Road within the unit is dedicated, but not constructed. Until constructed or utilized for trail use, no buffer is necessary. The Talkeetna Bluffs Trail shall also be buffered. Any other dedicated rights-of-way or dedicated trails shall also be buffered.

See *Roads, Trails, Waterbodies, Wetlands and Riparian Areas* map at the beginning of this section for, wetlands with a Special Management Zone, waterbodies and roads and trails with buffers.

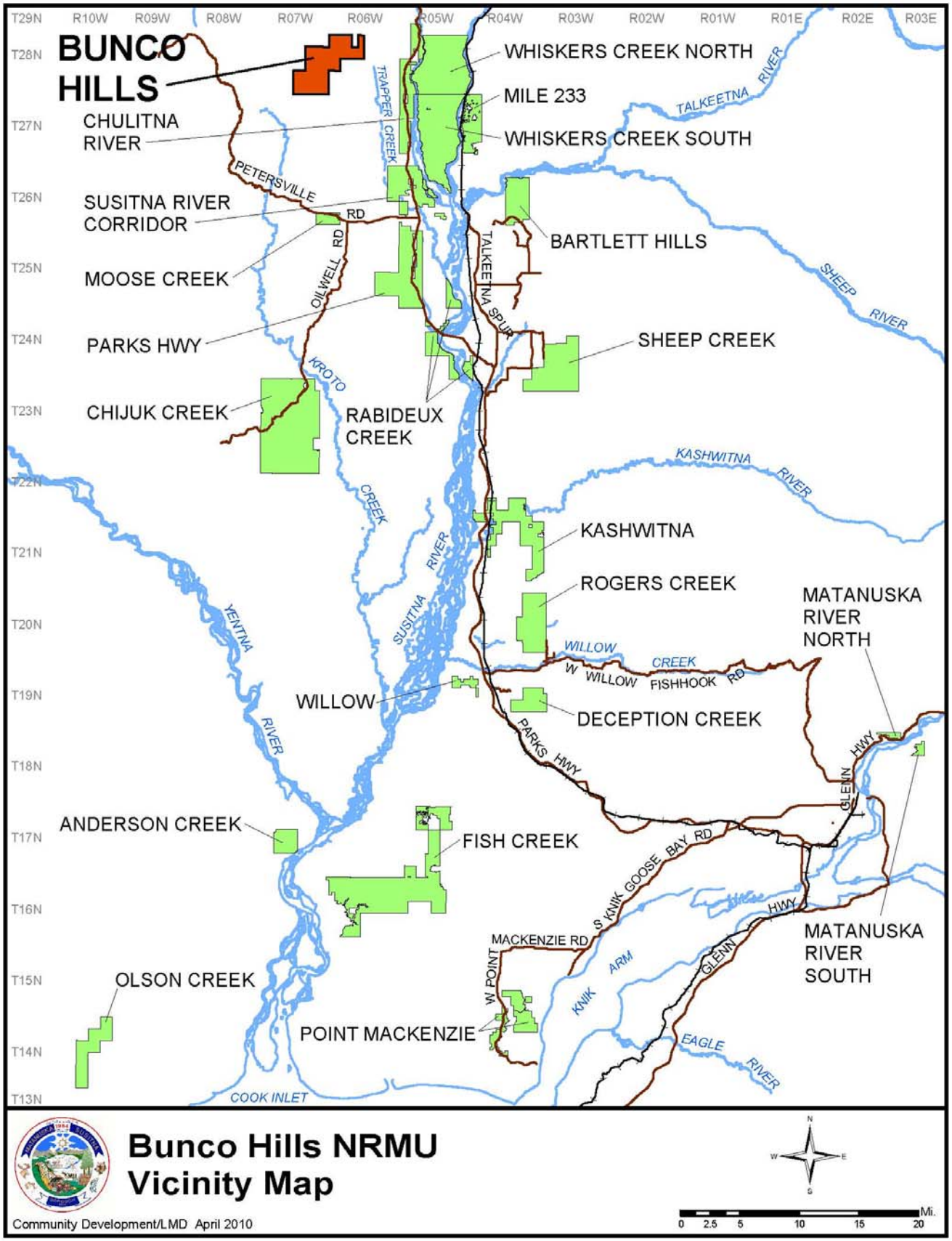
Also, see Volume I, Chapter 2, *Buffers* and *Special Management Zones* for more information.

Forest Trust

Because there will not be any timber harvest in the unit, the unit shall not be designated as a "forest Trust" to be managed by a local board as stated in the Talkeetna Comprehensive Plan. However, the Talkeetna Community Council, or a committee or non-profit organization endorsed by the Community Council shall be provided an opportunity to review and comment on plan implementation and any future management decisions.

Other Uses

No additional unit-specific guidelines are needed for this unit. See Volume I, Chapters 2 and 3 for area-wide guidelines that apply to all Natural Resource Management Units.


BUNCO HILLS
CHULITNA RIVER
SUSITNA RIVER CORRIDOR
MOOSE CREEK
PARKS HWY
CHIJUK CREEK
RABIDEUX CREEK
WHISKERS CREEK NORTH
MILE 233
WHISKERS CREEK SOUTH
BARTLETT HILLS
SHEEP CREEK
KASHWITNA
ROGERS CREEK
MATANUSKA RIVER NORTH
WILLOW
DECEPTION CREEK
ANDERSON CREEK
FISH CREEK
OLSON CREEK
POINT MACKENZIE
MATANUSKA RIVER SOUTH
TRAPPER CREEK
PETERSVILLE RD
OILWELL RD
TALKEETNA SPUR
KROTO CREEK
SUSITNA RIVER
YENTNA RIVER
TALKEETNA RIVER
SHEEP RIVER
KASHWITNA RIVER
WILLOW CREEK
W WILLOW FISHHOOK RD
PARKS HWY
GLENN HWY
S KNIK GOOSE BAY RD
MACKENZIE RD
W POINT
KNIK ARM
EAGLE RIVER
COOK INLET
T29N R10W R09W R08W R07W R06W R05W R04W R03W R02W R01W R01E R02E R03E
T28N T27N T26N T25N T24N T23N T22N T21N T20N T19N T18N T17N T16N T15N T14N T13N
Bunco Hills NRMU
Vicinity Map
Community Development/LMD April 2010
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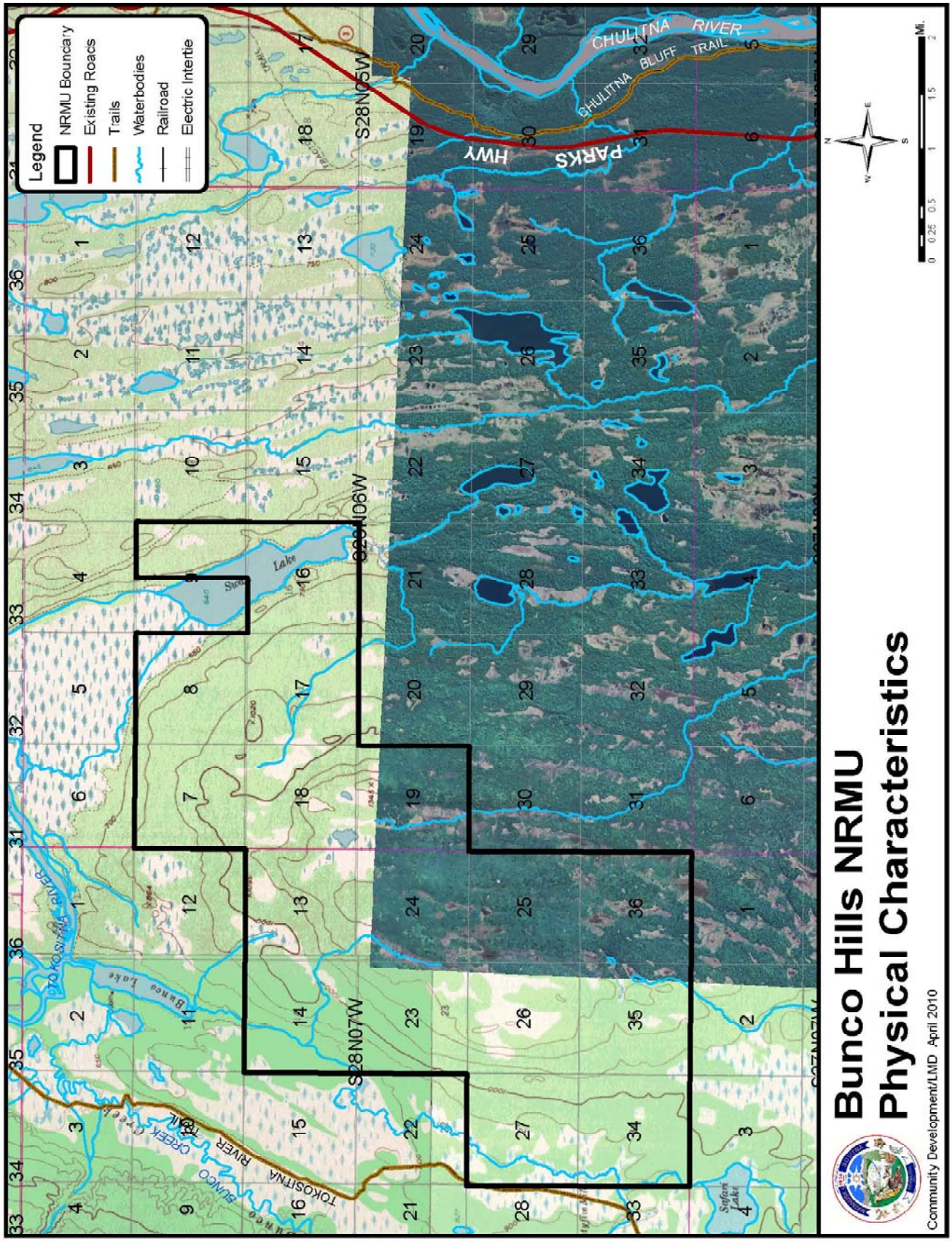
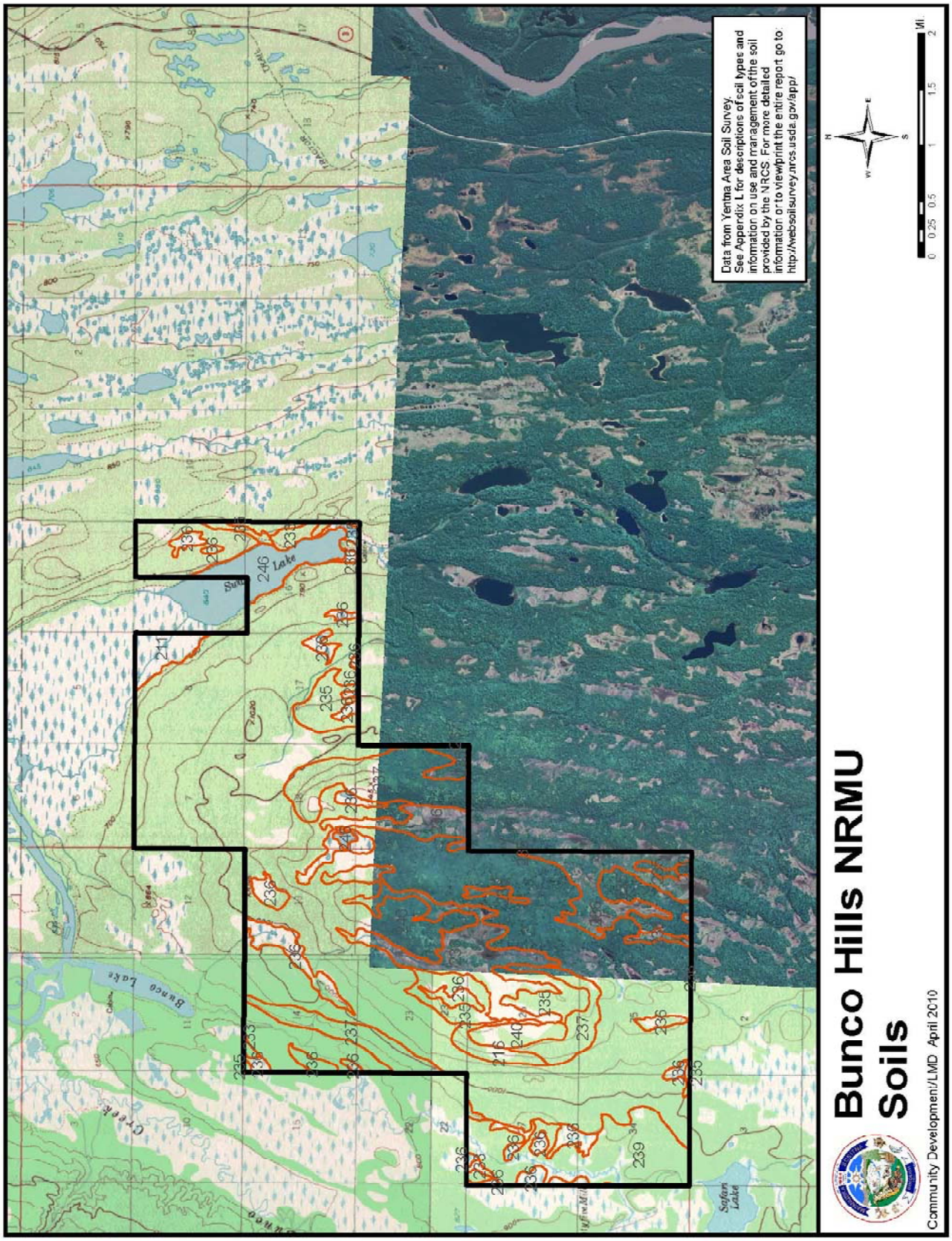


Bunco Hills NRMU Physical Characteristics


Data from Yentna Area Soil Survey.
See Apperdix L for descriptions of soil types and information on use and management of the soil provided by the NRCS. For more detailed information or to view/print the entire report go to: http://websoilsurvey.nrcs.usda.gov/app/
Bunco Hills NRMU
Soils
Community Development/LMD April 2010
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Safari Lake
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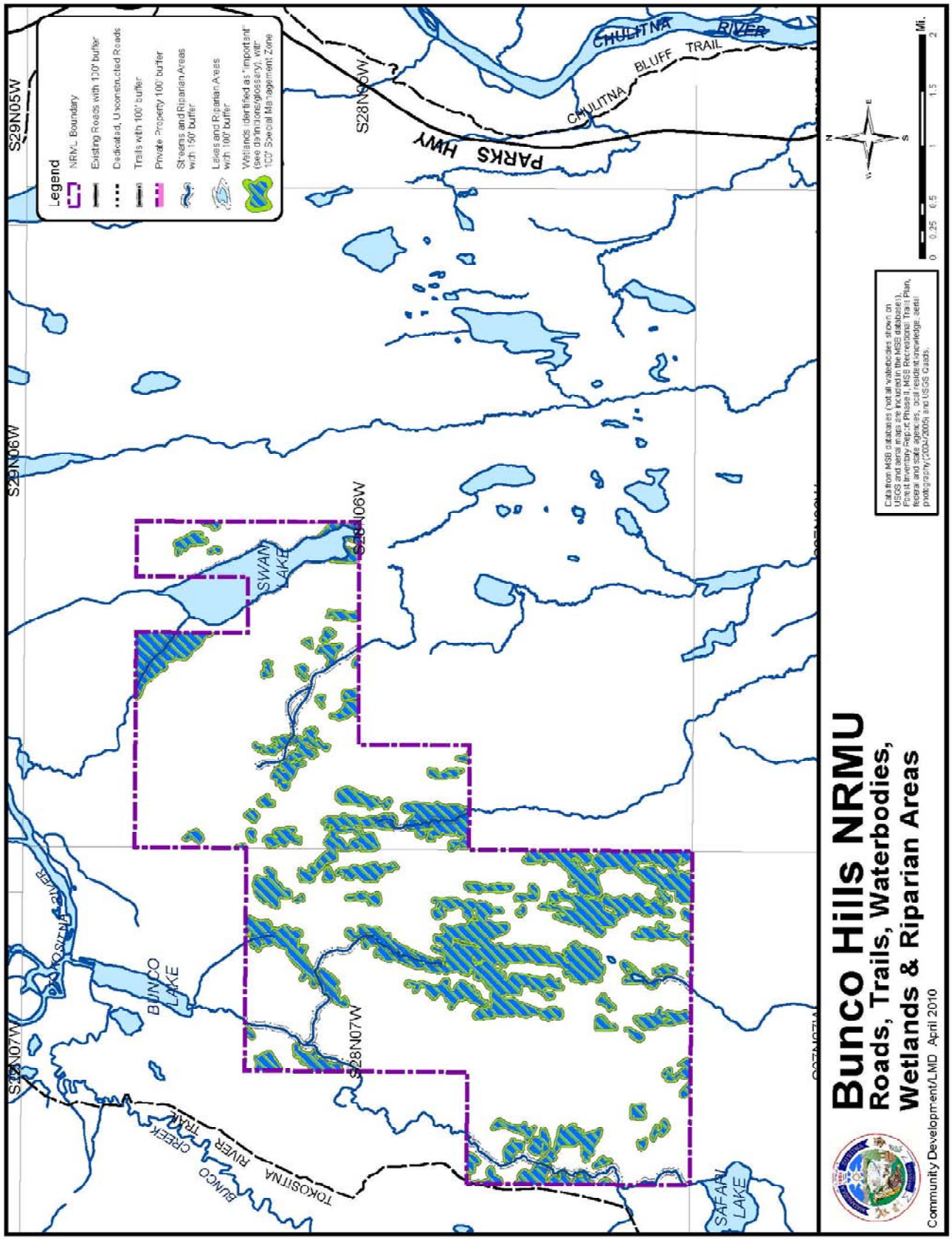
Legend
NRMU Boundary
Existing Roads with 100' buffer
Dedicated, Unconstructed Roads
Trails with 100' buffer
Private Property 100' buffer
Streams and Riparian Areas with 150' buffer
Lakes and Riparian Areas with 100' buffer
Wetlands identified as "important" (see dam/dike/glossary), with 100' Special Management Zone
S29N05W
S29N06W
S28N06W
S28N07W
S28N06W
S28N07W
PARKS HWY
CHULITNA RIVER
CHULITNA BLUFF TRAIL
SWAN LAKE
BUNCO LAKE
BUNCO CREEK
TOKOSITNA RIVER TRAIL
SAFARI LAKE
Data from MSB databases (not all waterbodies shown on USGS and aerial maps are included in the MSB database!), Forest Inventory Report Phase II, MSB Recreational Trail Plan, Resource Inventory and assessment knowledge, aerial photography (2004-2005) and USGS Quads.
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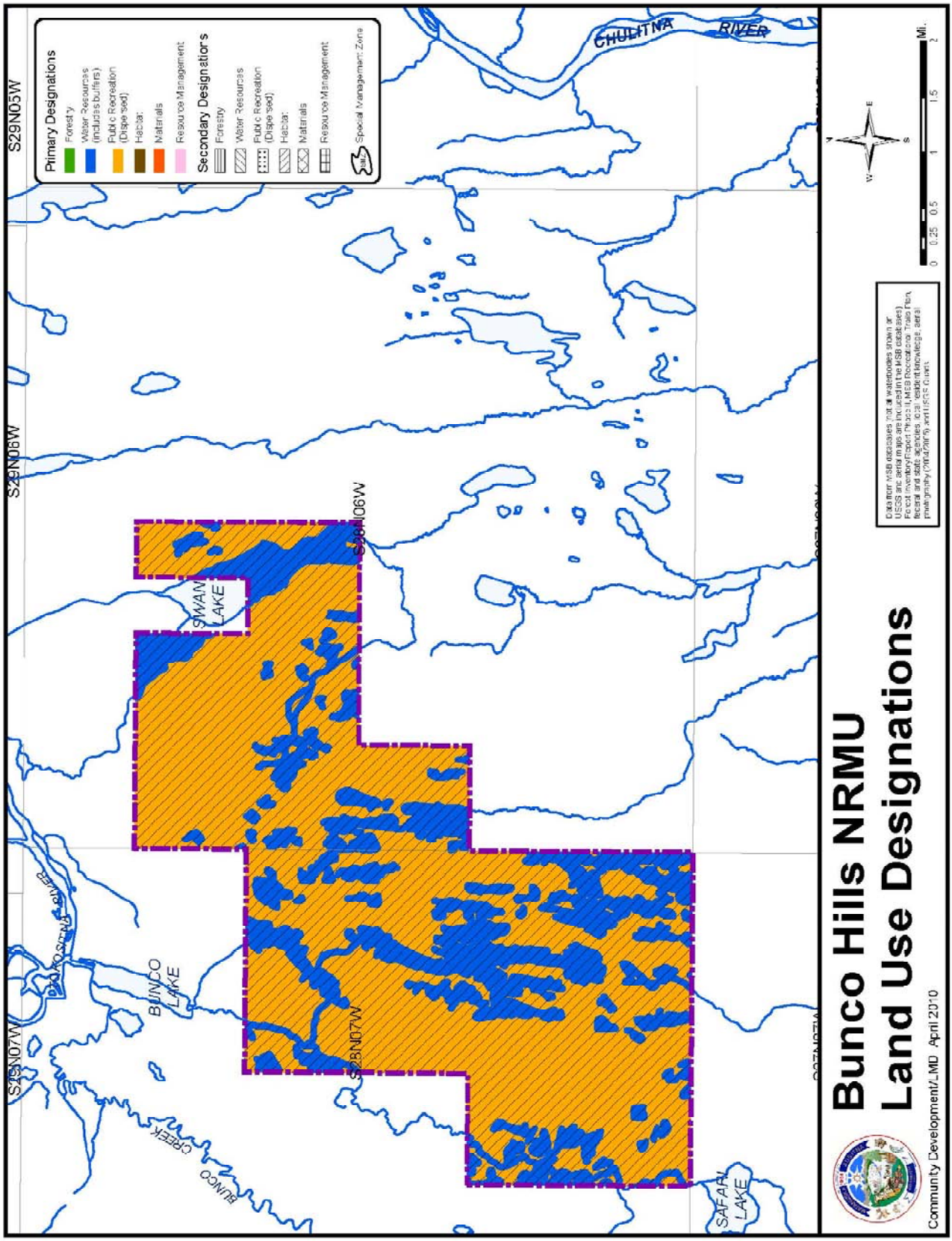
Bunco Hills NRMU
Roads, Trails, Waterbodies, Wetlands & Riparian Areas
Community Development/LMD April 2010


Primary Designations
Forestry
Water Resources (includes buffers)
Public Recreation (Dispersed)
Habitat
Materials
Resource Management
Secondary Designations
Forestry
Water Resources
Public Recreation (Dispersed)
Habitat
Materials
Resource Management
Special Management Zone
S29N05W
S29N06W
S28N06W
S28N07W
S29N07W
CHULITNA RIVER
SWAN LAKE
BUNCO LAKE
BUNCO CREEK
SAFAR LAKE
Bunco Hills NRMU
Land Use Designations
Community Development/LMD April 2010
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BUNCO HILLS
Natural Resource Management Unit

General Information:

The Bunco Hills Natural Resource Management Unit totals about 10,450 acres and is located approximately 5 to 7- miles west of the Parks Highway and approximately 10 miles north and east of the Petersville Road. Bunco Lake is one (1) mile to the north, Safari Lake touches the southern boundary of the unit, and about one-half of Swan Lake is within the unit.

The southern boundary of Denali State Park begins one-mile north of the northern boundary of the unit. The new South Denali Visitors Center will be located approximately 10-miles to the northeast.

The physical characteristics of the area is rolling hills, mostly in a sub-alpine tundra setting with exposed ridges, alder and some marshy/wetland areas. The southern portion of the unit is below tree line. The majority of the unit has shallow soils with outcroppings of bed rock.

Borough Tax Maps
Petersville 2, 3, 14, and 15

Current Land Use
Various general dispersed public recreation activities. The area is major winter time recreation area and is popular with snowmobilers.

Surrounding Land Use
The surrounding land is owned by the state with some scattered parcels of private land surrounding the unit which is used for recreation and vacation get-a-ways. The state land is also used for general dispersed public recreation.

Community Council Area
Trapper Creek and Petersville

Existing Land Use Plans

- Mat-Su Borough, *Multiple Use Forest Management Plan*, 1989, which will be replaced with this plan.
- Alaska Department of Natural Resources, *Susitna Area Plan* (1985), Petersville Road Unit, Tokosha Subunit (2e); values for public recreation, settlement and wildlife habitat. This plan is currently being revised by the State, Department of Natural Resources and will be called the *Susitna-Matanuska Area Plan*. The revised plan will replace the *Susitna Area Plan* and will not apply to borough owned land.
- Mat-Su Borough, *Recreational Trails Plan* (2007).

- Mat-Su Borough, *Parks, Recreation and Open Space Plan* (2001), which is currently being updated.

Existing Land Use Classifications
Forest Management Lands

Summary of Resources and Uses

Agriculture and Grazing
A review of soil types, published by the Department of Agriculture, Natural Resources Conservation Service (http://websoilsurvey.ncrs.usda.gov/app/), indicates that there are no known lands suitable for agricultural development or grazing within the unit.

Also, see *Soils* map at the beginning of this section.

Cultural Resources and Heritage Sites
There are no documented historical or heritage sites within the unit. There is a possibility that there are undiscovered archaeology sites around Swan Lake where salmon stream and springs enter the lake. One of the other areas that could yield a prehistoric cook-out and/or camping site is the 1,000 foot ridge that runs between Bunco and Swan Lakes.

It is unknown whether a complete cultural resource assessment has taken place within the unit. Because of the substantial use of the region, both historically and prehistorically an on-the-ground cultural survey should be conducted prior to any natural resource extraction or other development activities take place in the unit.

Fish and Wildlife Resources
The unit has general moose and bear habitat with general moose use in the summer time. Black bear and some brown bear are also found in the area. Wildlife populations are low to moderate because of a lack of suitable habitat. Moderate numbers of furbearer species occur throughout the general area.

There are no known seasonal wildlife concentration areas except for Trumpeter Swans which are described below. Black and Brown bears have been known to inhabit the unit, with the most use seen around “Bunco Bump” (center of Section 18, T. 29 N., R. 6 W., SM), and on Hill 1460 (Sections 24 and 25, T. 29 N., R. 7 W., SM).

The area is known to have swan nesting sites on ponds and muskeg areas north of Swan Lake and outside of the unit. Swans, however, are common on Swan Lake and the outlet creek during the summer and congregate there in the fall. The same area is also used for nesting and rearing of waterfowl. There are no documented eagle nests in the unit, although there have been eagle nests reported and have been known to nest in the Swan lake area in the past.

Additional field work may be necessary to identify all these sites and areas that may need seasonal protection.

Swan Lake and the outlet steam through the wetlands in Section 8, T. 28 N., R. 6 W. S.M., the upper reaches of Kroto Creek (Section 35, T. 28 N., R. 7 W., SM, and the stream connecting Safari and Bunco Lakes are cataloged anadromous steams that are important for sockeye spawning and rearing. The Alaska Department of Fish and Game may identify more waterbodies in the future as a result of the *Susitna Production Study*.

Prior to any resource extraction projects, the anadromous fish distribution in any wetlands should be established, any additional anadromous or important resident fish waterbodies need to be identified and the Alaska Department of Fish and Game will need to verify the cataloged anadromous resident fish streams as described above.

The Alaska Department of Fish and Game will require Fish Habitat Permits, accompanied by detailed project plans, prior to any planned resource extraction project adjacent to anadromous or resident waterbodies.

There is a commercial lodge located approximately six miles northeast of the unit. There are no known fish camps in the area.

Forest Resources

A timber inventory was conducted in 2007 which found some commercial quality timber in the unit. However, the area has very limited potential for any commercial forestry uses because of the units remote location, sub-alpine elevation, steep terrain to access the area, and existing timber values make it uneconomic to harvest timber resources.

Private Property

There is no private property within the unit. There is private property (mainly recreation use cabins) located outside the unit.

Public Recreation and Tourism

The primary recreational uses include bird watching, dog mushing, snow shoeing, skiing, snowmobiling, fishing, trapping, and hunting.

There is nothing of special interest that attracts tourists to this unit in any significant numbers, especially because of its semi-remote location and difficulty to access. However, because of the units' location, it is on one of the flight seeing flight lines to and from Denali National Park and Preserve, specifically the Mount McKinley area.

Roads and Trails

There are no dedicated roads within or immediately adjacent to the unit.

The Tokositna River Trail (aka Kroto Trail) crosses or lies just outside the western boundary of the unit.

Also, see *Roads, Trails, Waterbodies, Wetlands and Riparian Areas* map at the beginning of this section.

Rock, Sand and Gravel

A review of soil types, published by the Department of Agriculture, Natural Resources Conservation Service (http://websoilsurvey.ncrs.usda.gov/app/), indicates that there are no known lands with commercial quantities of rock, sand or gravel resources within the unit. There may be rock, sand or gravel resources present in enough quantity to support small projects, such as trail construction within the unit.

Also, see *Soils* map at the beginning of this section.

Unit Management Intent

The management intent for the Bunco Hills Unit shall be for important habitat protection, various forms of public recreation, and watershed protection.

The unit has limited access because of its remote location. Access is by airplane on floats in the summer or by skis in the winter, backcountry skiers, snowmobiles and dog mushers in the winter. The unit has scenic qualities, swan and waterfowl nesting and seasonal congregation areas, is in close proximity to Denali State Park and Denali National Park and Preserve. Other than the above, the unit lacks of any one or more other specific resources or resource uses.

Land Use Designations

Bunco Hills		
Designation	**Classification**	**Management Intent**
Primary		
Public Recreation - Dispersed	Public Recreation Lands	Remainder of Unit outside of areas designated as Water Resources. Special Management Zone's may be used in bear denning locations, Eagle perching and nesting areas, Swan nesting and layover areas and other important habitat areas if use in the unit changes.

Bunco Hills (continued)		
Designation	Classification	Notes
Water Resources	Watershed Lands	All waterbodies, riparian areas, and important wetlands. This includes those riparian areas where Trumpeter swans and other waterfowl use for nesting. Any waterbodies, riparian areas or important wetlands determined after adoption of this plan to be anadromous, important for resident fish, or important wetlands for fish and wildlife shall also be similarly designated and classified. [6]
Secondary		
Habitat		Entire unit. Important wildlife habitat areas are also protected with the (primary) water resources designation.

Also, see the *Land Use Designations* map at the beginning of this section.

Management Guidelines

See Volume I, Chapters 2 and 3 for area-wide guidelines for all Natural Resource Management Units. The remainder of this section presents unit-specific guidelines.

<u>Buffers and Special Management Zones.</u>

All flowing waterbodies, including lakes that are part of a flowing water system that are connected to creeks, streams, and rivers shall be protected through the use of undisturbed natural vegetation buffers.

All wetlands over 40 acres and all smaller important wetland areas (see definition in *Definitions/Glossary* at the end of this chapter or in Volume III) shall be protected with a Special Management Zone which shall include a 100-foot area around the wetland area. The Zone shall not allow disturbance of the wetland area, but some uses may be allowed.

[6] Such designation and classification shall be considered as a "Minor Change" to the Plan (See Volume I, Chapter 4, *Procedures for Changes to the Plan, Goals, and Guidelines.*

For example, winter time recreational use is allowed when no waterfowl are present and sufficient snow cover exists to not harm the natural vegetation.

At such time that new activities are contemplated in the unit, all potentially impacted waterbodies and wetlands shall be assessed as to their habitat and watershed value. Depending on the assessment, the waterbodies and wetlands will be provided additional protection through the use of buffers or placed in a Special Management Zone, as appropriate.

Because all waterbodies will be designated for watershed protection and have mandatory buffers, and all upland areas will be designated for public recreation with no development or extraction activities, seasonal Special Management Zones for additional protection of Trumpeter swan and waterfowl nesting areas, and bear denning areas are not needed at this time.

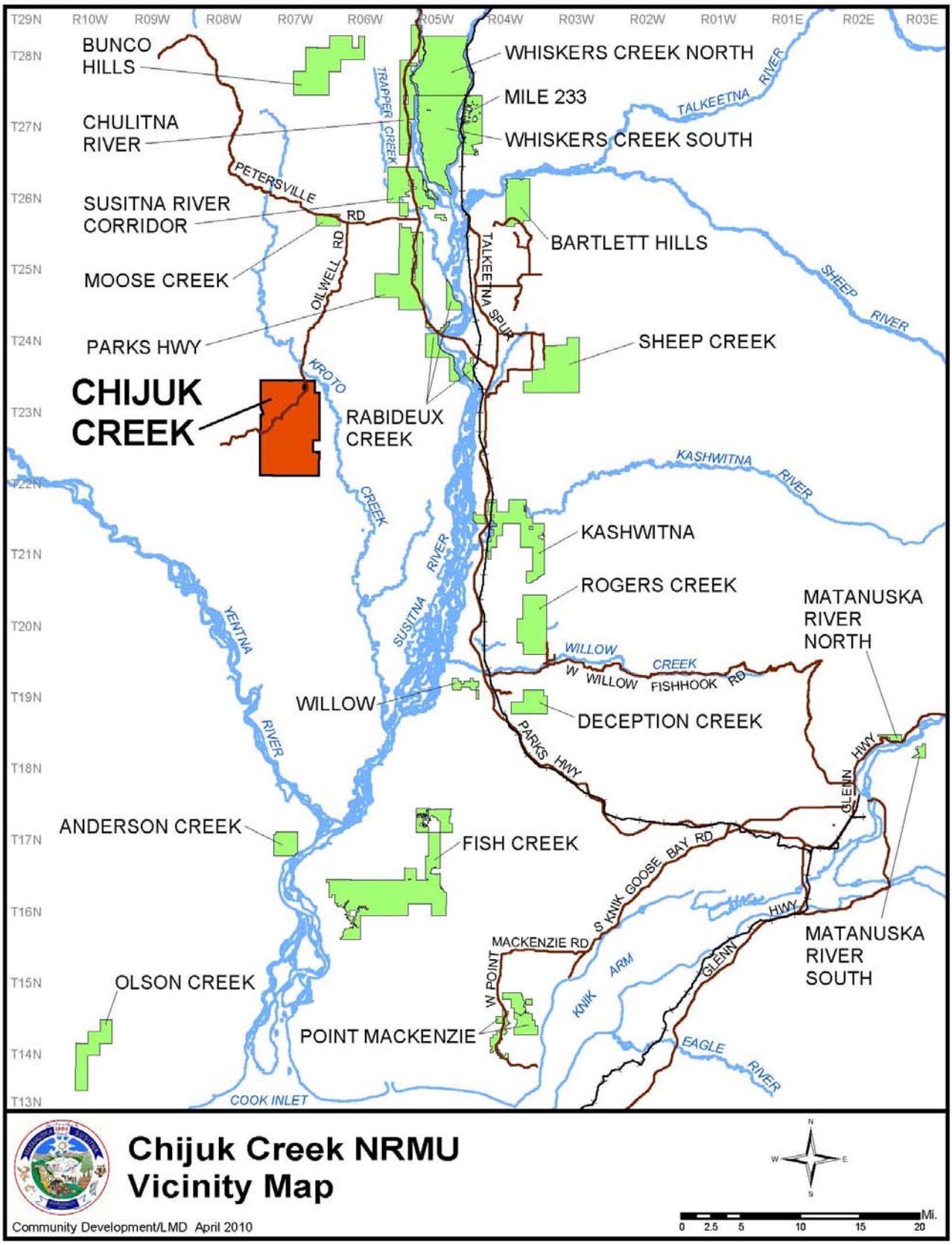
However, if the present use of the area changes, including the level or nature of recreational use, Special Management Zones may be established after consulting with the Alaska Department of Fish and Game to establish size, location and management parameters.

See *Roads, Trails, Waterbodies, Wetlands and Riparian Areas* map at the beginning of this section for, wetlands with a Special Management Zone, waterbodies and trails with buffers.

Also, see Volume I, Chapter 2, *Buffers* and *Special Management Zones,* for additional information.

<u>Other Uses</u>
No additional unit-specific guidelines are needed for this unit. See Volume I, Chapters 2 and 3 for area-wide guidelines that apply to all Natural Resource Management Units.

<u>Other Recommendation</u>
Because of the units' proximity to Denali State Park, the wildlife and recreation values of this unit, the borough may want to exchange this unit for other state land with revenue producing values. Such an exchange should only occur if the area will be added to Denali State Park, placed in a state game refuge (or similar habitat protection category) or managed by the state under some other similar management regime. It is also recommended that the state land surrounding Swan Lake and the adjoining riparian and wetlands areas should be added to this management regime as well if a land exchange or similar state management regime occurs.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BUNCO HILLS
CHULITNA RIVER
SUSITNA RIVER CORRIDOR
MOOSE CREEK
PARKS HWY
CHIJUK CREEK
WHISKERS CREEK NORTH
MILE 233
WHISKERS CREEK SOUTH
BARTLETT HILLS
SHEEP CREEK
RABIDEUX CREEK
KASHWITNA
ROGERS CREEK
MATANUSKA RIVER NORTH
WILLOW
DECEPTION CREEK
ANDERSON CREEK
FISH CREEK
OLSON CREEK
POINT MACKENZIE
MATANUSKA RIVER SOUTH
TRAPPER CREEK
PETERSVILLE RD
OILWELL RD
TALKEETNA SPUR
KROTO CREEK
SUSITNA RIVER
YENTNA RIVER
TALKEETNA RIVER
SHEEP RIVER
KASHWITNA RIVER
WILLOW CREEK
W WILLOW FISHHOOK RD
PARKS HWY
GLENN HWY
S KNIK GOOSE BAY RD
MACKENZIE RD
W POINT
KNIK ARM
EAGLE RIVER
COOK INLET
Chijuk Creek NRMU
Vicinity Map
Community Development/LMD April 2010
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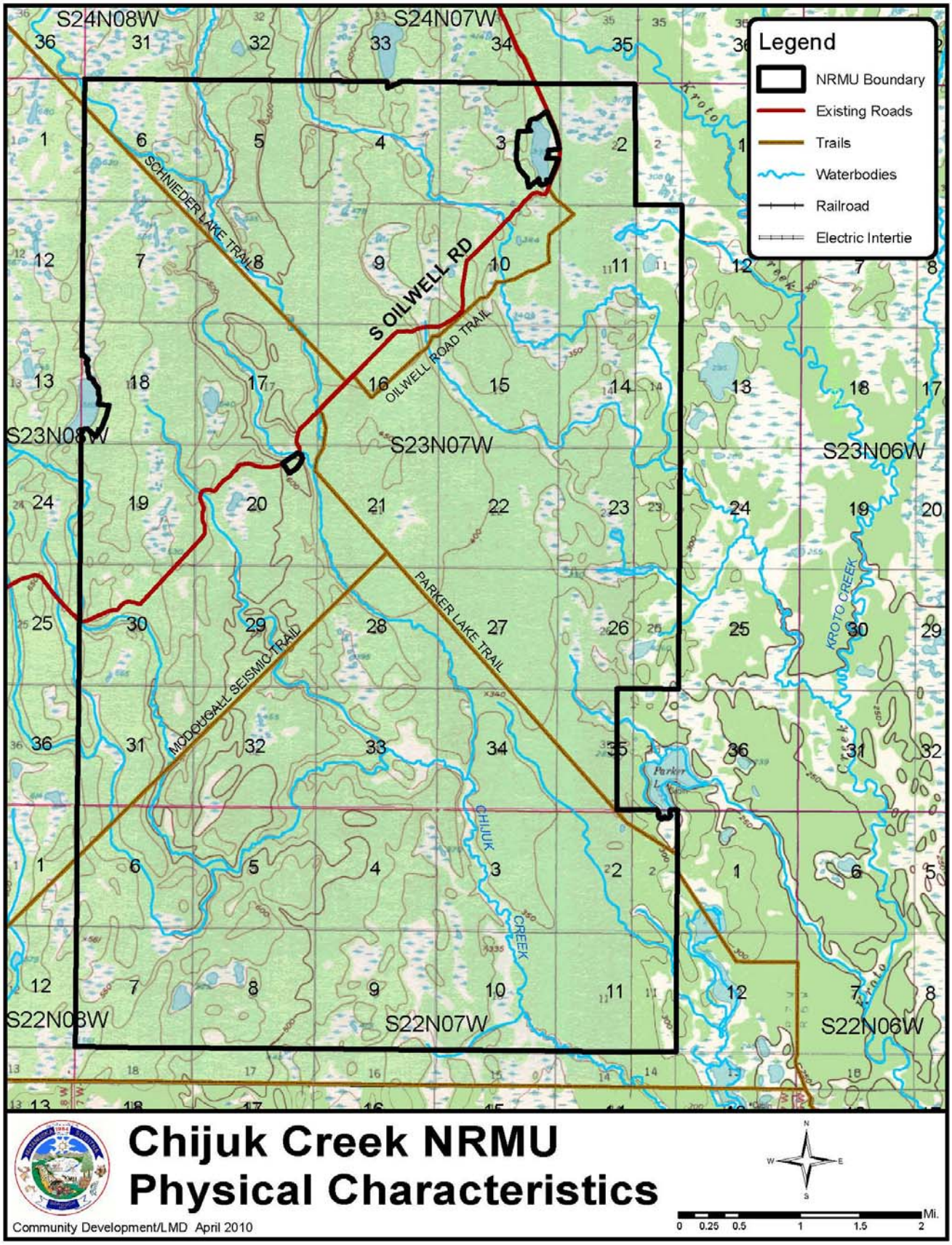
Legend
NRMU Boundary
Existing Roads
Trails
Waterbodies
Railroad
Electric Intertie
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S23N06W
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S22N07W
S22N06W
S OILWELL RD
OILWELL ROAD TRAIL
SCHNIEDER LAKE TRAIL
PARKER LAKE TRAIL
MCDOUGALL SEISMIC TRAIL
CHIJUK CREEK
KROTO CREEK
Chijuk Creek NRMU
Physical Characteristics
Community Development/LMD April 2010
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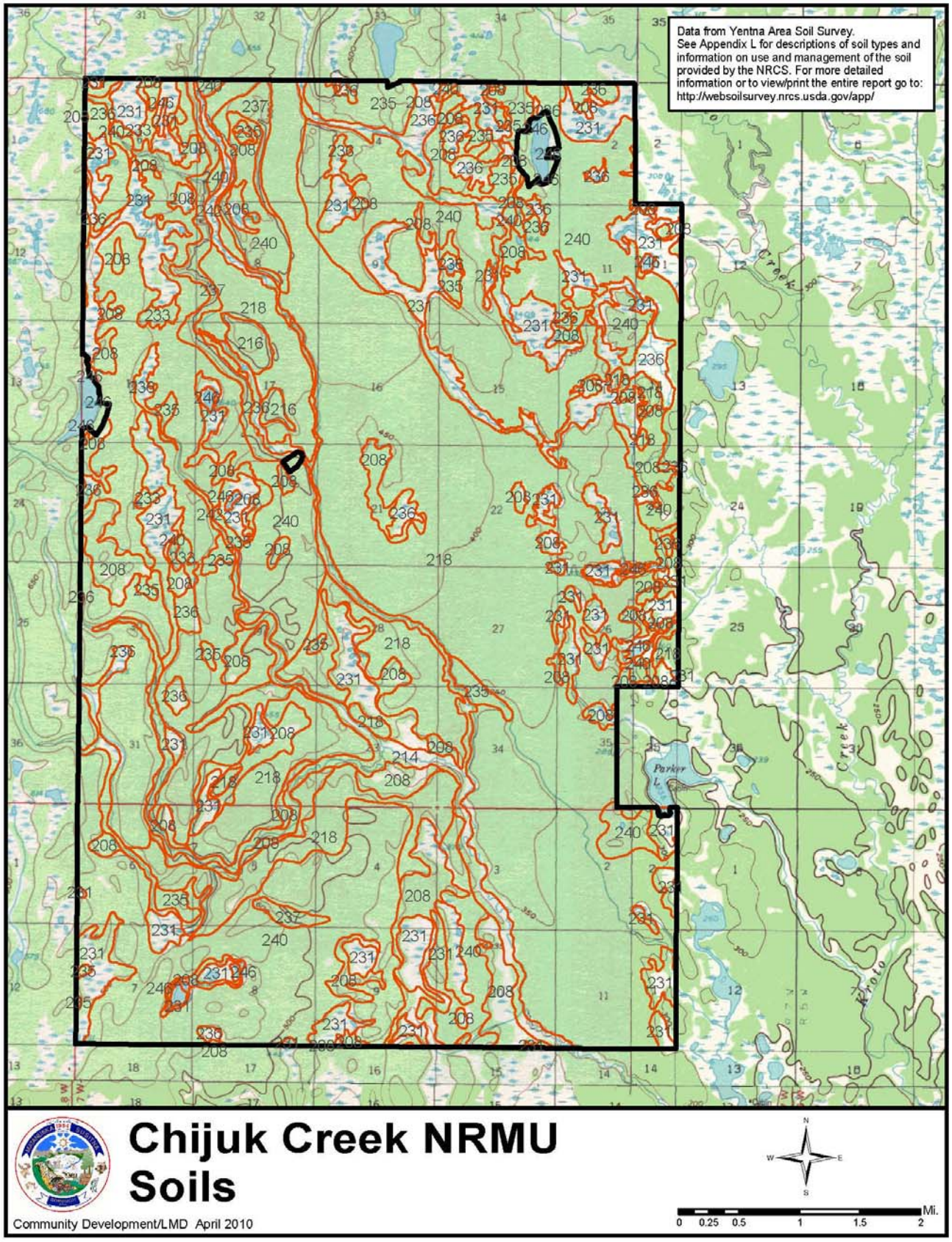
Data from Yentna Area Soil Survey.
See Appendix L for descriptions of soil types and information on use and management of the soil provided by the NRCS. For more detailed information or to view/print the entire report go to:
http://websoilsurvey.nrcs.usda.gov/app/
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Soils
Community Development/LMD April 2010
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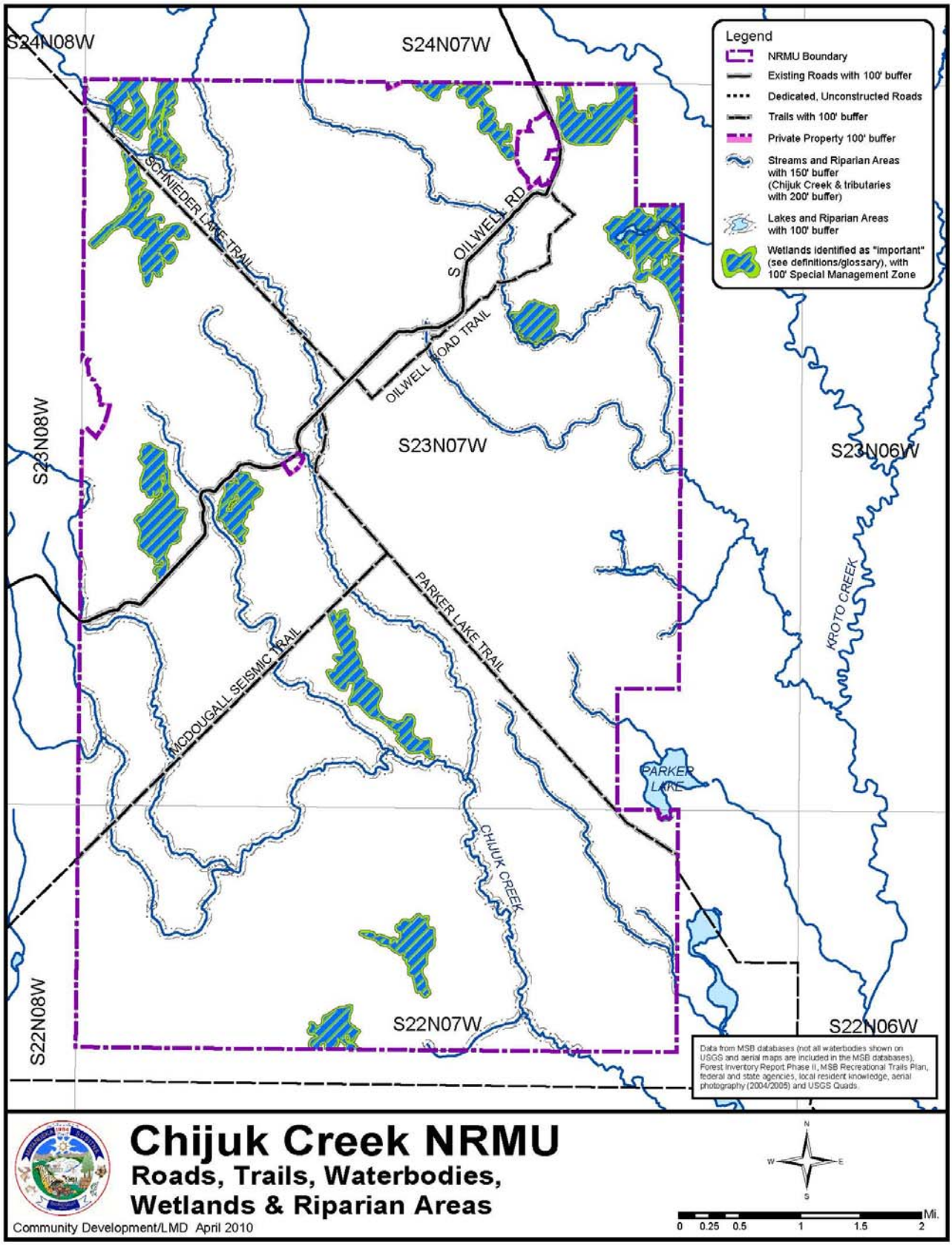
S24N08W
S24N07W
Legend
NRMU Boundary
Existing Roads with 100' buffer
Dedicated, Unconstructed Roads
Trails with 100' buffer
Private Property 100' buffer
Streams and Riparian Areas with 150' buffer (Chijuk Creek & tributaries with 200' buffer)
Lakes and Riparian Areas with 100' buffer
Wetlands identified as "important" (see definitions/glossary), with 100' Special Management Zone
SCHNIEDER LAKE TRAIL
S OILWELL RD
OILWELL ROAD TRAIL
S23N08W
S23N07W
S23N06W
PARKER LAKE TRAIL
KROTO CREEK
MCDOUGALL SEISMIC TRAIL
PARKER LAKE
CHIJUK CREEK
S22N08W
S22N07W
S22N06W
Data from MSB databases (not all waterbodies shown on USGS and aerial maps are included in the MSB databases), Forest Inventory Report Phase II, MSB Recreational Trails Plan, federal and state agencies, local resident knowledge, aerial photography (2004/2005) and USGS Quads.
Chijuk Creek NRMU
Roads, Trails, Waterbodies, Wetlands & Riparian Areas
Community Development/LMD April 2010
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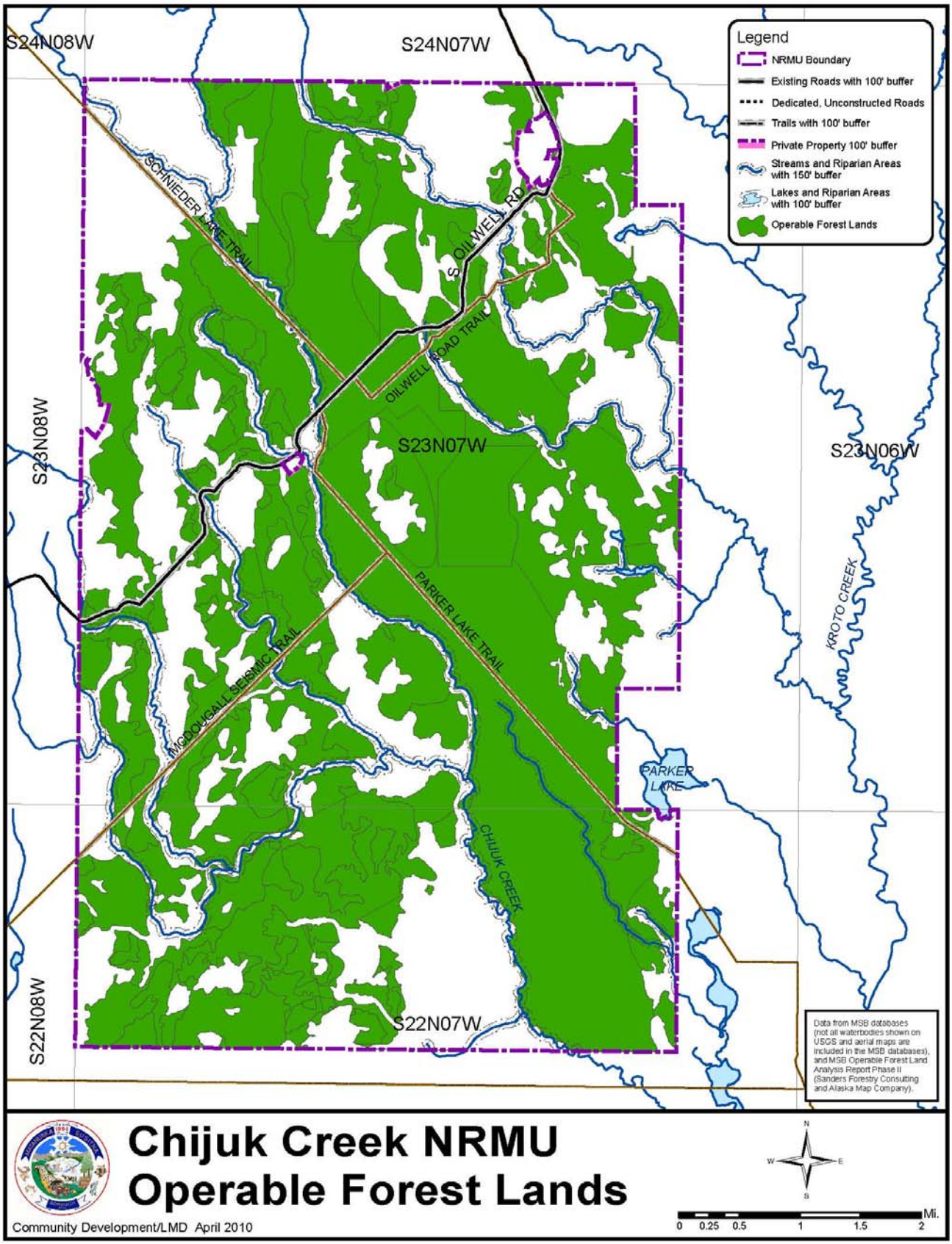
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Legend
NRMU Boundary
Existing Roads with 100' buffer
Dedicated, Unconstructed Roads
Trails with 100' buffer
Private Property 100' buffer
Streams and Riparian Areas with 150' buffer
Lakes and Riparian Areas with 100' buffer
Operable Forest Lands
SCHNIEDER LAKE TRAIL
S. OILWELL RD.
OILWELL ROAD TRAIL
S23N08W
S23N07W
S23N06W
PARKER LAKE TRAIL
KROTO CREEK
MCDOUGALL SEISMIC TRAIL
PARKER LAKE
CHIJUK CREEK
S22N08W
S22N07W
Data from MSB databases (not all waterbodies shown on USGS and aerial maps are included in the MSB databases), and MSB Operable Forest Land Analysis Report Phase II (Sanders Forestry Consulting and Alaska Map Company).
Chijuk Creek NRMU
Operable Forest Lands
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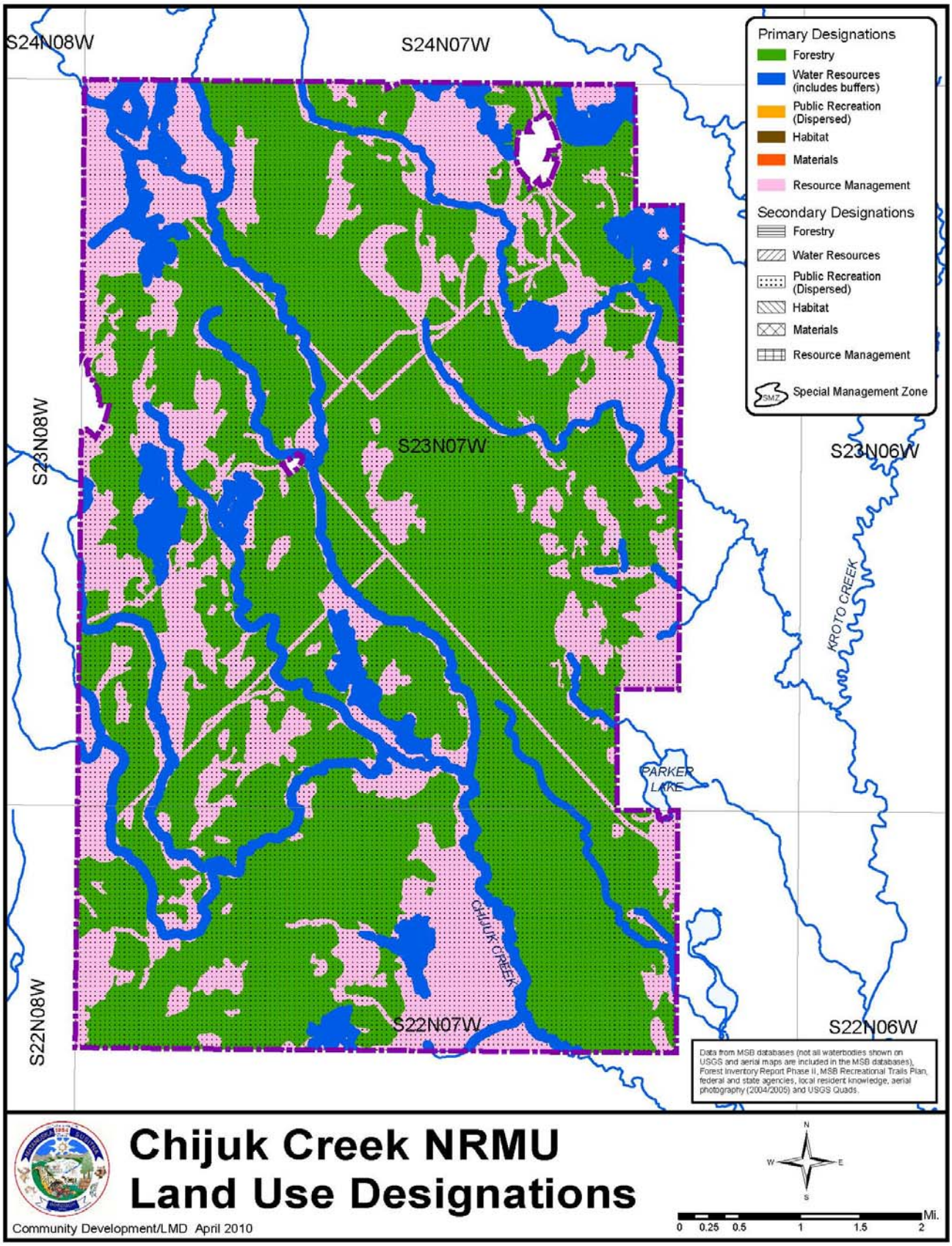
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S23N06W
S22N08W
S22N07W
S22N06W
KROTO CREEK
CHIJUK CREEK
PARKER LAKE
Primary Designations
Forestry
Water Resources (includes buffers)
Public Recreation (Dispersed)
Habitat
Materials
Resource Management
Secondary Designations
Forestry
Water Resources
Public Recreation (Dispersed)
Habitat
Materials
Resource Management
Special Management Zone
Data from MSB databases (not all waterbodies shown on USGS and aerial maps are included in the MSB databases), Forest Inventory Report Phase II, MSB Recreational Trails Plan, federal and state agencies, local resident knowledge, aerial photography (2004/2005) and USGS Quads.
Chijuk Creek NRMU
Land Use Designations
Community Development/LMD April 2010
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CHIJUK CREEK
Natural Resource Management Unit

General Information:

The Chijuk Creek Natural Resource Management Unit consists of about 24,660 acres and is located between the Kahiltna and Susitna River drainages. The unit is approximately 30 air miles northwest of Willow, and 22 air miles southwest of Talkeetna. The unit can be accessed via Oilwell Road.

The unit is in the Susitna lowlands that are generally flat with some rolling terrain. Vegetation is a mix of mostly good soils with some wetland areas.

Borough Tax Maps
Kroto Creek 3 and 4
Moose Creek 11, 12, 13, and 14

Current Land Use
The area has seen some timber harvest for birch and spruce. The area experiences a significant variety of dispersed recreational uses, mainly in the winter when access to the area is easier. Private parcels exist on land surrounding Lilly and Parker Lakes. A few of these have cabins, mainly for recreational uses. Over the past decade, Oilwell Road has been improved. This included the addition of bridges which has increased all-season access.

Surrounding Land Use
The adjoining land is mostly owned by the State of Alaska. There are some private parcels with residences along Oilwell Road east of the unit. Some locally organized and dispersed recreational use occurs, similar to that which occurs within the unit, on these surrounding lands as well.

Community Council Area
None

Existing Land Use Plans

- Mat-Su Borough, *Chijuk Creek Forest Management Plan* (1985), which will be replaced with this plan.
- Mat-Su Borough, *Multiple Use Forest Management Plan* (1989), which will be replaced by this plan.
- Alaska Department of Natural Resources, *Susitna Area Plan* (1985) subunit 10; designated for forestry, public recreation, and wildlife habitat. This plan is currently being revised by the State, Department of Natural Resources and will be called the *Susitna-Matanuska Area Plan*. This plan will replace the *Susitna Area Plan* and will not apply to borough owned land.
- Mat-Su Borough, *Recreational Trails Plan* (2007).

- Mat-Su Borough, *Parks, Recreation and Open Space Plan* (2001), which is currently being updated.

Existing Land Use Classification
Forest Management Lands

Summary of Resources and Uses

Agriculture and Grazing
A review of soil types, published by the Department of Agriculture, Natural Resources Conservation Service (http://websoilsurvey.ncrs.usda.gov/app/), indicates that there are no known lands suitable for agricultural development or grazing within the unit.

Also, see *Soils* map at the beginning of this section.

Cultural Resources and Heritage Sites
There are no recorded historical or heritage sites and the unit has not been surveyed for cultural resources. Additional field work may be required before any natural resource extraction or other development activities take place in the unit.

Fish and Wildlife Habitat and Resources
Low to moderate numbers of moose are found throughout the unit in the summer, but they are relatively scarce during the winter because of a lack of available browse except in areas where timber harvest has occurred in recent years. Black and brown bears are common in the area. Moderate numbers of furbearer species occur throughout the general area.

There are no known bear dens, Trumpeter Swans or eagle nests within the unit; however the habitat is such that they could exist. Additional fieldwork will be required prior to any natural resource extraction or other development activities take place to verify this information.

Chijuk Creek is the only documented anadromous stream in the unit. Rainbow trout, Dolly Varden, whitefish and grayling also reside in Chijuk Creek.

Prior to any resource extraction projects, the anadromous fish distribution in any wetlands should be established, any additional anadromous or important resident fish waterbodies need to be identified and the Alaska Department of Fish and Game will need to verify the cataloged anadromous resident fish streams as described above.

The Alaska Department of Fish and Game will require Fish Habitat Permits, accompanied by detailed project plans, prior to any planned resource extraction project adjacent to anadromous or resident waterbodies.

There are no commercial lodges or fish camps in the area.

Forest Resources

The principal timber type is old growth (over 100 years) birch and spruce sawtimber. Within the 24,660 acre unit, there are 17,405 acres (70% of the unit) of Commercial Forest Land of which 15,173 acres (62% of the unit) are Operable Forest Land.

The 2009 Operable Forest Land Analysis Report found the following timber composition within the unit:

Stratum 1: Pole Timber – Closed Canopy	904 acres
Stratum 2: Pole Timber – Open Canopy	2,023 acres
Stratum 3: Hardwood Saw Timber – Closed Canopy	0 acres
Stratum 4: Hardwood Saw Timber – Open Canopy	903 acres
Stratum 5: Mixed Forest Saw Timber – Closed Canopy	8,602 acres
Stratum 6: Mixed Forest Saw Timber – Open Canopy	2,694 acres
TOTAL	15,126 acres

Also, see *Operable Forest Lands* map at the beginning of this section.

Private Property

There is private property around Lilly, Parker, and September Lakes, within the exterior boundaries of the unit. The private property has been excluded from the unit and is not subject to the provisions of this plan.

Public Recreation and Tourism

Winter access to the area is readily available from Oilwell Road and numerous trails. Summer access is also available via Oilwell Road, although the road is not maintained all the way to the unit. The primary recreational uses include dog mushing, snowmobiling, ATV's, trapping, hunting and fishing.

Tourism interest in this area is very low because this unit is located well off the main highway system, not on any regular flight seeing flight path and there are no outstanding features to draw tourists to the area.

Roads and Trails

The area has direct access from Oilwell Road, via the Parks Highway and Petersville Road. Oilwell Road, in the immediate area surrounding and within the unit, is not within an existing Road Service District.

The Oilwell Road Winter Trail, McDougall Seismic Trail, Parker Lake Trail, and the Shulin Lake Trail are located within the unit and all are included in the Mat-Su Borough Recreational Trails Plan.

Also, see *Roads, Trails, Waterbodies, Wetlands and Riparian Areas* map at the beginning of this section.

Rock, Sand and Gravel

This unit, because of semi-remote location and long distance off the main highway system has not been extensively inventoried for potential commercial quantities of rock, sand and gravel resources. Soil mapping (see (http://websoilsurvey.ncrs.usda.gov/app/) and experience from pioneer road construction indicates that some rock, sand and gravel resources exist.

Also, see *Soils* map at the beginning of this section.

Unit Management Intent

The Chijuk Natural Resource Management Unit will be managed for forest resources with the intent to develop a multi-aged forest. The area shall also be managed to protect water resources, continued recreational activities and habitat enhancement and other multiple use purposes.

Land Use Designations

Chijuk Creek		
Designation	**Classification**	**Management Intent**
Primary		
Forestry	Forest Management Lands	Only those areas determined to be operable forest land. Protect and improve wildlife habitat areas. Recognize and manage for recreational uses.
Resource Management	Resource Management Lands	Remainder of unit not designated as Forestry. Protect and improve wildlife habitat areas. Recognize and manage for recreational uses. No timber harvest permitted on these lands in the unit.

	Chijuk Creek (continued)	
Designation	**Classification**	**Management Intent**
Primary		
Water Resources	Watershed Lands	All waterbodies, riparian areas, and important wetlands. Any waterbodies, riparian areas or important wetlands determined after adoption of this plan to be anadromous, important for resident fish, or important wetlands for fish and wildlife shall also be similarly designated and classified[7].
Secondary		
Public Recreation - Dispersed		Entire unit

Also, see the *Land Use Designations* map at the beginning of this section.

Management Guidelines

See Volume I, Chapters 2 and 3 for area-wide guidelines for all Natural Resource Management Units. The remainder of this section presents unit-specific guidelines.

<u>Buffers and Special Management Zones</u>
All flowing waterbodies, including lakes that are part of a flowing water system that are connected to creeks, streams, and rivers, and riparian areas will be protected through the use of undisturbed natural vegetation buffers.

Chijuk Creek and its tributaries shall have a 200-foot buffer on either side of the Creek. Conveyance of this land from the state (patent # 18594) was subject to a 200-foot wide buffer for the purpose of protecting fish and wildlife resources and habitat and for hunting, trapping, fishing and other recreational activities.

All wetlands over 40 acres and all smaller important wetland areas (see definition in *Definitions/Glossary* at the end of this chapter or in Volume III) shall be protected with a Special Management Zone which shall include a 100-foot area around the wetland area. The Zone shall not allow disturbance of the wetland area, but some uses may be allowed.

[7] Such designation and classification shall be considered as a "Minor Change" to the Plan (See Volume I, Chapter 4, *Procedures for Changes to the Plan, Goals, and Guidelines.*

For example, winter time recreational use is allowed when no waterfowl are present and sufficient snow cover exists to not harm the natural vegetation.

At such time that new activities are contemplated in the unit, all potentially impacted waterbodies and wetlands shall be assessed as to their habitat and watershed value. Depending on the assessment, the waterbodies and wetlands will be provided additional protection through the use of buffers or placed in a Special Management Zone, as appropriate.

All roads and trails as shown on the *Roads, Trails, Waterbodies, Wetlands and Riparian Areas* map shall be protected through the use of a natural undisturbed vegetative buffer. These buffers may only be modified following the provisions in Volume I, Chapter 2, *Buffers* and MSB 23.20.070.

All private property shall be protected through the use of a natural undisturbed vegetative buffer. These buffers may only be modified following the provisions in Volume I, Chapter 2, *Buffers* and MSB 23.20.070.

See *Roads, Trails, Waterbodies, Wetlands and Riparian Areas* map at the beginning of this section for, wetlands with a Special Management Zone, waterbodies and roads and trails with buffers.

Also see Volume I, Chapter 2, *Buffers* and *Special Management Zones* for additional information.

Forest Management

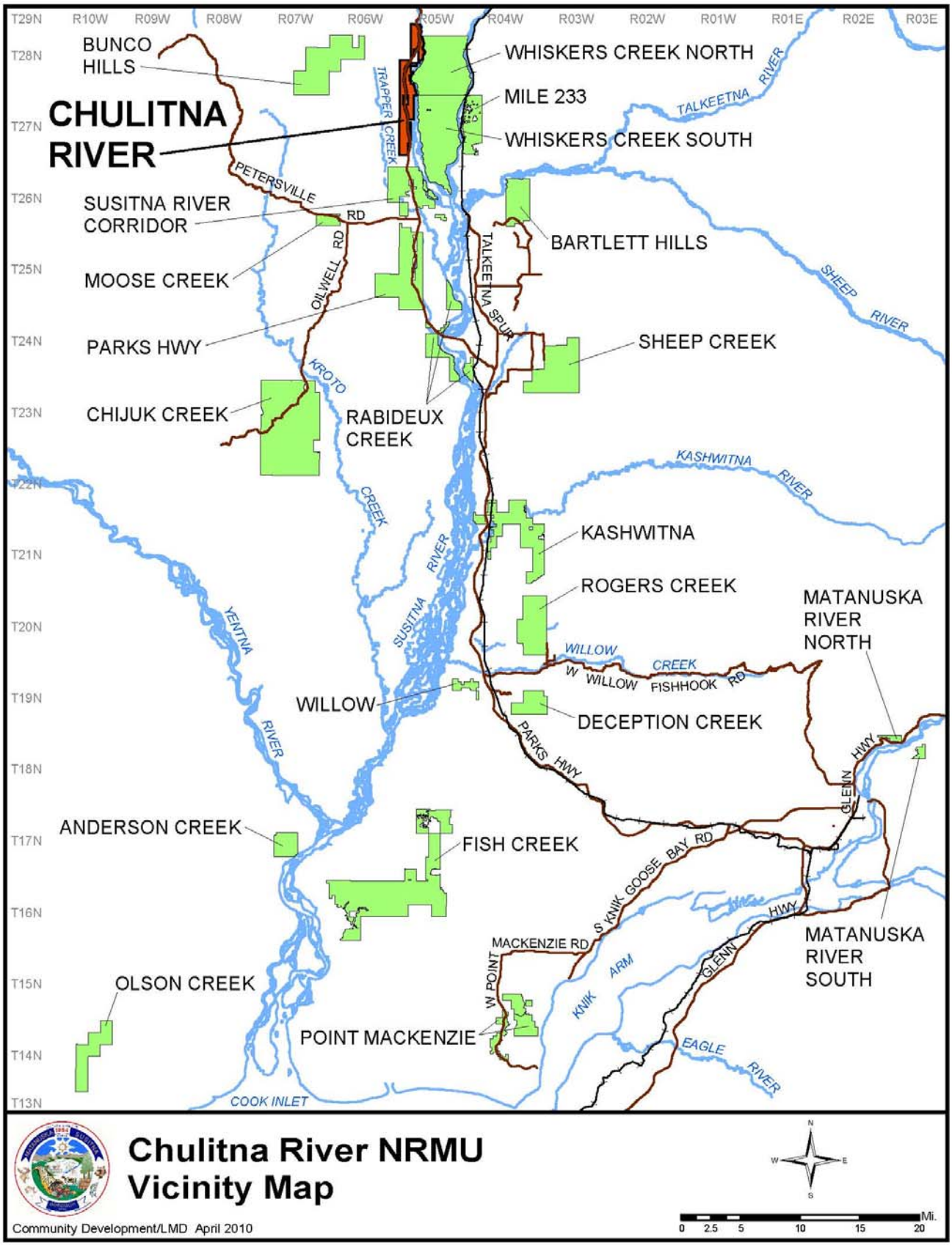
This unit contains the highest quality and value birch and white spruce within all the Natural Resource Management Units with the best potential for economic return to the borough and the harvester in the form of value added and some pulp products. The area is fairly remote and does not have any other outstanding natural resource values, although a variety of multiple use activities including dispersed public recreation occurs in the unit.

The majority of the borough's annual allowable cut should occur in this unit in order to develop a multi-aged forest and healthy forest as soon as practical. Any type of timber harvest technique and timber harvest unit size may be utilized on those lands designated and classified for forest management. No timber harvest shall occur on lands designated and classified for resource management. Harvest unit layout shall be coordinated with the Alaska Department of Fish and Game to enhance wildlife habitat where practical and feasible.

Harvest units and timber harvest activities shall also recognize the areas recreational activities.

Other Uses

No additional unit-specific guidelines are needed for this unit. See Volume I, Chapters 2 and 3 for area-wide guidelines that apply to all Natural Resource Management Units.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TRAPPER CREEK
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SUSITNA RIVER CORRIDOR
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SHEEP RIVER
PARKS HWY
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KNIK ARM
GLENN HWY
MATANUSKA RIVER SOUTH
OLSON CREEK
POINT MACKENZIE
EAGLE RIVER
COOK INLET
Chulitna River NRMU
Vicinity Map
Community Development/LMD April 2010
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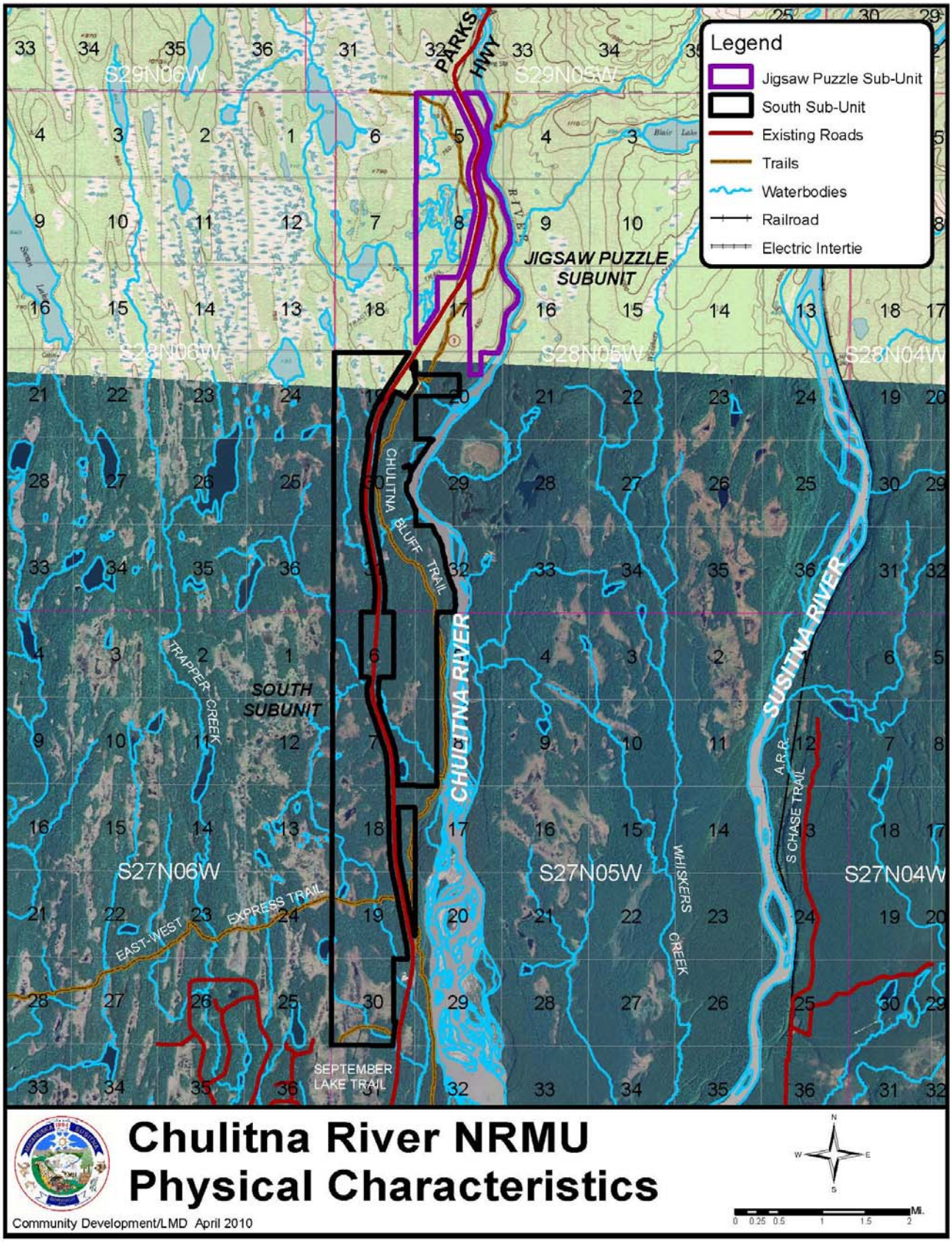
Legend
Jigsaw Puzzle Sub-Unit
South Sub-Unit
Existing Roads
Trails
Waterbodies
Railroad
Electric Intertie
PARKS HWY
JIGSAW PUZZLE SUBUNIT
SOUTH SUBUNIT
CHULITNA BLUFF TRAIL
CHULITNA RIVER
SUSITNA RIVER
TRAPPER CREEK
WHISKERS CREEK
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EAST-WEST EXPRESS TRAIL
SEPTEMBER LAKE TRAIL
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Chulitna River NRMU
Physical Characteristics
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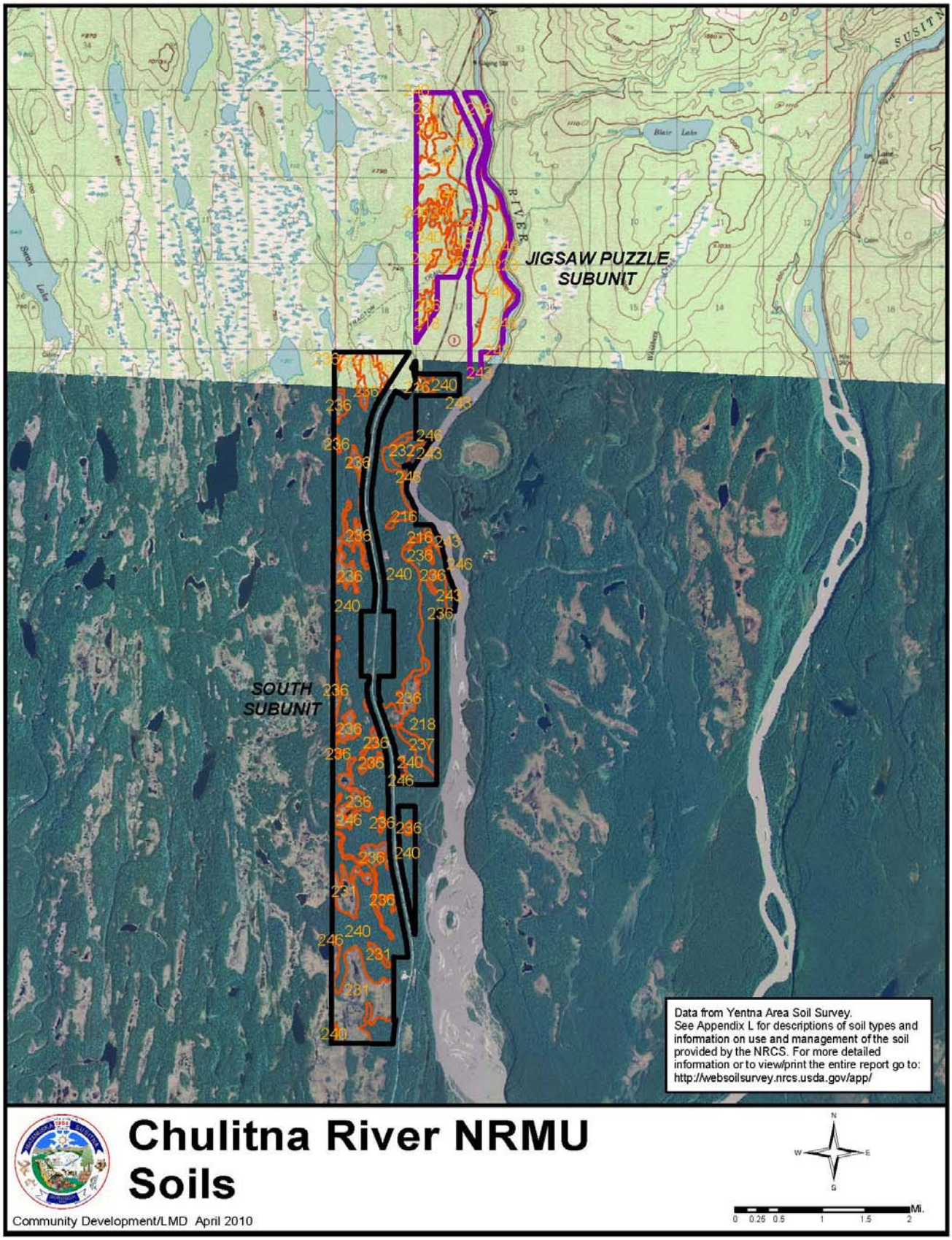
JIGSAW PUZZLE SUBUNIT
SOUTH SUBUNIT
Data from Yentna Area Soil Survey.
See Appendix L for descriptions of soil types and information on use and management of the soil provided by the NRCS. For more detailed information or to view/print the entire report go to:
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Soils
Community Development/LMD April 2010
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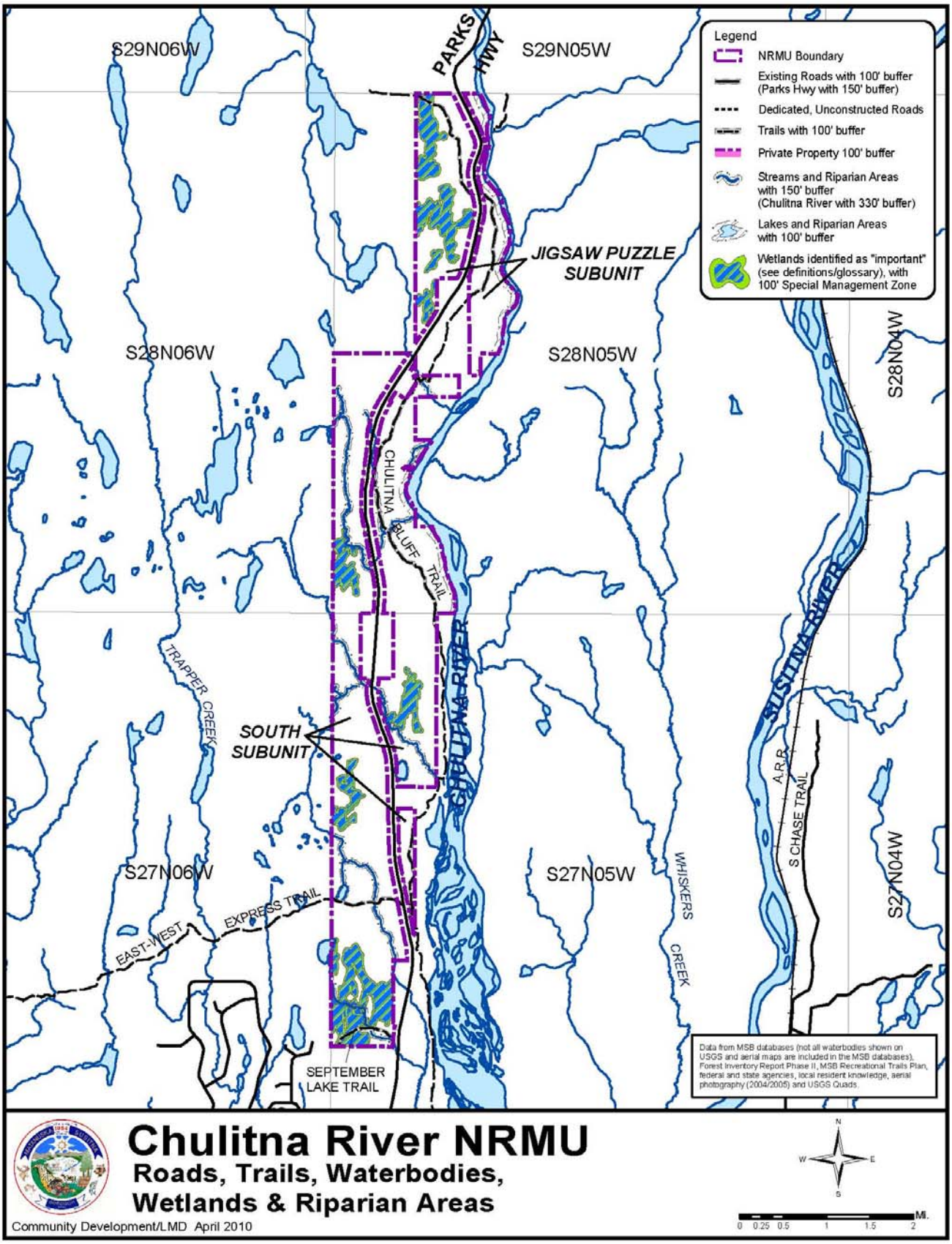
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NRMU Boundary
Existing Roads with 100' buffer (Parks Hwy with 150' buffer)
Dedicated, Unconstructed Roads
Trails with 100' buffer
Private Property 100' buffer
Streams and Riparian Areas with 150' buffer (Chulitna River with 330' buffer)
Lakes and Riparian Areas with 100' buffer
Wetlands identified as "important" (see definitions/glossary), with 100' Special Management Zone
S29N06W
S29N05W
PARKS HWY
JIGSAW PUZZLE SUBUNIT
S28N06W
S28N05W
S28N04W
CHULITNA BLUFF TRAIL
CHULITNA RIVER
SUSITNA RIVER
TRAPPER CREEK
SOUTH SUBUNIT
A.R.R.
S CHASE TRAIL
S27N06W
S27N05W
S27N04W
WHISKERS CREEK
EAST-WEST EXPRESS TRAIL
SEPTEMBER LAKE TRAIL
Data from MSB databases (not all waterbodies shown on USGS and aerial maps are included in the MSB databases), Forest Inventory Report Phase II, MSB Recreational Trails Plan, federal and state agencies, local resident knowledge, aerial photography (2004/2005) and USGS Quads.
Chulitna River NRMU
Roads, Trails, Waterbodies, Wetlands & Riparian Areas
Community Development/LMD April 2010
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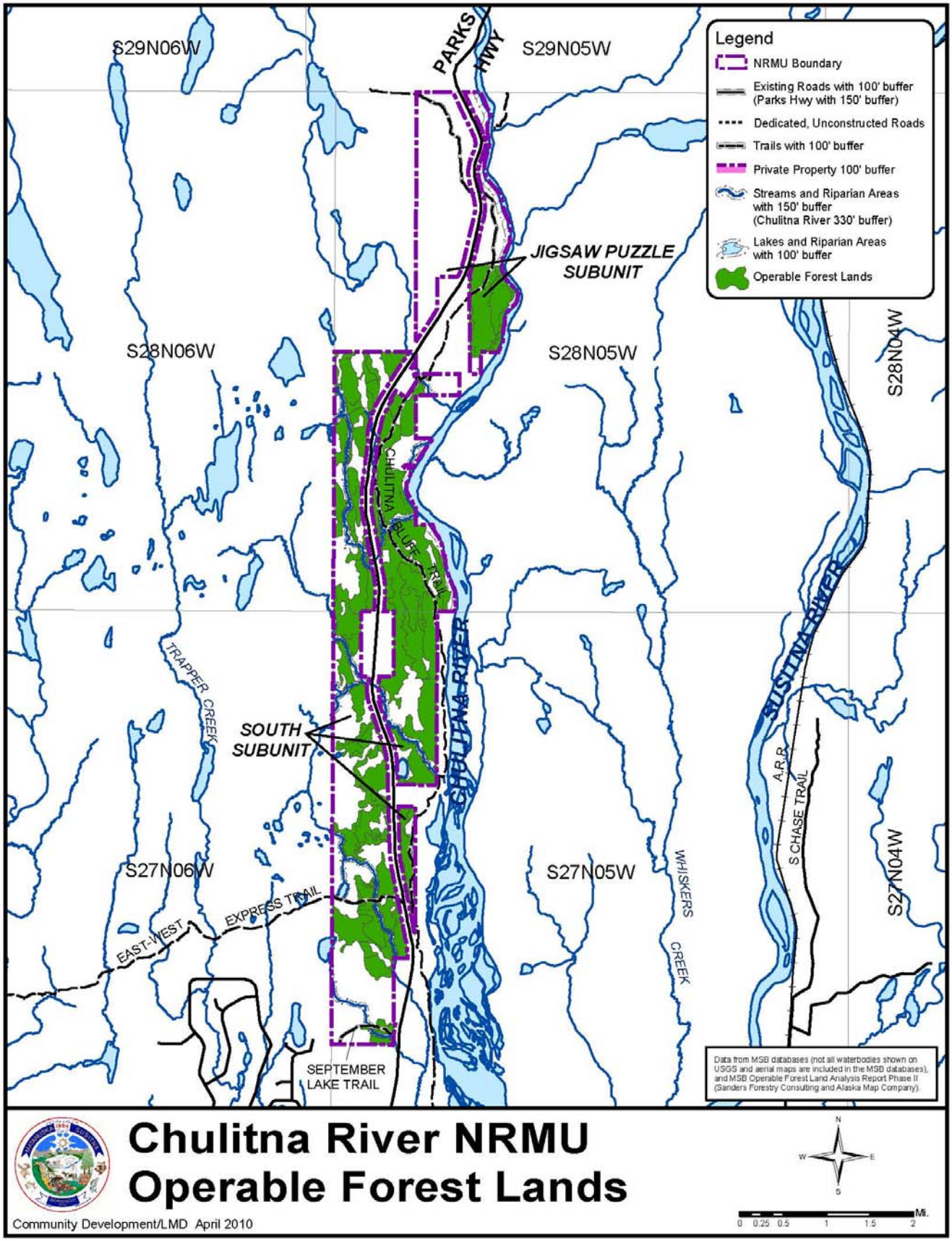
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Lakes and Riparian Areas with 100' buffer
Operable Forest Lands
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S29N05W
PARKS HWY
JIGSAW PUZZLE SUBUNIT
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CHULITNA BLUFF TRAIL
CHULITNA RIVER
SUSITNA RIVER
TRAPPER CREEK
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SEPTEMBER LAKE TRAIL
Data from MSB databases (not all waterbodies shown on USGS and aerial maps are included in the MSB databases), and MSB Operable Forest Land Analysis Report Phase II (Sanders Forestry Consulting and Alaska Map Company).
Chulitna River NRMU
Operable Forest Lands
Community Development/LMD April 2010
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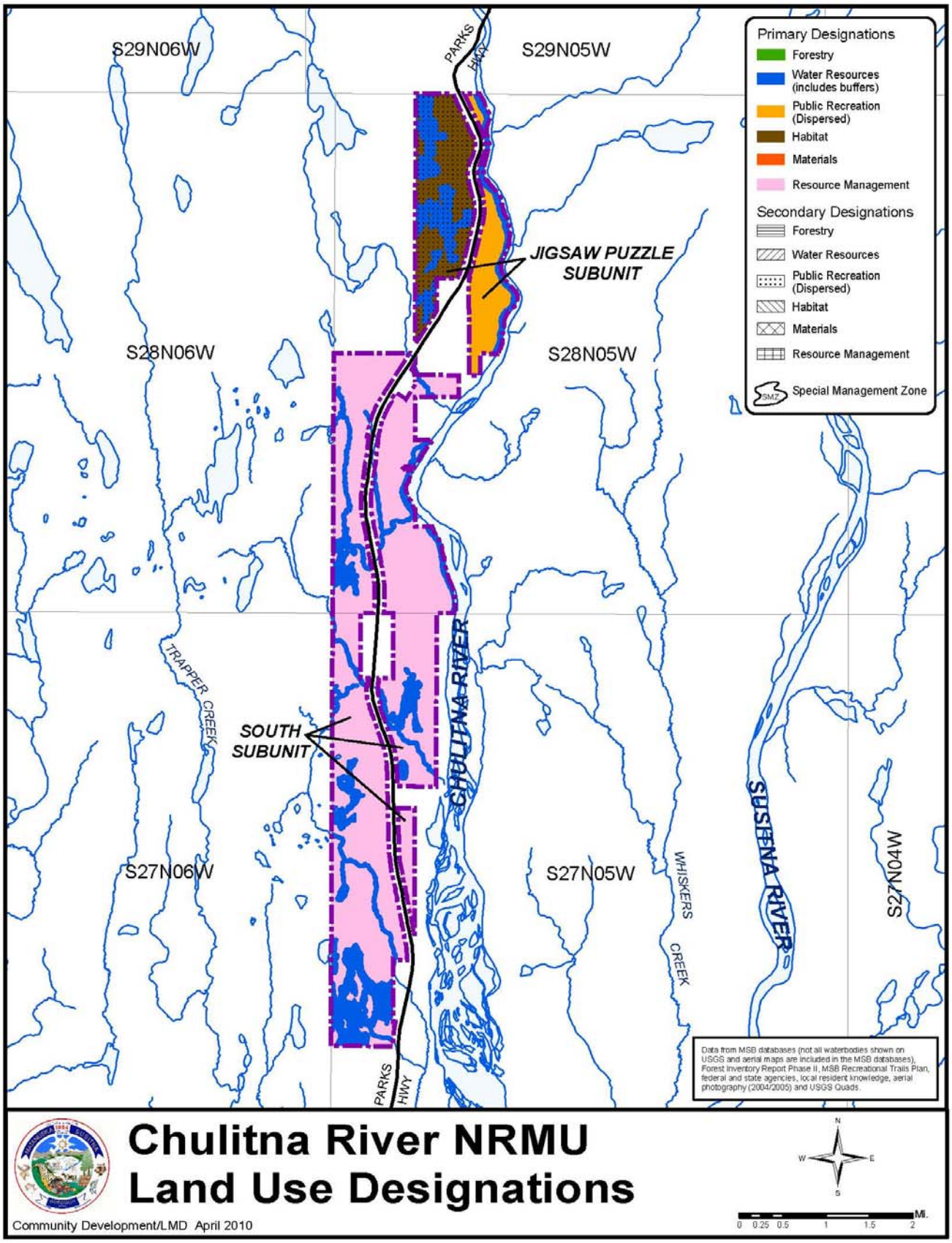
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PARKS HWY
Primary Designations
Forestry
Water Resources (includes buffers)
Public Recreation (Dispersed)
Habitat
Materials
Resource Management
Secondary Designations
Forestry
Water Resources
Public Recreation (Dispersed)
Habitat
Materials
Resource Management
Special Management Zone
JIGSAW PUZZLE SUBUNIT
S28N06W
S28N05W
TRAPPER CREEK
SOUTH SUBUNIT
CHULITNA RIVER
SUSITNA RIVER
S27N06W
S27N05W
WHISKERS CREEK
S27N04W
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Chulitna River NRMU
Land Use Designations
Community Development/LMD April 2010
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CHULITNA RIVER
Natural Resource Management Unit

General Information

The Chulitna River Natural Resource Management Unit contains about 6,100 acres and is located along both sides of the Parks Highway (west) and the Chulitna River (east) from approximately mile 120 and 130.5 of the Parks Highway. Denali State Park is located just north of this unit.

The unit has been divided into two subunits; Chulitna River – Jigsaw Lakes and Chulitna River – South.

The Jigsaw Lakes Subunit contains two blocks of land (one each side of the Parks Highway) at the northern end on the unit totaling about 1,450 acres. The eastern block lies between the Parks Highway and the Chulitna River. It is generally flat with some rolling terrain and steep bluffs between the Chulitna River and the upland area. The western block is flat with numerous small lakes (Jigsaw Puzzle Lakes) and wetland areas,

The South Subunit contains about 4,630 acres and is generally flat with some rolling terrain. There are also some steep cliffs between the upland area and the Chulitna River that do become less steep towards the southern end of the subunit.

Borough Tax Maps
Chase 4, 5, 12 and 13

Current Land Use
The unit has a variety of recreational uses, both in the summer related to access and use of the Chulitna River and in the winter on the two trails (see "Roads and Trails" below). There have been several small timber harvests within the South Subunit.

Surrounding Land Use
Borough, State and private land are located adjacent to and near this unit. The same activities that occur within the unit occur on these lands with dispersed public recreation being the principal activity. The northern boundary of the Jigsaw Lakes Subunit is adjacent to Denali State Park.

Community Council Area
Trapper Creek

Existing Land Use Plans

- Mat-Su Borough, *Multiple Use Forest Management Plan*, 1989, which will be replaced by this plan.
- Alaska, Department of Natural Resources, *Susitna Area Plan* (1985), Petersville Road Unit, Trapper Creek (5b) and Tokosha (2e) Subunits (5d). The area is

designated recreation and borough land bank with forestry, wildlife habitat and settlement values. This plan is currently being revised by the Alaska, Department of Natural Resources and will be called the *Susitna-Matanuska Plan*. The revised plan will replace the *Susitna Area Plan* and will not apply to borough owned land.

- Mat-Su Borough, *Recreational Trails Plan* (2007).
- Mat-Su Borough, *Parks, Recreation and Open Space Plan* (2001), which is currently being updated.
- National Park Service, *South Denali Implementation Plan and EIS* (2006).

The Trapper Creek Community Council is currently working on a comprehensive plan.

A Scenic Highways Plan is currently being developed along the Parks Highway starting at the Susitna River Bridge crossing and continuing north through Denali State Park. In October 2009 the George Parks Highway north from the Chulitna River Bridge was designated as a National Scenic Byway.

Existing Land Use Classifications
Forest Management Lands and unclassified land

Summary of Resources and Uses

Agriculture and Grazing
A review of soil types, published by the Department of Agriculture, Natural Resources Conservation Service (http://websoilsurvey.ncrs.usda.gov/app/), indicates that there are no known lands suitable for agricultural development or grazing within the unit.

Also, see *Soils* map at the beginning of this section.

Cultural Resources and Heritage Sites
The corridor along the Chulitna River is extremely important to the archaeological record. A survey for sites has not been conducted in this area, however an on-the-ground survey with shovel testing was conducted just south of this area where historic and cultural sites were recovered.

Before any ground disturbing activities such as timber cutting, brushing out of trails, etc. takes place, it is tantamount that an archaeological, on-the-ground reconnaissance survey with shovel testing be carried out within the unit. The location of additional sites would assist in confirming that migration of the earliest settlers into the region came through the Chulitna corridor. Other areas of concern, for additional more recently used sites may occur at the confluence of salmon streams with the Chulitna River.

Fish and Wildlife Habitat and Resources
Wildlife values are considered moderate in this unit, with moose and black bear fairly common. Moderate numbers of furbearer species occur throughout the general area.

There are no known bear dens, Trumpeter Swan or eagle nests within the unit. Additional fieldwork will be required prior to any natural resource extraction or other development activities taking place to verify this information.

In the Jigsaw Puzzle Subunit the parcel to the west of the Parks Highway in the Jigsaw Puzzle Subunit has a high density of various species of birds and nesting waterfowl. Trumpeter Swans have also been reported to nest in this area.

The Chulitna River is a documented anadromous fish stream. Many of the smaller streams that enter the Chulitna River from the east and west are also known salmon streams. Dolly Varden and grayling also reside in these same waterbodies.

Prior to any resource extraction projects, the anadromous fish distribution in any wetlands should be established, any additional anadromous or important resident fish waterbodies need to be identified and the Alaska Department of Fish and Game will need to verify the cataloged anadromous resident fish streams as described above.

The Alaska Department of Fish and Game will require Fish Habitat Permits, accompanied by detailed project plans, prior to any planned resource extraction project adjacent to anadromous or resident waterbodies.

There is a commercial lodge approximately three (3) miles north of the unit. There are no known fish camps in the unit.

Forest Resources

The principal timber type is old growth (over 100 years old) birch and spruce sawtimber. Within the 6,082 acre unit, there is 3,505 acres (58% of the unit) of Commercial Forest Land, of which 2,845 acres (47% of the unit) is considered Operable Forest Land. The majority of the Operable Forest Land is located in the South Subunit.

The 2009 Operable Forest Land Analysis Report found the following timber composition within the unit:

Stratum 1: Pole Timber – Closed Canopy	59 acres
Stratum 2: Pole Timber – Open Canopy	87 acres
Stratum 3: Hardwood Saw Timber – Closed Canopy	0 acres
Stratum 4: Hardwood Saw Timber – Open Canopy	8 acres
Stratum 5: Mixed Forest Saw Timber – Closed Canopy	1,468 acres
Stratum 6: Mixed Forest Saw Timber – Open Canopy	1,222 acres
TOTAL	**2,845 acres**

Also, see the *Operable Forest Lands* map at the beginning of this section.

The Trapper Creek Community Council has requested that an area along the road system be designated as a wood lot for local residents to be able to cut firewood in this and other nearby Natural Resource Management Units (Moose Creek, Parks Highway, Rabideux and Susitna River Corridor).

There has also been interest expressed by some residents of the Talkeetna area that this unit and other local units are made available for supplying fuel wood for a wood-fired boiler for the new Su-Valley High School and possibly other public facilities in the future. This would require approximately 300 cords of fuel wood per year (equivalent to approximately 15.6 acres per year). This equates to 27,000 cords or approximately the equivalent of 1,400 acres of fuel wood over an average of 90 years for a mixed rotation period of birch and spruce (Sanders Forestry Consulting and Northern Economics, 2009).

Private Property

There is no private property within the unit. There are parcels of state land along the Parks Highway (gravel pits) which have been excluded from the exterior boundaries of the unit.

Public Recreation and Tourism

The primary recreational uses include skiing, snowmobiling, hiking and floating the Chulitna River. Trapping, hunting and fishing also occur.

There is no specific resource or activity that draws tourists to this area other than the areas scenic values which exists throughout the entire area. Because of the units' location, it is on one of the fight seeing flight lines to and from Denali National Park and Preserve, especially in the Mount McKinley area. The Denali Princess Lodge Hotel is located approximately 3 miles north of the northern boundary of the unit along the Parks Highway.

Roads and Trails

The entire unit has direct access from the Parks Highway.

The East-West Express Trail and Chulitna Bluffs Trail are located within the unit and are included in the *Mat-Su Borough Recreational Trails Plan*.

The September Lake Trail crosses a small portion of the south end of the unit and accesses Trapper Creek Glenn Subdivision. The September Lake Trail is not in the *Recreational Trails Plan*, but is a trail of local significance.

A trail that accesses Swan Lake Alaska Subdivision (ASLS 79-145) originates at a trail head/parking lot at Mile 129.6 of the Parks Highway and extends west around the north end of Sunny Lake. This trail has been in existence since the late 1970's or early 1980's. Another trail begins at the gravel pit at Mile 131 of the Parks Highway and extends southwest and intersects the Sunny Lake Trail in Section 7, T. 28 N., R. 5 W. S.M., which is outside of the unit. Neither of these trails is in the *Recreational Trails Plan*, and has not been found to be a trail of local significance. The trails are important, however, to property owners accessing their property in the Swan Lakes Alaska Subdivision.

Also, see the *Roads, Trails, Waterbodies, Wetlands and Riparian Areas* map at the beginning of this section.

Rock, Sand and Gravel

Soil mapping (see http://websoilsurvey.ncrs.usda.gov/app/) indicates that there may rock, sand and gravel resources within the Unit. This is exhibited by the extraction pits located on either side of the Parks Highway as it traverses through the unit. There are no developed rock, sand or gravel extraction areas within the unit. A more extensive field inventory will be necessary to determine the volume, extent and feasibility of possible developing this resource.

Also, see the *Soils* map at the beginning of this section.

Unit Management Intent

The management intent for the Chulitna River - Jigsaw Puzzle Subunit is to protect the important habitat area around the Jigsaw Puzzle Lakes, and recognize the recreational uses for the entire Subunit. There shall be no timber harvest or material extraction in the Subunit.

The management intent for the Chulitna River - South Subunit shall be to protect the water resources in the subunit and encourage continued recreational uses of the area, while meeting some limited wood product needs in a way that does not significantly reduce from the areas recreational uses and scenic resources. Examples include small wood lots for firewood for local residents and selective harvest for specialty wood products.

Land Use Designations

Chulitna River – Jigsaw Puzzle Lakes Subunit		
Designation	**Classification**	**Management Intent**
Primary		
Habitat	Public Recreation Land	All areas west of the Parks Highway in the subunit, except those designated as water resources.
Public Recreation - Dispersed	Public Recreation Land	All upland areas east of the Parks Highway in the subunit, except those designated as water resources.

Chulitna River – Jigsaw Puzzle Lakes Subunit		
Designation	**Classification**	**Management Intent**
Water Resources	Watershed Lands	All waterbodies, riparian areas, and important wetlands. Any waterbodies, riparian areas or important wetlands determined after adoption of this plan to be anadromous, important for resident fish, or important wetlands for fish and wildlife shall also be similarly designated and classified[8]. The important wetlands areas in the Jigsaw Lakes subunit shall be included in this designation.
Secondary		
Public Recreation		Entire subunit west of Parks Highway. Public recreation may be restricted winter time use only.

Chulitna River – South Subunit		
Designation	**Classification**	**Management Intent**
Primary		
Resource Management	Resource Management Lands	All upland areas, except those designated as water resources. Available for forest management and small timber harvests in those areas determined to be operable forest land and where it does not significantly reduce the areas recreational activities. Protect and improve important wildlife habitat

[8] Such designation and classification shall be considered as a "Minor Change" to the Plan (See Volume I, Chapter 4, *Procedures for Changes to the Plan, Goals, and Guidelines.*

Chulitna River – South Subunit		
Designation	Classification	Management Intent
		areas. Recognize and manage for the subunits recreational uses.

Chulitna River – South Subunit		
Designation	Classification	Management Intent
Primary		
Water Resources	Watershed Lands	All waterbodies, riparian areas, and important wetlands. Any waterbodies, riparian areas or important wetlands determined after adoption of this plan to be anadromous, important for resident fish, or important wetlands for fish and wildlife shall also be similarly designated and classified[9].
Secondary		
None		

Also, see the *Land Use Designations* map at the beginning of this section.

Management Guidelines

See Volume I, Chapters 2 and 3 for area-wide guidelines for all Natural Resource Management Units. The remainder of this section presents unit-specific guidelines.

<u>Buffers and Special Management Zones</u>
All flowing waterbodies, including lakes that are part of a flowing water system that are connected to creeks, streams and rivers, and riparian areas will be protected through the use of undisturbed natural vegetation buffers.

All wetlands over 40 acres and all smaller important wetland areas (see definition in *Definitions/Glossary* at the end of this chapter or in Volume III) shall be protected with a Special Management Zone which shall include a 100-foot area around the wetland area. For

[9] Such designation and classification shall be considered as a "Minor Change" to the Plan (See Volume I, Chapter 4, *Procedures for Changes to the Plan, Goals, and Guidelines.*

example, winter time recreational use is allowed when no waterfowl are present and sufficient snow cover exists to not harm the natural vegetation.

The important wetland lands areas around the Jigsaw Lakes in the Jigsaw Puzzle subunit are important wetlands and shall have a Special Management Zone on the lakes, riparian areas and wetlands including an area extending 100-foot around them.

At such time that new activities are contemplated in the South Subunit, all potentially impacted waterbodies and wetlands shall be assessed as to their habitat and watershed value. Depending on the assessment, the waterbodies and wetlands will be provided additional protection through the use of buffers or placed in a Special Management Zone, as appropriate.

The Chulitna River shall be subject to an undisturbed natural vegetation buffer as required in the Alaska Forest Resources Practices Act or 330 feet, whichever is greater.

The Parks Highway shall have a 150-foot natural vegetation buffer from either side of the right-of way. The unit boundary starts on the outer edge of this buffer.

The East-West Express Trail, Chulitna Bluff Trail and the September Lake Trail shall be buffered.

The state owned material extraction sites shall be buffered with an undisturbed natural vegetative buffer. This buffer may only be modified following the provisions in Volume I, Chapter 2, *Buffers* and MSB 23.20.070.

See *Roads, Trails, Waterbodies, Wetlands and Riparian Areas* map at the beginning of this section for, wetlands with a Special Management Zone, waterbodies and roads and trails with buffers.

Also, see Volume I, Chapter 2, *Buffers* and *Special Management Zones,* for additional information.

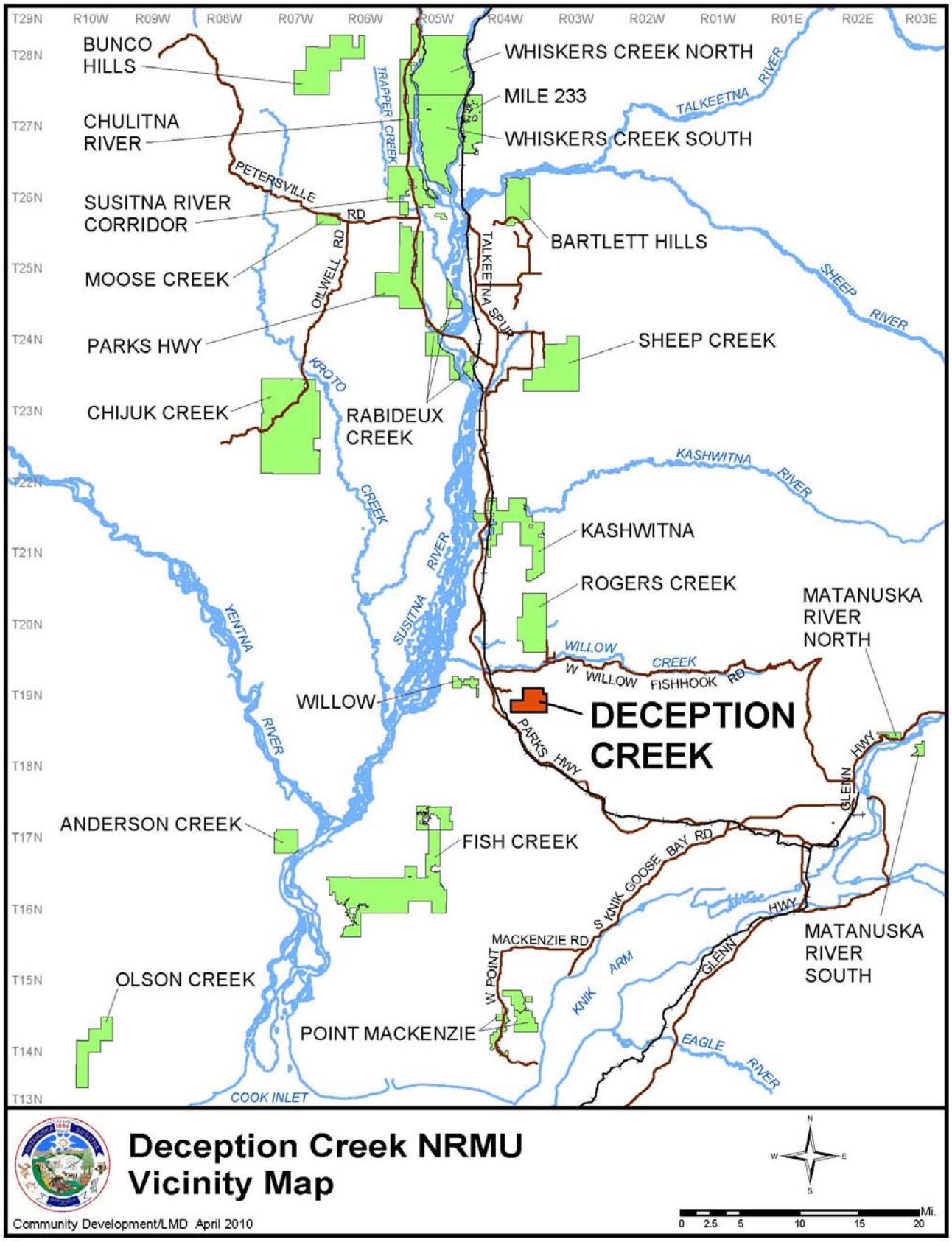
<u>Forest Management</u>
Small timber harvest in the South Subunit is permitted when it does not significantly reduce the areas recreational, watershed and scenic values. There shall be no timber harvesting, including personal use, in the Jigsaw Puzzle Subunit. Timber harvests shall be limited to woodlots for firewood or dispersed select cut for specialty wood products including house logs.

Timber harvest shall be small in volume in the amount harvested per year. Besides not significantly reducing the areas recreational, watershed and scenic values, small and limited harvest areas are necessary so that winter moose habitat areas are not created that would draw moose into the Parks Highway corridor.

This unit should not be utilized for supplying fuel wood for the Su Valley High School proposed wood-fired boiler, or any project of a similar commercial scale, because of the units' location and long lineal configuration.

Other Uses

No additional unit-specific guidelines are needed for this unit. See Volume I, Chapters 2 and 3 for area-wide guidelines that apply to all Natural Resource Management Units.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Deception Creek NRMU
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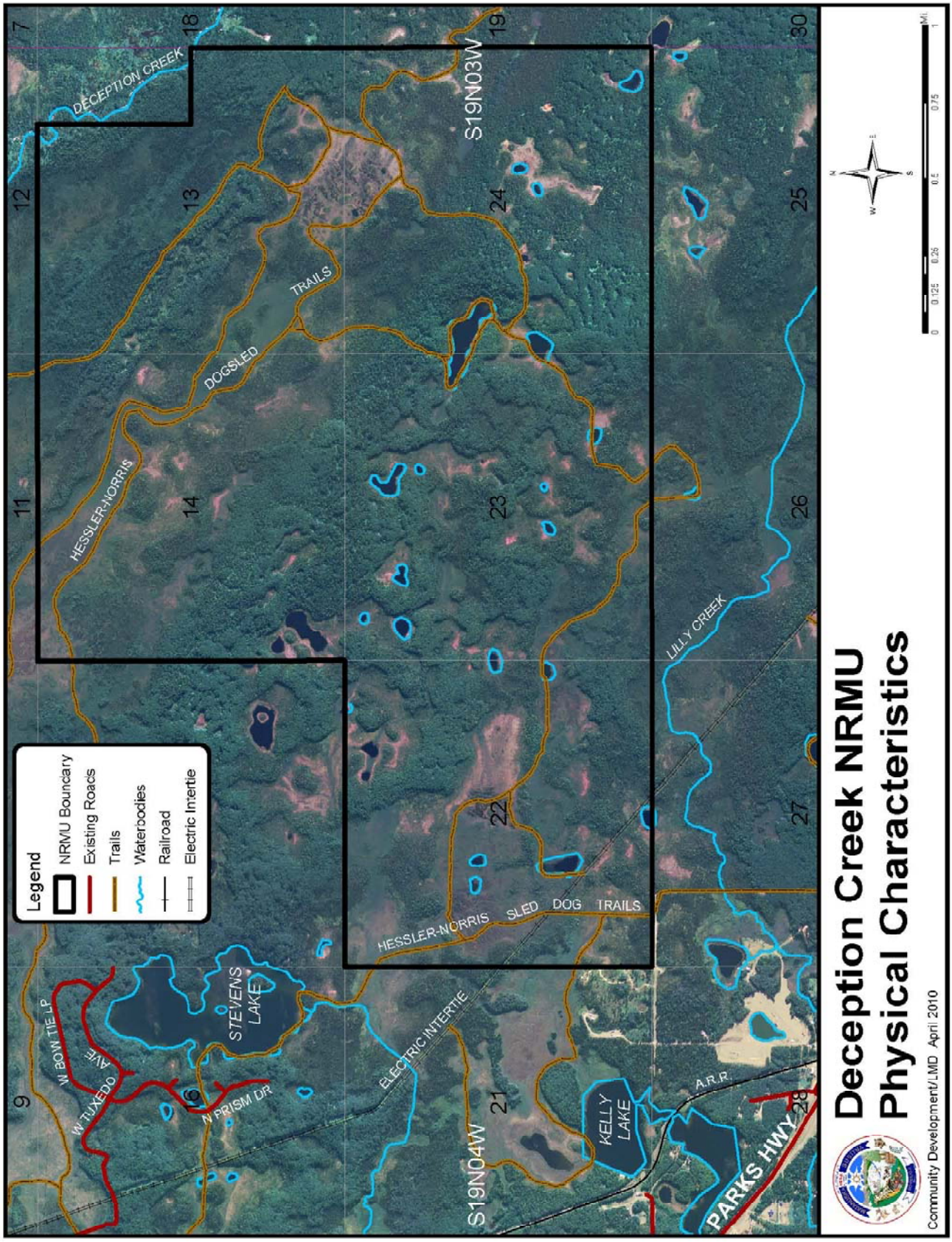
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Physical Characteristics
Community Development/LMD April 2010
Legend
NRMU Boundary
Existing Roads
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Electric Intertie
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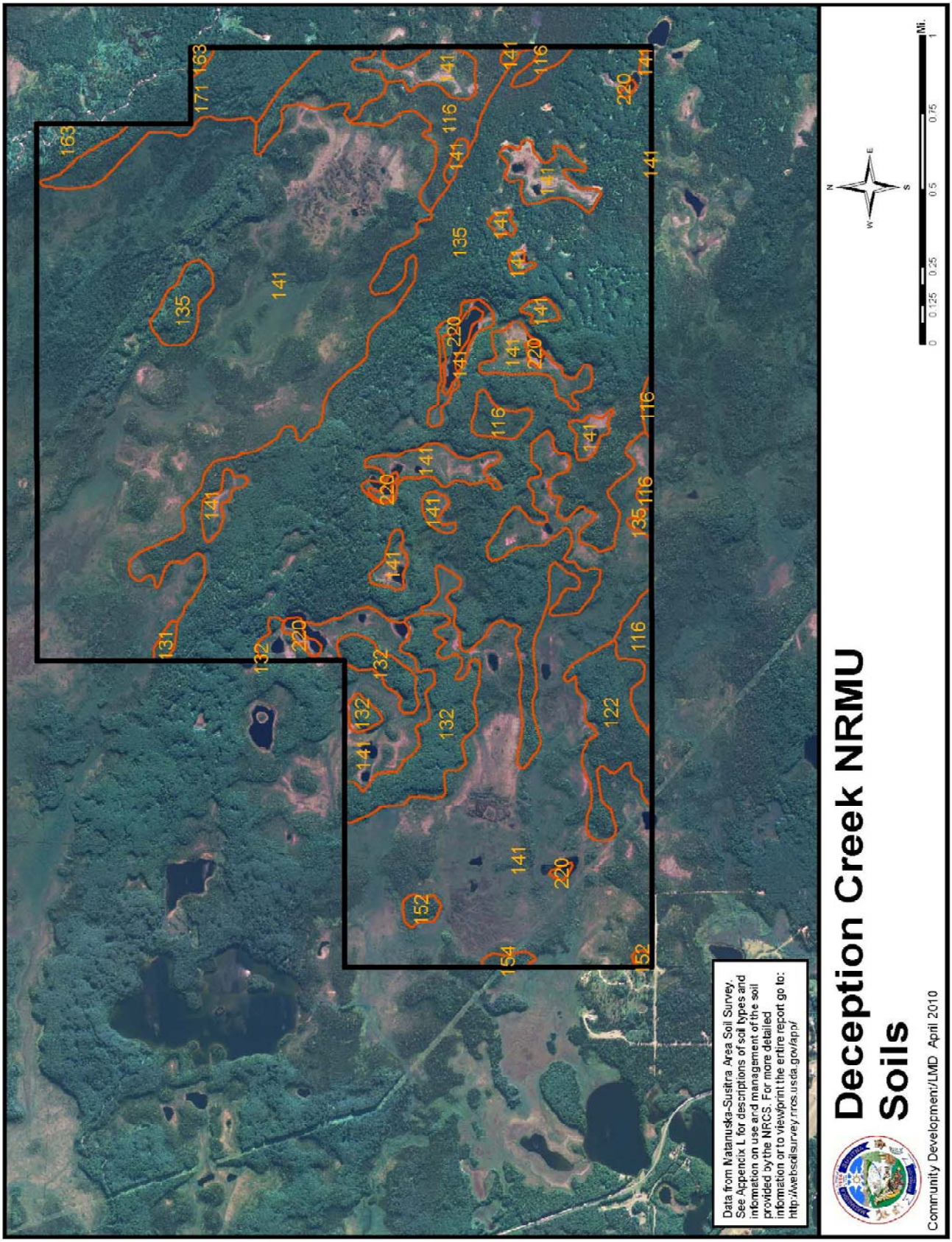
Deception Creek NRMU
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Data from Matanuska-Susitna Area Soil Survey.
See Appendix L for descriptions of soil types and information on use and management of the soil provided by the NRCS. For more detailed information or to viewprint the entire report go to:
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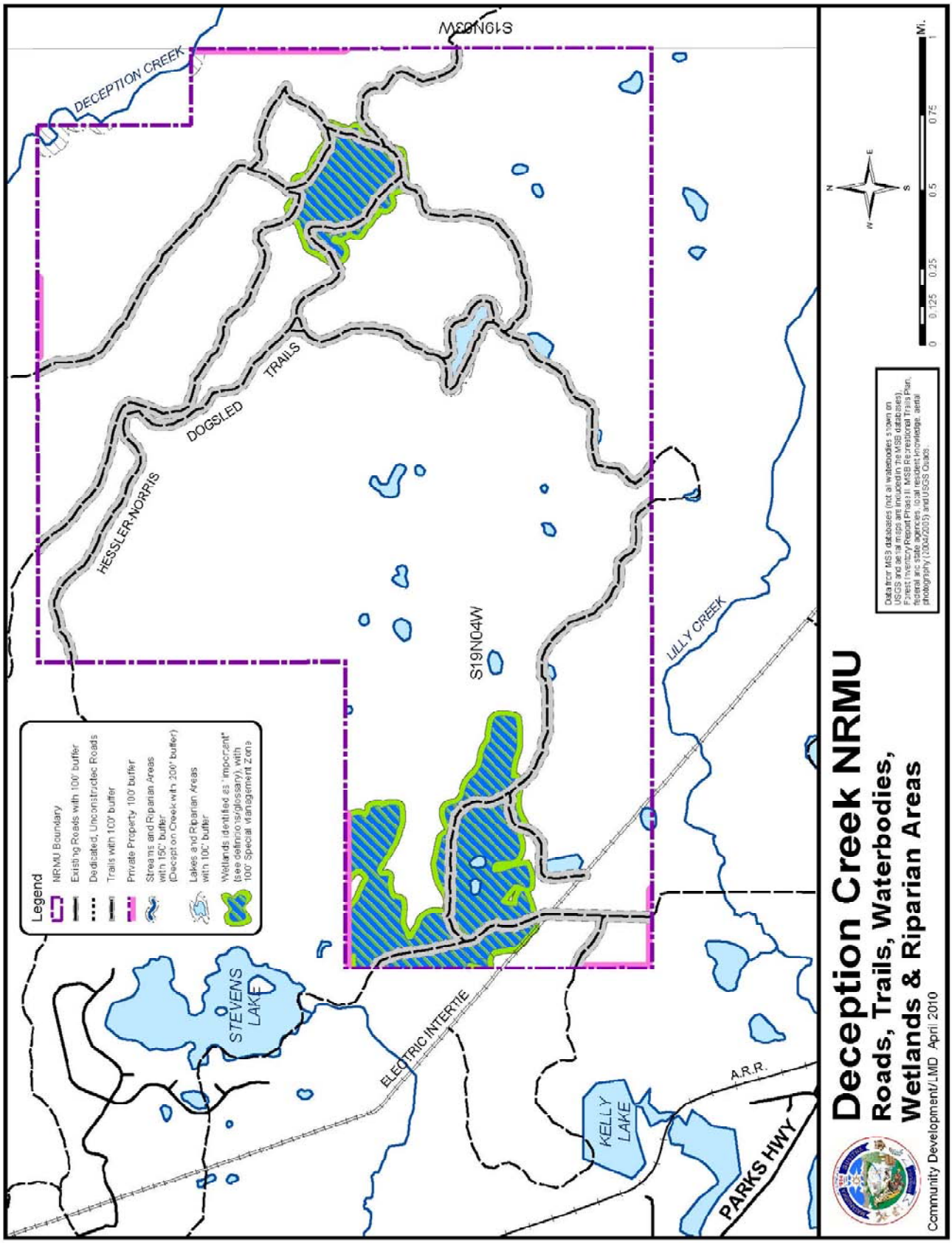
Deception Creek NRMU
Roads, Trails, Waterbodies, Wetlands & Riparian Areas
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Private Property 100' buffer
Streams and Riparian Areas with 150' buffer (Deception Creek with 200' buffer)
Lakes and Riparian Areas with 100' buffer
Wetlands identified as "important" (see definition in glossary), with 100' Special Management Zone
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TRAILS
S19N04W
LILLY CREEK
STEVENS LAKE
ELECTRIC INTERTIE
KELLY LAKE
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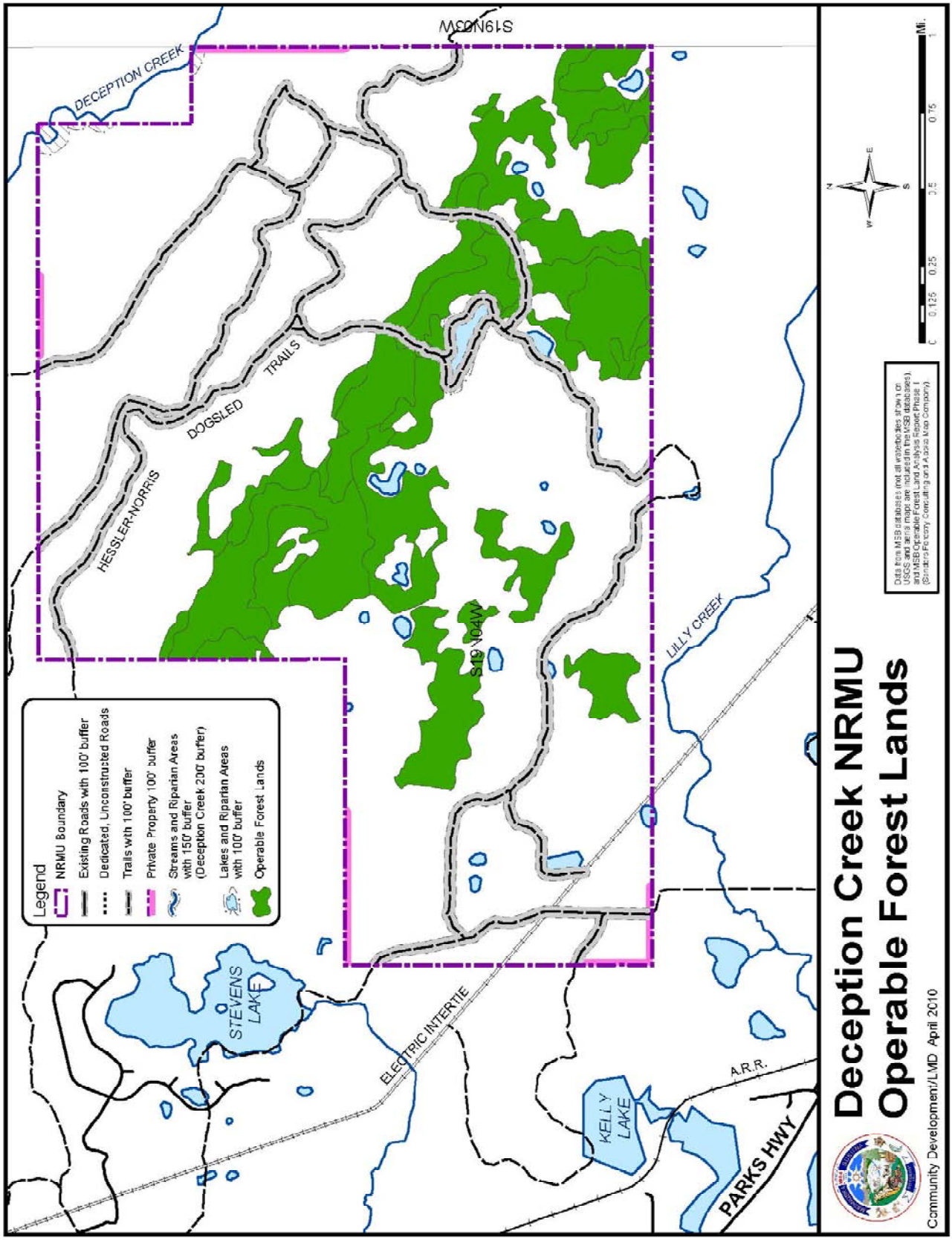
Deception Creek NRMU
Operable Forest Lands
Community Development/LMD April 2010
Legend
NRMU Boundary
Existing Roads with 100' buffer
Dedicated, Unconstructed Roads
Trails with 100' buffer
Private Property 100' buffer
Streams and Riparian Areas with 150' buffer (Deception Creek 200' buffer)
Lakes and Riparian Areas with 100' buffer
Operable Forest Lands
Data from MSB databases (not all waterbodies shown on USGS and aerial maps are included in the MSB databases), and MSB Operable Forest Land Analysis Report Phase I (Sandstone Forestry Consulting and Alaska Map Company)
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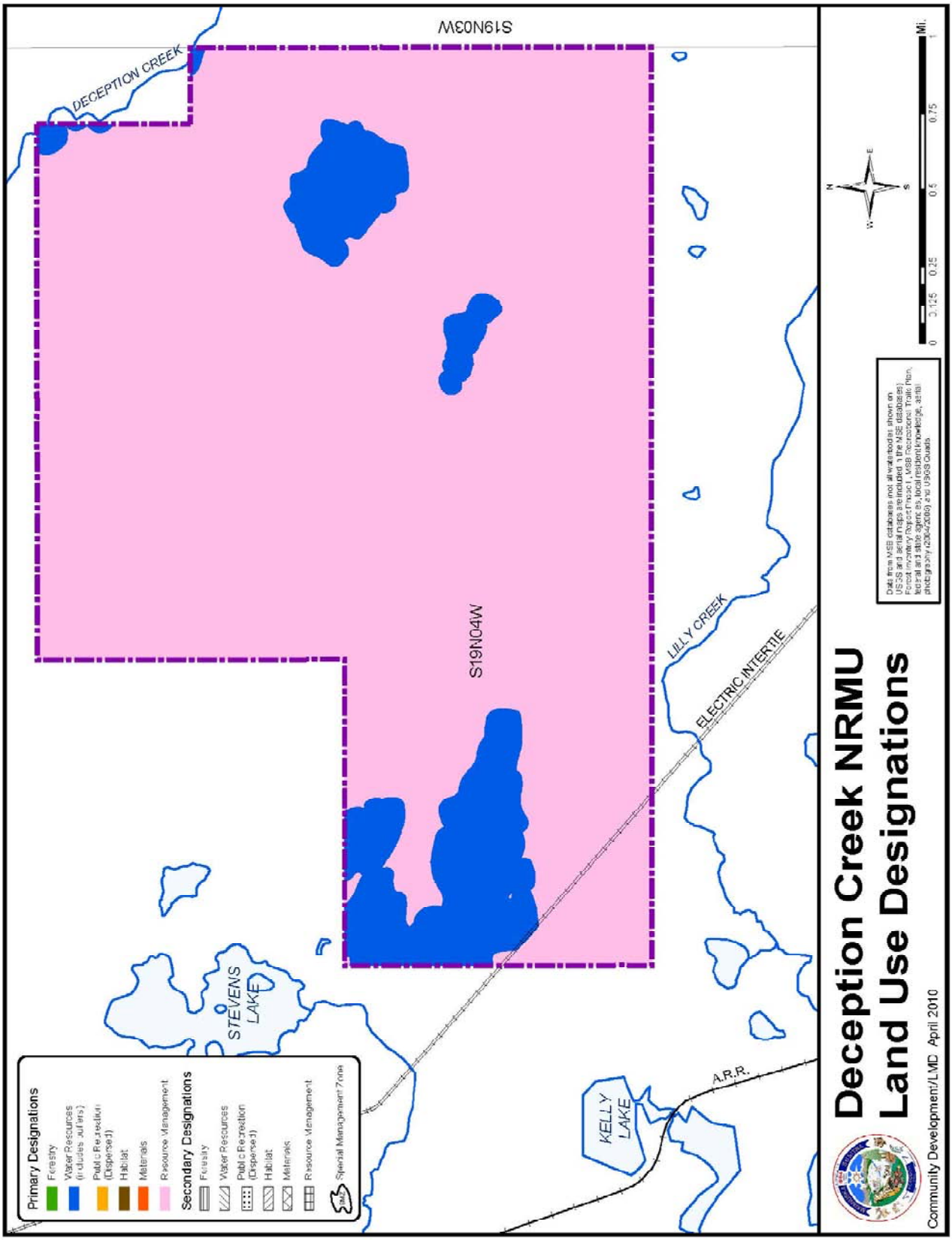
HESSLER-NORRIS
DOGSLED
TRAILS
LILLY CREEK
STEVENS LAKE
ELECTRIC INTERTIE
KELLY LAKE
A.R.R.
PARKS HWY


Deception Creek NRMU
Land Use Designations
Community Development/LMD April 2010
Primary Designations
Forestry
Water Resources (includes buffers)
Public Recreation (Dispersed)
Habitat
Materials
Resource Management
Secondary Designations
Forestry
Water Resources
Public Recreation (Dispersed)
Habitat
Materials
Resource Management
Special Management Zone
S19N03W
S19N04W
DECEPTION CREEK
LILLY CREEK
ELECTRIC INTERTIE
STEVENS LAKE
KELLY LAKE
A.R.R.
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DECEPTION CREEK
Natural Resource Management Unit

General Information

The Deception Creek Natural Resource Management Unit contains approximately 3,120 acres. The unit is located approximately 3/4 of a mile east of the Alaska Railroad and 1 mile east of the Parks Highway. Willow Creek and the Willow Fishhook Road are located approximately 4 miles to the north of the unit. The Anchorage-Fairbanks electric Intertie passes through the southwest portion of the unit.

This unit is in the Susitna Lowlands which is generally flat with some rolling terrain. The area has large areas of poorly drained soils, some wetlands and with some moderately to well drained soils in the hilly areas which cut diagonally southeast to northwest through the center of the unit.

Borough Tax Maps
Willow 9 and 16

Current Land Use
General dispersed public recreation. There are numerous dog mushing trails that are located within the unit.

Surrounding Land Use
General dispersed public recreation. The same dog mushing trails that are located within the unit extend onto the adjoining land. There has also been some timber harvest on state land in the general area.

Community Council Area
Willow Area Community Organization

Existing Land Use Plans:

- Alaska, Department of Natural Resources, *Southeast Susitna Area Plan* (2009); state land in the area has been designated as forestry. This plan replaced the *Willow Sub-Basin Area Plan* (1982), and the *Deception Creek Land Use Plan* (1989). The *Southeast Susitna Area Plan* does not apply to borough land.
- Mat-Su Borough, *Recreational Trails Plan* (2007).
- Mat-Su Borough *Parks, Recreation and Open Space Plan* (2001), which is currently being updated.

The Willow Area Community Organization is currently working on a Comprehensive Plan for this area.

Existing Land Use Classifications
General Purpose and Unclassified

Summary of Resources and Uses

Agriculture and Grazing

A review of soil types, published by the Department of Agriculture, Natural Resources Conservation Service (http://websoilsurvey.ncrs.usda.gov/app/), indicates that there are no known lands suitable for agricultural development or grazing within the unit.

Also, see *Soils* map at the beginning of this section.

Cultural Resources and Heritage Sites

There are no documented historical or heritage sites within the unit. Known cache pits were previously located at the confluence of Deception Creek with Willow Creek which is outside of the unit. They have since been destroyed by gravel pit operations. There is a strong likelihood of native subsistence historic/prehistoric sites associated with Lily Creek, Stevens Lake and the wetlands within the unit.

No cultural survey has taken place with this unit. Additional field work will be required if any natural resource extraction or other development activities take place in the unit.

Fish and Wildlife Habitat and Resources

Moose and Black and Brown bears are fairly common in the unit. The moose population is relatively high and the habitat supports the current population. The unit is a transition range for moose, between their wintering and summer range. Moose winter range could be improved with habitat manipulation which could include timber harvest. Improving winter range would reduce moose mortality along the Parks Highway and Alaska Railroad corridors.

Moderate numbers of furbearer species occur throughout the area.

Residents of the area have reported seeing bear dens and Trumpeter Swans in the unit. There are no known or eagle nests within the unit, but the habitat is such that they could exist in the unit. Additional fieldwork will be required prior to any natural resource extraction or other development activities taking place to verify this information.

Deception Creek is the only cataloged anadromous fish stream in the unit. Dolly Varden, Rainbow Trout and grayling also reside in Deception Creek.

Prior to any resource extraction projects, the anadromous fish distribution in any wetlands should be established, any additional anadromous or important resident fish waterbodies need to be identified and the Alaska Department of Fish and Game will need to verify the cataloged anadromous resident fish streams as described above.

The Alaska Department of Fish and Game will require Fish Habitat Permits, accompanied by detailed project plans, prior to any planned resource extraction project adjacent to anadromous or resident waterbodies.

There is no known commercial hunting or fishing camps in the unit.

Forest Resources

The principal timber type is relatively younger-growth forest with high composition of hardwood, primarily birch and aspen. Although young, this timber type contains a relatively high timber volume per acre. Within the 3,118 acre unit, there is 1,027 acres of (33% of the unit) Commercial Forest Land, of which 676 acres (22% of the unit) is considered as Operable Forest Land.

The 2009 Operable Forest Land Analysis Report found the following timber composition within the unit:

Stratum 1: Pole Timber – Closed Canopy	383 acres
Stratum 2: Pole Timber – Open Canopy	0 acres
Stratum 3: Hardwood Saw Timber – Closed Canopy	0 acres
Stratum 4: Hardwood Saw Timber – Open Canopy	74 acres
Stratum 5: Mixed Forest Saw Timber – Closed Canopy	154 acres
Stratum 6: Mixed Forest Saw Timber – Open Canopy	65 acres
TOTAL	**676 acres**

Also, see *Operable Forest Lands* map at the beginning of this section.

Private Property

There is no private property within the unit.

Public Recreation and Tourism

Year around public recreation does occur in the area, mainly for fishing in the summer, hunting in the fall, and snowmobiling and dog mushing in the winter.

There is no specific resource or activity that draws tourists to this area.

Roads and Trails:

The closest access is the Alaska Railroad and the Parks Highway, both approximately 1 to 2 miles to the west.

The Hessler-Norris Dogsled Trail System traverses extensively throughout the unit.

The Willow Area Community Organization adopted the Willow Area Trails Plan in 2006 which documents historical and current trails and uses in the unit.

Also, see the *Roads, Trails, Waterbodies, Wetlands and Riparian Areas* map at the beginning of this section.

Rock, Sand and Gravel

Soil mapping (see http://websoilsurvey.ncrs.usda.gov/app/) indicates that there are no rock, sand or gravel commercial quantities of rock, sand and gravel within the unit. A more extensive field inventory will be necessary to determine the volume, extent and feasibility of developing this resource.

Also, see *Soils* map at the beginning of this section.

Unit Management Intent

The management intent for the Deception Creek Natural Resource Management Unit shall be for general resource management purposes. Because of the location of this unit and the land of any dominate resource or use, the unit shall be managed to protect water resources, encourage continued recreational uses of the area, improving wildlife habitat and meeting some wood product needs. Forest management and timber harvest shall be permitted as long as it does not significantly reduce the areas recreational uses.

Land Use Designations

Deception Creek		
Designation	**Classification**	**Management Intent**
Primary		
Resource Management	Resource Management Lands	All upland areas, except those designated as water resources. Available for forest management and timber harvests in those areas determined to be operable forest land and where it does not significantly reduce the areas recreational activities. Protect and improve important wildlife habitat areas. Recognize and manage for the units recreational uses.

Deception Creek		
Designation	Classification	Management Intent
Primary		
Water Resources	Watershed Lands	All waterbodies, riparian areas, and important wetlands. Any waterbodies, riparian areas or important wetlands determined after adoption of this plan to be anadromous, important for resident fish, or important wetlands for fish and wildlife shall also be similarly designated and classified[10].
Secondary		
None		

Also, see the *Land Use Designations* map at the beginning of this section.

Management Guidelines

See Volume I, Chapters 2 and 3 for area-wide guidelines for all Natural Resource Management Units. The remainder of this section presents unit specific guidelines.

<u>Buffers and Special Management Zones</u>
All flowing waterbodies, including lakes that are part of a flowing water system that are connected to creeks, streams and rivers, and riparian areas will be protected through the use of undisturbed natural vegetation buffers.

All wetlands over 40 acres and all smaller important wetland areas (see definition in *Definitions/Glossary* in Volume III) shall be protected with a Special Management Zone which shall include a 100-foot area around the wetland area. The Zone shall not allow disturbance of the wetland area, but some uses may be allowed. For example, winter time recreational use is allowed when no waterfowl are present and sufficient snow cover exists to not harm the natural vegetation.

At such time that new activities are planned in the unit, all potentially impacted waterbodies and wetlands shall be assessed as to their habitat and watershed value. Depending on the assessment, the waterbodies and wetlands will be provided additional protection through the use of buffers or placed in a Special Management Zone, as appropriate.

The Hessler-Norris Trail System shall be buffered.

[10] Such designation and classification shall be considered as a "Minor Change" to the Plan (See Volume I, Chapter 4, *Procedures for Changes to the Plan, Goals, and Guidelines.*

See *Roads, Trails, Waterbodies, Wetlands and Riparian Areas* map at the beginning of this section for, wetlands with a Special Management Zone, waterbodies and roads and trails with buffers.

Also, see Volume I, Chapter 2, *Buffers* and *Special Management Zones* for additional information.

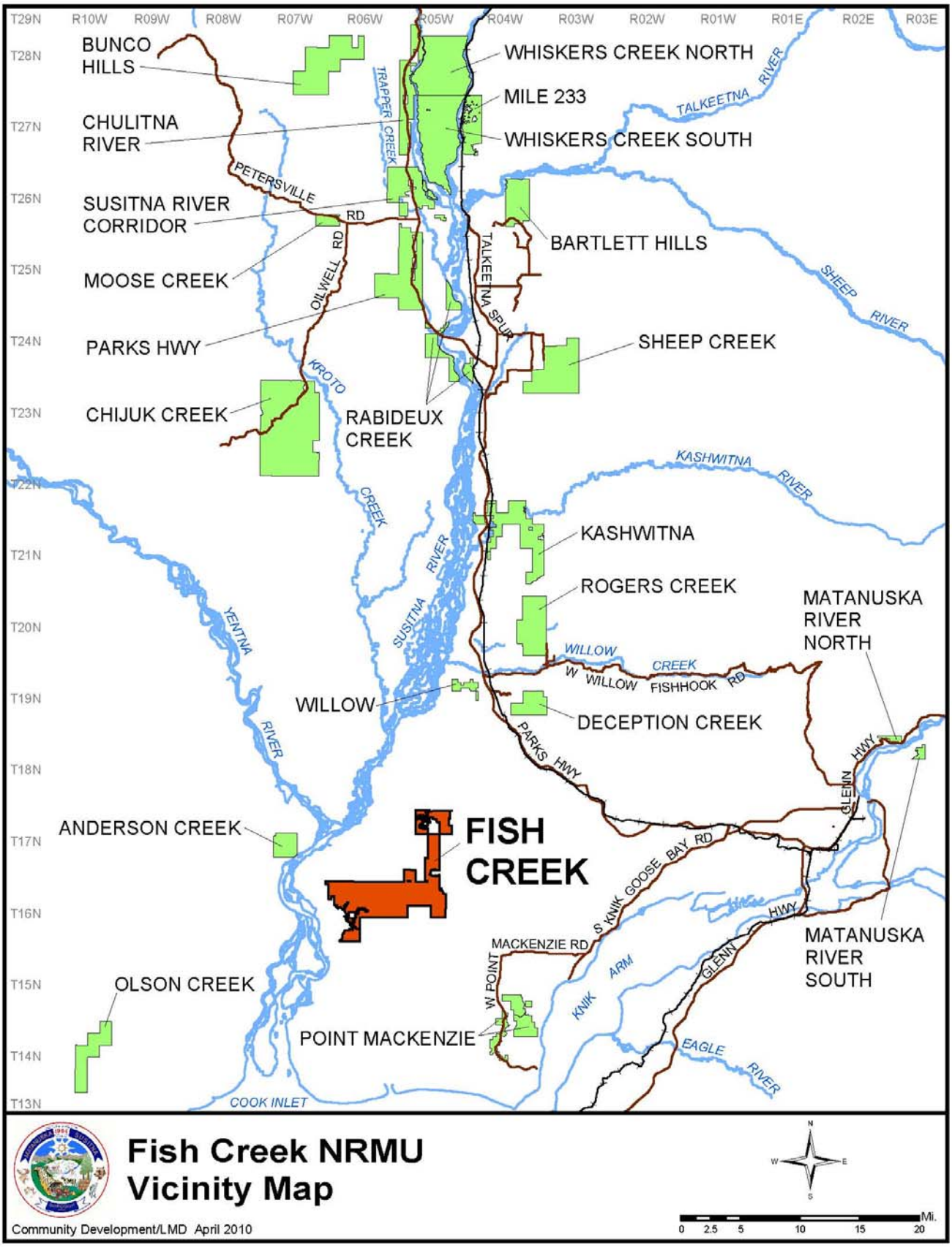
Forest Management

Timber harvests are permitted when and where it does not significantly reduce the areas recreational activities. Timber harvest shall be managed for improving forest health, wildlife habitat, and providing forest products utilizing professionally accepted practices. Examples include firewood, sawlogs and selective harvest for specialty wood products. This may include harvesting (selective thinning) the existing pole timber (Stratum 1) in order to produce an overall higher value product (sawlogs) at maturity.

Large acreage (approximately 100 acres) timber harvests shall only be held after consultation with and/or at the request of the Alaska Department of Fish and Game. Harvest units should be laid out to improve wildlife habitat, especially winter habitat for moose to reduce transportation related fatalities.

Other Uses

No additional unit-specific guidelines are needed for this unit. See Volume I, Chapters 2 and 3 for area-wide guidelines that apply to all Natural Resource Management Units.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BUNCO HILLS
CHULITNA RIVER
SUSITNA RIVER CORRIDOR
MOOSE CREEK
PARKS HWY
CHIJUK CREEK
WHISKERS CREEK NORTH
MILE 233
WHISKERS CREEK SOUTH
BARTLETT HILLS
SHEEP CREEK
RABIDEUX CREEK
KASHWITNA
ROGERS CREEK
MATANUSKA RIVER NORTH
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DECEPTION CREEK
ANDERSON CREEK
FISH CREEK
MATANUSKA RIVER SOUTH
OLSON CREEK
POINT MACKENZIE
TRAPPER CREEK
PETERSVILLE RD
OILWELL RD
TALKEETNA SPUR
KROTO CREEK
SUSITNA RIVER
YENTNA RIVER
TALKEETNA RIVER
SHEEP RIVER
KASHWITNA RIVER
WILLOW CREEK
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PARKS HWY
GLENN HWY
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COOK INLET
Fish Creek NRMU
Vicinity Map
Community Development/LMD April 2010
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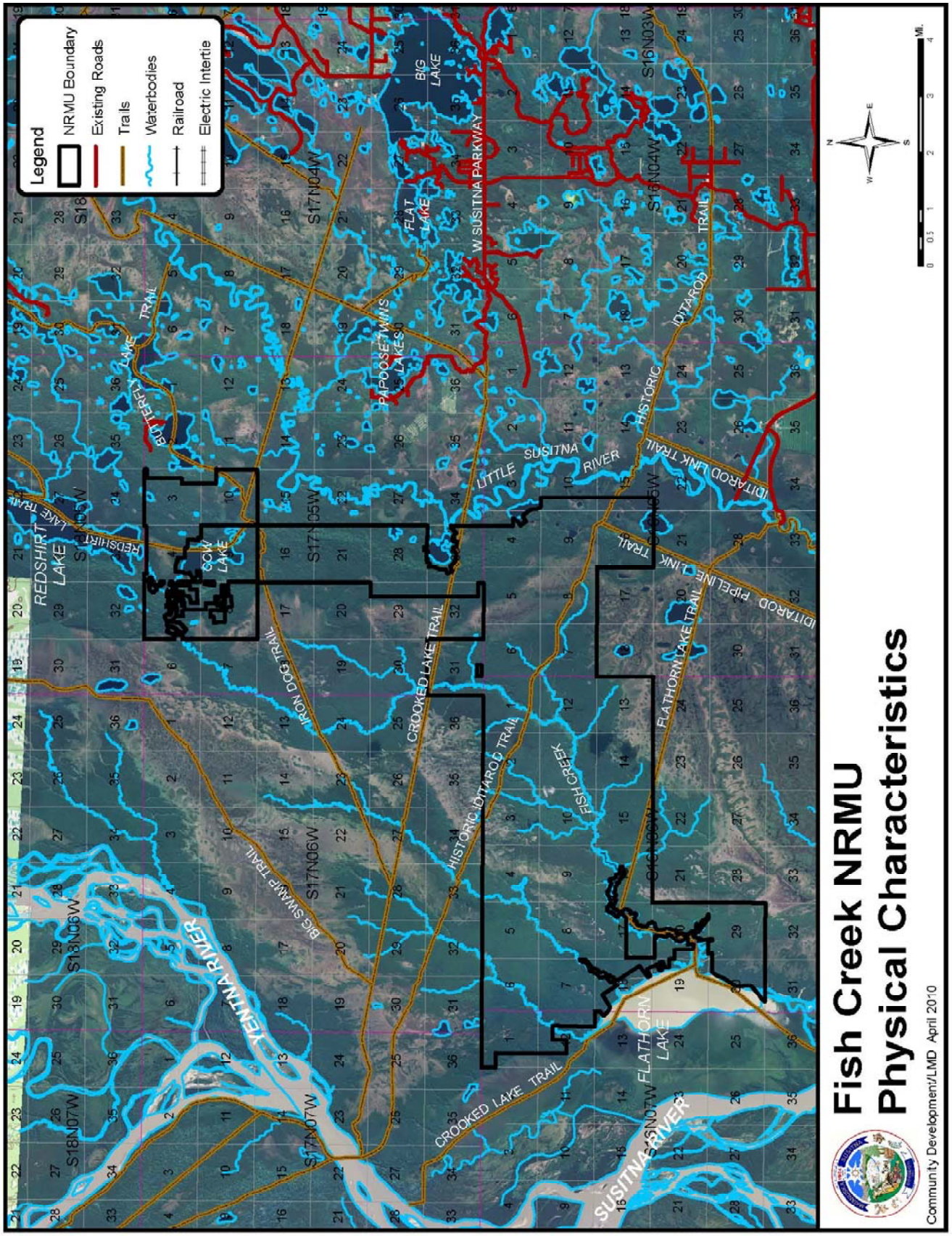
Legend
NRMU Boundary
Existing Roads
Trails
Waterbodies
Railroad
Electric Intertie
Fish Creek NRMU
Physical Characteristics
Community Development/LMD April 2010
REDSHIRT LAKE
COW LAKE
BUTTERFLY LAKE
PAPOOSE TWINS LAKES
FLAT LAKE
BIG LAKE
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LITTLE SUSITNA RIVER
HISTORIC IDITAROD TRAIL
IDITAROD PIPELINE LINK TRAIL
FLATHORN LAKE TRAIL
FLATHORN LAKE
FISH CREEK
CROOKED LAKE TRAIL
IRON DOG TRAIL
BIG SWAMP TRAIL
YENTNA RIVER
SUSITNA RIVER
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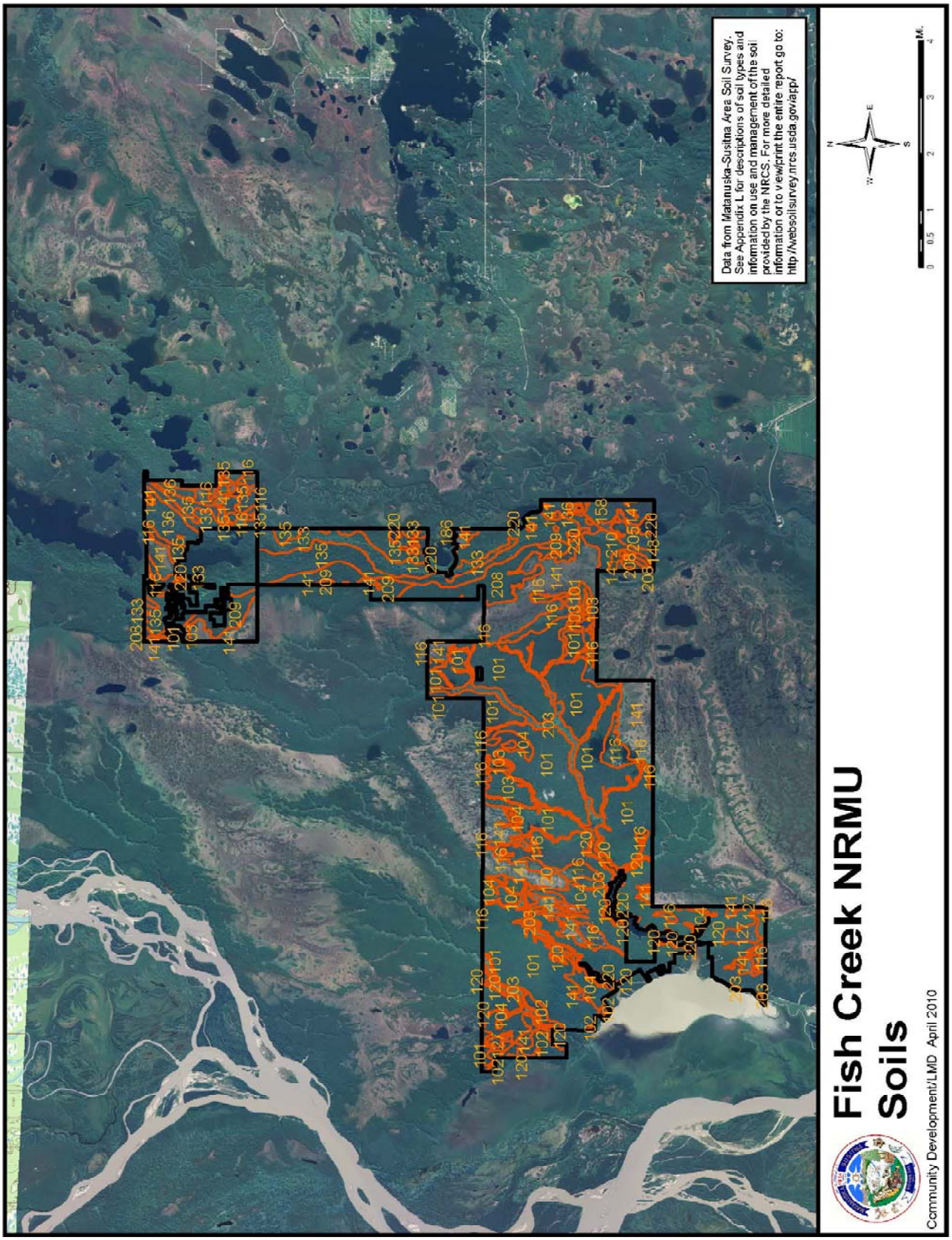
Data from Matanuska-Susitna Area Soil Survey.
See Appendix L for descriptions of soil types and information on use and management of the soil provided by the NRCS. For more detailed information or to view/print the entire report go to:
http://websoilsurvey.nrcs.usda.gov/app/
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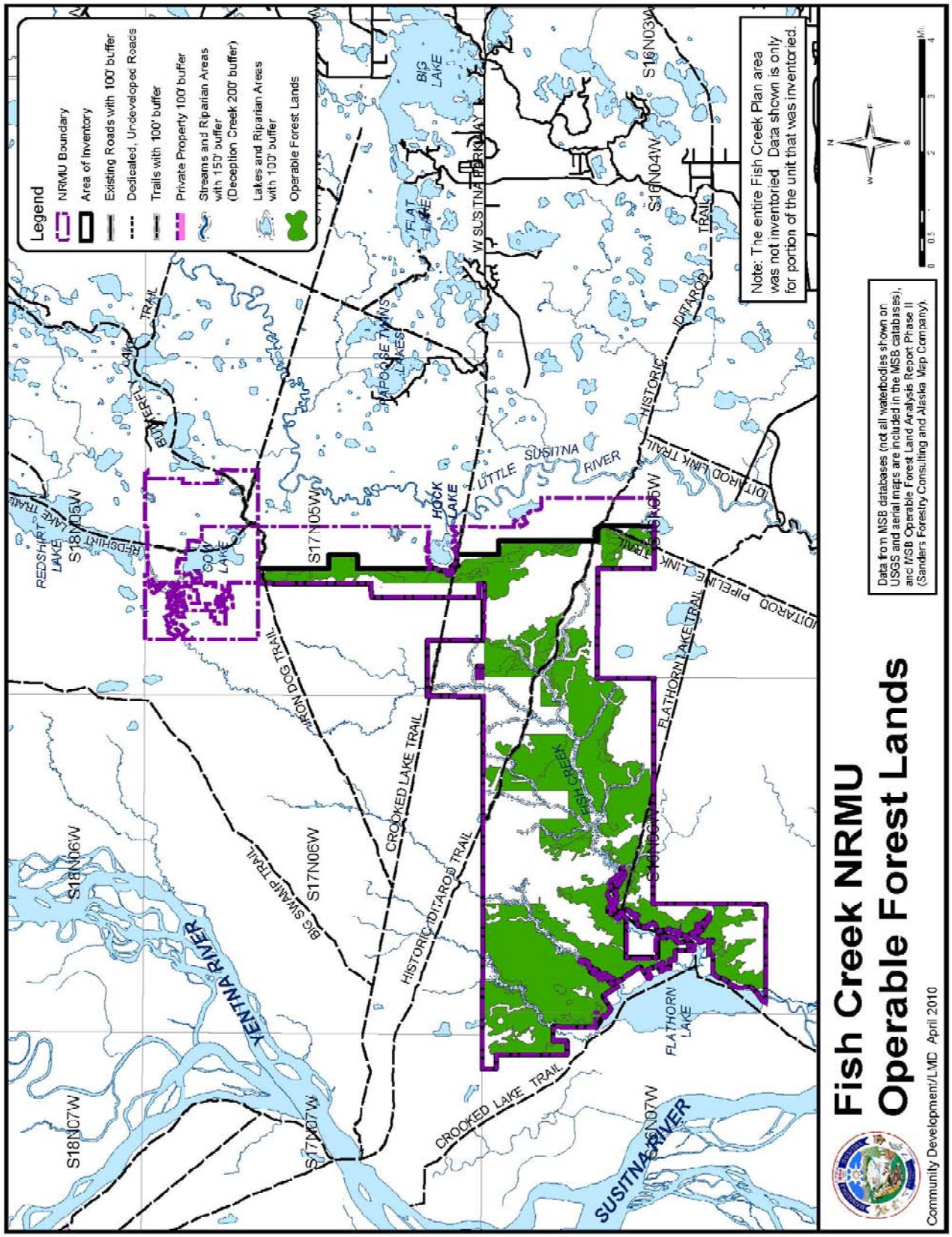
Soils
Community Development/LMD April 2010


Legend
NRMU Boundary
Area of Inventory
Existing Roads with 100' buffer
Dedicated, Undeveloped Roads
Trails with 100' buffer
Private Property 100' buffer
Streams and Riparian Areas with 150' buffer (Deception Creek 200' buffer)
Lakes and Riparian Areas with 100' buffer
Operable Forest Lands
Note: The entire Fish Creek Plan area was not inventoried. Data shown is only for portion of the unit that was inventoried.
Data from MSB databases (not all waterbodies shown on USGS and aerial maps are included in the MSB databases), and MSB Operable Forest Land Analysis Report Phase II (Sanders Forestry Consulting and Alaska Map Company).
Fish Creek NRMU
Operable Forest Lands
Community Development/LMD April 2010
SUSITNA RIVER
LITTLE SUSITNA RIVER
FISH CREEK
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BIG SWAMP TRAIL
IRON DOG TRAIL
HISTORIC IDITAROD TRAIL
FLATHORN LAKE TRAIL
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BIG LAKE
FLAT LAKE
HOCK LAKE
GOW LAKE
REDSHIRT LAKE
BUTTERFLY LAKE
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S18N05W
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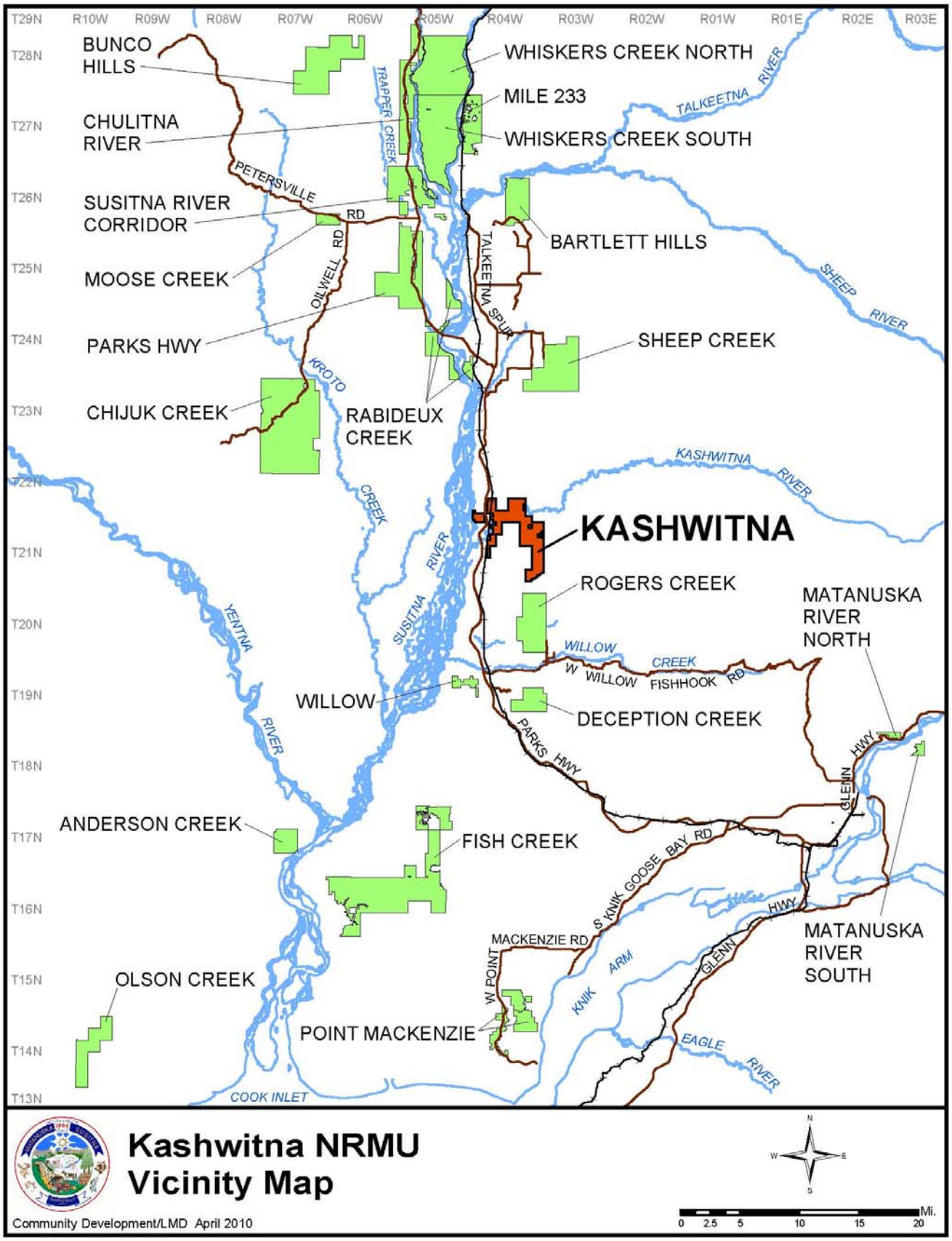
S16N03W

FISH CREEK
Natural Resource Management Unit

The Fish Creek Management Plan was written and adopted separately (Ordinance Serial # 09-130, September 15, 2009) from this Natural Resource Management Unit Plan process. Although adopted separately the area covered by the Fish Creek Management Plan is a Natural Resource Management Unit.

The Fish Creek management Plan covers both state (14,860 acres) and borough (28,450 acres) owned land and governs the management of both borough and state land.

Please see the Fish Creek Management Plan for the management intent, land-use classifications, land-use designations, guidelines and best management practices to be used for managing this area.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BUNCO HILLS
CHULITNA RIVER
SUSITNA RIVER CORRIDOR
MOOSE CREEK
PARKS HWY
CHIJUK CREEK
WHISKERS CREEK NORTH
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WHISKERS CREEK SOUTH
BARTLETT HILLS
SHEEP CREEK
RABIDEUX CREEK
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ROGERS CREEK
MATANUSKA RIVER NORTH
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KROTO CREEK
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Kashwitna NRMU
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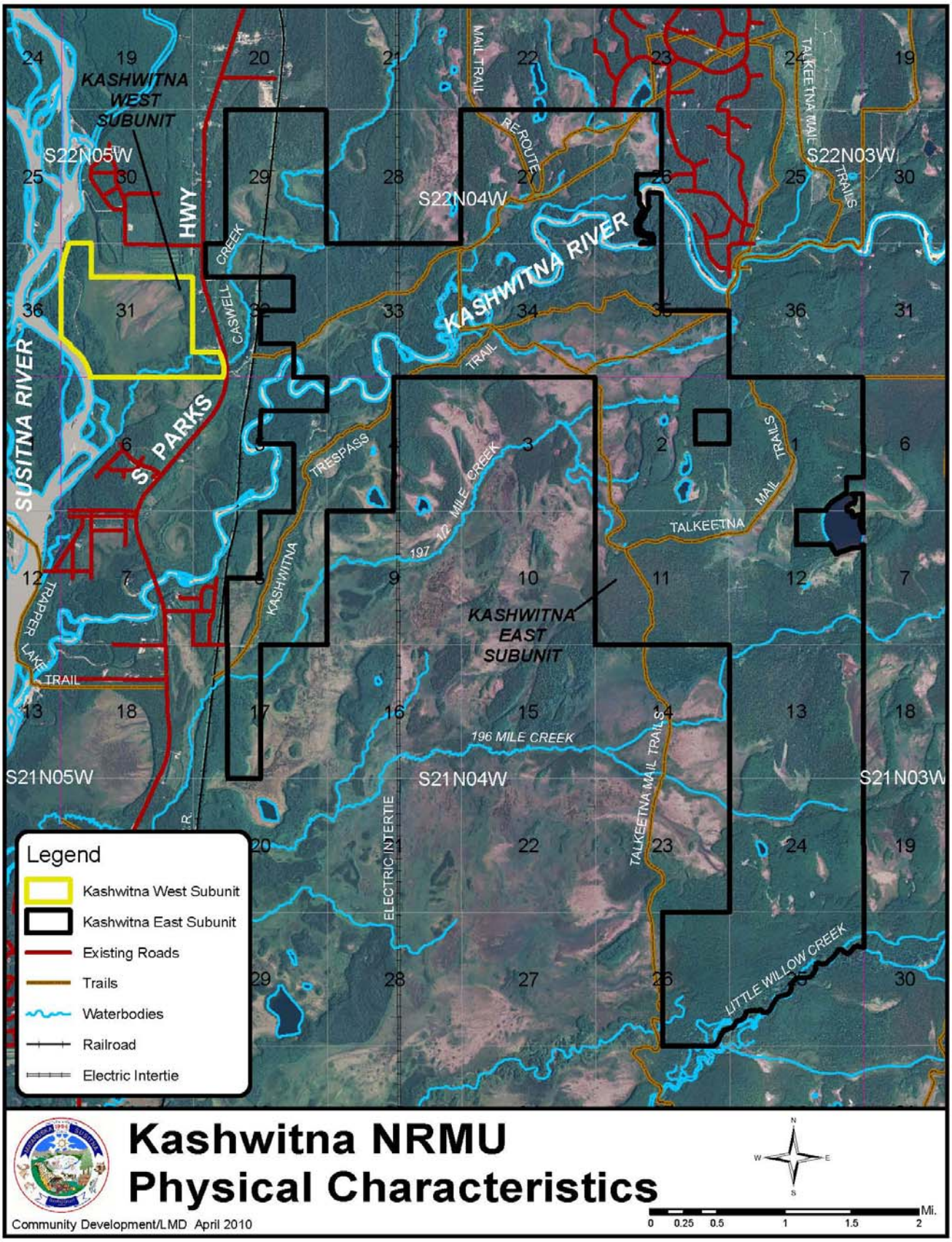
KASHWITNA WEST SUBUNIT
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KASHWITNA RIVER
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CASWELL CREEK
MAIL TRAIL
REROUTE
TALKEETNA MAIL TRAILS
TRESPASS
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KASHWITNA
TALKEETNA MAIL TRAILS
KASHWITNA EAST SUBUNIT
TRAPPER LAKE TRAIL
196 MILE CREEK
ELECTRIC INTERTIE
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Kashwitna West Subunit
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Existing Roads
Trails
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Electric Intertie
Kashwitna NRMU
Physical Characteristics
Community Development/LMD April 2010
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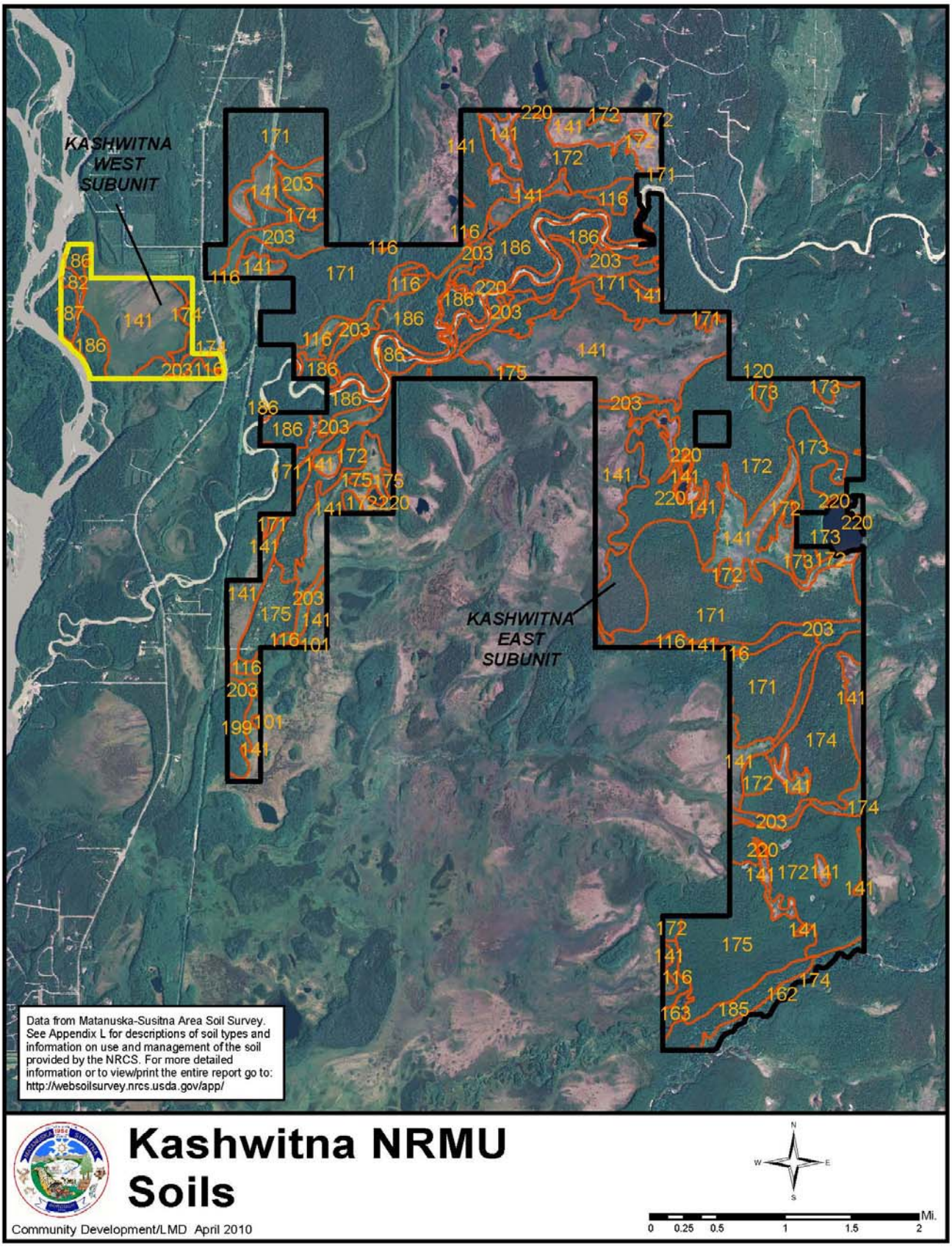
KASHWITNA WEST SUBUNIT
KASHWITNA EAST SUBUNIT
Data from Matanuska-Susitna Area Soil Survey. See Appendix L for descriptions of soil types and information on use and management of the soil provided by the NRCS. For more detailed information or to view/print the entire report go to: http://websoilsurvey.nrcs.usda.gov/app/
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Soils
Community Development/LMD April 2010
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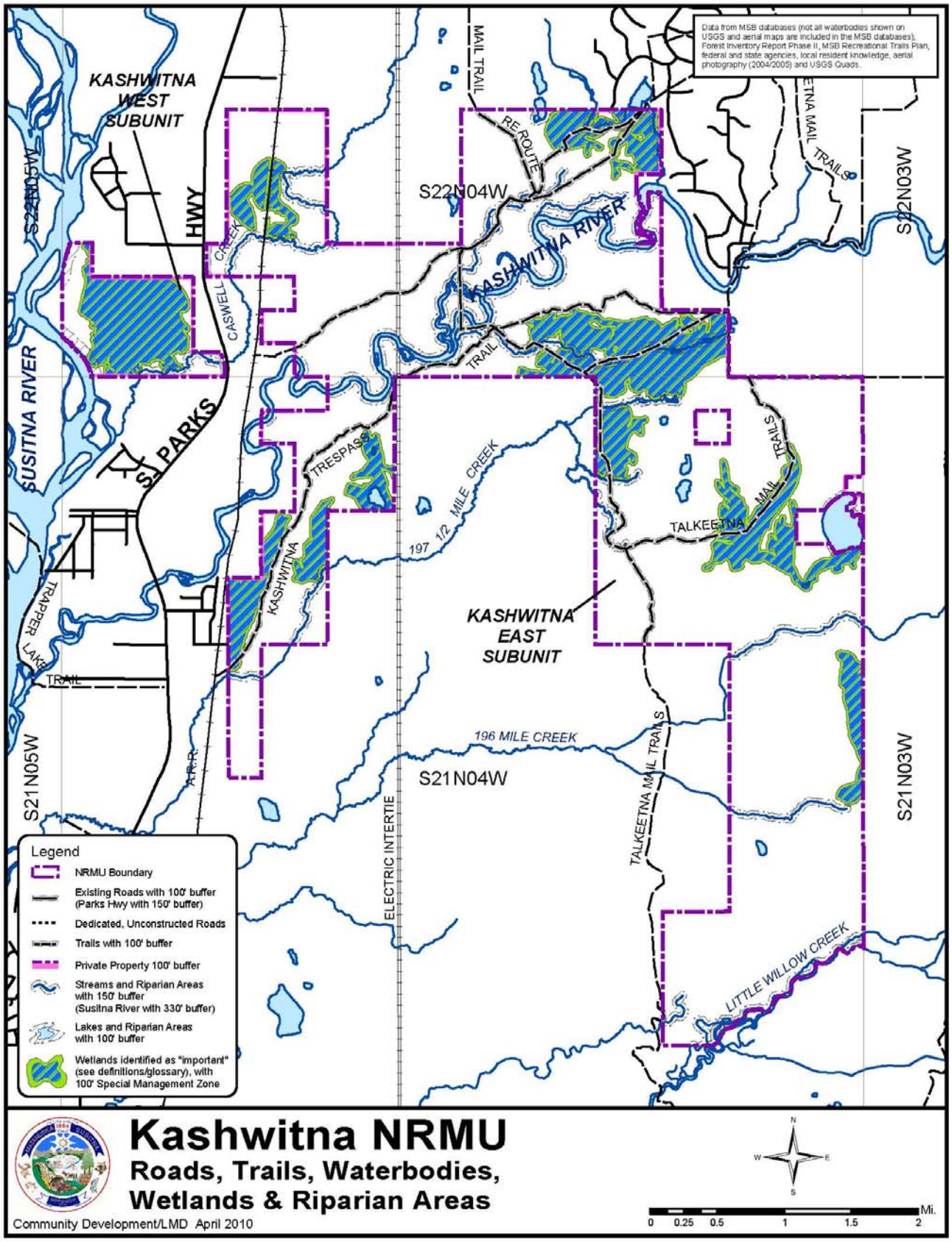
Data from MSB databases (not all waterbodies shown on USGS and aerial maps are included in the MSB databases), Forest Inventory Report Phase II, MSB Recreational Trails Plan, federal and state agencies, local resident knowledge, aerial photography (2004/2005) and USGS Quads.
KASHWITNA WEST SUBUNIT
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SUSITNA RIVER
PARKS
TRESPASS
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TALKEETNA MAIL TRAILS
KASHWITNA
KASHWITNA EAST SUBUNIT
TRAPPER LAKE TRAIL
196 MILE CREEK
S21N05W
A.T.R.R.
S21N04W
ELECTRIC INTERTIE
TALKEETNA MAIL TRAILS
S21N03W
LITTLE WILLOW CREEK
Legend
NRMU Boundary
Existing Roads with 100' buffer (Parks Hwy with 150' buffer)
Dedicated, Unconstructed Roads
Trails with 100' buffer
Private Property 100' buffer
Streams and Riparian Areas with 150' buffer (Susitna River with 330' buffer)
Lakes and Riparian Areas with 100' buffer
Wetlands identified as "important" (see definitions/glossary), with 100' Special Management Zone
Kashwitna NRMU
Roads, Trails, Waterbodies, Wetlands & Riparian Areas
Community Development/LMD April 2010
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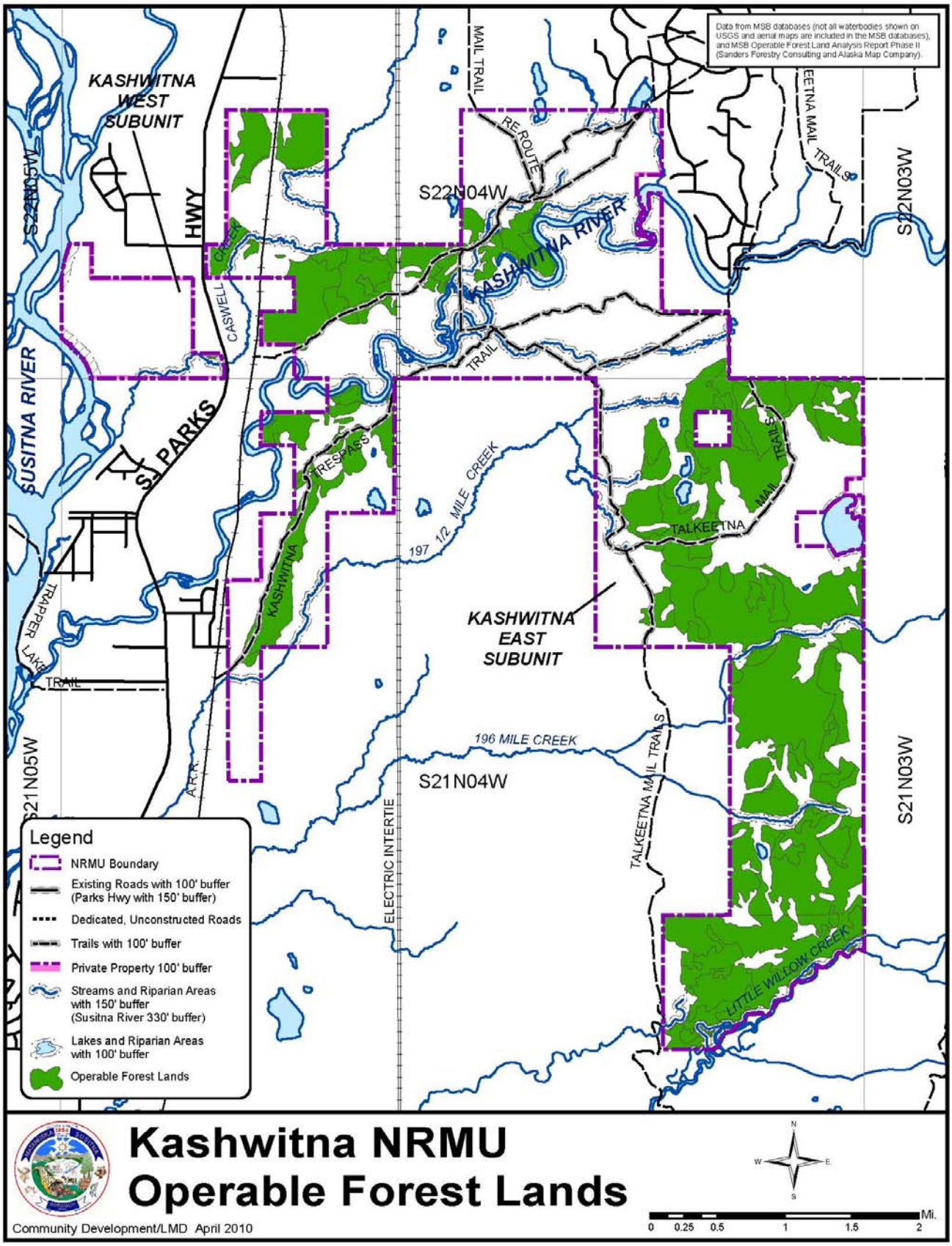
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KASHWITNA WEST SUBUNIT
KASHWITNA EAST SUBUNIT
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CASWELL CREEK
MAIL TRAIL
REROUTE
TALKEETNA MAIL TRAILS
TRAIL
TRESPASS
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TALKEETNA
196 MILE CREEK
TRAPPER LAKE TRAIL
A.R.R.
ELECTRIC INTERTIE
LITTLE WILLOW CREEK
Legend
NRMU Boundary
Existing Roads with 100' buffer (Parks Hwy with 150' buffer)
Dedicated, Unconstructed Roads
Trails with 100' buffer
Private Property 100' buffer
Streams and Riparian Areas with 150' buffer (Susitna River 330' buffer)
Lakes and Riparian Areas with 100' buffer
Operable Forest Lands
Kashwitna NRMU
Operable Forest Lands
Community Development/LMD April 2010
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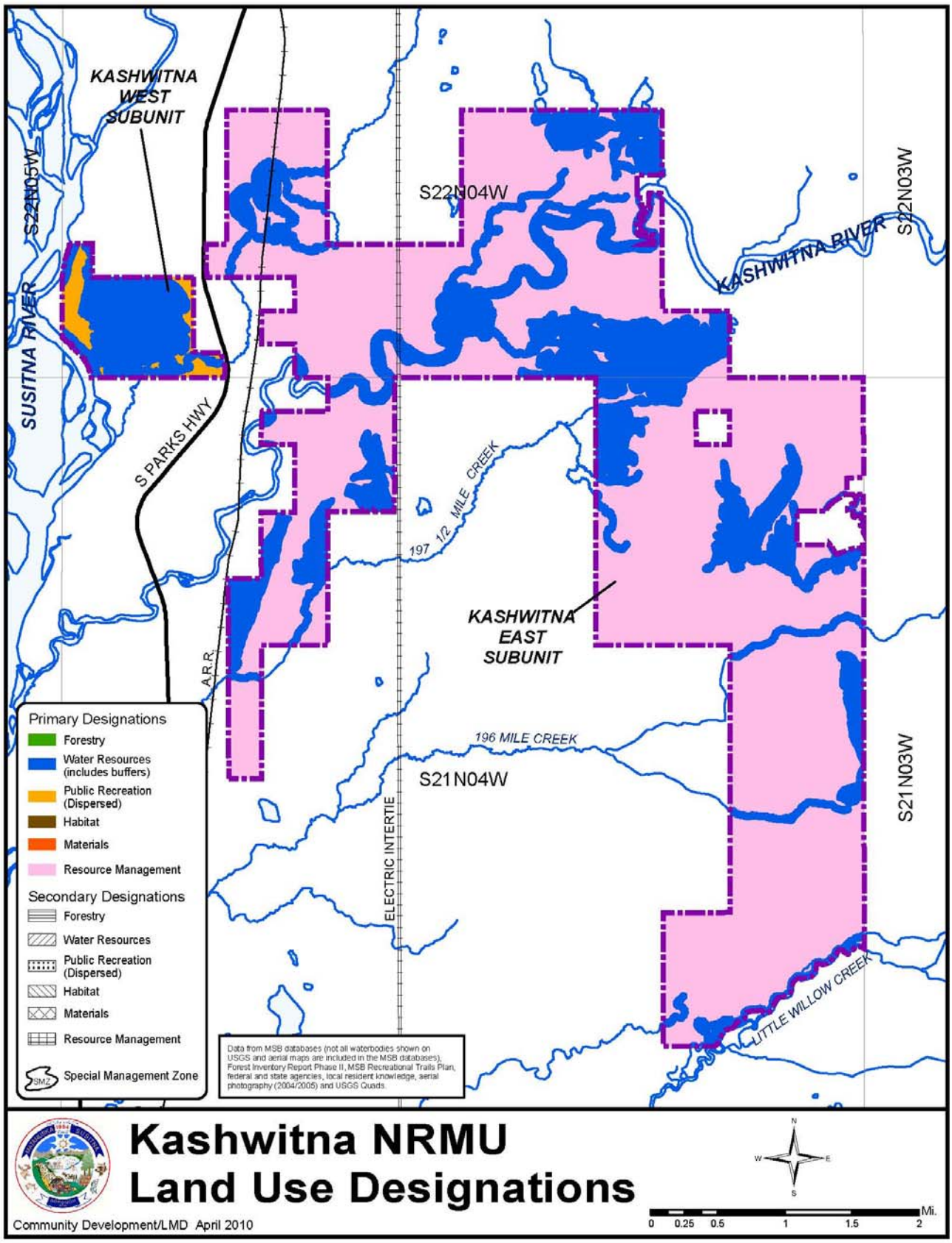
KASHWITNA WEST SUBUNIT
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197 1/2 MILE CREEK
KASHWITNA EAST SUBUNIT
196 MILE CREEK
S21N04W
ELECTRIC INTERTIE
S21N03W
LITTLE WILLOW CREEK
Primary Designations
Forestry
Water Resources (includes buffers)
Public Recreation (Dispersed)
Habitat
Materials
Resource Management
Secondary Designations
Forestry
Water Resources
Public Recreation (Dispersed)
Habitat
Materials
Resource Management
SMZ
Special Management Zone
Data from MSB databases (not all waterbodies shown on USGS and aerial maps are included in the MSB databases), Forest Inventory Report Phase II, MSB Recreational Trails Plan, federal and state agencies, local resident knowledge, aerial photography (2004/2005) and USGS Quads.
Kashwitna NRMU
Land Use Designations
Community Development/LMD April 2010
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KASHWITNA
Natural Resource Management Unit

General Information

The Kashwitna Natural Resource Management contains about 9,360 acres. The unit is located east of the Susitna River with the Alaska Railroad and Parks Highway bisecting part of the unit. The Kashwitna River and Caswell Creek transect the northern portion of the unit and Little Willow Creek forms the southern boundary of the unit.

The unit is between 8 to 12 miles north of Willow. The Anchorage to Fairbanks electric intertie runs north-south through the center of the unit roughly paralleling the Alaska Railroad Corporation rail line which is 1-mile to the west.

This unit is in the Susitna Lowlands that is generally flat with some rolling terrain. The area has areas of poorly drained soils with wetland areas interspersed with some moderately to well drained soils in the hilly areas.

Borough Tax Maps
Caswell 7, 8, 9, 10, and 16.

Current Land Use
The unit has a variety of dispersed recreational uses, mainly in the winter when access to the area is easier. There has also been some timber harvest within the unit.

Surrounding Land Use
The adjoining land is owned by the State of Alaska. Timber harvests have taken place on these lands and general dispersed recreational use also occurs.

Community Council Areas
Susitna Community Council
Willow Area Community Organization

Existing Land Use Plans

- Mat-Su Borough, *Multiple Use Forest Management Plan*, 1989, which will be replaced by this plan.
- Alaska Department of Natural Resources, *Southeast Susitna Area Plan* (2009); the state land adjoining the unit has been designated as forestry. This plan, replaced the *Susitna Area Plan* (1985) and the *Willow Sub-Basin Area Plan* (1982). The *Southeast Susitna Area Plan* does not affect borough land.
- Mat-Su Borough, *Recreational Trails Plan* (2007).
- Mat-Su Borough, *Parks, Recreation and Open Space Plan* (2001), which is currently being updated.

A portion of the unit lies within the Susitna Community Council boundary. The Susitna (formerly the "Y") Comprehensive Plan (2007) includes policies for:

- promoting timber harvest in a manner that helps create and maintain the rural lifestyle of the area
- reclamation requirements
- impacts on water and air quality
- lighting
- site standards for slope, natural vegetation, views
- commercial use of roads
- screening and buffers
- focused management plans for each harvest area
- reforestation requirements
- compliance and enforcement

The Willow Area Community Organization is currently working on a Comprehensive Plan for the portion of the unit that is within their community council area.

Existing Land Use Classifications
Forest Management Lands and unclassified land. In addition, there is one 40 acre parcel in Section 2, T. 21 N., R. 4 W., SM that is classified Private Recreation and is in private ownership.

Summary of Resources and Uses

Agriculture and Grazing
A review of soil types, published by the Department of Agriculture, Natural Resources Conservation Service (http://websoilsurvey.ncrs.usda.gov/app/), indicates that there are no known lands suitable for agricultural development or grazing within the unit.

Also, see *Soils* map at the beginning of this section.

Cultural Resources and Heritage Sites
A historic railroad trestle bridge is situate within Section 29, T. 22 N., R. 4 W. S.M. There are also trails that traverse through the unit that have been included in the borough's *Recreational Trails Plan*.

The general area is extremely sensitive to Native sites. The 400-500 foot elevations above the four Susitna tributaries, which include the Kashwitna River and the extensive lowlands, have a strong likelihood of harboring prehistoric hunting and camping sites.

No cultural resource survey has taken place within this unit. It is important to conduct an on-the-ground survey prior to any ground disturbing activities.

Fish and Wildlife Habitat and Resources

Most of the unit contains high-value moose habitat and supports moderate concentrations of moose in the summer with higher concentrations in the winter. Black bears are common with occasional brown bears. The existing timber and vegetation provide important wildlife cover habitat and forage. Wetland areas are common throughout the area and support a diverse number of wildlife species, mostly furbearers.

There are no documented bear dens, Trumpeter Swan or eagle nests within the unit. There have been reports of Swans and cranes using the general area and the habitat is suitable so that they could exist in the unit.

Fieldwork will be required prior to any natural resource extraction or other development activities taking place to verify this information.

This unit includes and is near several cataloged anadromous fish streams. Caswell Creek is an important Coho salmon spawning and rearing system. The Kashwitna River, with its many oxbows and sloughs, provides habitat for pink, chum, Chinook and Coho salmon spawning. Chinook salmon rearing habitat has been documented to the upper reaches of both Mile 196 and 197 ½ Mile Creeks. The Little Willow Creek drainage is important for Chinook and Coho Salmon spawning and rearing. These water bodies also support important resident fish populations of rainbow trout, grayling, Dolly Varden and char.

Prior to any resource extraction projects, the anadromous fish distribution in any wetlands should be established, any additional anadromous or important resident fish waterbodies need to be identified and the Alaska Department of Fish and Game will need to verify the cataloged anadromous resident fish streams as described above.

The Alaska Department of Fish and Game will require Fish Habitat Permits, accompanied by detailed project plans, prior to any planned resource extraction project adjacent to anadromous or resident waterbodies.

There are no commercial lodges or fish camps in the unit.

Forest Resources

Commercial Forest Lands are composed of a mosaic of mixed hardwoods, primarily birch and with some spruce timber stands ranging in size, density and age class (wildfire origins). Within the 9,358 acre unit, 5,038 acres (54% of the unit) is Commercial Forest Land, of which 5,023 acres (54% of the unit) is Operable Forest Land.

The 2009 Operable Forest Land Analysis Report found the following timber composition within the unit:

Stratum 1: Pole Timber – Closed Canopy	2,597 acres
Stratum 2: Pole Timber – Open Canopy	383 acres
Stratum 3: Hardwood Saw Timber – Closed Canopy	232 acres
Stratum 4: Hardwood Saw Timber – Open Canopy	101 acres
Stratum 5: Mixed Forest Saw Timber – Closed Canopy	1,210 acres
Stratum 6: Mixed Forest Saw Timber – Open Canopy	501 acres
TOTAL	**5,024 acres**

Also, see *Operable Forest Lands* map at the beginning of this section.

Private Property

There is one piece of private property located within the exterior boundaries of the unit. This parcel has been excluded from the unit and is not subject to this plan.

There is private land located along both the Alaska Railroad and the Parks Highway, and at other scattered locations outside the unit.

Public Recreation and Tourism

There are many unnamed and not-dedicated fishing trails via the Parks Highway that provide excellent and very active fishing opportunities along the steams within and adjacent to the unit. Moose hunting is also popular in the area.

There is no specific resource or activity that draws tourists to this area other than the fishing and hunting opportunities that residents also enjoy.

Roads and Trails

The area has access from the Alaska Railroad and the Parks Highway.

The Talkeetna Mail (Herning) Trail is an RS 2477 (RST 1691) that meanders through the unit, generally in a north/south direction through the portion of the center of the unit mainly in wetlands and low areas.

The Kashwitna Trespass Trail runs from southwest to northeast through the unit, generally paralleling the Kashwitna River which is to the north of the trail.

Also, see the *Roads, Trails, Waterbodies, Wetlands and Riparian Areas* map at the beginning of this section.

Rock, Sand and Gravel

Soil mapping (see http://websoilsurvey.ncrs.usda.gov/app/) indicates that rock, sand and gravel exist within and adjacent to the unit. Existing material sites are located either side of the Parks Highway as it traverses through the unit. There are no developed rock, sand or gravel extraction areas within the unit.

Also, see *Soils* map at the beginning of this section.

Unit Management Intent

For management purposes, the Kashwitna Natural Resource Management Unit is separated into two Subunits. One subunit lies west of the Parks Highway (Kashwitna West) and the remainder, and much larger portion of the unit, lies to the east of the Parks Highway (Kashwitna East Subunit).

The management intent for the Kashwitna West Natural Resource Management Subunit is to protect water resources and encourage continued recreational uses of the area. The primary recreation activities are concentrated along Caswell Creek where it crosses the Parks Highway and downstream to its mouth at the Susitna River.

The management intent for the Kashwitna East Natural Resource Management Subunit shall be for general resource management, primarily to to protect water resources, encourage continued recreational uses of the area, while meeting some wood product needs. Forest management and timber harvest shall be a permitted activity on the Operable Timber Land areas.

Land Use Designations

Kashwitna West		
Designation	**Classification**	**Management Intent**
Primary		
Public Recreation - Dispersed	Public Recreation Lands	All upland areas, except those designated as water resources.
Water Resources	Watershed Lands	All waterbodies, riparian areas, and important wetlands. Any waterbodies, riparian areas or important wetlands determined after adoption of this plan to be anadromous, important for resident fish, or important wetlands for fish and wildlife shall also be similarly designated and classified[11].
Secondary		
None		

[11] Such designation and classification shall be considered as a "Minor Change" to the Plan (See Volume I, Chapter 4, *Procedures for Changes to the Plan, Goals, and Guidelines.*

Kashwitna East		
Designation	**Classification**	**Notes**
Primary		
Resource Management	Resource Management Lands	All upland areas, except those designated as water resources. Available for forest management and timber harvests in those areas determined to be operable forest land and where it does not significantly reduce the areas recreational activities. Protect and improve important wildlife habitat areas. Recognize and manage for the subunits recreational uses.
Water Resources	Watershed Lands	All waterbodies, riparian areas, and important wetlands. Any waterbodies, riparian areas or important wetlands determined after adoption of this plan to be anadromous, important for resident fish, or important wetlands for fish and wildlife shall also be similarly designated and classified[12].
Secondary		
None		

Also, see the *Land Use Designations* map at the beginning of this section.

[12] Such designation and classification shall be considered as a "Minor Change" to the Plan (See Volume I, Chapter 4, *Procedures for Changes to the Plan, Goals, and Guidelines.*

Management Guidelines

See Volume I, Chapters 2 and 3 for area-wide guidelines for all Natural Resource Management Units. The remainder of this section presents unit-specific guidelines.

Buffers and Special Management Zones

All flowing waterbodies, including lakes that are part of a flowing water system that are connected to creeks, streams, and rivers, and riparian areas will be protected through the use of undisturbed natural vegetation buffers.

All wetlands over 40 acres and all smaller important wetland areas (see definition in *Definitions/Glossary* at the end of this chapter or in Volume III) shall be protected with a Special Management Zone which shall include a 100-foot area around the wetland area. The Zone shall not allow disturbance of the wetland area, but some uses may be allowed. For example, winter time recreational use is allowed when no waterfowl are present and sufficient snow cover exists to not harm the natural vegetation.

At such time that new activities are proposed in the unit, all potentially impacted waterbodies and wetlands shall be assessed as to their habitat and water resource values. Depending on the assessment, the waterbodies and wetlands will be provided additional protection through the use of buffers or placed in a Special Management Zone, as appropriate.

The Kashwitna Trespass Trail and the Talkeetna Mail Trails, including the alternate routes shall be buffered.

Where the unit adjoins private property, the private property shall be protected through the use of a no extraction and development buffer. These buffers may only be modified following the provisions in Volume I, Chapter 2, *Buffers* and MSB 23.20.070.

See *Roads, Trails, Waterbodies, Wetlands and Riparian Areas* map at the beginning of this section for, wetlands with a Special Management Zone, waterbodies and roads and trails with buffers.

Also, see Volume I, Chapter 2, *Buffers* and *Special Management Zones,* for additional information.

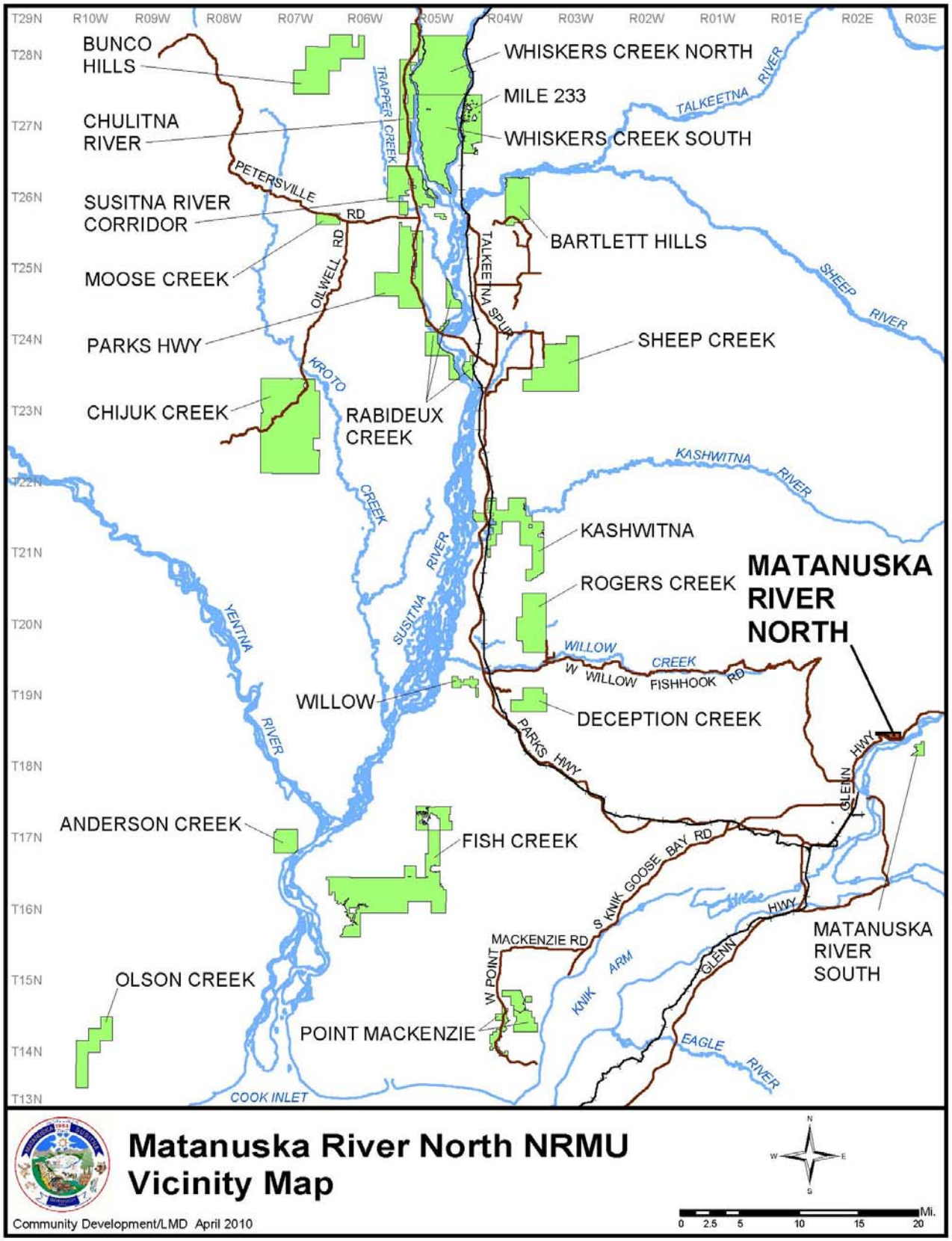
Forest Management

Timber harvest is a permitted activity in only the eastern subunit. Any timber harvest shall not significantly reduce the areas recreational values. Timber harvest shall be managed for improving forest health and providing forest products utilizing professionally accepted practices. Examples include wood lots for firewood, sawlogs and selective harvest for specialty wood products. This may include harvesting (selective thinning) the existing pole timber (Stratum 1) in order to produce an overall higher value product (sawlogs) at maturity.

Large timber harvests shall only be held after consultation with and/or at the request of the Alaska Department of Fish and Game. Harvest units should be laid out to improve wildlife habitat, especially winter habitat for moose to reduce moose fatalities in transportation corridors.

Other Uses

No additional unit-specific guidelines are needed for this unit. See Volume I, Chapters 2 and 3 for area-wide guidelines that apply to all Natural Resource Management Units.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BUNCO HILLS
CHULITNA RIVER
SUSITNA RIVER CORRIDOR
MOOSE CREEK
PARKS HWY
CHIJUK CREEK
WHISKERS CREEK NORTH
MILE 233
WHISKERS CREEK SOUTH
BARTLETT HILLS
SHEEP CREEK
RABIDEUX CREEK
KASHWITNA
ROGERS CREEK
MATANUSKA RIVER NORTH
WILLOW
DECEPTION CREEK
ANDERSON CREEK
FISH CREEK
OLSON CREEK
POINT MACKENZIE
MATANUSKA RIVER SOUTH
TRAPPER CREEK
PETERSVILLE RD
OILWELL RD
TALKEETNA SPUR
KROTO CREEK
SUSITNA RIVER
YENTNA RIVER
TALKEETNA RIVER
SHEEP RIVER
KASHWITNA RIVER
WILLOW CREEK
W WILLOW FISHHOOK RD
PARKS HWY
GLENN HWY
S KNIK GOOSE BAY RD
MACKENZIE RD
W POINT
KNIK ARM
EAGLE RIVER
COOK INLET
Matanuska River North NRMU
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Community Development/LMD April 2010
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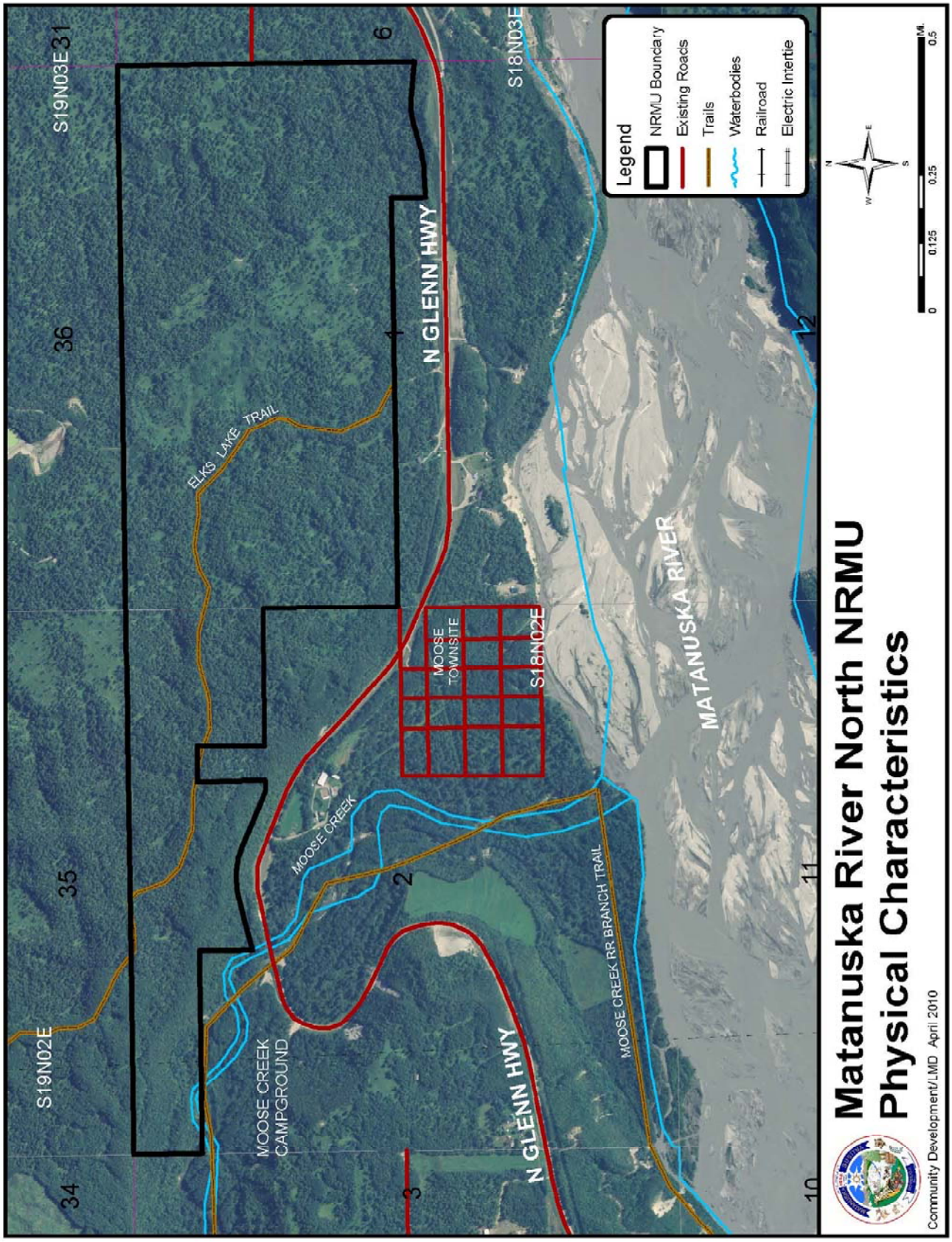
Matanuska River North NRMU
Physical Characteristics
Community Development/LMD April 2010
Legend
NRMU Boundary
Existing Roads
Trails
Waterbodies
Railroad
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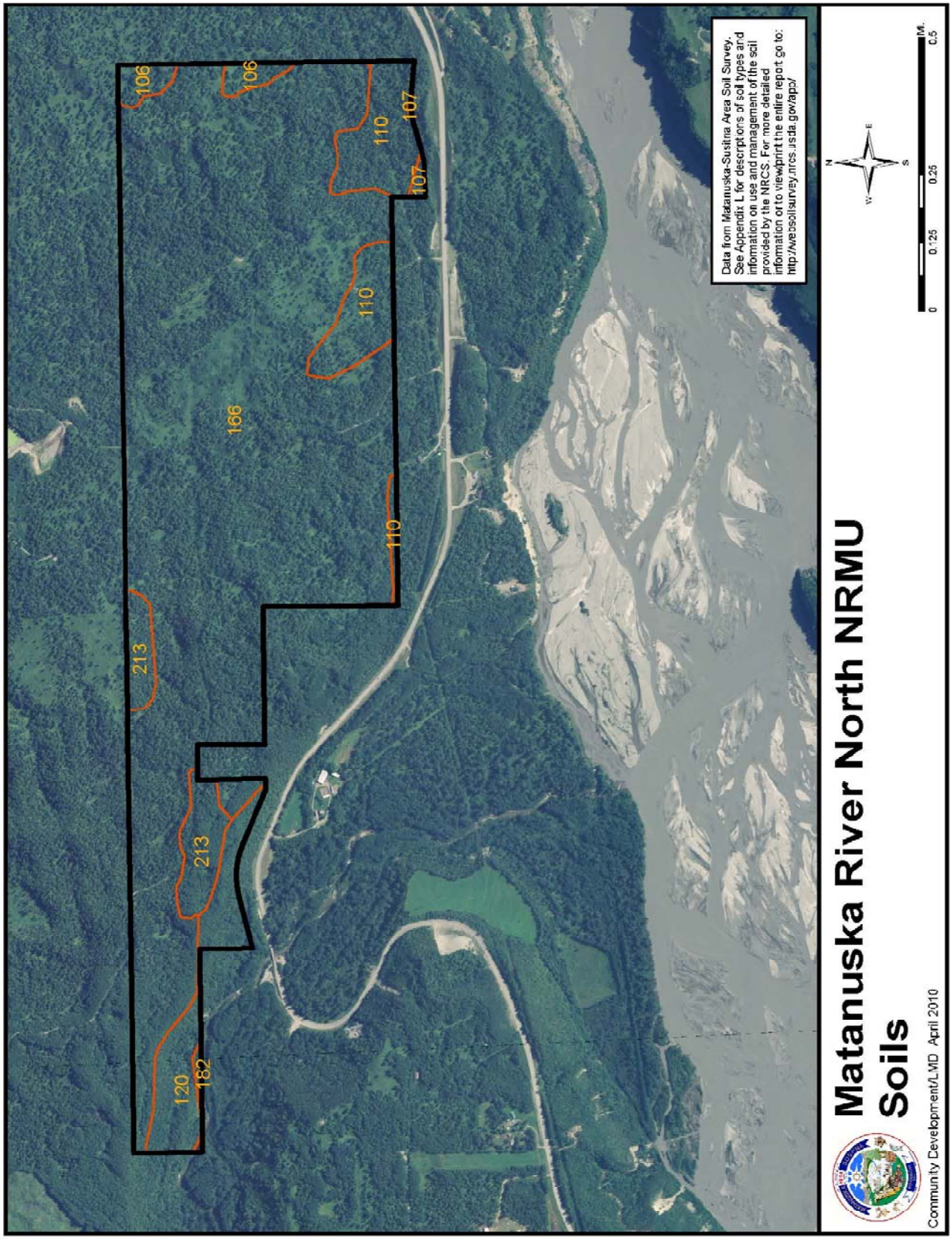
MATANUSKA RIVER
MOOSE TOWNSITE
MOOSE CREEK
MOOSE CREEK CAMPGROUND
MOOSE CREEK RR BRANCH TRAIL
ELKS LAKE TRAIL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Data from Matanuska-Susitna Area Soil Survey. See Appendix L for descriptions of soil types and information on use and management of the soil provided by the NRCS. For more detailed information or to view/print the entire report go to: http://websoilsurvey.nrcs.usda.gov/app/
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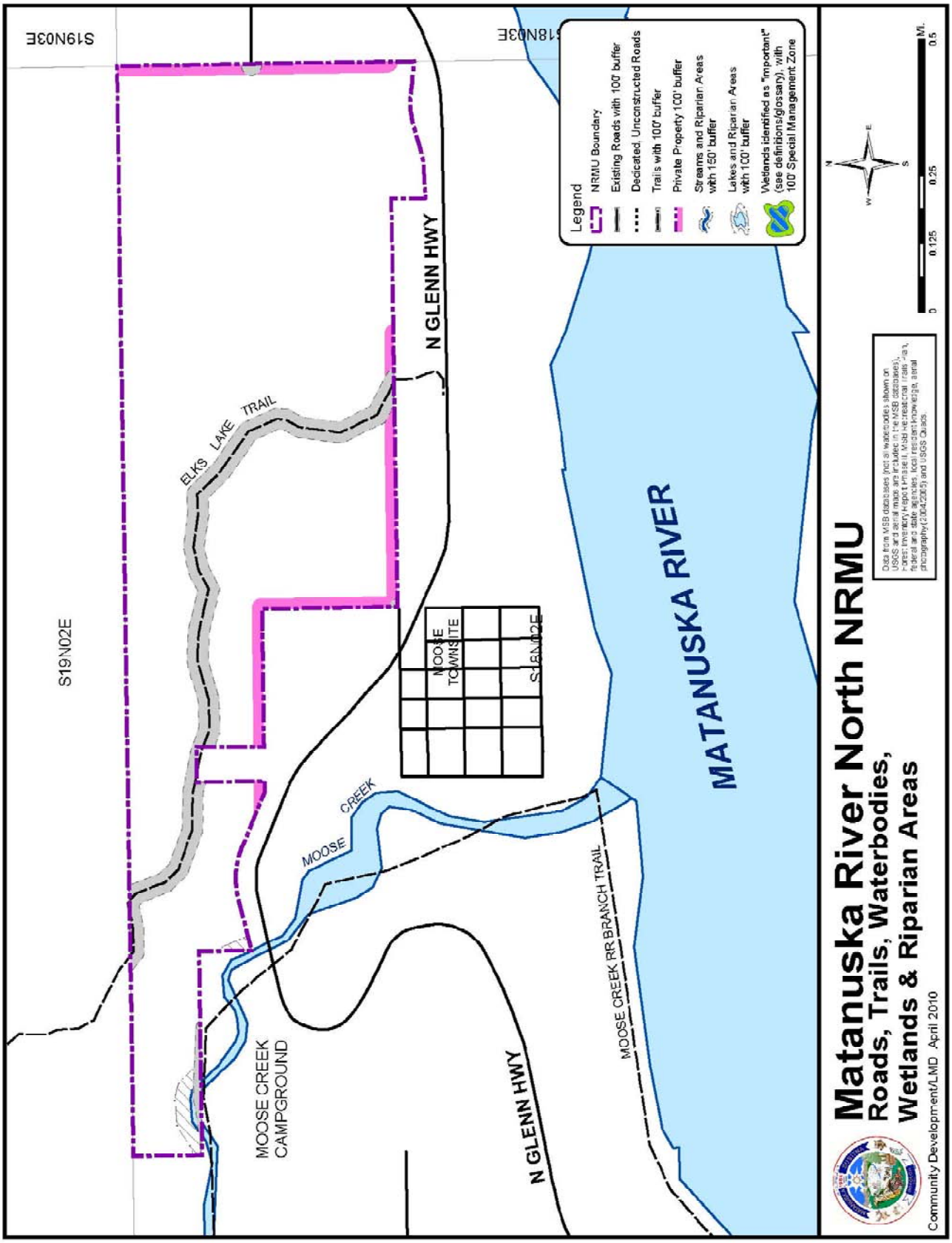
Matanuska River North NRMU
Soils
Community Development/LMD April 2010


Matanuska River North NRMU
Roads, Trails, Waterbodies,
Wetlands & Riparian Areas
Community Development/LMD April 2010
Legend
NRMU Boundary
Existing Roads with 100' buffer
Dedicated, Unconstructed Roads
Trails with 100' buffer
Private Property 100' buffer
Streams and Riparian Areas with 150' buffer
Lakes and Riparian Areas with 100' buffer
Wetlands identified as "important" (see definitions/glossary), with 100' Special Management Zone
MATANUSKA RIVER
N GLENN HWY
ELKS LAKE TRAIL
MOOSE CREEK
MOOSE CREEK CAMPGROUND
MOOSE CREEK RR BRANCH TRAIL
MOOSE TOWNSITE
S19N02E
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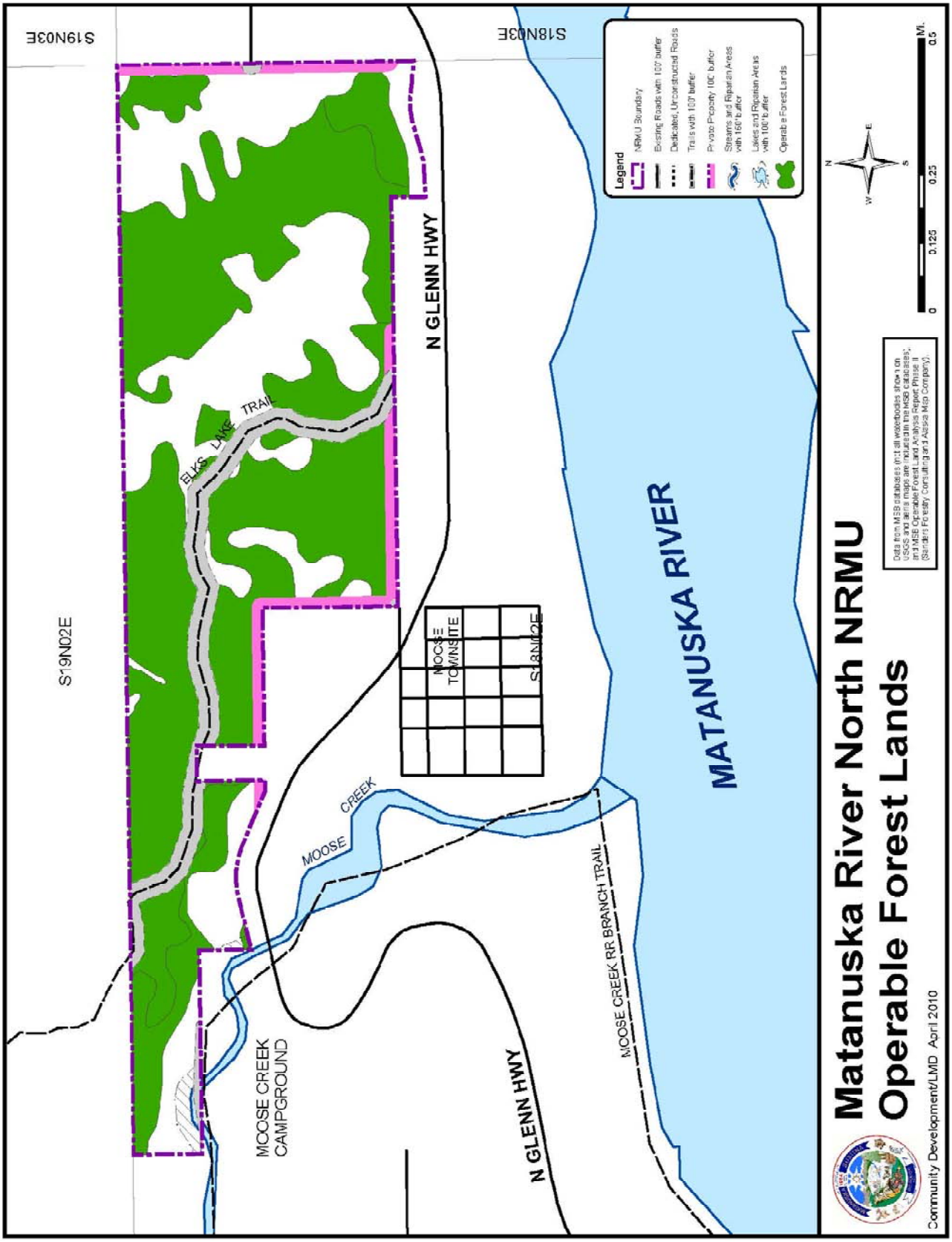
Matanuska River North NRMU
Operable Forest Lands
Community Development/LMD April 2010
Legend
NRMU Boundary
Existing Roads with 100' buffer
Dedicated, Unconstructed Roads
Trails with 100' buffer
Private Property 100' buffer
Streams and Riparian Areas with 150' buffer
Lakes and Riparian Areas with 100' buffer
Operable Forest Lands
Data from MSB databases (incl all waterbodies shown on USGS and aerial maps are included in the MSB databases; and MSB Operable Forest Land Analysis Report, Phase II (Saunders Forestry Consulting and Alaska Mill Company).
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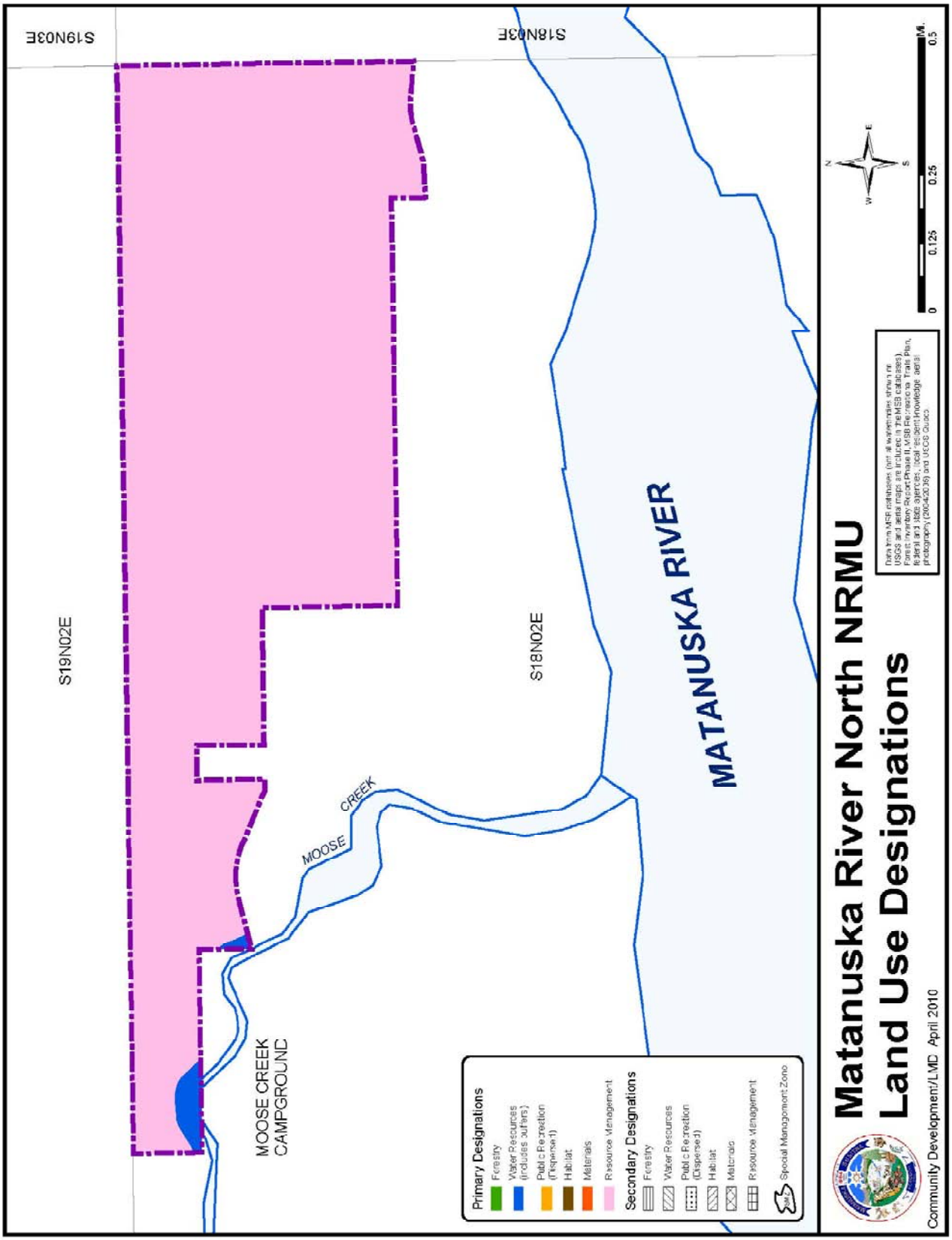
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MOOSE CREEK CAMPGROUND
MOOSE CREEK
MATANUSKA RIVER
Primary Designations
Forestry
Water Resources (includes buffers)
Public Recreation (Dispersed)
Habitat
Materials
Resource Management
Secondary Designations
Forestry
Water Resources
Public Recreation (Dispersed)
Habitat
Materials
Resource Management
Special Management Zone
Matanuska River North NRMU
Land Use Designations
Community Development/LMD April 2010
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MATANUSKA RIVER NORTH
Natural Resource Management Unit

General Information

The Matanuska River North Natural Resource management Unit contains about 450 acres. The unit is located about half way between Palmer and Sutton, north of the Glenn Highway at about milepost 55.

The unit lies at the base of the Chugach Mountains in well drained and in moderately steep terrain.

Borough Tax Maps
Palmer 3

Current Land Use
The area has seen some commercial and personal use timber harvest for birch and spruce. The area also continues to have a variety of dispersed recreational uses. These recreational uses have been reported to also occur without authorization on adjacent private property.

Surrounding Land Use
The unit is surrounded by state and private land. The state land to the north is within the Matanuska Valley Moose Range. The land between the Glenn Highway and unit has private residences and businesses. The area has and continues to see various dispersed recreational uses.

Community Council Area
Sutton/Alpine Community Council

Existing Land Use Plans

- *Sutton Comprehensive Plan* (2000) (update scheduled for Assembly consideration)
- Mat-Su Borough, *Forest Management Plan* (1989), which will be superseded by this plan.
- Alaska Department of Natural Resources, *Susitna Area Plan* (1985), Glenn Highway Unit, Palmer-Sutton-Butte Subunit (1i); area designated for forestry (personal use only), public recreation, and settlement. This plan is currently being updated as the *Susitna-Matanuska Area Plan* and will not apply to borough land. When completed, the *Susitna-Matanuska Area Plan* will replace the *Susitna Area Plan*.
- Mat-Su Borough, *Recreational Trails Plan* (2007).
- Mat-Su Borough, *Parks, Recreation and Open Space Plan* (2001), which is currently being updated.

Existing Land Use Classifications
Forest Management

Summary of Resources and Uses

Agriculture and Grazing

A review of soil types, published by the Department of Agriculture, Natural Resources Conservation Service (http://websoilsurvey.ncrs.usda.gov/app/), indicates that there are no known lands suitable for agricultural development or grazing within the unit.

Also, see *Soils* map at the beginning of this section.

Cultural Resources and Heritage Sites

There are no documented historical or heritage sites within the unit. However there are several historic sites associated with Moose Creek (which passes through the northeast portion of the unit) and in other locations along Moose Creek in the vicinity of the unit. Apart from the mentioned historic sites, this region was used extensively by the Ahtna and Dena'ina.

Sites associated with coal mining in the area are; the Doherty mine, Premier Mine, Rawson, Buffalo Mine and Center Mine. Two of the larger mines comprised the Evan Jones Mine and Eska Mine. A number of smaller mines were also in the region.

It is unknown whether a complete cultural resource assessment has taken place within the unit. Due to substantial use of the region, both historically and prehistorically, it is strongly recommended that an on-the-ground cultural resource survey and inventory take place prior to any ground disturbing activity be undertaken with the unit.

Fish and Wildlife Habitat and Resources

This unit is seasonally important for moose in the winter and spring, especially in deep snow years. The unit is adjacent to the State Matanuska Moose Range, which is to the north. Timber harvesting has and is continuing to occur to create moose and grouse habitat in the Moose Range.

There are no known bear dens, Trumpeter Swans or eagle nests within the unit. Additional fieldwork will be required prior to any natural resource extraction or other development activities taking place to verify this information.

Moose Creek is a cataloged anadromous stream that touches the southwest corner of the parcel. Moose Creek is currently undergoing significant habitat improvements to bring the creek back to produce more salmon like it had been historically. These improvements are located outside the unit and south of the Glenn Highway.

Prior to any resource extraction projects, the anadromous fish distribution in any wetlands should be established, any additional anadromous or important resident fish waterbodies need to be identified and the Alaska Department of Fish and Game will need to verify the cataloged anadromous resident fish streams as described above.

The Alaska Department of Fish and Game will require Fish Habitat Permits, accompanied by detailed project plans, prior to any planned resource extraction project adjacent to anadromous or resident waterbodies.

Forest Resources

The principal cover is mixed birch and spruce of varying size, age class and density. Although a very small management unit, this unit is one of the few areas in the borough that exhibits a balance of timber age class and timber types.

Within the 445 acre unit, 331 acres (74% of the unit) is Commercial Forest Land, of which 264 acres (59% of the unit) is Operable Forest Land, some of which has been partially harvested.

The 2009 Operable Forest Land Analysis Report found the following timber composition:

Stratum 1: Pole Timber – Closed Canopy	21 acres
Stratum 2: Pole Timber – Open Canopy	0 acres
Stratum 3: Hardwood Saw Timber – Closed Canopy	82 acres
Stratum 4: Hardwood Saw Timber – Open Canopy	161 acres
Stratum 5: Mixed Forest Saw Timber – Closed Canopy	0 acres
Stratum 6: Mixed Forest Saw Timber – Open Canopy	0 acres
TOTAL	**264 acres**

Also, see *Operable Forest Lands* map at the beginning of this section.

Private Property

There is no private property within the unit. There is private property that abuts the unit on the southern and eastern sides. These private parcels are not subject to the provisions of this Plan.

Public Recreation and Tourism

Dispersed recreation occurs, mainly by local residents who take advantage of the limited hunting and trapping resources in the area. The Elks Lake Trail provides passive recreational opportunities.

There is no specific resource or activity that draws tourists to this area.

Roads and Trails

There is no existing road access within the unit. There is a dedicated road corridor that is under lease to Usibelli Coal Mine. The lease expires in June 2015. The corridor is described by aliquot parts and ranges from approximately 460 to 660 feet in width.

The Elks Lake Trail bisects the unit generally running north and west. The Elks Creek Trail where it meets the Glenn Highway crosses private property, where permission is required. According to the Alaska Department of Fish and Game, the Elks Lake Trail provides important public access to the Matanuska Valley Moose Range.

Also, see the *Roads, Trails, Waterbodies, Wetlands and Riparian Areas* map at the beginning of this section.

Rock Sand and Gravel

There are no developed rock, sand or gravel extraction areas within the unit. Soil mapping (see http://websoilsurvey.ncrs.usda.gov/app/) does not reveal any potential commercial rock, sand and gravel resources. However, rock and gravel resources are abundant in the area.

Also, see the *Soils* map at the beginning of this section.

Unit Management Intent

The management intent for the Matanuska River North Natural Resources Management Unit shall be for general resource management in the Operable Timber areas as long as it does not significantly reduce the areas recreational opportunities, and protect and improve any important wildlife habitat areas. Because of the units' small size and location, the unit may also be used as a Forest Education and Improvement Study Area.

Land Use Designations

Matanuska River North		
Designation	**Classification**	**Management Intent**
Primary		
Resource Management	Resource Management Lands	All upland areas, except those designated as water resources. Available for forest management and small timber harvests in those areas determined to be operable forest land and where it does not significantly reduce the areas recreational activities. Protect and improve important wildlife habitat areas. Recognize and manage for the units recreational uses.
Water Resources	Watershed Lands	All waterbodies, riparian areas, and important wetlands.

Matanuska River North		
Designation	Classification	Management Intent
Primary		
		Any waterbodies, riparian areas or important wetlands determined after adoption of this plan to be anadromous, important for resident fish, or important wetlands for fish and wildlife shall also be similarly designated and classified[13].
Secondary		
None		

Also, see the *Land Use Designations* map at the beginning of this section.

Management Guidelines

See Volume I, Chapters 2 and 3 for area-wide guidelines for all Natural Resource Management Units. The remainder of this section presents unit-specific guidelines.

Buffers and Special Management Zones

Moose Creek shall be protected through the use of an undisturbed natural vegetation buffer.

The Elks Creek Trail shall be buffered.

Where the unit adjoins private property, the private property shall be protected through the use of an undisturbed natural vegetation buffer. These buffers may only be modified following the provisions in Volume I, Chapter 2, *Buffers* and MSB 23.20.070.

See *Roads, Trails, Waterbodies, Wetlands and Riparian Areas* and map at the beginning of this section for wetlands with a Special Management Zone, and waterbodies, private property, roads and trails with buffers.

Also, see Volume I, Chapter 2, *Buffers* and *Special Management Zones* for additional information.

Forest Management

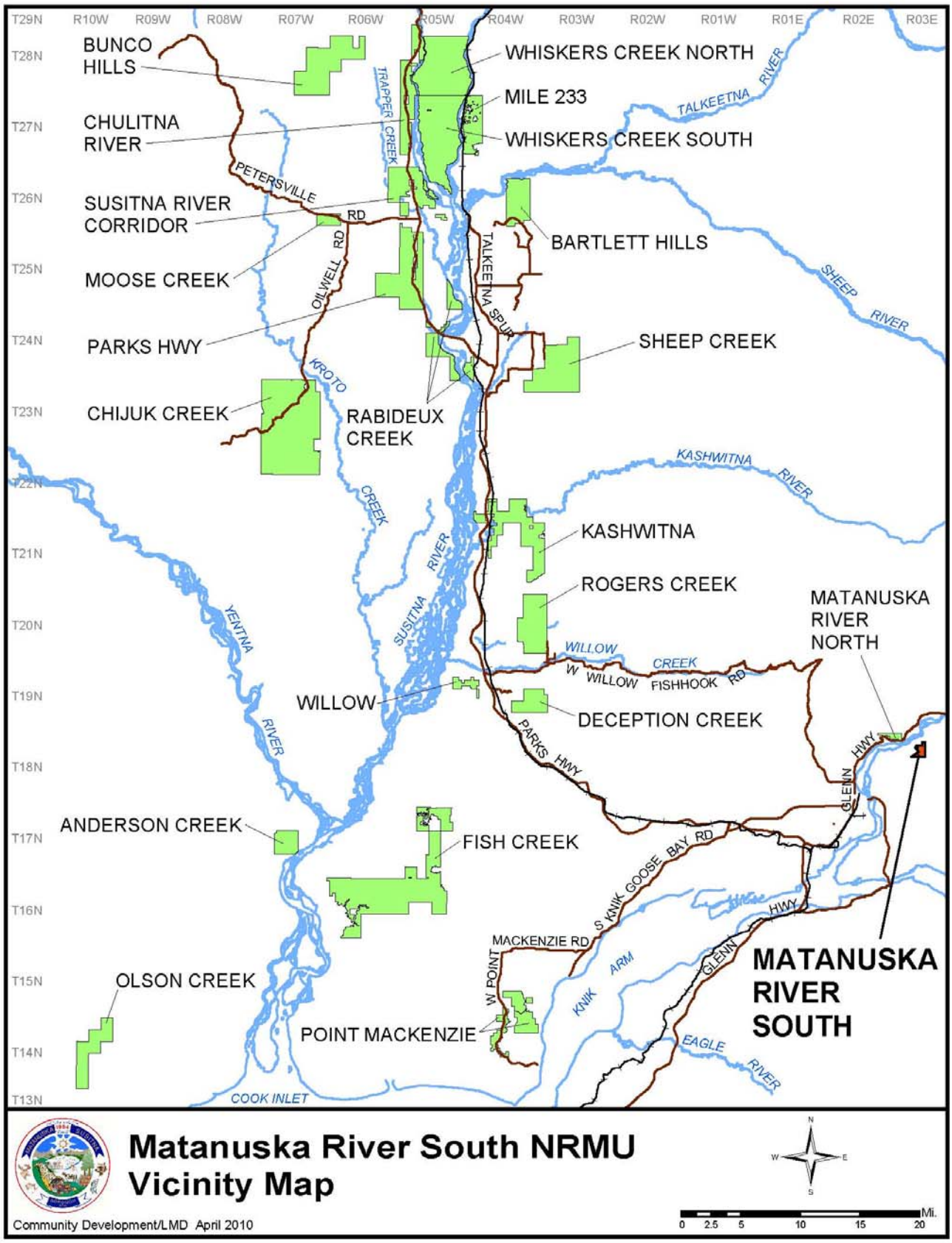
Small timber harvests are a permitted use if it does not significantly reduce the areas other values. Timber harvest shall be small in volume in the amount harvested per year. Examples include woodlots for firewood, sawlogs and specialty wood products.

[13] Such designation and classification shall be considered as a "Minor Change" to the Plan (See Volume I, Chapter 4, *Procedures for Changes to the Plan, Goals, and Guidelines.*

Other Uses

Because of the units' small size (445 acres), its close proximity to the community of Sutton, particularly the Sutton Elementary School, being adjacent to the Matanuska Valley Moose Range and the Moose River, this unit could be designated as a Special Management Area for the purpose of establishing a Forest Education and Improvement Study Area. (See Volume I, Chapter 3; *Forest Education and Improvement Study Area(s)* for additional information.)

No additional unit-specific guidelines are needed for this unit. See Volume I, Chapters 2 and 3 for area-wide guidelines that apply to all Natural Resource Management Units.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CHULITNA RIVER
SUSITNA RIVER CORRIDOR
MOOSE CREEK
PARKS HWY
CHIJUK CREEK
WHISKERS CREEK NORTH
MILE 233
WHISKERS CREEK SOUTH
BARTLETT HILLS
SHEEP CREEK
RABIDEUX CREEK
KASHWITNA
ROGERS CREEK
MATANUSKA RIVER NORTH
WILLOW
DECEPTION CREEK
ANDERSON CREEK
FISH CREEK
OLSON CREEK
POINT MACKENZIE
MATANUSKA RIVER SOUTH
TRAPPER CREEK
PETERSVILLE RD
OILWELL RD
TALKEETNA SPUR
KROTO CREEK
SUSITNA RIVER
YENTNA RIVER
TALKEETNA RIVER
SHEEP RIVER
KASHWITNA RIVER
WILLOW CREEK
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MACKENZIE RD
W POINT
KNIK ARM
EAGLE RIVER
COOK INLET
Matanuska River South NRMU
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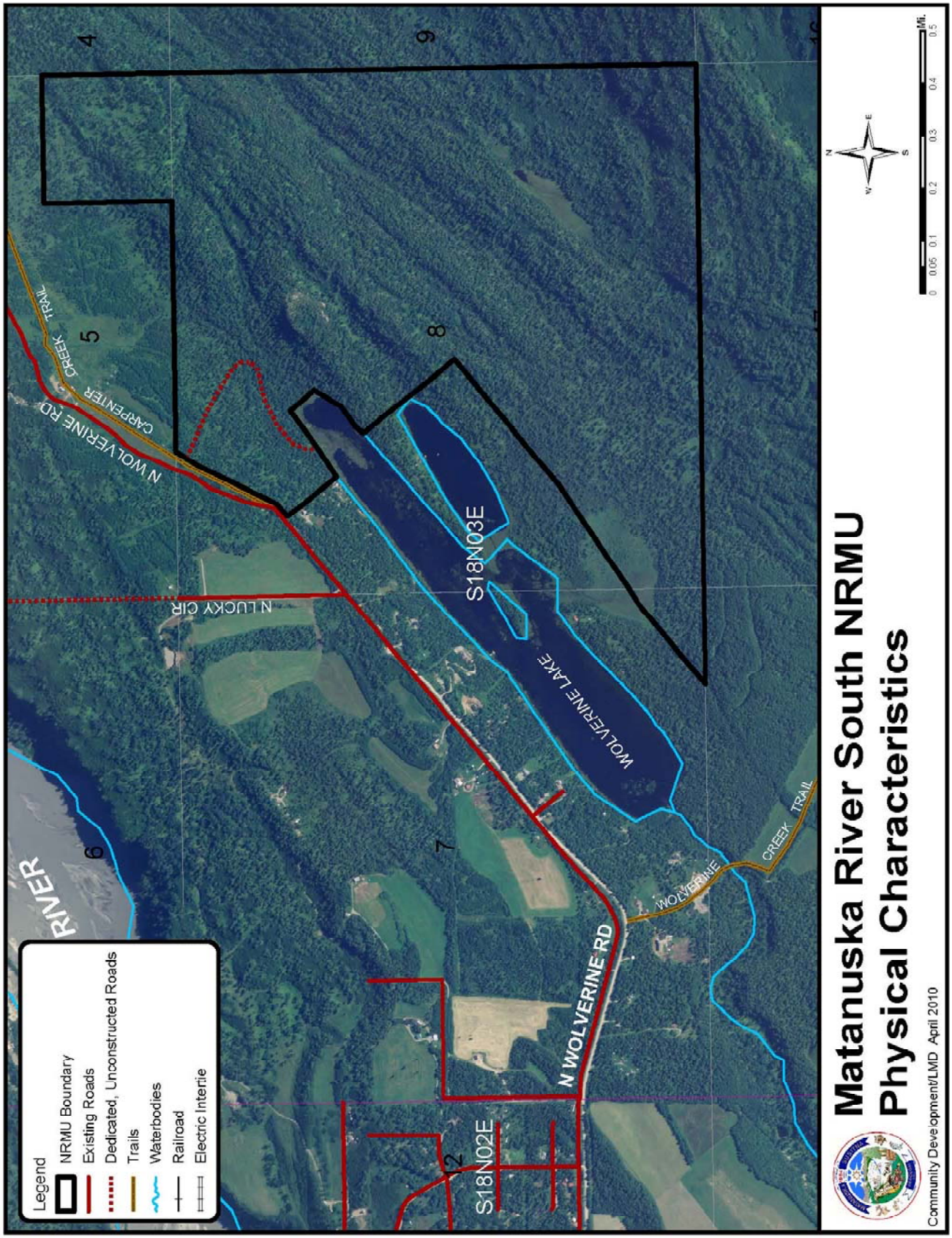
Legend
NRMU Boundary
Existing Roads
Dedicated, Unconstructed Roads
Trails
Waterbodies
Railroad
Electric Interie
RIVER
S18N02E
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N WOLVERINE RD
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WOLVERINE LAKE
WOLVERINE CREEK TRAIL
CARPENTER CREEK TRAIL
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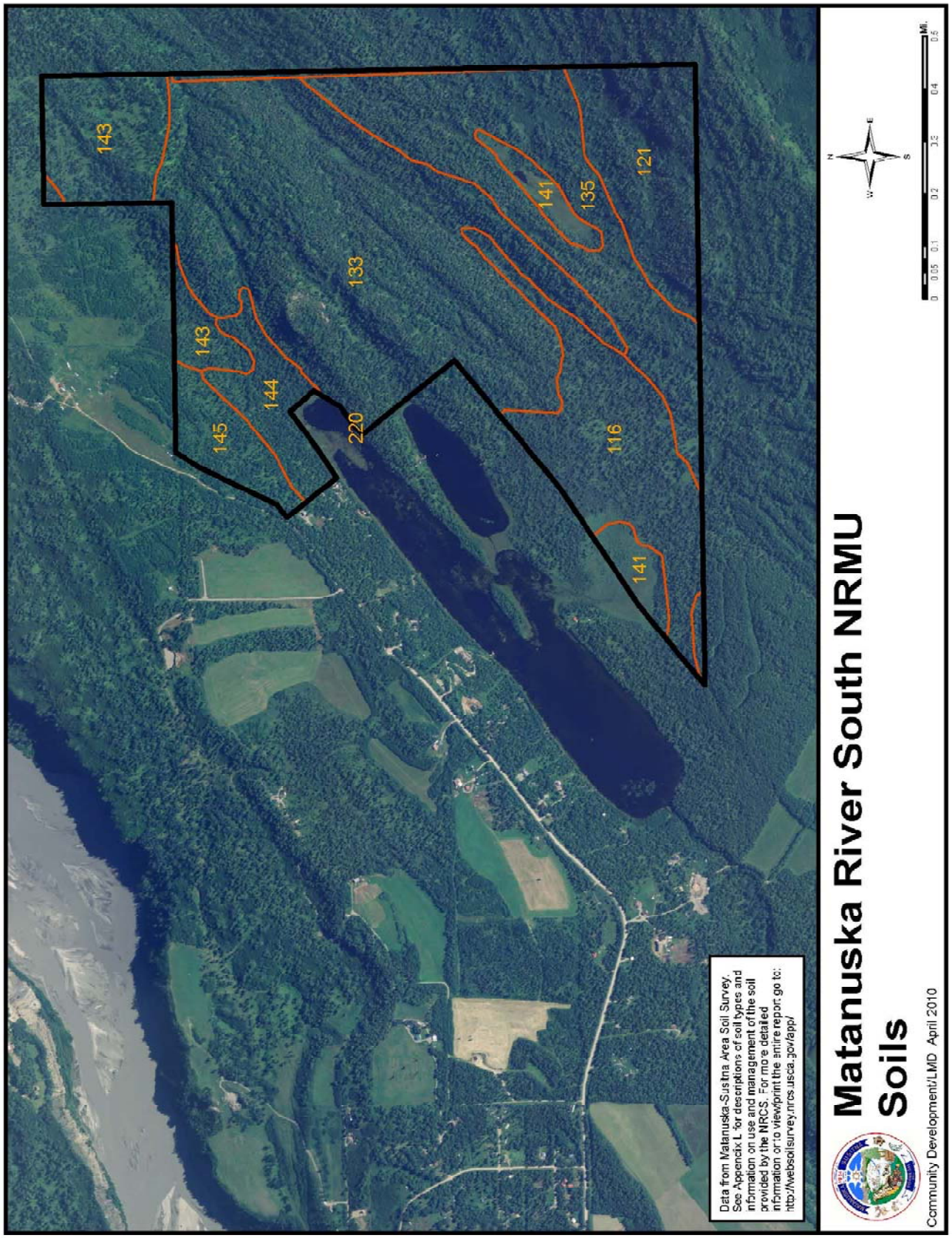
Matanuska River South NRMU
Physical Characteristics
Community Development/LMD April 2010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Data from Matanuska-Susitna Area Soil Survey. See Appendix L for descriptions of soil types and information on use and management of the soil provided by the NRCS. For more detailed information or to view/print the entire report go to: http://websoilsurvey.nrcs.usda.gov/app/
Matanuska River South NRMU
Soils
Community Development/LMD April 2010
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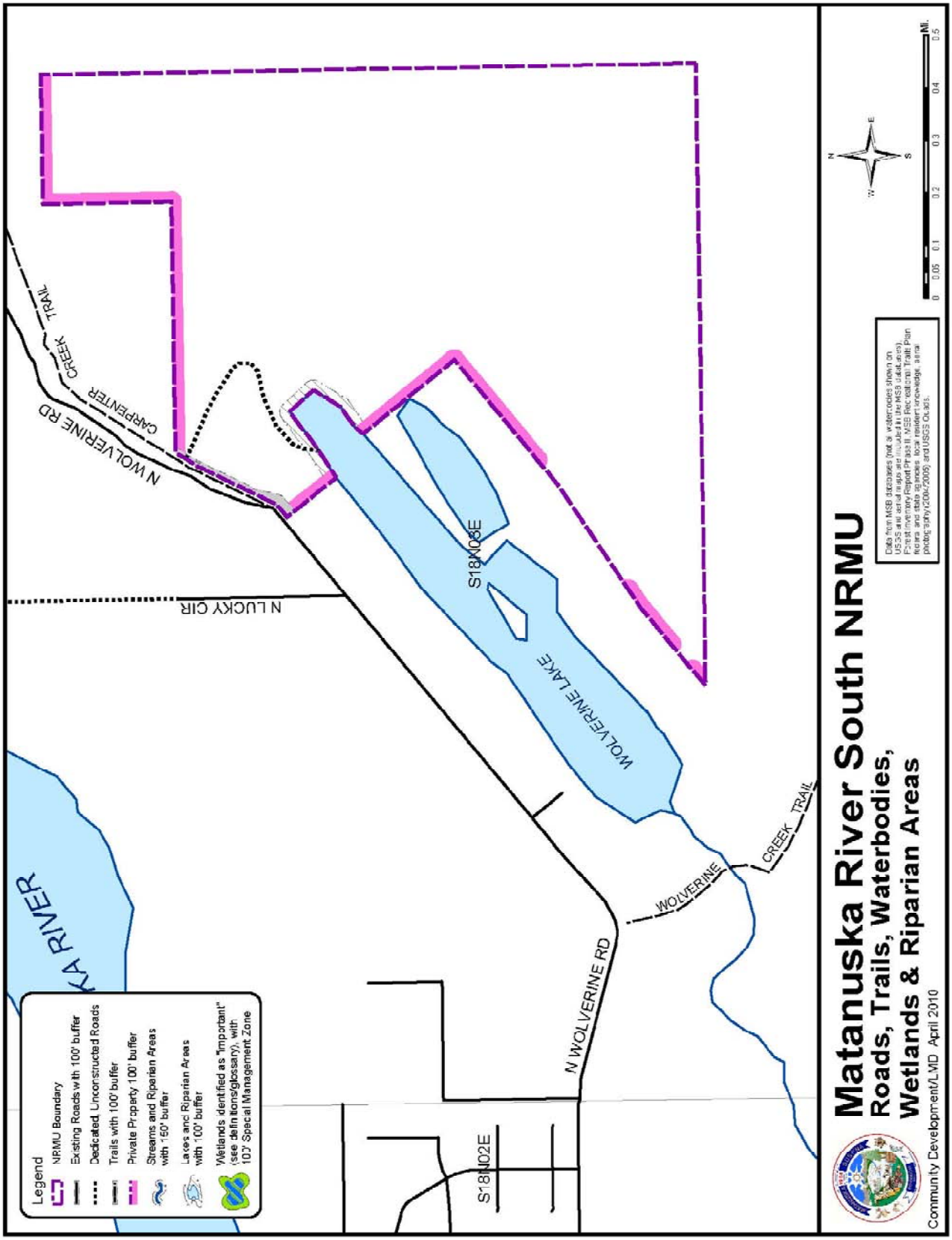
Matanuska River South NRMU
Roads, Trails, Waterbodies, Wetlands & Riparian Areas
Community Development/LMD April 2010
Legend
NRMU Boundary
Existing Roads with 100' buffer
Dedicated Unconstructed Roads
Trails with 100' buffer
Private Property 100' buffer
Streams and Riparian Areas with 150' buffer
Lakes and Riparian Areas with 100' buffer
Wetlands identified as "important" (see definitions/glossary), with 100' Special Management Zone
N WOLVERINE RD
WOLVERINE CREEK TRAIL
WOLVERINE LAKE
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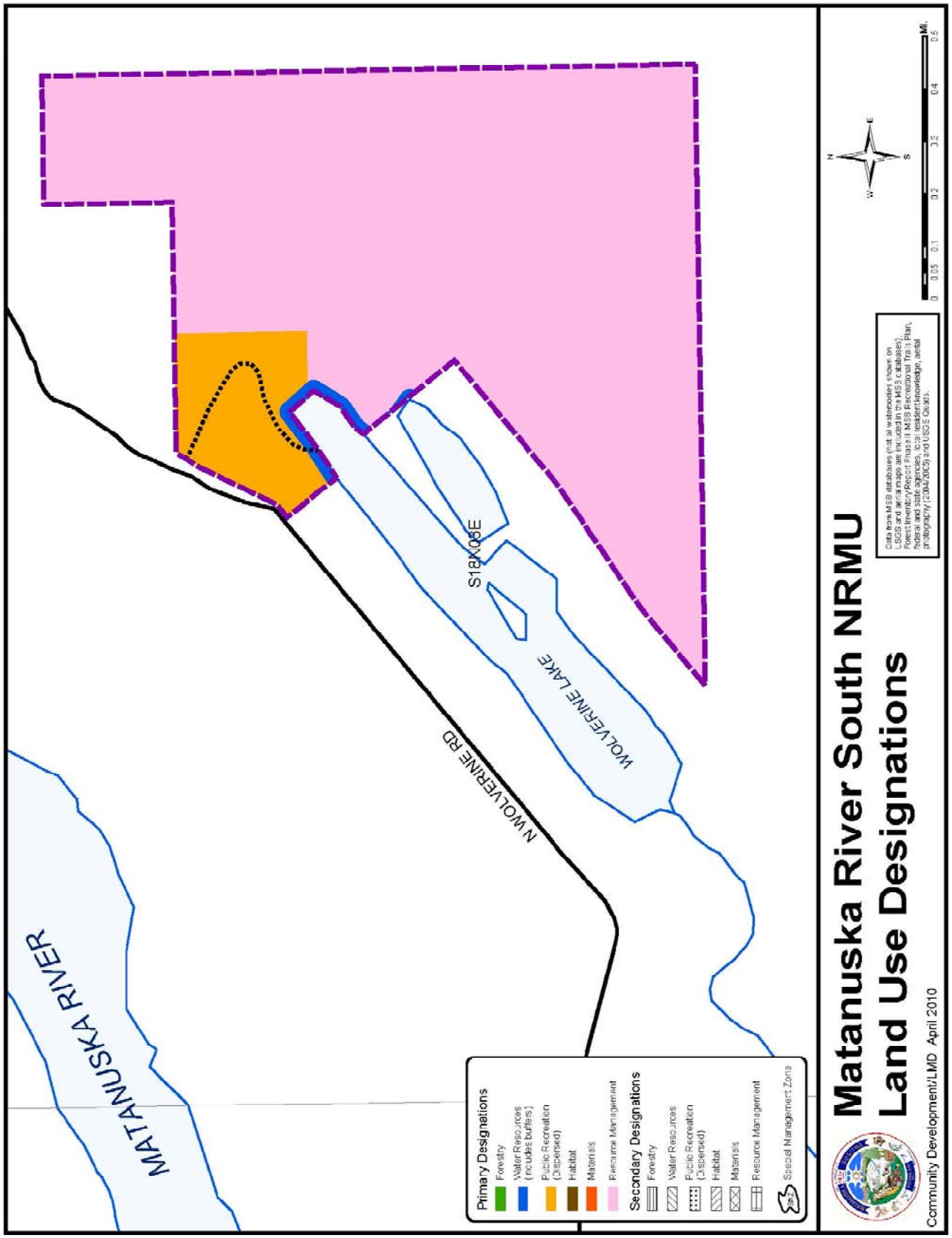
MATANUSKA RIVER
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WOLVERINE LAKE
S18X08E
Primary Designations
Forestry
Water Resources (includes buffers)
Public Recreation (Dispersed)
Habitat
Materials
Resource Management
Secondary Designations
Forestry
Water Resources
Public Recreation (Dispersed)
Habitat
Materials
Resource Management
Special Management Zone
Matanuska River South NRMU
Land Use Designations
Community Development/LMD April 2010
Data from MSB databases (not all waterbodies shown on USGS and aerial maps are included in the MSB databases). Forest Inventory Report (Phase II MSB Recreational Trail Plan, Resource Inventory Report, 2010), Wetlands Inventory, aerial photography (2004/2005) and USGS Quads.
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MATANUSKA RIVER SOUTH
Natural Resource Management Unit

General Information

The Matanuska River South Natural Resource Management Unit contains approximately 540 acres and is located about 6 miles northeast of Palmer, east of Wolverine Lake and south of North Wolverine Road.

The topography is a combination of rolling hills and rugged terrain with generally shallow and rocky soils.

Borough Tax Maps
Palmer 2

Current Land Use
Although the majority of this unit has been in a Forest Management Unit since 1990, there has been no recent timber harvesting in the unit. There was a small harvest in the area many years ago. The area has a variety of dispersed recreational use, especially in and around Wolverine Lake.

Surrounding Land Use
The unit is surrounded by a combination of state, Native, and private land. The private land consists of some small farms and private residences. The state and Native land is largely undeveloped. Various dispersed recreational uses occur on the state land.

Community Council Area
Lazy Mountain Community Council

Existing Land Use Plans

- Mat-Su Borough, *Forest Management Plan* (1989). That plan will be replaced when this plan is adopted.
- Alaska Department of Natural Resources, *Susitna Area Plan* (1985), Glenn Highway Unit, Palmer-Sutton-Butte Subunit (1i); area designated for forestry (personal use only), public recreation, and settlement. This plan is currently being revised as the *Susitna-Matanuska Area Plan* and will not apply to borough land. When it is completed it will replace the *Susitna Area Plan*.
- Mat-Su Borough, *Recreational Trails Plan* (2007).
- Mat-Su Borough, *Parks, Recreation and Open Space Plan* (2001), which is currently being updated.
- *Wolverine Lake Management Plan* (2004).
- *Lazy Mountain Community Council Area Comprehensive Plan* (2008). This plan has goals and policies pertinent to this plan including:
    - Protect water quality, watersheds and natural resources.

    - Protect existing land uses and patterns, while respecting the agrarian character, existing recreational opportunities, open space, local heritage, and culture of Lazy Mountain.
    - Maintain and improve existing public recreational facilities and opportunities on Lazy Mountain.
    - Reserve appropriately suited public lands for open space and recreational use.
    - Reserve, as appropriate, borough parcels on Lazy Mountain for public open spaces, trails, wildlife viewing, recreational areas, and public facilities, such as trailheads.
- The Lazy Mountain Community Council is currently working on a Special Land Use District (zoning) for the area.

Existing Land Use Classifications
Majority is Forest Management Lands (approximately 500 acres), and part is Public Recreation Lands (approximately 40 acres).

Summary of Resources and Uses

Agriculture and Grazing
There are some agricultural uses in the general area. A review of the general topography in the unit and soil types, published by the Department of Agriculture, Natural Resources Conservation Service (http://websoilsurvey.ncrs.usda.gov/app/), indicates that there are no known lands suitable for agricultural development or grazing within the unit.

Also, see *Soils* map at the beginning of this section.

Cultural Resources and Heritage Sites
There are no documented historical or heritage sites and no cultural survey has taken place within the unit. Additional field work may be required if any natural resource extraction or other development activities take place or the use of the unit changes significantly.

Fish and Wildlife Habitat and Resources
The general area contains a variety of wildlife. Moose, fox, squirrels, wolves, and bears are prevalent throughout the area. The forest cover and wetlands provide excellent travel corridors and habitat for moose. Song birds, raptors, grouse, eagles, water fowl and other birds are common.

There are no known bear dens, Trumpeter Swan nesting areas or eagle nests within the unit. Additional fieldwork may be required prior to any natural resource extraction or other development activities taking place to verify this information.

A small portion of Wolverine Lake is immediately adjacent to the unit and is a cataloged anadromous water body. Native rainbow trout and Dolly Varden can also be found in Wolverine Lake. There are no other waterbodies within or immediately adjacent to the unit.

A small commercial lodge exists on Wolverine Lake. There are no known fish camps in the area.

Forest Resources

The principal cover is mixed birch and spruce of varying size, age class and density.

The 2007 inventory determined that the commercial timber stands present in the unit economically unfeasible, thus inoperable due to low timber volumes and rugged terrain.

Private Property

There is no private property within the unit. There is private property that abuts the unit on the northern and western sides. These private parcels are not subject to the provisions of this Plan.

Public Recreation and Tourism

Dispersed recreation occurs throughout the unit, with most of it concentrated on or adjacent to Wolverine Lake. Local residents take advantage of the hunting and trapping resources in the area.

There is no specific resource or activity that draws tourists to this area.

Roads and Trails

North Wolverine Road is dedicated to the northeast portion of the unit; however, the road is not constructed to the unit.

There is an unconstructed dedicated 30 foot road/trail located on a floating easement from the (unconstructed) east end of Wolverine Road that heads generally southerly down to the eastern end of Wolverine Lake. A former logging road, locally referred to as the Wolf Lake Trail, may provide a portion of the route for this access.

Carpenter Creek Trail generally parallels the unconstructed portion of North Wolverine Road. The trail does not appear to be in the unit.

Also, see the *Roads, Trails, Waterbodies, Wetlands and Riparian Areas* map at the beginning of this section.

Rock, Sand and Gravel

There are no developed rock, sand or gravel extraction areas within the unit. Soil mapping (see http://websoilsurvey.ncrs.usda.gov/app/) does not reveal any potential commercial rock, sand and gravel resources.

Also, see the *Soils* map at the beginning of this section.

Unit Management Intent

The management intent for the Matanuska River South Natural Resource Management Unit shall be to protect the Wolverine Lake watershed, the recreational activities in the entire unit, particularly at the northeast end of Wolverine Lake and to provide open space for the area. The area does not have any other resource that should have priority over another for the majority of the land in the unit. This management intent is consistent with the Lazy Mountain Comprehensive Plan.

Land Use Designations

Matanuska River South		
Designation	**Classification**	**Management Intent**
Primary		
Public Recreation - Dispersed	Public Recreation Lands	The parcel currently designated and classified as public recreation shall remain as public recreation land (Section 8, Parcel B10T. 18 N. R. 2 E. S.M,).
Resource Management	Resource Management Lands	Remainder of the unit not designated as Water Resources or Public Recreation.
Water Resources	Watershed Lands	Any waterbodies, riparian areas or important wetlands determined after adoption of this plan to be anadromous, important for resident fish, or important wetlands for fish and wildlife shall be designated and classified[14].
Secondary		
None	None	

Also, see the *Land Use Designations* map at the beginning of this section.

Management Guidelines

See Volume I, Chapters 2 and 3 for area-wide guidelines for all Natural Resource Management Units. The remainder of this section presents unit-specific guidelines.

[14] Such designation and classification shall be considered as a "Minor Change" to the Plan (See Volume I, Chapter 4, *Procedures for Changes to the Plan, Goals, and Guidelines.*

Buffers and Special Management Zones

That portion of Wolverine Lake that is within the unit, including any associated riparian and wetland areas shall be protected through the use of an undisturbed natural vegetative buffer.

When constructed, the dedicated access road from North Wolverine Road to Wolverine Lake may cross into the buffer. A small parking area is permitted, but shall be located as far away as the lake shore as practical and feasible. The intent is to minimize potential erosion and sedimentation impacts to the lake and to leave as much natural vegetation as possible.

At such time that any new activities are proposed in the unit, all potentially impacted waterbodies and wetlands shall be assessed as to their habitat and water resource values. Depending on the assessment, the waterbodies and wetlands will be provided additional protection through the use of buffers or placed in a Special Management Zone, as appropriate.

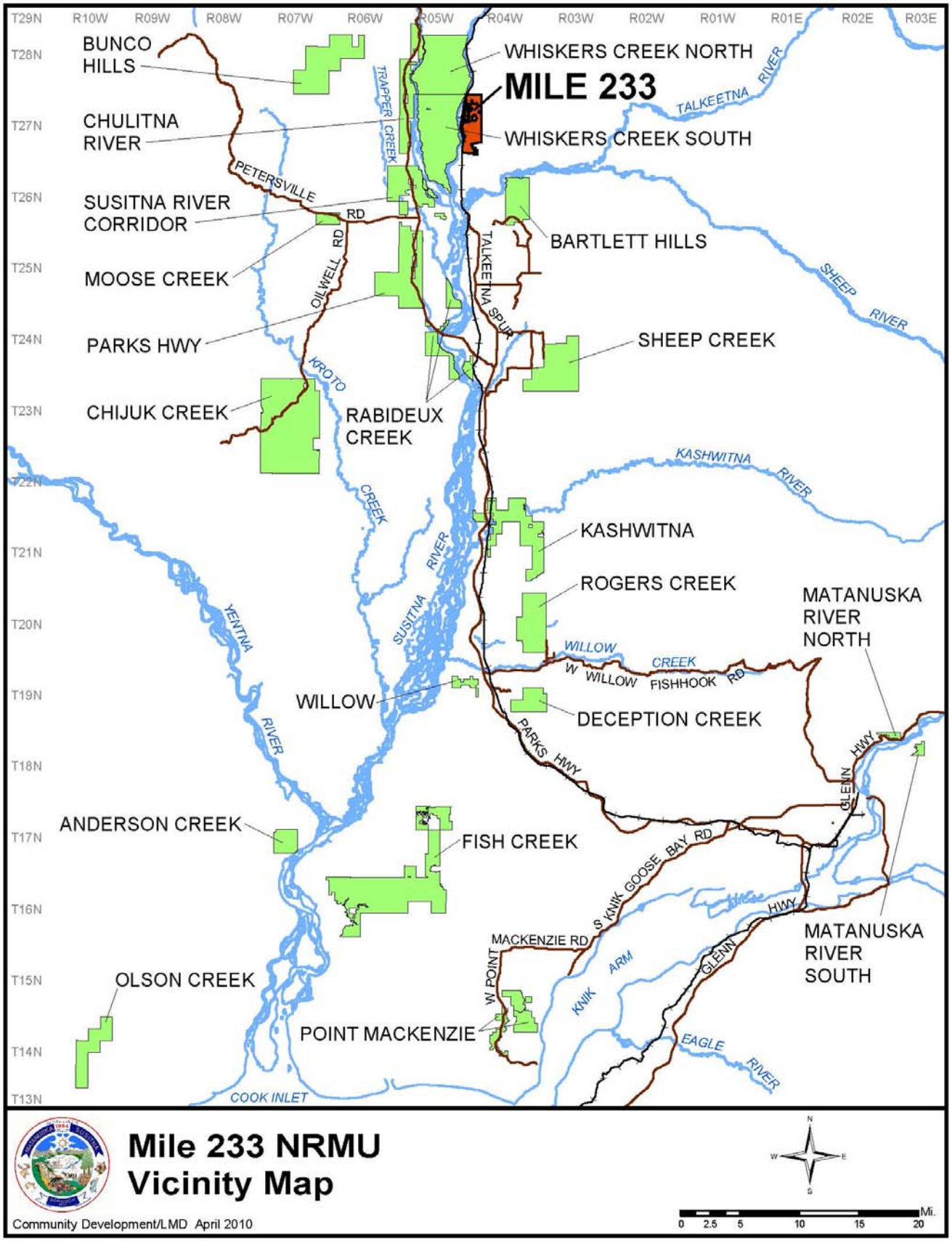
The Alaska Department of Fish and Game will require Fish Habitat Permits, accompanied by detailed project plans, prior to any planned resource extraction project adjacent to anadromous or resident waterbodies.

See *Roads, Trails, Waterbodies, Wetlands* and *Riparian Areas* map at the beginning of this section for waterbodies that shall have buffers, wetlands with a Special Management Zone, and roads and trails with buffers.

Also, see Volume I, Chapter 2, *Buffers* and *Special Management Zones* for additional information.

Other Uses

No additional unit-specific guidelines are needed for this unit. See Volume I, Chapters 2 and 3 for area-wide guidelines that apply to all Natural Resource Management Units.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SUSITNA RIVER CORRIDOR
MOOSE CREEK
PARKS HWY
CHIJUK CREEK
WHISKERS CREEK NORTH
MILE 233
WHISKERS CREEK SOUTH
BARTLETT HILLS
SHEEP CREEK
RABIDEUX CREEK
KASHWITNA
ROGERS CREEK
MATANUSKA RIVER NORTH
WILLOW
DECEPTION CREEK
ANDERSON CREEK
FISH CREEK
MATANUSKA RIVER SOUTH
OLSON CREEK
POINT MACKENZIE
TRAPPER CREEK
PETERSVILLE RD
OILWELL RD
TALKEETNA SPUR
KROTO CREEK
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YENTNA RIVER
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KNIK ARM
EAGLE RIVER
COOK INLET
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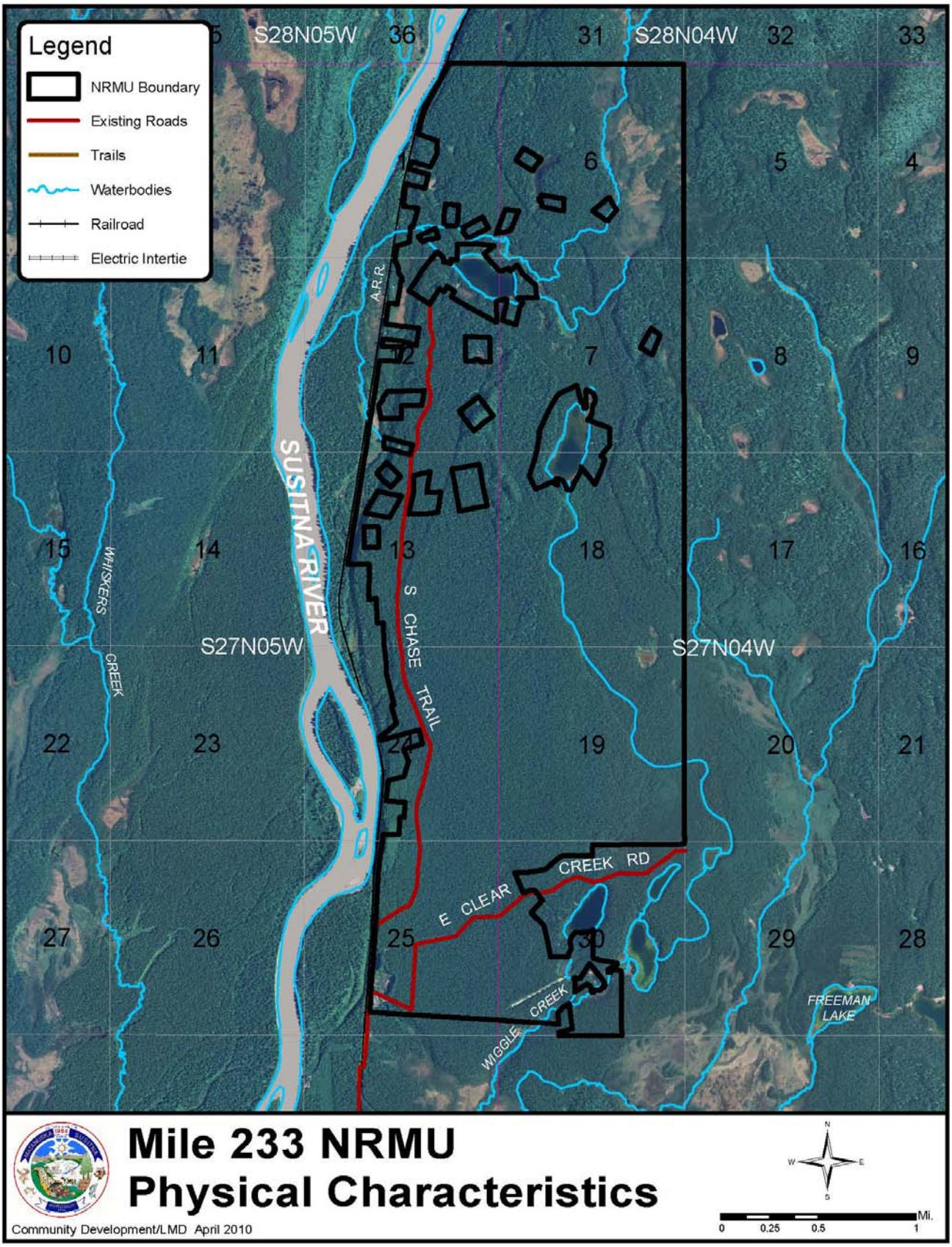
Legend
NRMU Boundary
Existing Roads
Trails
Waterbodies
Railroad
Electric Intertie
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S28N04W
S27N05W
S27N04W
SUSITNA RIVER
WHISKERS CREEK
A.R.R.
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WIGGLE CREEK
FREEMAN LAKE
Mile 233 NRMU
Physical Characteristics
Community Development/LMD April 2010
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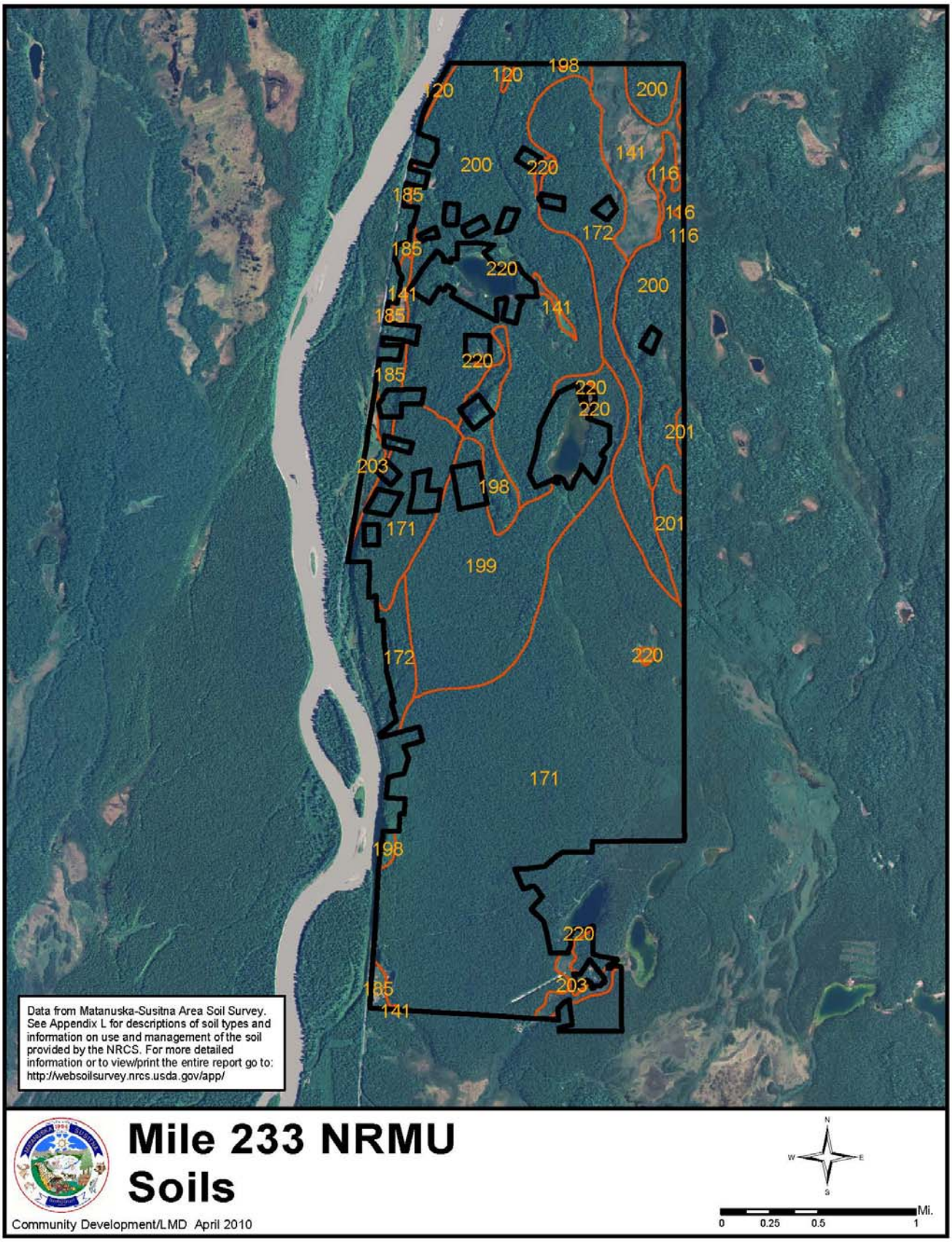
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Data from Matanuska-Susitna Area Soil Survey. See Appendix L for descriptions of soil types and information on use and management of the soil provided by the NRCS. For more detailed information or to view/print the entire report go to: http://websoilsurvey.nrcs.usda.gov/app/
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Soils
Community Development/LMD April 2010
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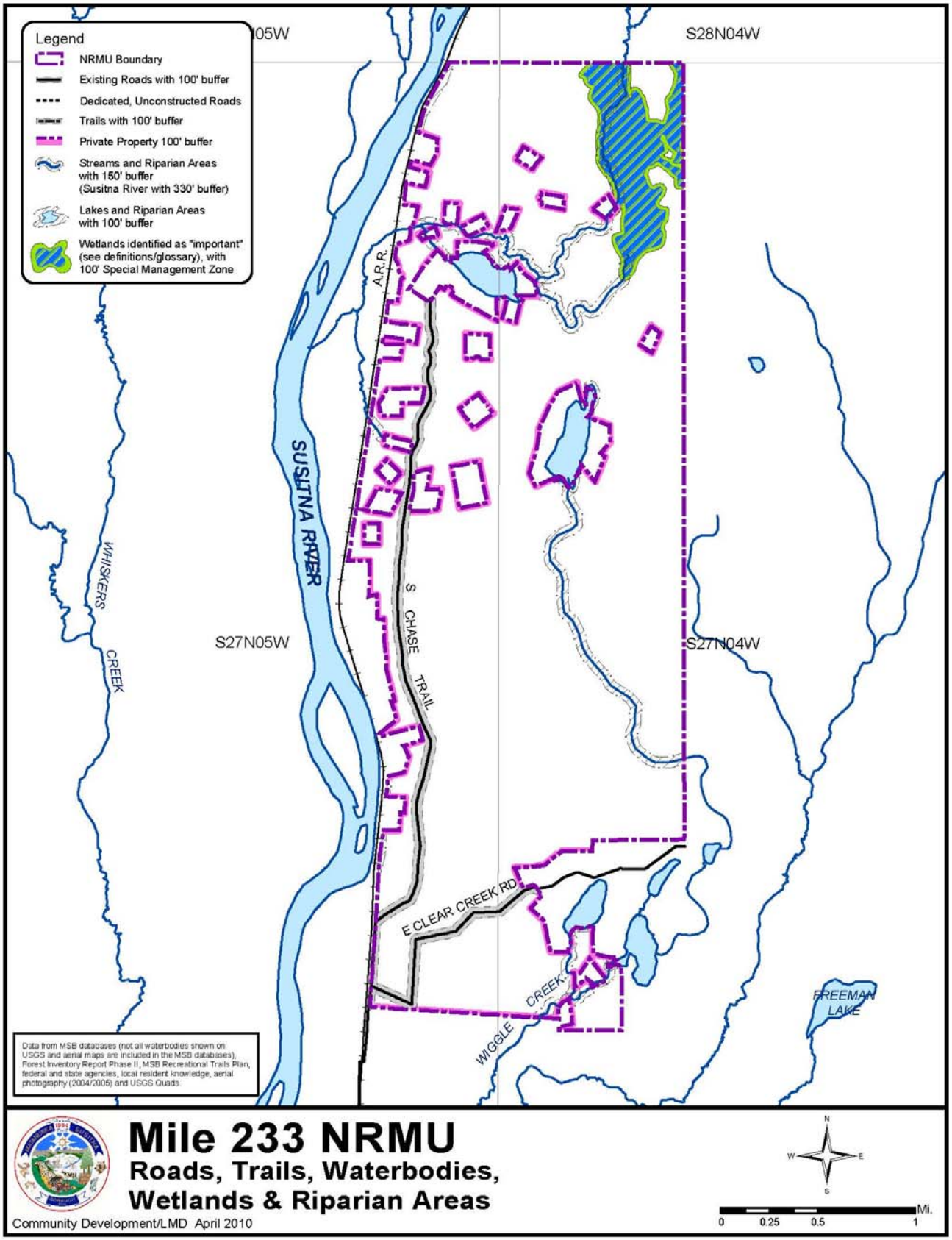
Legend
NRMU Boundary
Existing Roads with 100' buffer
Dedicated, Unconstructed Roads
Trails with 100' buffer
Private Property 100' buffer
Streams and Riparian Areas with 150' buffer (Susitna River with 330' buffer)
Lakes and Riparian Areas with 100' buffer
Wetlands identified as "important" (see definitions/glossary), with 100' Special Management Zone
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S27N05W
S27N04W
SUSITNA RIVER
WHISKERS CREEK
A.R.R.
S CHASE TRAIL
E CLEAR CREEK RD
WIGGLE CREEK
FREEMAN LAKE
Data from MSB databases (not all waterbodies shown on USGS and aerial maps are included in the MSB databases), Forest Inventory Report Phase II, MSB Recreational Trails Plan, federal and state agencies, local resident knowledge, aerial photography (2004/2005) and USGS Quads.
Mile 233 NRMU
Roads, Trails, Waterbodies, Wetlands & Riparian Areas
Community Development/LMD April 2010
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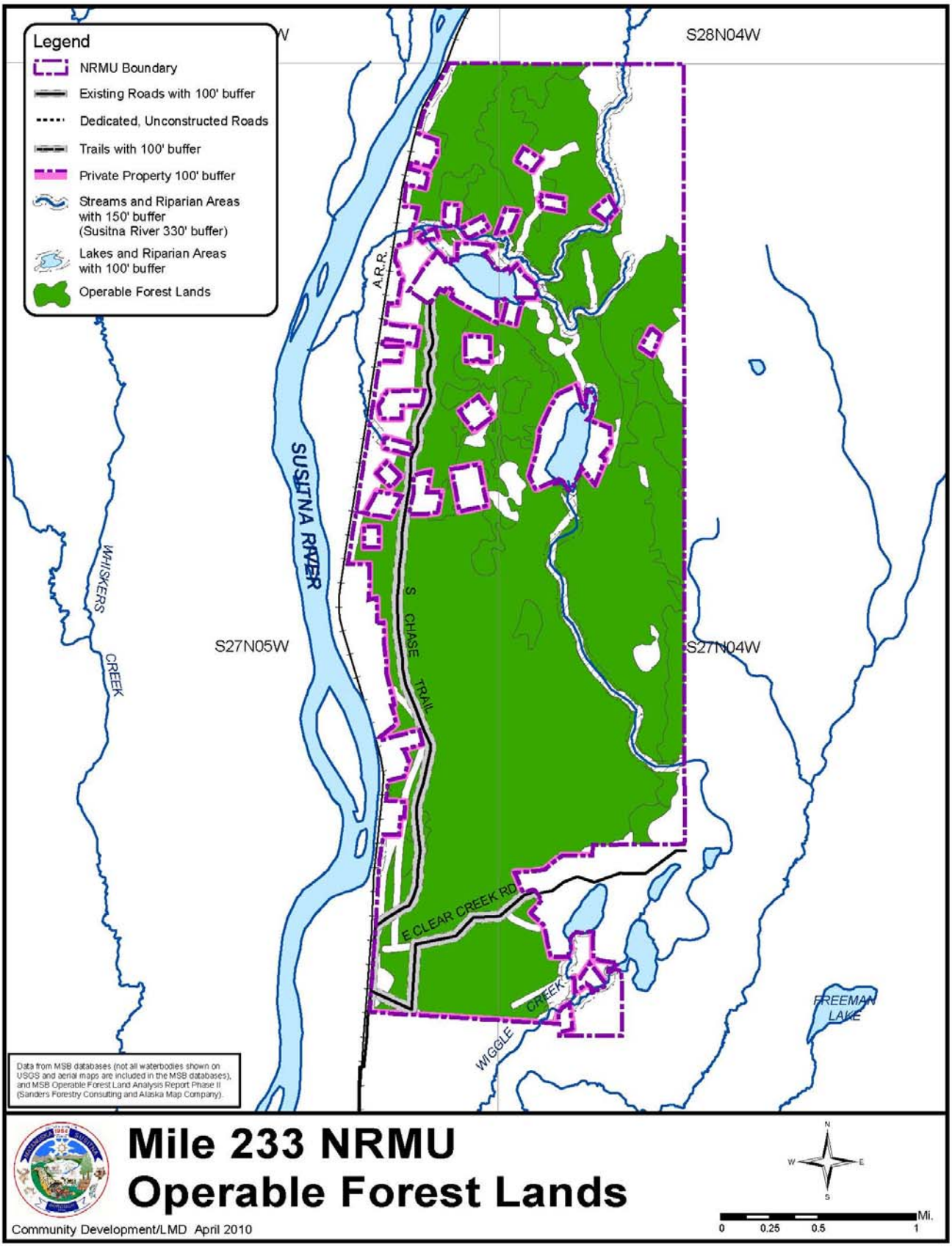
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NRMU Boundary
Existing Roads with 100' buffer
Dedicated, Unconstructed Roads
Trails with 100' buffer
Private Property 100' buffer
Streams and Riparian Areas with 150' buffer (Susitna River 330' buffer)
Lakes and Riparian Areas with 100' buffer
Operable Forest Lands
S28N04W
S27N05W
S27N04W
SUSITNA RIVER
WHISKERS CREEK
A.R.R.
S CHASE TRAIL
E CLEAR CREEK RD
WIGGLE CREEK
FREEMAN LAKE
Data from MSB databases (not all waterbodies shown on USGS and aerial maps are included in the MSB databases), and MSB Operable Forest Land Analysis Report Phase II (Sanders Forestry Consulting and Alaska Map Company).
Mile 233 NRMU
Operable Forest Lands
Community Development/LMD April 2010
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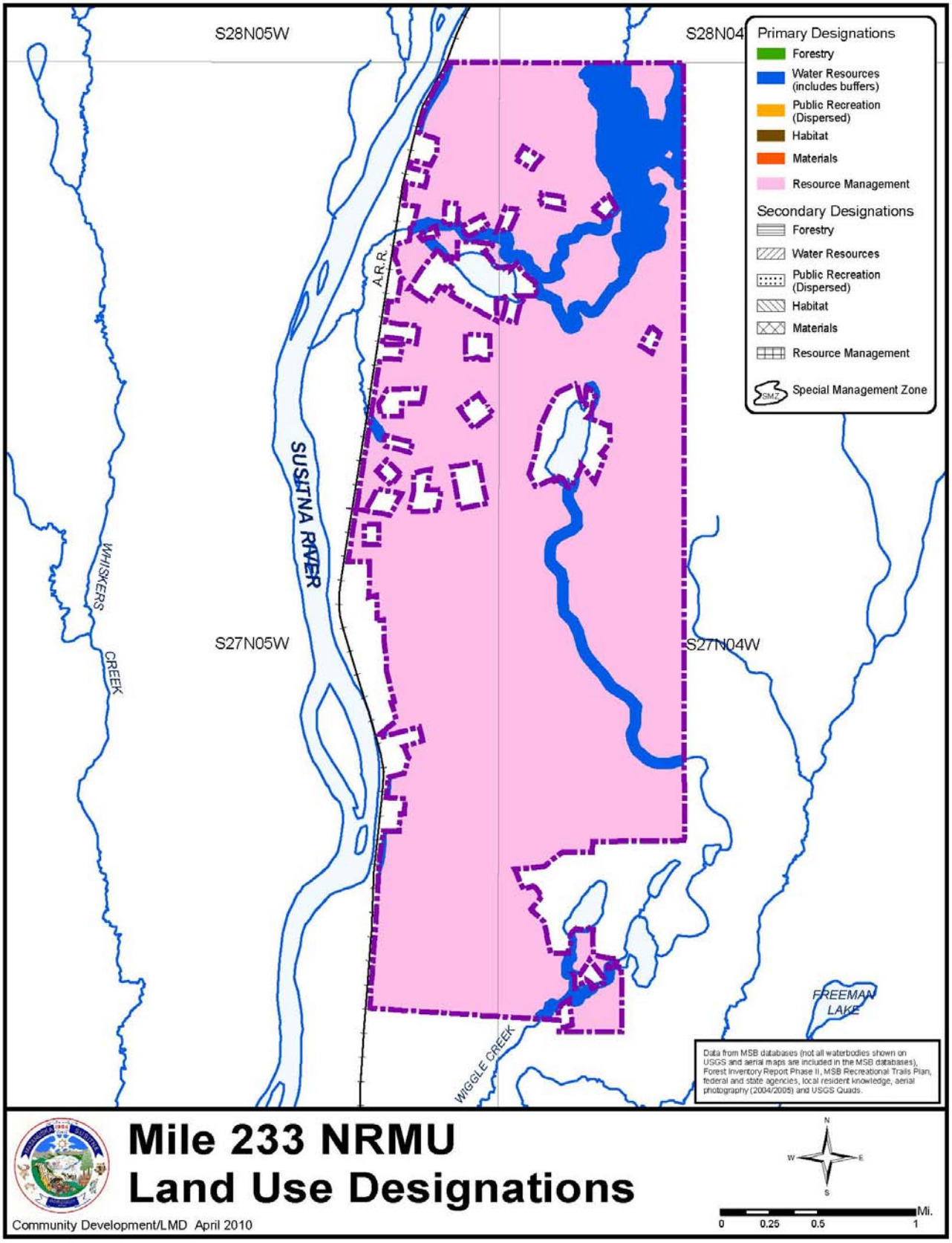
S28N05W
S28N04
Primary Designations
Forestry
Water Resources (includes buffers)
Public Recreation (Dispersed)
Habitat
Materials
Resource Management
Secondary Designations
Forestry
Water Resources
Public Recreation (Dispersed)
Habitat
Materials
Resource Management
Special Management Zone
A.R.R.
SUSITNA RIVER
WHISKERS CREEK
S27N05W
S27N04W
FREEMAN LAKE
WIGGLE CREEK
Data from MSB databases (not all waterbodies shown on USGS and aerial maps are included in the MSB databases), Forest Inventory Report Phase II, MSB Recreational Trails Plan, federal and state agencies, local resident knowledge, aerial photography (2004/2005) and USGS Quads.
Mile 233 NRMU
Land Use Designations
Community Development/LMD April 2010
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MILE 233
Natural Resource Management Unit

General Information

The Mile 233 Natural Resource Management Unit contains about 4,150 acres. The unit is located east of the Susitna River and along the eastern right-of-way of the Alaska Railroad from milepost 232 to 237. The community of Chase consists of dispersed private parcels and recreational/residential cabins, located primarily in the northern portion of the unit.

The unit lies between the Talkeetna Mountains to the east and the Alaska Range to the west and is characterized as having hills and ridges divided by gullies, kettles, muskegs and streams. The majority of the unit has good well drained soils.

Borough Tax Maps
Chase 10, 11, 14, and 15.

Current Land Use
This unit has been in a Forest Management Unit since 1990 but there has been no commercial timber harvesting in the unit. Local residents are known to use the timber in the unit for personal use. The area has a variety of dispersed recreational and local resident rural lifestyle uses, mainly related to salmon fishing, moose hunting and some trapping.

Surrounding Land Use
The adjoining land is owned by the State of Alaska and some scattered private land. The same dispersed recreational uses occurs on these lands.

Community Council Area
Chase Community Council

Existing Land Use Plans

- Mat-Su Borough, *Multiple-Use Forest Management Plan* (1989), which will be replaced by this plan when adopted.
- Alaska Department of Natural Resources, *Susitna Area Plan* (1985), South Parks Highway Unit: Susitna/Chulitna Subunit (2) with designated land uses for forestry, public recreation, watershed, and wildlife. Chase Subunit (4b) which is designated Borough Land Bank with values for forestry, public recreation, watershed and wildlife. The *Susitna Area Plan* is currently being revised as the *Susitna-Matanuska Area Plan* and will not apply to borough land. When the *Susitna-Matanuska Area Plan* is completed it will replace the *Susitna Area Plan.*
- Mat-Su Borough, *Recreational Trails Plan* (2007).
- Mat-Su Borough, *Parks, Recreation and Open Space Plan* (2001), which is currently being updated.

Chase Comprehensive Plan (1993) includes policies stipulating that:

- timber used for mining or agriculture use should be salvaged.
- educational and technical information regarding use of forest products should be made available with woodcutting permits.
- a local forestry advisory board be established to work with the Borough in managing the forest.
- personal woodlots should be established.
- buffers for timber harvest in the vicinity of private property shall be provided.

Existing Land Use Classification
Forest Management Lands

Summary of Resources and Uses

Agriculture and Grazing
A review of soil types, published by the Department of Agriculture, Natural Resources Conservation Service (http://websoilsurvey.ncrs.usda.gov/app/), indicates that there are some areas with soils suitable for agricultural development or grazing within the unit. However, due to the units' remote location with limited access and climate limitations agricultural development is not feasible at this time. Small agriculture uses and development may occur to support local resident's rural lifestyles.

Also, see *Soils* map at the beginning of this section.

Cultural Resources and Heritage Sites
There are no documented historical or heritage sites and no cultural survey has taken place within the unit. Because of the units' location along the Susitna River the possibility of prehistoric and historic fishing and/or hunting camps is likely, especially where fresh water streams enter into the Susitna River.

Additional field work may be required if any natural resource extraction or other development activities take place or use of the unit changes substantially.

Fish and Wildlife Habitat and Resources
This unit has both summer and winter range for moderate numbers of moose. Black bears are abundant along anadromous steams and in subalpine habitats. Brown bears are common seasonally in subalpine habitats. Fur bearers are also common in the area. Local residents report that they frequently see wood frogs.

Wetland areas support a plethora of birds, including eagles, owls, migratory birds, peregrine falcons and many others.

There are no documented bear denning areas or eagle nests in the unit. However, the terrain and habitat in the area is such that bears would be expected to den within the unit and eagles and other raptors could nest there as well. Additional fieldwork will be required

prior to any natural resource extraction or other development activities taking place to verify this information.

The Susitna River is a cataloged anadromous stream with all five species of Pacific salmon existing in the Susitna River drainage. An unnamed creek crossing the railroad right-of-way at approximately Mile 236 and its tributaries support Chinook and Coho salmon spawning. Other unnamed streams entering the Susitna River from the east, while also not cataloged, are known to be are very active spawning grounds for sockeye, Coho, Chinook, pink and humpies.

Prior to any resource extraction projects, the anadromous fish distribution in any wetlands should be established, any additional anadromous or important resident fish waterbodies need to be identified and the Alaska Department of Fish and Game will need to verify the cataloged anadromous resident fish streams as described above.

The Alaska Department of Fish and Game will require Fish Habitat Permits, accompanied by detailed project plans, prior to any planned resource extraction project adjacent to anadromous or resident waterbodies.

There are no known commercial lodges or fish camps.

Forest Resources

The principal timber type is mature mixed birch and spruce sawtimber stands. Within the 4,146 acre unit, 3,738 (90% of the unit) is Commercial Forest Land, of which 3,080 (74% of the unit) is Operable Forest Land.

For the area that was inventoried, the 2009 Operable Forest Land Analysis Report found the following timber composition within the unit:

Stratum 1: Pole Timber – Closed Canopy	190 acres
Stratum 2: Pole Timber – Open Canopy	0 acres
Stratum 3: Hardwood Saw Timber – Closed Canopy	0 acres
Stratum 4: Hardwood Saw Timber – Open Canopy	68 acres
Stratum 5: Mixed Forest Saw Timber – Closed Canopy	2,347 acres
Stratum 6: Mixed Forest Saw Timber – Open Canopy	475 acres
TOTAL	**3,080 acres**

Also, see *Operable Forest Lands* map at the beginning of this section.

Local residents use the forest resources as a supply for fire wood to heat their homes.

Private Property

There is a significant amount of private property located within the exterior boundaries of the unit. Most are located along the Alaska Railroad, the Chase Trail and along the various lakes and streams that are located within the northern half of the unit. These parcels have been excluded from the unit and are not subject to this plan.

Public Recreation and Tourism

The unit is moderately good for hunting and fishing, with local residents taking advantage of these opportunities which is especially popular in June. General recreation also occurs in the area, particularly along the Alaska Railroad and around the Chase and Clear Creek Trails during the winter when access is easier.

There is nothing of special interest that would attract tourists to this unit in significant numbers, especially because of its semi-remote location and is difficult to access. However, because of its location it is on one of the flight seeing flight lines to and from Denali National Park and Preserve, specifically the Mount McKinley area. A commercial rafting operation also takes clients on the train from Talkeetna to Chase and then floats back to Talkeetna on the Susitna River.

Roads and Trails

There is no dedicated road access into the area. The Alaska Railroad provides access to the area and provides "flag stop" service to local residents and visitors.

The Chase Trail and Clear Creek Road, both of which are dedicated, also access the area. The Chase Trail is serviced by a Trail Service District.

There are numerous non-dedicated local trails leading from the Susitna River, Alaska Railroad and the Chase Trail that lead to the private properties located throughout the exterior boundaries of the unit.

Also, see the *Roads, Trails, Waterbodies, Wetlands and Riparian Areas* map at the beginning of this section.

Rock, Sand and Gravel

There are no developed rock, sand or gravel extraction areas within the unit. Soil mapping (see http://websoilsurvey.ncrs.usda.gov/app/) does not reveal any potential commercial rock, sand and gravel resources. Just outside the unit there is an old unused material site at Mile 232 which is the property of the Alaska Railroad Corporation.

Also, see the *Soils* map at the beginning of this section.

Unit Management Intent

The management intent for the Mile 233 Natural Resource Management Unit is to encourage continued recreational and rural lifestyle uses of the area, recognize the areas scenic values while meeting some limited wood product needs.

Land Use Designations

Mile 233		
Designation	**Classification**	**Management Intent**
Primary		
Resource Management	Resource Management Lands	All upland areas, except those designated as water resources. Available for forest management and small timber harvests in those areas determined to be operable forest land and where it does not significantly reduce the areas recreational activities and area resident's rural lifestyles. Protect and improve important wildlife habitat areas.
Water Resources	Watershed Lands	All waterbodies, riparian areas, and important wetlands. Any waterbodies, riparian areas or important wetlands determined after adoption of this plan to be anadromous, important for resident fish, or important wetlands for fish and wildlife shall also be similarly designated and classified[15].
Secondary		
None		

Also, see the *Land Use Designations* map at the beginning of this section.

[15] Such designation and classification shall be considered as a "Minor Change" to the Plan (See Volume I, Chapter 4, *Procedures for Changes to the Plan, Goals, and Guidelines.*

Management Guidelines

See Volume I, Chapters 2 and 3 for area-wide guidelines for all Natural Resource Management Units. The remainder of this section presents unit-specific guidelines.

Buffers and Special Management Zones

All flowing waterbodies, including lakes that are part of a flowing water system that are connected to creeks, streams and rivers, and their associated riparian areas shall be protected through the use of undisturbed natural vegetation buffers.

All wetlands over 40 acres and all smaller important wetland areas (see definition in *Definitions/Glossary* at the end of this chapter or in Volume III) shall be protected with a Special Management Zone which shall include a 100-foot area around the wetland area. The Zone shall not allow disturbance of the wetland area, but some uses may be allowed. For example, winter time recreational use is allowed once sufficient snow cover exists to not harm the natural vegetation.

At such time that new activities are contemplated in the unit, all potentially impacted waterbodies and wetlands shall be assessed as to their habitat and water resource value. Depending on the assessment, the waterbodies and wetlands will be provided additional protection through buffers or placed in a Special Management Zone, as appropriate.

The Chase Trail and Clear Creek Road shall have an undisturbed natural vegetation buffer.

Where the unit adjoins private property, the private property shall be protected through the use of an undisturbed natural vegetation buffer. These buffers may only be modified following the provisions in Volume I, Chapter 2, *Buffers* and MSB 23.20.070.

See *Roads, Trails, Waterbodies, Wetlands and Riparian Areas* and map at the beginning of this section for wetlands with a Special Management Zone, and waterbodies, private property, roads and trails with buffers.

Also, see Volume I, Chapter 2, *Buffers* and *Special Management Zones,* for more information.

Forest Management

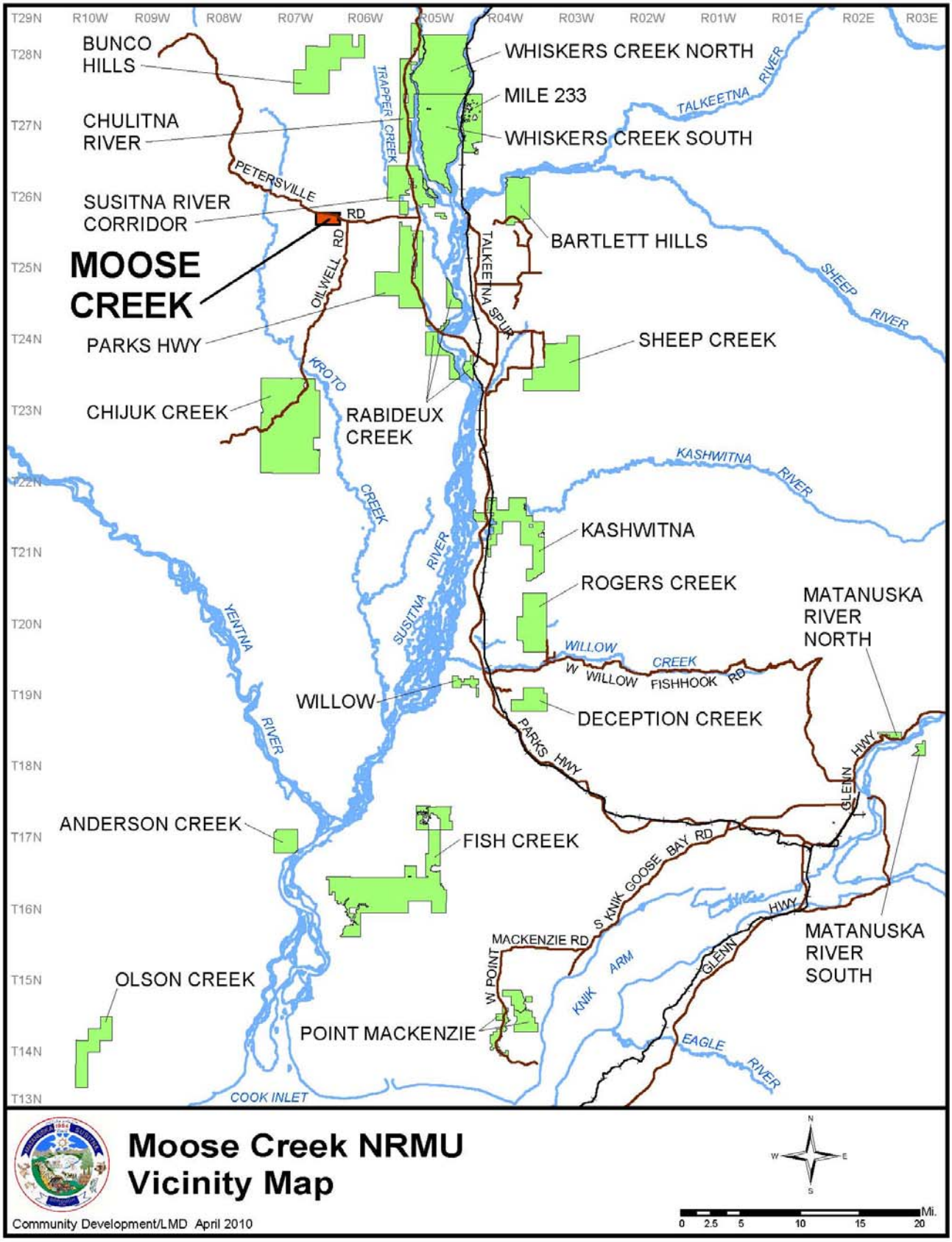
Timber harvest is a permitted use when it does not significantly reduce the local resident's rural lifestyles and the areas recreational, and scenic values. Timber harvests shall generally be small. Examples include selective cuts for specialty products, sawlogs, house logs, personal/community use and firewood harvests.

Larger size timber harvests may be held after consultation with the Alaska Department of Fish and Game with harvest areas designed to improve wildlife habitat and/or to create winter moose habitat to reduce moose mortality along the Alaska Railroad. Location and layout of timber harvest areas shall also be designed to minimize negative visual impact on tourist flights in route to Denali National Park and Preserve.

Wood lots should be created to support local resident needs, while at the same time improving wildlife habitat and forest health.

Other Uses

No additional unit-specific guidelines are needed for this unit. See Volume I, Chapters 2 and 3 for area-wide guidelines that apply to all Natural Resource Management Units.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BUNCO HILLS
CHULITNA RIVER
SUSITNA RIVER CORRIDOR
MOOSE CREEK
PARKS HWY
CHIJUK CREEK
WHISKERS CREEK NORTH
MILE 233
WHISKERS CREEK SOUTH
BARTLETT HILLS
SHEEP CREEK
RABIDEUX CREEK
KASHWITNA
ROGERS CREEK
MATANUSKA RIVER NORTH
DECEPTION CREEK
WILLOW
ANDERSON CREEK
FISH CREEK
OLSON CREEK
POINT MACKENZIE
MATANUSKA RIVER SOUTH
TRAPPER CREEK
PETERSVILLE RD
OILWELL RD
TALKEETNA SPUR
TALKEETNA RIVER
SHEEP RIVER
KROTO CREEK
KASHWITNA RIVER
SUSITNA RIVER
YENTNA RIVER
WILLOW CREEK
W WILLOW FISHHOOK RD
PARKS HWY
GLENN HWY
S KNIK GOOSE BAY RD
MACKENZIE RD
W POINT
KNIK ARM
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COOK INLET
Moose Creek NRMU
Vicinity Map
Community Development/LMD April 2010
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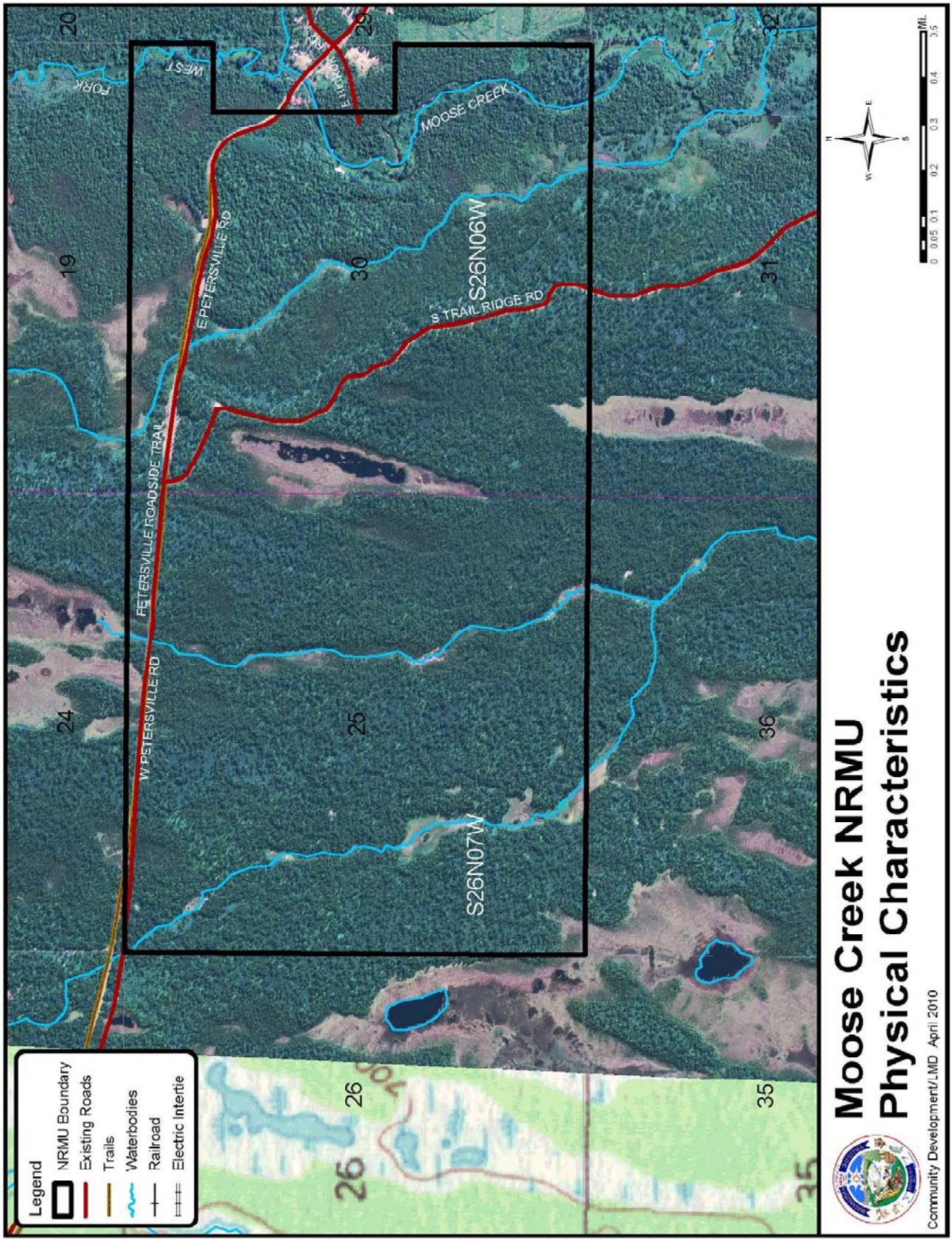
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NRMU Boundary
Existing Roads
Trails
Waterbodies
Railroad
Electric Intertie
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PETERSVILLE ROADSIDE TRAIL
E PETERSVILLE RD
S TRAIL RIDGE RD
MOOSE CREEK
S26N06W
S26N07W
24
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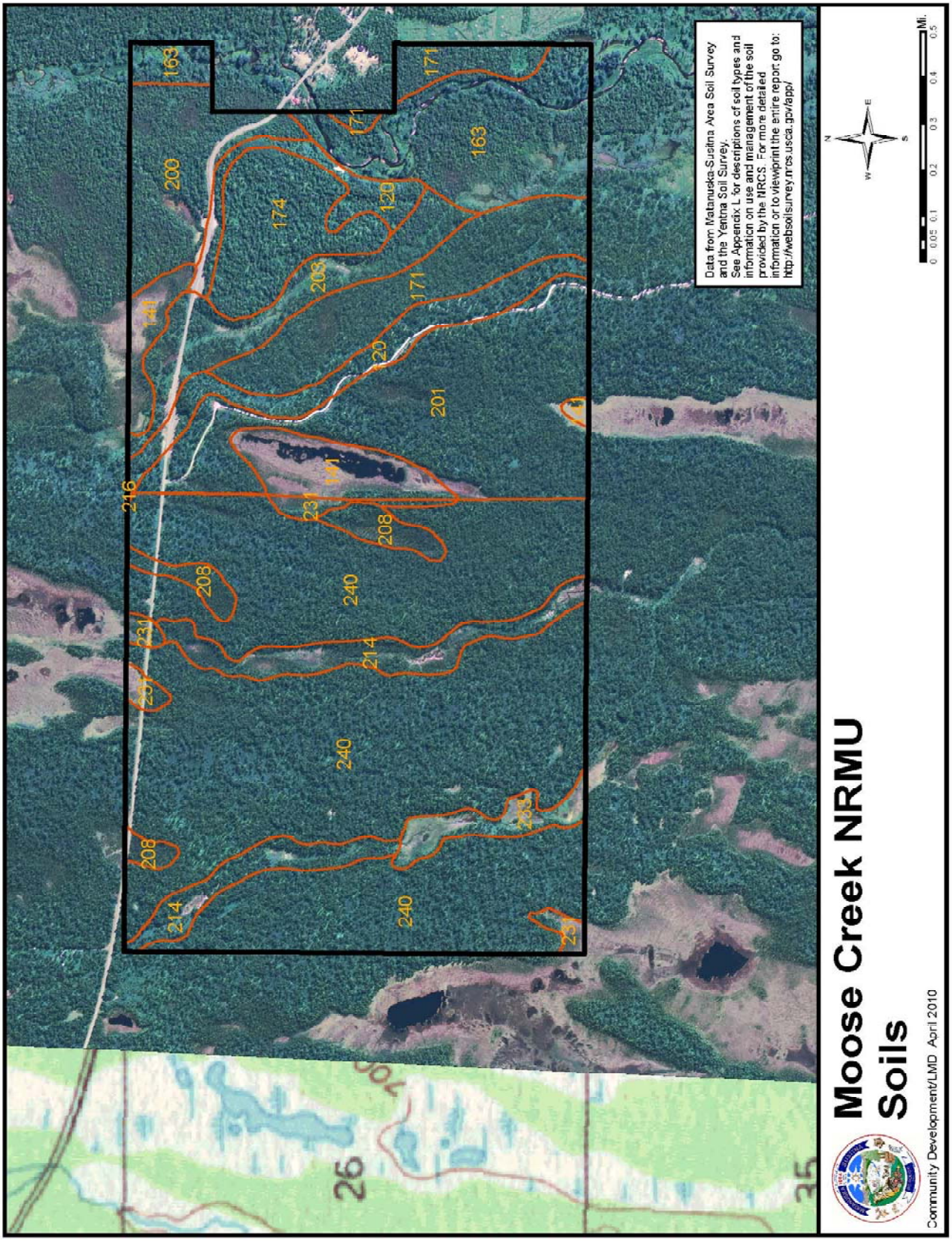
Moose Creek NRMU
Physical Characteristics
Community Development/LMD April 2010


Moose Creek NRMU
Soils
Community Development/LMD April 2010
Data from Matanuska-Susitna Area Soil Survey and the Yentna Soil Survey.
See Appendix L for descriptions of soil types and information on use and management of the soil provided by the NRCS. For more detailed information or to viewprint the entire report go to: http://websoilsurvey.nrcs.usda.gov/app/
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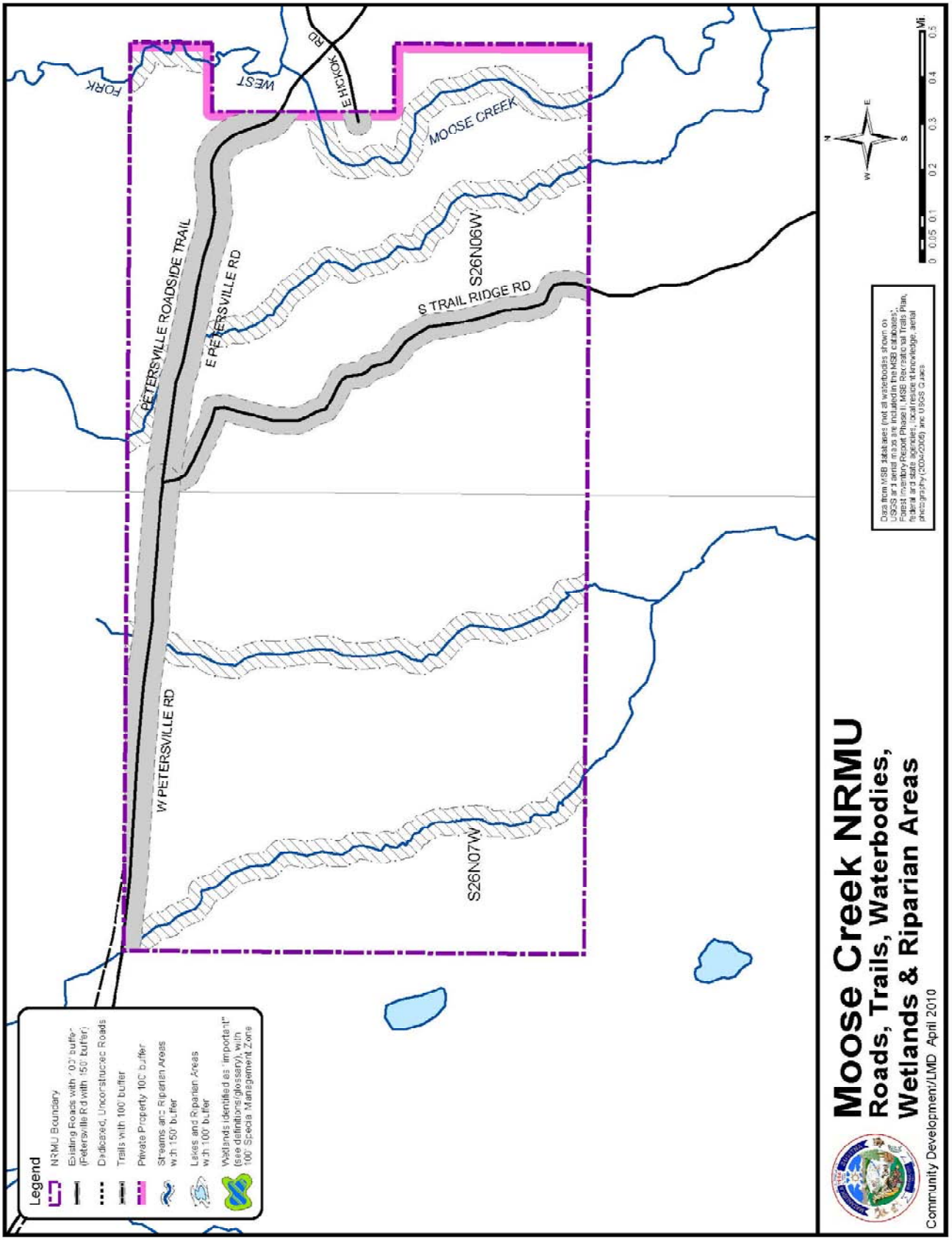
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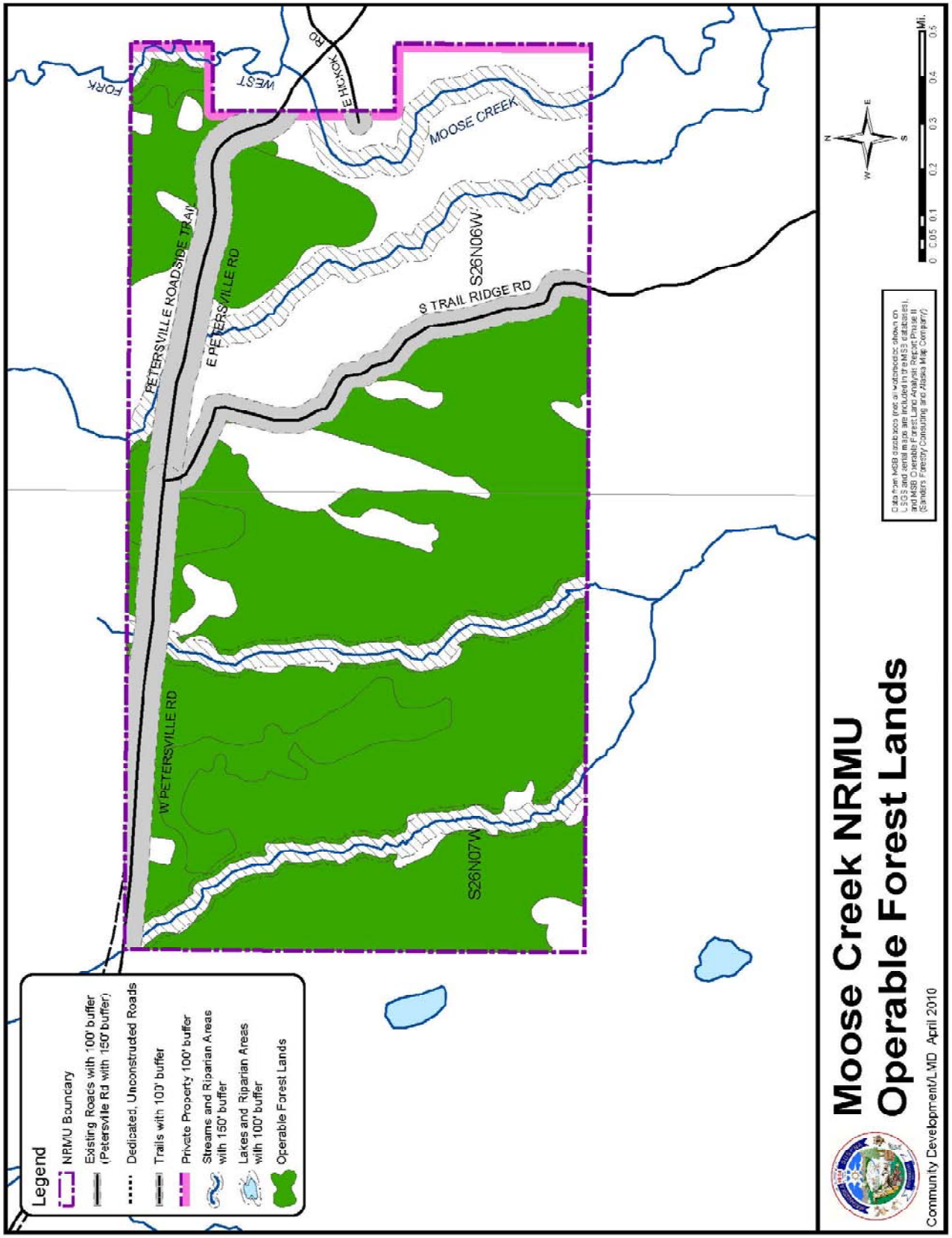
NRMU Boundary
Existing Roads with 100' buffer (Petersville Rd with 150' buffer)
Dedicated, Unconstructed Roads
Trails with 100' buffer
Private Property 100' buffer
Streams and Riparian Areas with 150' buffer
Lakes and Riparian Areas with 100' buffer
Wetlands identified as "important" (see definitions/glossary), with 100' Special Management Zone
W PETERSVILLE RD
S26N07W
PETERSVILLE ROADSIDE TRAIL
E PETERSVILLE RD
S26N06W
S TRAIL RIDGE RD
MOOSE CREEK
WEST
FORK
HICKOK
RD
Data from MSB database (not all waterbodies shown on USGS aerial maps are included in the MSB database). Roads and trails are based on MSB Recreational Trails Plan, federal and state agencies, local resident knowledge, aerial photography (2004-2006) and USGS Quads
0 0.05 0.1 0.2 0.3 0.4 0.5 Mi
Moose Creek NRMU
Roads, Trails, Waterbodies, Wetlands & Riparian Areas
Community Development/LMD April 2010


Legend
NRMU Boundary
Existing Roads with 100' buffer (Petersville Rd with 150' buffer)
Dedicated, Unconstructed Roads
Trails with 100' buffer
Private Property 100' buffer
Streams and Riparian Areas with 150' buffer
Lakes and Riparian Areas with 100' buffer
Operable Forest Lands
W PETERSVILLE RD
PETERSVILLE ROADSIDE TRAIL
E PETERSVILLE RD
S TRAIL RIDGE RD
MOOSE CREEK
S26N06W
S26N07W
WEST
FORK
E HICKOK
RD
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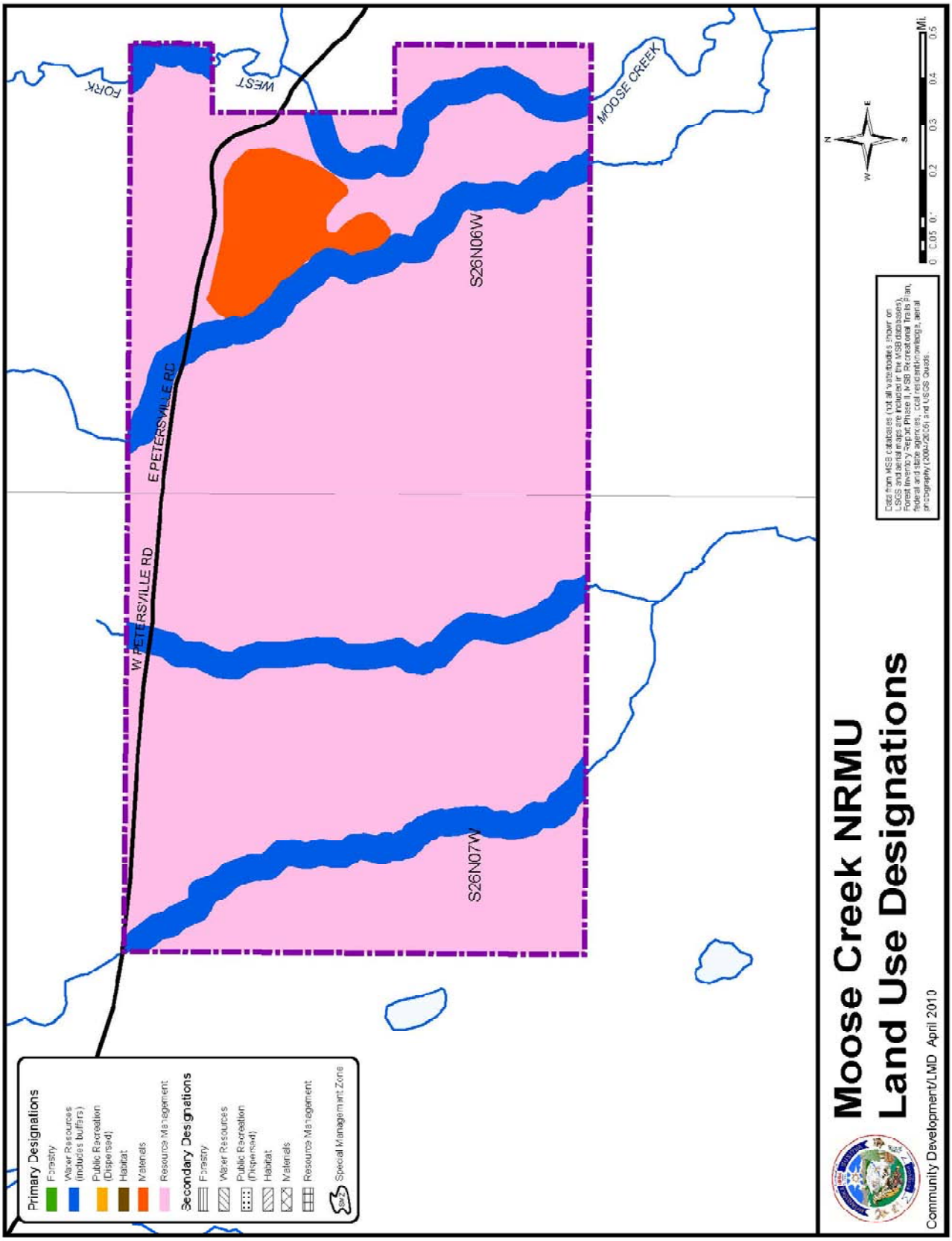
Data from MSB database (not all watercourses shown on USGS and aerial maps are included in the MSB database), and MSB Operable Forest Land Analysis Report Phase II (Sanders Forestry Consulting and Alaska Map Company)
Moose Creek NRMU
Operable Forest Lands
Community Development/LMD April 2010


Primary Designations
Forestry
Water Resources (includes buffers)
Public Recreation (Dispersed)
Habitat
Materials
Resource Management
Secondary Designations
Forestry
Water Resources
Public Recreation (Dispersed)
Habitat
Materials
Resource Management
Special Management Zone
W PETERSVILLE RD
E PETERSVILLE RD
S26N07W
S26N06W
FORK
WEST
MOOSE CREEK
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Data from MSB databases (not all waterbodies shown on USGS and aerial maps are included in the MSB database), Forest Inventory Report, Phase II, MSB Recreational Trails Plan, federal and state agencies, local residents/owners, aerial photography (2004/2005) and USGS Quads.
Moose Creek NRMU
Land Use Designations
Community Development/LMD April 2010

MOOSE CREEK (Petersville Area)
Natural Resource Management Unit

General Information

There are about 1,230 acres in the Moose Creek Unit. The unit is located along the Petersville Road, approximately 8 miles west of the intersection of Petersville Road and the Parks Highway.

The topography in the unit is generally flat with some rolling hills and meandering streams that run generally north to south.

Borough Tax Maps
Petersville 46 and 47

Current Land Use
The area has a variety of dispersed recreational uses.

Surrounding Land Use
The majority of the adjoining land is owned by the State of Alaska. The land to the north is within the Moose Creek Unit of the Susitna Recreational Rivers. Various dispersed recreational uses occur in the state land, similar to what happens within the unit. There are also some adjacent private land to the south and east.

Community Council Area
Trapper Creek Community Council

Existing Land Use Plans

- Mat-Su Borough, *Multiple-Use Forest Management Plan* (1989). This plan will be replaced by this plan when it is adopted.
- Alaska Department of Natural Resources, *Susitna Area Plan* (1985), Petersville Road Unit, Gate Creek/Amber Lake Subunit (3(e) with designated uses for Forestry, Public Recreation, and Water Resources. This plan is currently being revised as the *Susitna-Matanuska Area Plan* and will not apply to borough land. When completed the *Susitna-Matanuska Area Plan* will replace the *Susitna Area Plan*.
- Mat-Su Borough, *Recreational Trails Plan* (2007).
- Mat-Su Borough, *Parks, Recreation and Open Space Plan* (2001), which is currently being updated.

The Trapper Creek Community Council is currently working on a Comprehensive Plan.

Existing Land Use Classification
Forest Management Lands

Summary of Resources and Uses

Agriculture and Grazing

While there is a significant amount of agricultural development in the general area, a review of soil types, published by the Department of Agriculture, Natural Resources Conservation Service (http://websoilsurvey.ncrs.usda.gov/app/), indicates that there are no known lands suitable for agricultural development or grazing within the unit.

Also, see *Soils* map at the beginning of this section.

Cultural Resources and Heritage Sites

There are no documented historical or heritage sites and no cultural survey has taken place within the unit. Additional field work should be conducted if any natural resource extraction or other development activities take place within the unit.

Fish and Wildlife Habitat and Resources

Moose and black bear are common. Moose tend to congregate in the winter in the riparian habitats. The unit, and the surrounding land, is used by the public for hunting and trapping, especially the area adjacent to the road system. Moderate numbers of furbearer species occur throughout the general area.

There are no known bear dens, Trumpeter Swans or eagle nests within the unit. Additional fieldwork will be required prior to any natural resource extraction or other development activities taking place to verify this information.

Moose Creek and the west fork are documented anadromous steams that flow through the eastern perimeter of the unit. Chinook, Coho and Sockeye salmon spawn and rear in the main stream. Pink salmon are also present. Both the main stream and the west fork also support rainbow trout, grayling and Dolly Varden char.

Prior to any resource extraction projects, the anadromous fish distribution in any wetlands should be established, any additional anadromous or important resident fish waterbodies need to be identified and the Alaska Department of Fish and Game will need to verify the cataloged anadromous resident fish streams as described above.

The Alaska Department of Fish and Game will require fish Habitat Permits, accompanied by detailed project plans, prior to any planned resource extraction project adjacent to anadromous or resident waterbodies.

There are no commercial lodges or fish camps located within the unit.

Forest Resources

The principal timber type is mature mixed birch and spruce. The unit was inventoried in 2009. Within the 1,228 acre unit, 991 acres (81% of the unit) was determined to be Commercial Forest Land, of which 732 acres (60% of the unit) was found to be Operable Forest Land.

The 2009 Operable Forest Land Analysis Report found the following timber composition:

Stratum 1: Pole Timber – Closed Canopy	1 acres
Stratum 2: Pole Timber – Open Canopy	0 acres
Stratum 3: Hardwood Saw Timber – Closed Canopy	6 acres
Stratum 4: Hardwood Saw Timber – Open Canopy	0 acres
Stratum 5: Mixed Forest Saw Timber – Closed Canopy	657 acres
Stratum 6: Mixed Forest Saw Timber – Open Canopy	68 acres
TOTAL	732 acres

Also, see *Operable Forest Lands* map at the beginning of this section.

The Trapper Creek Community Council has requested that an area along the road system be designated as a wood lot for local residents to be able to cut firewood in this and other nearby Natural Resource Management Units (Chulitna River, Parks Highway, Rabideux and Susitna River Corridor).

Private Property

There is no private land within the unit. There is some private land to the east of the unit and dispersed throughout the area.

Public Recreation and Tourism

Easy access via the Petersville and Trail Ridge Roads makes most portions of the area accessible. Hunters, anglers, trappers, cross-country skiers, dog mushers and snowmobilers all take advantage of this area.

There is no specific resource or activity that draws tourists to this area other than the scenic values which exists throughout the entire area.

Roads and Trails

The Petersville Road bisects the northern portion of the unit in an east/west direction. The Petersville Road when it crosses the unit is a scenic highway. Trail Ridge Road also bisects the unit, generally in a north/south direction.

The proposed Petersville Roadside Trail parallels the northern portion of Petersville Road and also bisects the unit in an east/west direction.

Also, see the *Roads, Trails, Waterbodies, Wetlands and Riparian Areas* map at the beginning of this section.

Rock, Sand and Gravel

Soil mapping (see http://websoilsurvey.ncrs.usda.gov/app/) indicates that there is rock, sand, and gravel resources within the unit. There are no developed rock, sand, or gravel extraction areas within the unit at this time. A more extensive field inventory will be

necessary to determine the volume, extent and feasibility of possible developing this resource.

Also, see the *Soils* map at the beginning of this section.

Unit Management Intent

The management intent for the Moose Creek Natural Resource Management Unit shall be to protect the units water resources, allow development of some rock, sand and gravel resources, meet some limited wood product needs, while not significantly reducing the recreational uses of the area and the local residents rural lifestyle.

Land Use Designations

Moose Creek		
Designation	**Classification**	**Management Intent**
Primary		
Materials	Material Lands	Only that area determined to be usable for commercial development in Section 30, T. 26 N., R. 6 W. SM. Extraction area(s) shall be adequately buffered and hours of operation limited. Conversion of use is permitted, provided public notice is provided prior to sale and extraction.
Resource Management	Resource Management Lands	Remainder of unit not designated as materials or water resources. Available for forest management and small timber harvests in those areas determined to be operable forest land and where it does not significantly reduce the areas recreational activities and area resident's rural lifestyles. Protect and improve important wildlife habitat areas.

Moose Creek (continued)		
Designation	Classification	Notes
Primary (continued)		
Water Resources	Watershed Lands	All waterbodies, riparian areas, and important wetlands. Any waterbodies, riparian areas or important wetlands determined after adoption of this plan to be anadromous, important for resident fish, or important wetlands for fish and wildlife shall also be similarly designated and classified[16].
Secondary		
None		

Also, see the *Land Use Designations* map at the beginning of this section.

Management Guidelines

See Volume I, Chapters 2 and 3 for area-wide guidelines for all Natural Resource Management Units. The remainder of this section presents unit-specific guidelines.

<u>Buffers and Special Management Zones</u>
All flowing waterbodies, including lakes that are part of a flowing water system that are connected to creeks, streams, and rivers, and associated riparian areas will be protected through the use of undisturbed natural vegetation buffers.

All wetlands over 40 acres and all smaller important wetland areas (see definition in *Definitions/Glossary* in Volume III) shall be protected with a Special Management Zone which shall include a 100-foot area around the wetland area. The Zone shall not allow disturbance of the wetland area, but some uses may be allowed. For example, winter time recreational use is allowed once sufficient snow cover exists to not harm the natural vegetation.

At such time that new activities are planned in the unit, all potentially impacted waterbodies and wetlands shall be assessed as to their habitat and water resource value. Depending on the assessment, the waterbodies and wetlands will be provided protection through the use of buffers or placed in a Special Management Zone, as appropriate.

[16] Such designation and classification shall be considered as a "Minor Change" to the Plan (See Volume I, Chapter 4, *Procedures for Changes to the Plan, Goals, and Guidelines.*

The Petersville Road, because it is a Scenic Highway shall have a 150-foot no development buffer from either side of the right-of way. S. Trail Ridge Road and the Petersville Roadside Trail shall receive standard road buffers.

Where the unit adjoins private property, the private property shall be protected through the use of an undisturbed natural vegetation buffer. These buffers may only be modified following the provisions in Volume I, Chapter 2, *Buffers* and MSB 23.20.070.

See *Roads, Trails, Waterbodies, Wetlands and Riparian Areas* map at the beginning of this section for, wetlands with a Special Management Zone, waterbodies and roads and trails with buffers.

Also, see Volume I, Chapter 2, *Buffers* and *Special Management Zones* for additional information.

Materials

Material sites may be developed outside of water resource areas and with sufficient quantities for commercial use. Sites shall be developed, operated and closed pursuant to State law and Borough code. One commercial site is known to exist in Section 30, T. 26 N., R. 6 W. SM. Material extraction may be limited to certain times of the year and hours of operation in recognition of local resident's lifestyles.

See volume I, Chapter 2, *Sand and Gravel*, for more information.

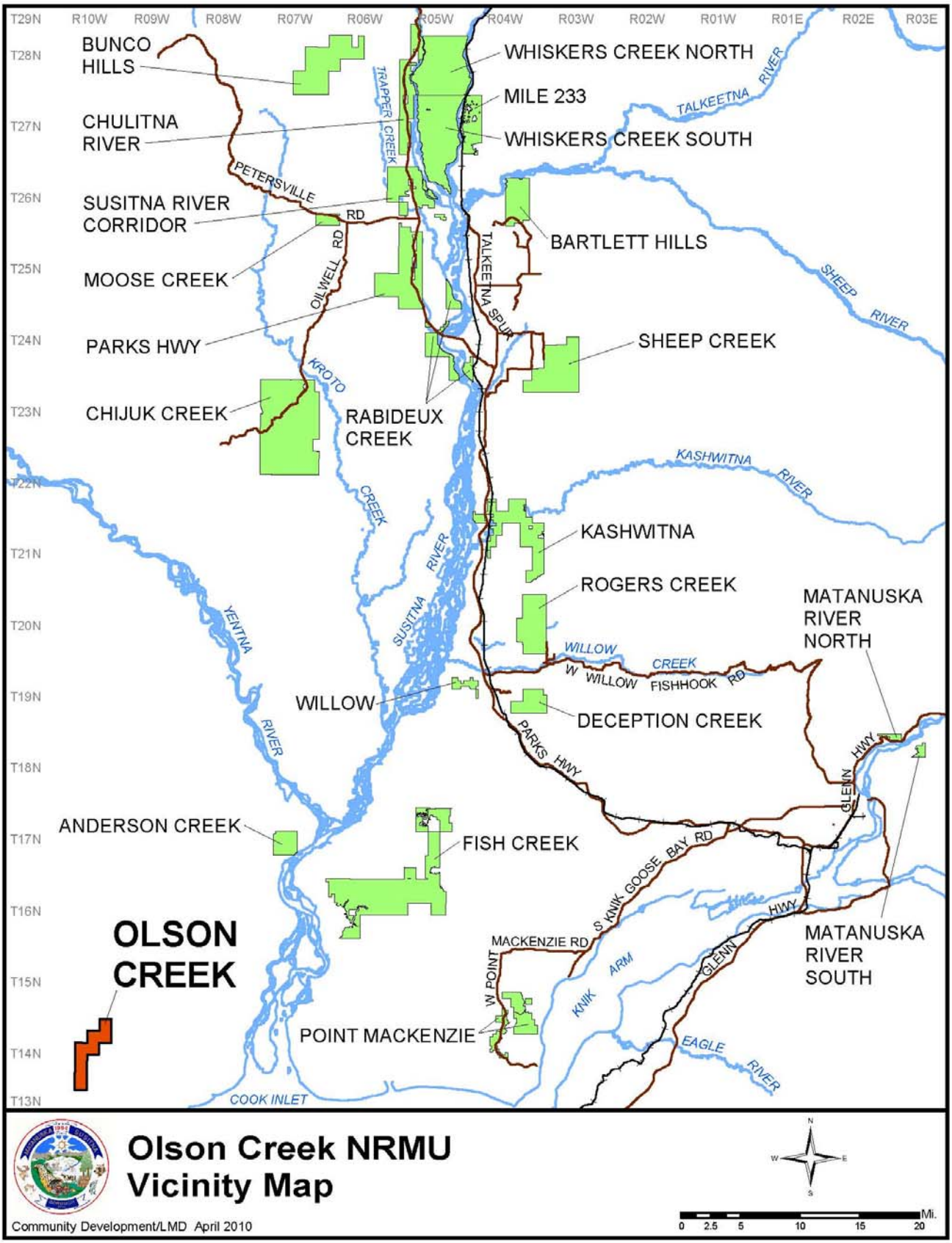
Forest Management

Timber harvest is permitted when it does not significantly reduce the areas recreational and habitat values and recognizes the local area resident's rural lifestyles. Timber harvests shall be small and limited to woodlots for firewood, sawlogs, and dispersed select cut for specialty wood products, including house logs.

The area designated for future material (rock, sand and gravel) extraction should be the first area offered or made available for timber harvest. If material extraction is expected to commence within 7-years of the timber harvest, regeneration/reforestation shall not be required.

Other Uses

No additional unit-specific guidelines are needed for this unit. See Volume I, Chapters 2 and 3 for area-wide guidelines that apply to all Natural Resource Management Units.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SUSITNA RIVER CORRIDOR
MOOSE CREEK
PARKS HWY
CHIJUK CREEK
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OILWELL RD
KROTO CREEK
TALKEETNA SPUR
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YENTNA RIVER
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GLENN HWY
S KNIK GOOSE BAY RD
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W POINT
KNIK ARM
EAGLE RIVER
COOK INLET
Olson Creek NRMU
Vicinity Map
Community Development/LMD April 2010
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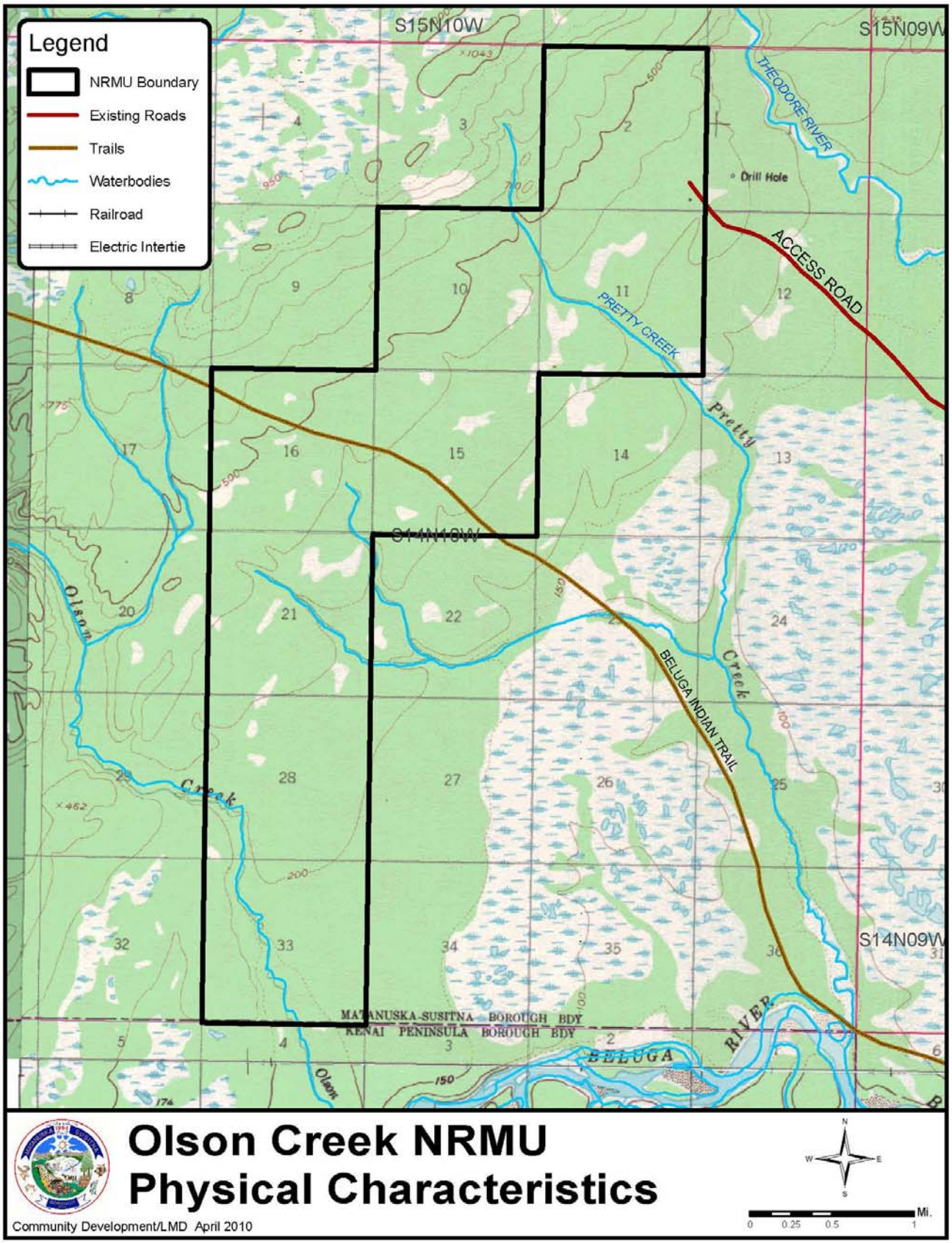
Legend
NRMU Boundary
Existing Roads
Trails
Waterbodies
Railroad
Electric Intertie
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S15N09W
S14N10W
S14N09W
THEODORE RIVER
Drill Hole
ACCESS ROAD
PRETTY CREEK
Pretty
Creek
Olson
Creek
BELUGA INDIAN TRAIL
MATANUSKA-SUSITNA BOROUGH BDY
KENAI PENINSULA BOROUGH BDY
BELUGA
RIVER
Olson
Olson Creek NRMU
Physical Characteristics
Community Development/LMD April 2010
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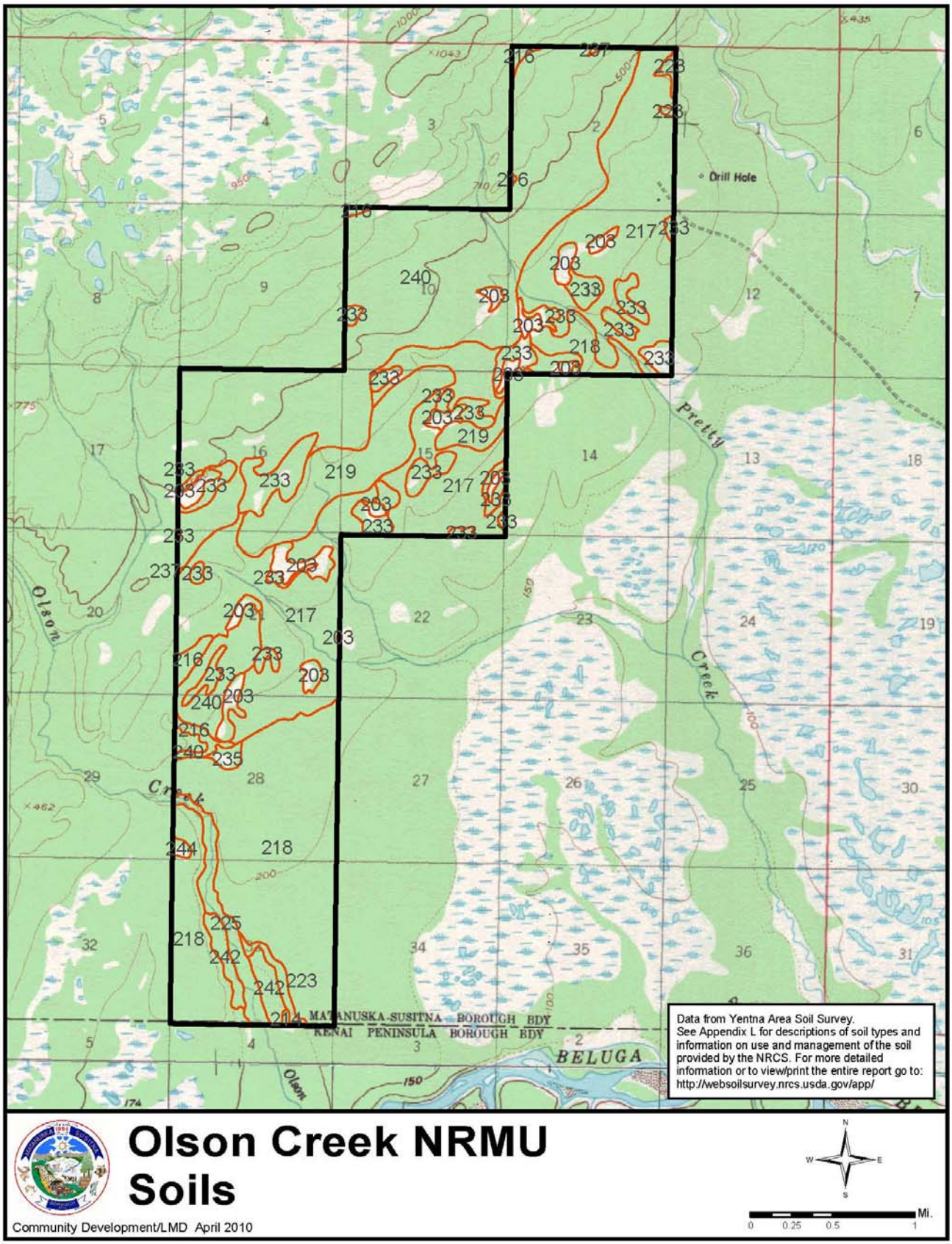
Olson Creek NRMU
Soils
Community Development/LMD April 2010
Data from Yentna Area Soil Survey.
See Appendix L for descriptions of soil types and information on use and management of the soil provided by the NRCS. For more detailed information or to view/print the entire report go to: http://websoilsurvey.nrcs.usda.gov/app/
Drill Hole
Pretty
Creek
Olson
Creek
Olson
MATANUSKA-SUSITNA BOROUGH BDY
KENAI PENINSULA BOROUGH BDY
BELUGA
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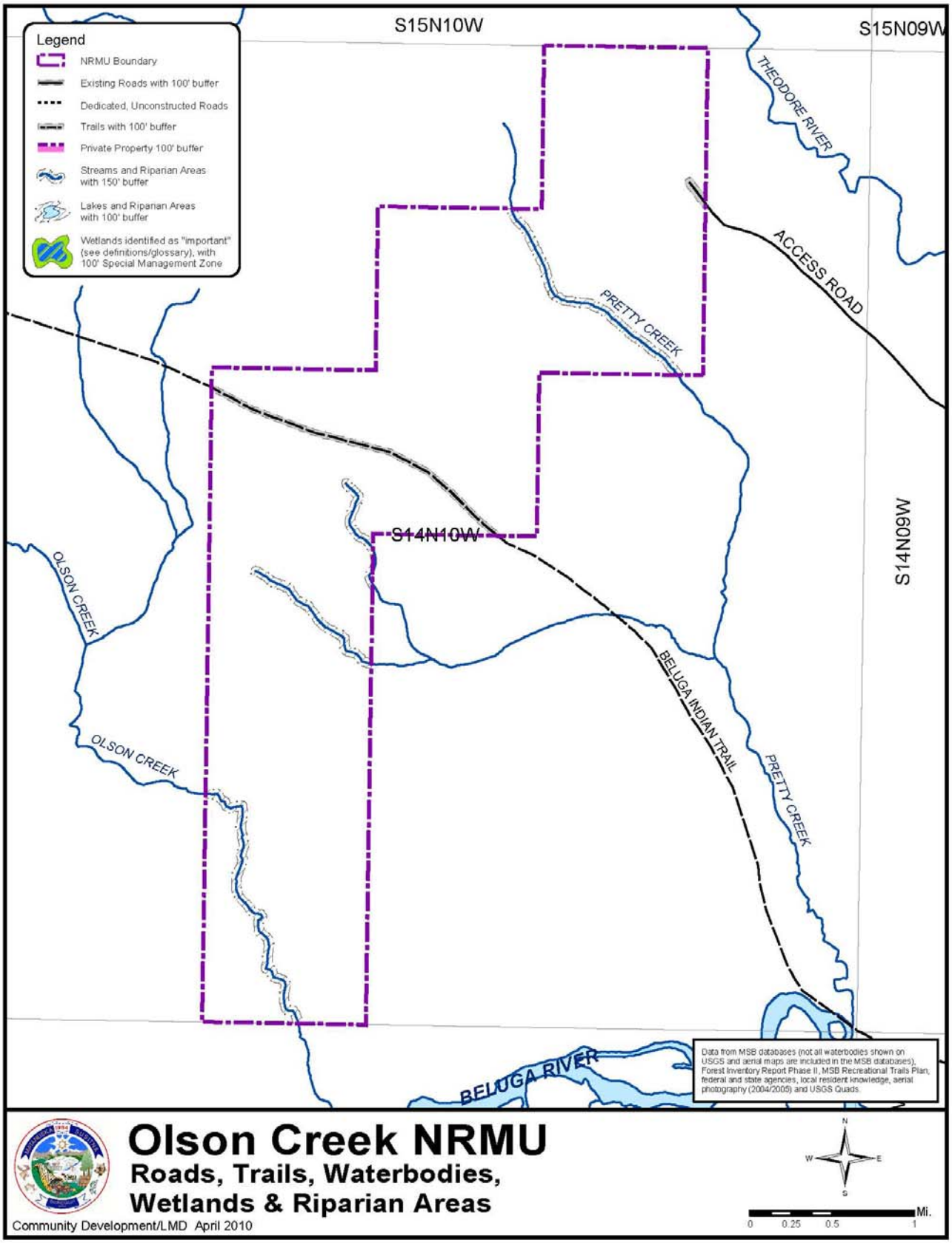
Legend
NRMU Boundary
Existing Roads with 100' buffer
Dedicated, Unconstructed Roads
Trails with 100' buffer
Private Property 100' buffer
Streams and Riparian Areas with 150' buffer
Lakes and Riparian Areas with 100' buffer
Wetlands identified as "important" (see definitions/glossary), with 100' Special Management Zone
S15N10W
S15N09W
S14N10W
S14N09W
THEODORE RIVER
ACCESS ROAD
PRETTY CREEK
OLSON CREEK
OLSON CREEK
BELUGA INDIAN TRAIL
PRETTY CREEK
BELUGA RIVER
Data from MSB databases (not all waterbodies shown on USGS and aerial maps are included in the MSB databases), Forest Inventory Report Phase II, MSB Recreational Trails Plan; federal and state agencies, local resident knowledge, aerial photography (2004/2005) and USGS Quads.
Olson Creek NRMU
Roads, Trails, Waterbodies, Wetlands & Riparian Areas
Community Development/LMD April 2010
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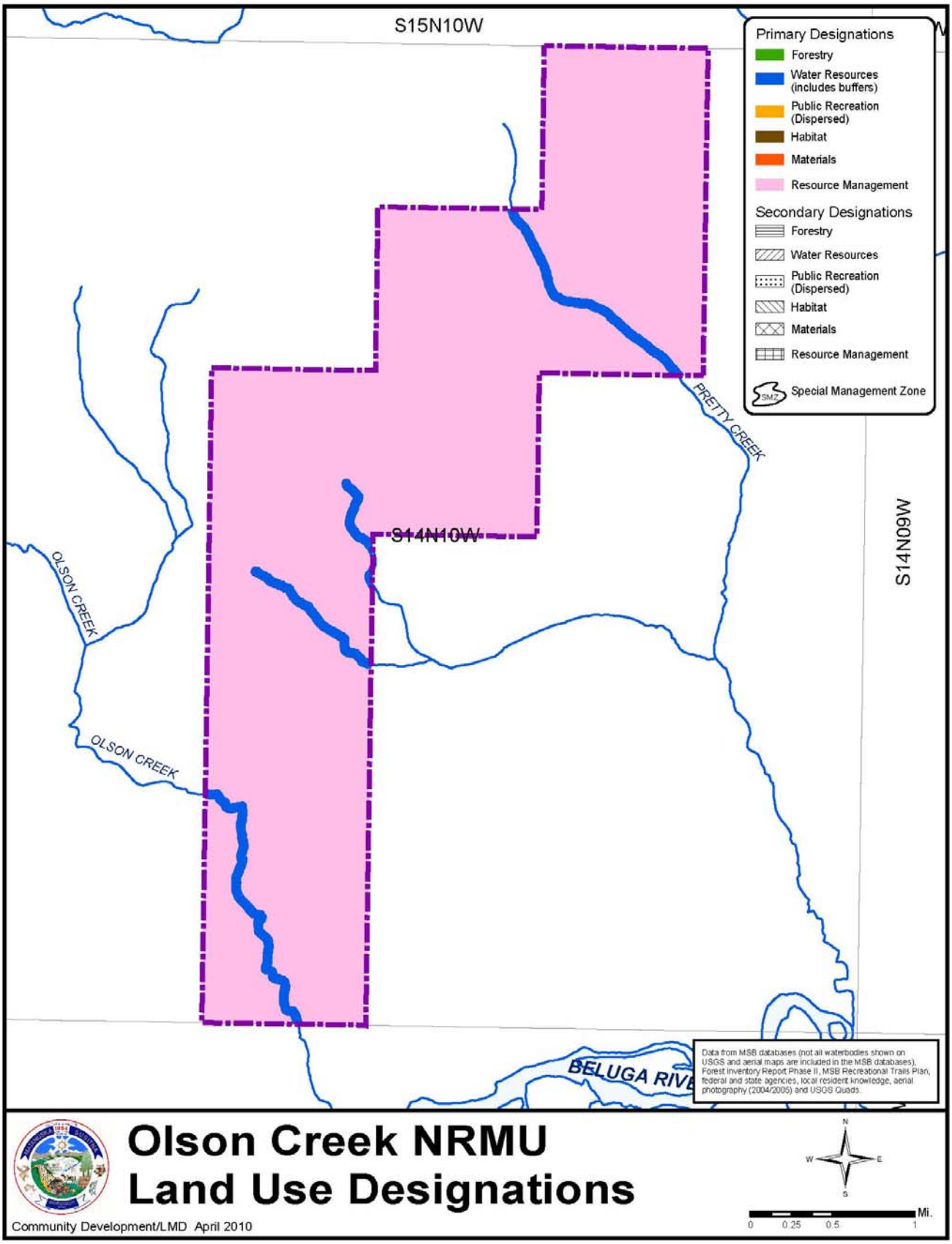
S15N10W
Primary Designations
Forestry
Water Resources (includes buffers)
Public Recreation (Dispersed)
Habitat
Materials
Resource Management
Secondary Designations
Forestry
Water Resources
Public Recreation (Dispersed)
Habitat
Materials
Resource Management
Special Management Zone
PRETTY CREEK
S14N10W
S14N09W
OLSON CREEK
OLSON CREEK
BELUGA RIVE
Data from MSB databases (not all waterbodies shown on USGS and aerial maps are included in the MSB databases). Forest Inventory Report Phase II, MSB Recreational Trails Plan, federal and state agencies, local resident knowledge, aerial photography (2004/2005) and USGS Quads.
Olson Creek NRMU
Land Use Designations
Community Development/LMD April 2010
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OLSON CREEK
Natural Resource Management Unit

General Information

There are approximately 5,120 acres in the Olson Creek Natural Resource Management Unit. The unit is located approximately 12 miles west of the Susitna River, 2 miles north of the Beluga River. The unit borders the west side of the Susitna Flats State Game Refuge. The entire area is isolated, remote and relatively inaccessible except by oil exploration pioneer roads.

The unit is located in the Susitna Lowlands in very flat terrain. Soils are for the most part very wet and poorly drained.

Borough Tax Maps
Beluga 27, 28, and 33

Current Land Use
No known activities, however, it is likely the area sees some use from people hunting, fishing and trapping. The unit is within an oil and gas exploration and development area which recently have become an area focused on efforts to demonstrate the feasibility of underground coal gasification technology in the Cook Inlet Basin.

Surrounding Land Use
The surrounding area is owned by the State, CIRI and Tyonek Native Corporation, with much of the surrounding land base subject to active oil and gas leases, as well as coal exploration activities. The Susitna Flats State Game Refuge borders the eastern side of the unit. General dispersed public recreation occurs in all the land surrounding the unit.

Community Council Area
None

Existing Land Use Plans

- Mat-Su Borough, *Multiple-Use Forest Management Plan* (1989). This plan will be superseded by this plan when adopted.
- Alaska Department of Natural Resources, *Susitna Area Plan* (1985), Mt. Susitna Unit, Little Mt. Susitna Subunit (2g); with designated land uses for forestry, public recreation, settlement and wildlife habitat. This plan is currently being revised as the *Susitna-Matanuska Area Plan*. When completed, the *Susitna-Matanuska Area Plan* will replace the *Susitna Area Plan* and will not apply to borough owned land.
- Mat-Su Borough, *Recreational Trails Plan* (2007).
- Mat-Su Borough, *Parks, Recreation and Open Space Plan* (2001); which is currently being updated.

Existing Land Use Classification
Forest Management Lands

Summary of Resources and Uses

Agriculture and Grazing
A review of soil types, published by the Department of Agriculture, Natural Resources Conservation Service (http://websoilsurvey.ncrs.usda.gov/app/), indicates that there are no known lands suitable for agricultural development or grazing within the unit.

Also, see *Soils* map at the beginning of this section.

Cultural Resources and Heritage Sites
There are no documented historical or heritage sites and no cultural survey has taken place within the unit. Additional field work should be required if any natural resource extraction or other development activities take place within the unit.

Fish and Wildlife Habitat and Resources
The area contains high value moose, black bear, brown bear and furbearer habitat. After migrating from the Little Mt. Susitna and Mt. Susitna areas, moose use the winter spruce cover and riparian habitats in late winter. Some calving occurs in late spring.

There are no known bear dens, Trumpeter Swans or eagle nests within the unit, but the habitat is such that they could exist. Additional fieldwork will be required prior to any natural resource extraction or other development activities taking place to verify this information.

Three important cataloged anadromous fish stream drainages (Theodore River, Pretty Creek, Olson Creek) course through the area. These streams and their tributaries are all important for Chinook, Coho, Sockeye and pink salmon spawning and rearing.

Prior to any resource extraction projects, the anadromous fish distribution in any wetlands should be established, any additional anadromous or important resident fish waterbodies need to be identified and the Alaska Department of Fish and Game will need to verify the cataloged anadromous resident fish streams as described above.

The Alaska Department of Fish and Game will require fish Habitat Permits, accompanied by detailed project plans, prior to any planned resource extraction project adjacent to anadromous or resident waterbodies.

There are no known commercial lodges or fish camps in the area.

Forest Resources
The area has not been field inventoried. While soils data indicate that commercial forest land exists, it is unfeasible for timber harvest at this time due to its remote location and lack of economical transportation. Aerial reconnaissance of this area showed Olson Creek to have steep side walls and the timber is sparse resembling sub-alpine or alpine conditions.

Private Property
Extensive private property holdings are located to the west and southeast of the unit, owned primarily by CIRI and the Tyonek Native Corporation. This includes the sub-surface estate.

Public Recreation and Tourism
There is a low to moderate use by anglers of the Theodore River, Pretty Creek and Olson Creek.

There is no specific resource or activity that draws tourists to this area

Roads and Trails
An Alaska State Land Survey (ASLS 75-28) access road barely enters the unit at the north end and on east side. The Beluga Indian Trail (RST 1862) crosses east/west through the center of the unit. A pioneer road also crosses the northern portion of the nit, connecting ASLS 75-28 to the Coffee Creek exploration well to the west of the unit. It is expected that this road will continue to be needed for ongoing exploration and development activities on adjacent CIRI lands. Any commercial use must be authorized in accordance with applicable borough and state requirements.

Also, see the *Roads, Trails, Waterbodies, Wetlands and Riparian Areas* map at the beginning of this section.

Rock, Sand and Gravel
Soil mapping (see http://websoilsurvey.ncrs.usda.gov/app/) indicates that there are no rock, sand and gravel resources within the unit. Because of the areas remote location and lack of access, it is highly unlikely that commercial development of material resources would occur in this area.

Also, see the *Soils* map at the beginning of this section.

Unit Management Intent

The management intent for the Olson Creek Natural Resource Management Unit is to protect the water resources and to manage the remainder of the land for its existing natural resource uses and values.

Land Use Designations

Olson Creek		
Designation	**Classification**	**Management Intent**
Primary		
Resource Management	Resource Management Lands	All upland areas, except those designated as water resources. No timber harvest is permitted in the unit.
Water Resources	Watershed Lands	All waterbodies, riparian areas, and important wetlands. Any waterbodies, riparian areas or important wetlands determined after adoption of this plan to be anadromous, important for resident fish, or important wetlands for fish and wildlife shall also be similarly designated and classified[17].
Secondary		
None		

Also, see the *Land Use Designations* map at the beginning of this section.

Management Guidelines

See Volume I, Chapters 2 and 3 for area-wide guidelines for all Natural Resource Management Units. The remainder of this section presents unit-specific guidelines.

<u>Buffers and Special Management Zones</u>
All flowing waterbodies, including lakes that are part of a flowing water system that are connected to creeks, streams, and rivers, and associated riparian areas will be protected through the use of undisturbed natural vegetation buffers.

All wetlands over 40 acres and all smaller important wetland areas (see definition in *Volume III, Definitions/Glossary*) shall be protected with a Special Management Zone which shall include a 100-foot area around the wetland area. The Zone shall not allow disturbance of

[17] Such designation and classification shall be considered as a "Minor Change" to the Plan (See Volume I, Chapter 4, *Procedures for Changes to the Plan, Goals, and Guidelines.*

the wetland area, but some uses may be allowed. For example, winter time recreational use is allowed once sufficient snow cover exists to not harm the natural vegetation.

At such time that new activities are planned in the unit, all potentially impacted waterbodies and wetlands shall be assessed as to their habitat and water resource values. Depending on the assessment, the waterbodies and wetlands will be provided additional protection through the use of buffers or placed in a Special Management Zone, as appropriate.

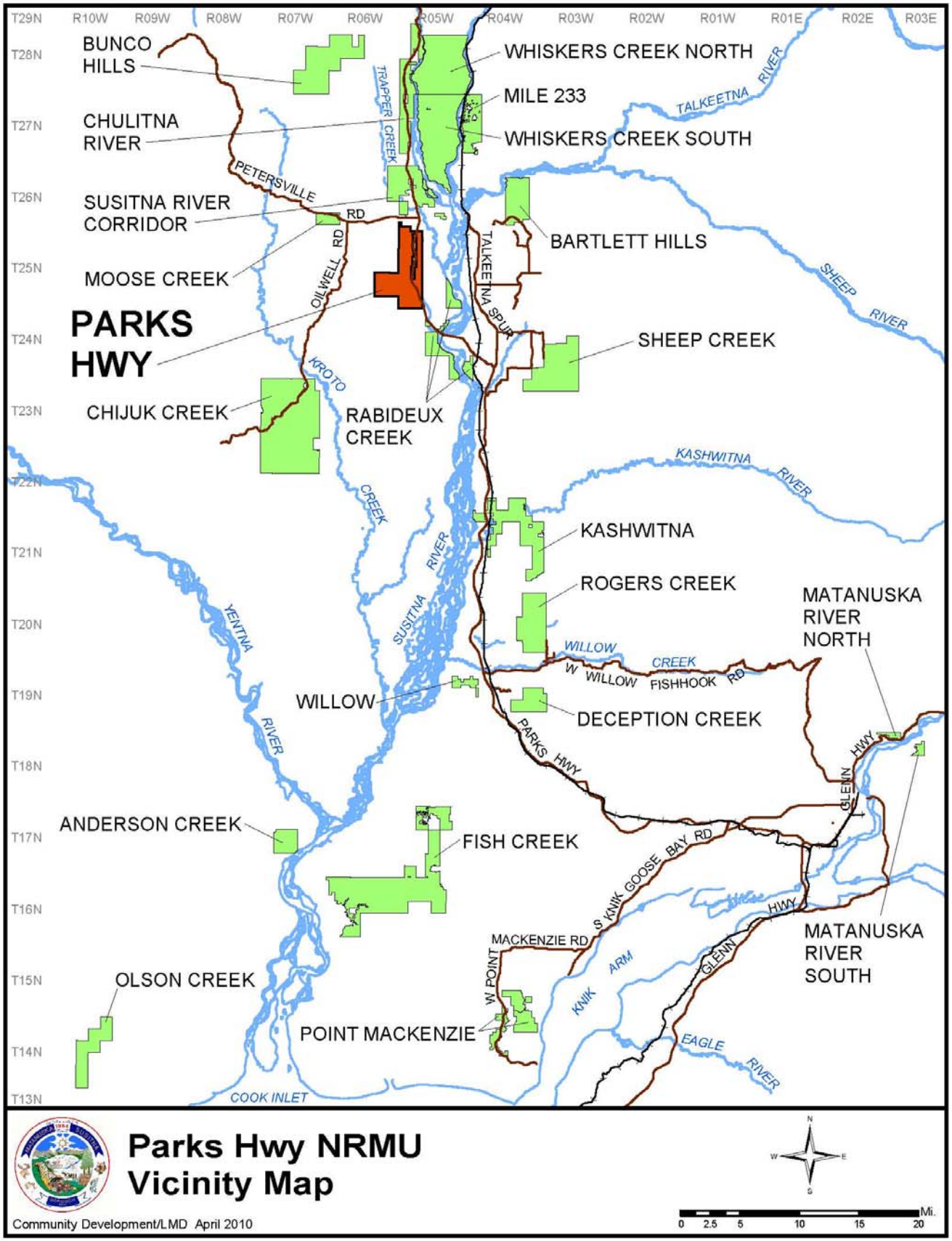
Existing trails (see Roads and Trails section above) shall be buffered.

See *Roads, Trails, Waterbodies, Wetlands and Riparian Areas* map at the beginning of this section for waterbodies and trails that shall have buffers, and wetlands with a Special Management Zones.

Also, see Volume I, Chapter 2, *Buffers* and *Special Management Zones*, for additional information.

<u>Roads</u>
The existing roads in the unit may be used for sub-surface exploration and development. Authorization from the state and/or borough shall be required prior to any commercial use.

<u>Other Uses</u>
No additional unit-specific guidelines are needed for this unit. See Volume I, Chapters 2 and 3 for area-wide guidelines that apply to all Natural Resource Management Units.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BUNCO HILLS
CHULITNA RIVER
SUSITNA RIVER CORRIDOR
MOOSE CREEK
PARKS HWY
CHIJUK CREEK
RABIDEUX CREEK
WHISKERS CREEK NORTH
MILE 233
WHISKERS CREEK SOUTH
BARTLETT HILLS
SHEEP CREEK
KASHWITNA
ROGERS CREEK
WILLOW
DECEPTION CREEK
MATANUSKA RIVER NORTH
MATANUSKA RIVER SOUTH
ANDERSON CREEK
FISH CREEK
OLSON CREEK
POINT MACKENZIE
TRAPPER CREEK
PETERSVILLE RD
OILWELL RD
TALKEETNA SPUR
KROTO CREEK
SUSITNA RIVER
YENTNA RIVER
TALKEETNA RIVER
SHEEP RIVER
KASHWITNA RIVER
WILLOW CREEK
W WILLOW FISHHOOK RD
PARKS HWY
GLENN HWY
S KNIK GOOSE BAY RD
MACKENZIE RD
W POINT
KNIK ARM
EAGLE RIVER
COOK INLET
Parks Hwy NRMU
Vicinity Map
Community Development/LMD April 2010
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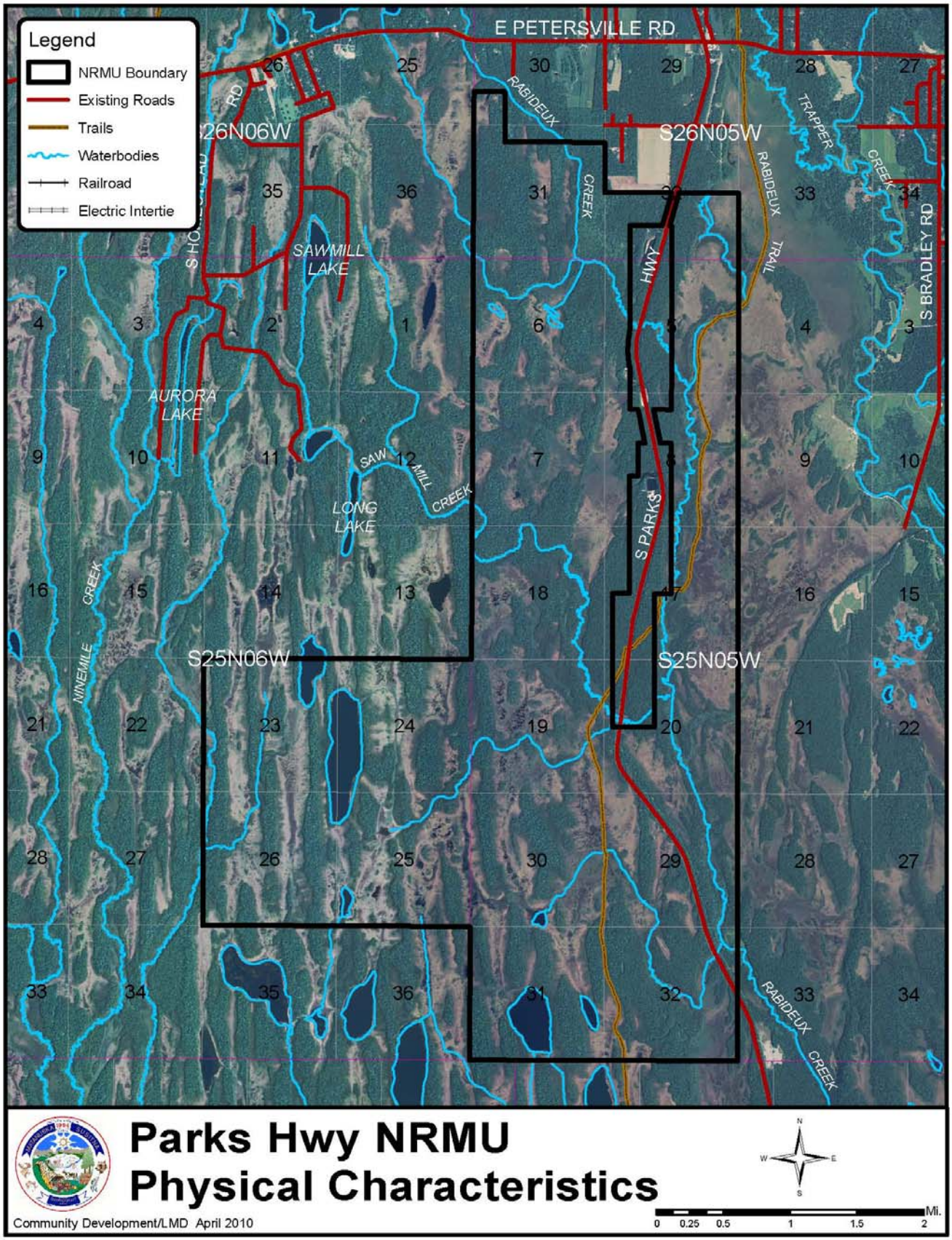
Legend
NRMU Boundary
Existing Roads
Trails
Waterbodies
Railroad
Electric Intertie
E PETERSVILLE RD
S26N06W
S26N05W
S25N06W
S25N05W
SAWMILL LAKE
AURORA LAKE
LONG LAKE
SAW MILL CREEK
NINEMILE CREEK
RABIDEUX CREEK
TRAPPER CREEK
RABIDEUX TRAIL
S PARKS HWY
S BRADLEY RD
Parks Hwy NRMU
Physical Characteristics
Community Development/LMD April 2010
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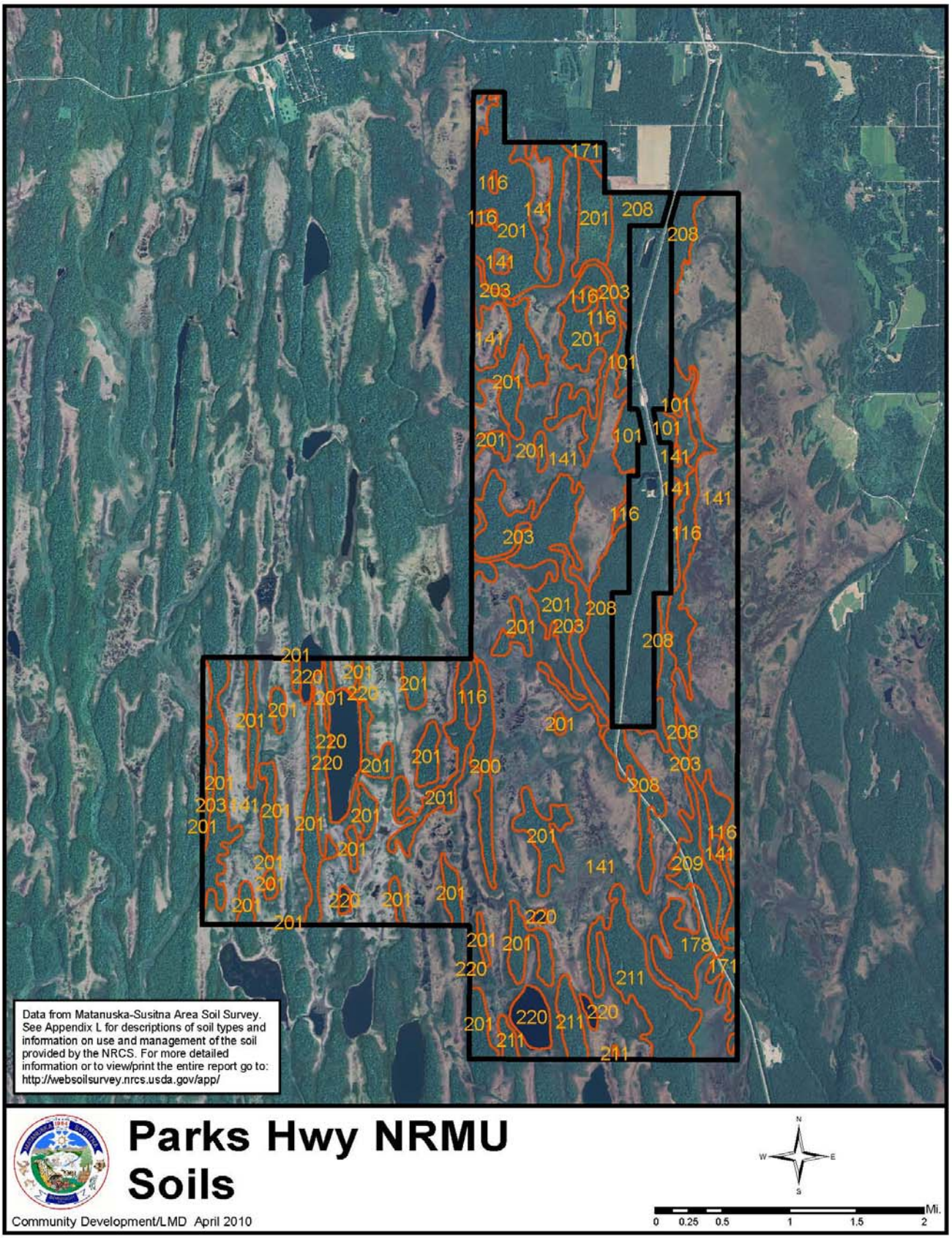
Data from Matanuska-Susitna Area Soil Survey. See Appendix L for descriptions of soil types and information on use and management of the soil provided by the NRCS. For more detailed information or to view/print the entire report go to: http://websoilsurvey.nrcs.usda.gov/app/
Parks Hwy NRMU
Soils
Community Development/LMD April 2010
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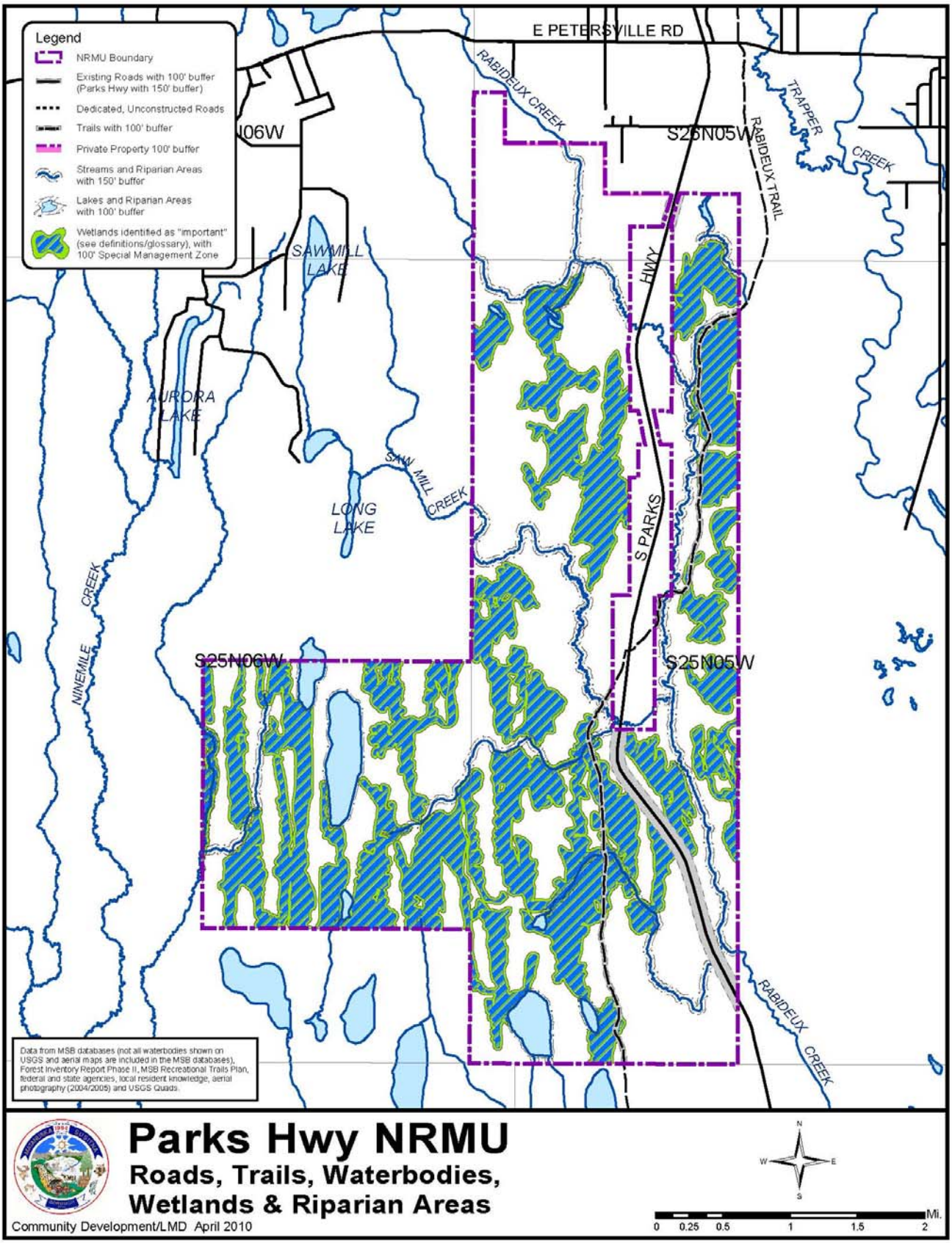
Legend
NRMU Boundary
Existing Roads with 100' buffer (Parks Hwy with 150' buffer)
Dedicated, Unconstructed Roads
Trails with 100' buffer
Private Property 100' buffer
Streams and Riparian Areas with 150' buffer
Lakes and Riparian Areas with 100' buffer
Wetlands identified as "important" (see definitions/glossary), with 100' Special Management Zone
E PETERSVILLE RD
RABIDEUX CREEK
TRAPPER CREEK
S26N05W
RABIDEUX TRAIL
N06W
SAWMILL LAKE
AURORA LAKE
SAW MILL CREEK
LONG LAKE
S PARKS HWY
NINEMILE CREEK
S25N06W
S25N05W
RABIDEUX CREEK
Data from MSB databases (not all waterbodies shown on USGS and aerial maps are included in the MSB databases), Forest Inventory Report Phase II, MSB Recreational Trails Plan, federal and state agencies, local resident knowledge, aerial photography (2004/2005) and USGS Quads.
Parks Hwy NRMU
Roads, Trails, Waterbodies, Wetlands & Riparian Areas
Community Development/LMD April 2010
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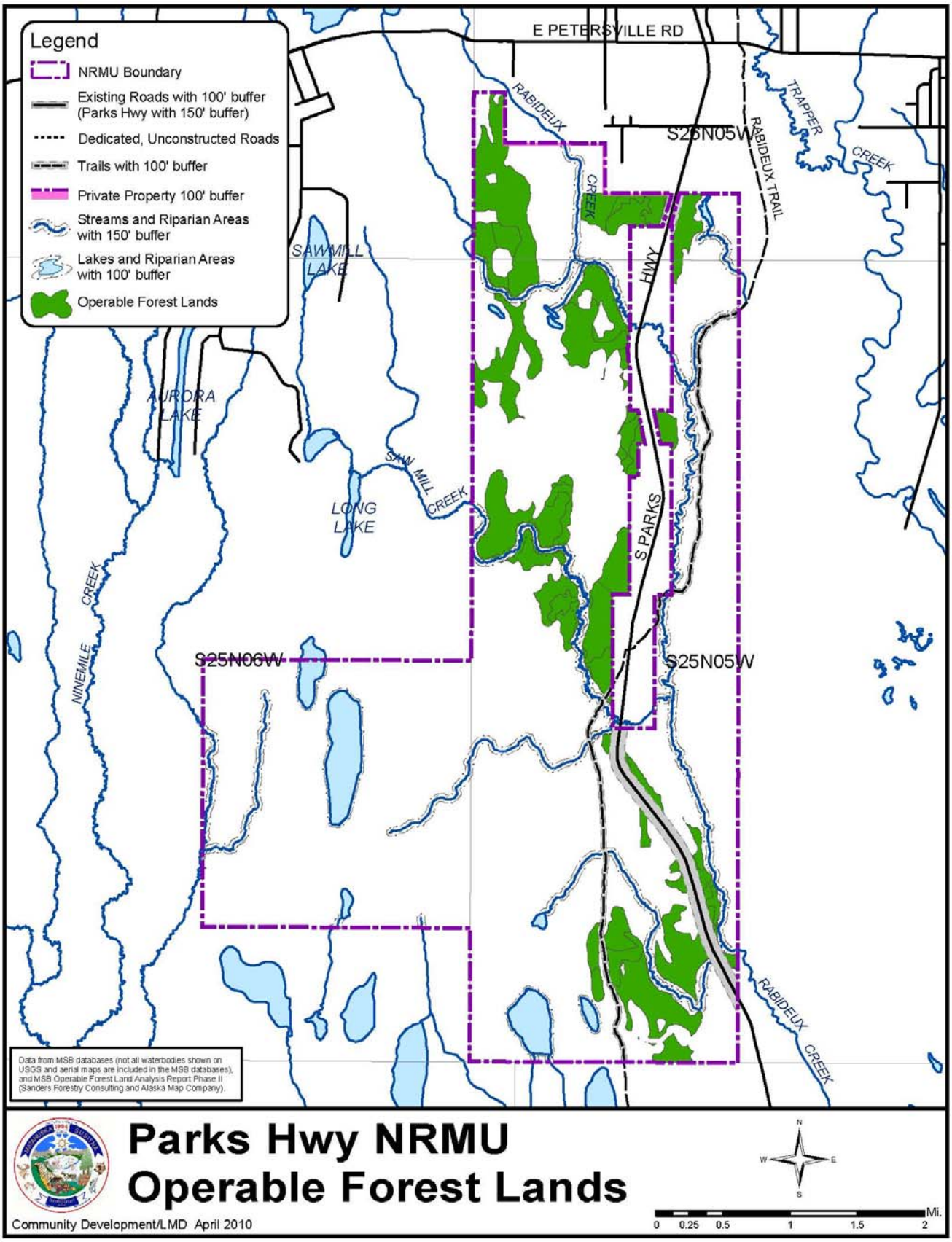
Legend
NRMU Boundary
Existing Roads with 100' buffer (Parks Hwy with 150' buffer)
Dedicated, Unconstructed Roads
Trails with 100' buffer
Private Property 100' buffer
Streams and Riparian Areas with 150' buffer
Lakes and Riparian Areas with 100' buffer
Operable Forest Lands
E PETERSVILLE RD
RABIDEUX
CREEK
S25N05W
RABIDEUX TRAIL
TRAPPER
CREEK
SAWMILL LAKE
HWY
AURORA LAKE
SAW MILL CREEK
LONG LAKE
S PARKS
NINEMILE CREEK
S25N06W
S25N05W
RABIDEUX CREEK
Data from MSB databases (not all waterbodies shown on USGS and aerial maps are included in the MSB databases), and MSB Operable Forest Land Analysis Report Phase II (Sanders Forestry Consulting and Alaska Map Company).
Parks Hwy NRMU
Operable Forest Lands
Community Development/LMD April 2010
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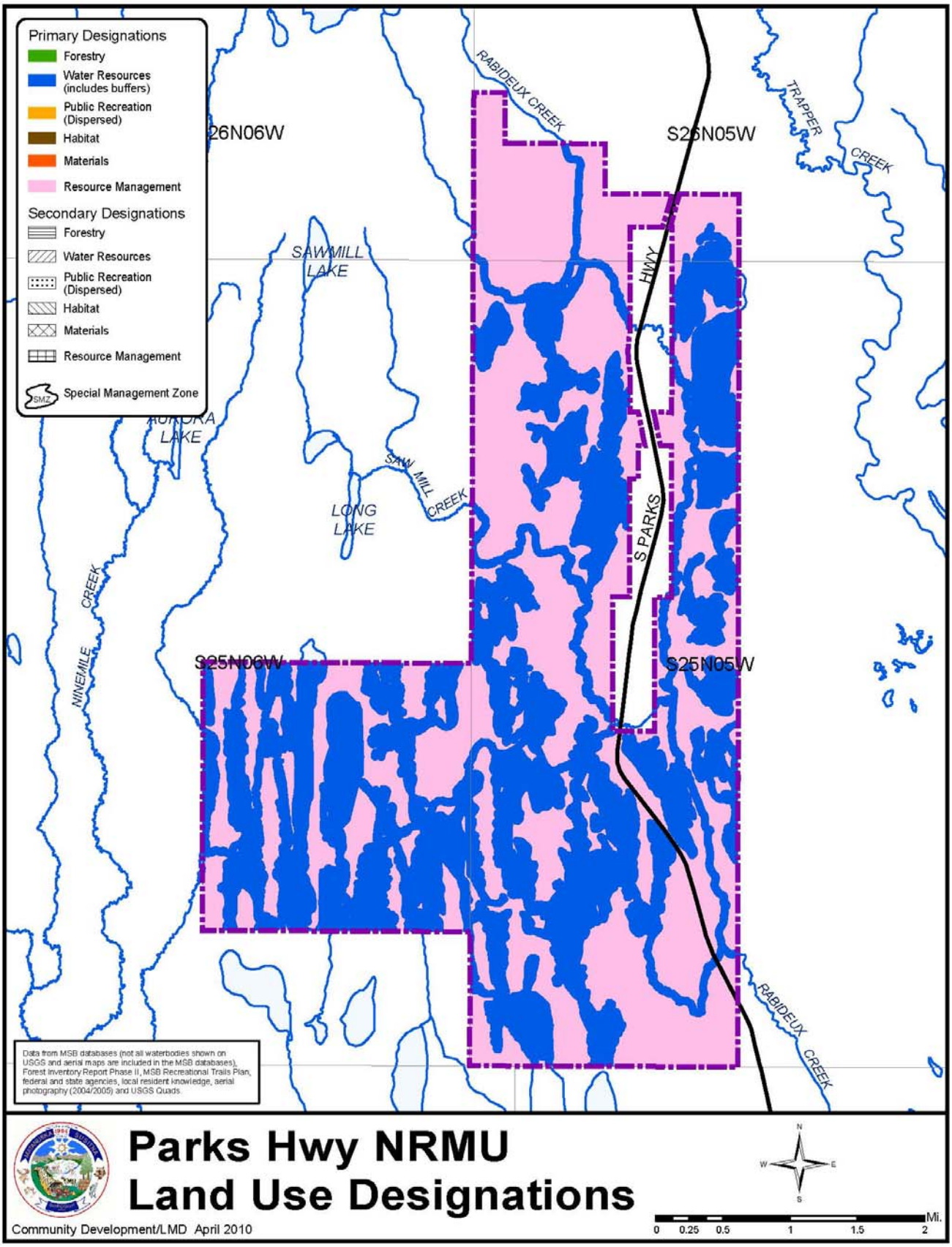
Primary Designations
Forestry
Water Resources (includes buffers)
Public Recreation (Dispersed)
Habitat
Materials
Resource Management
Secondary Designations
Forestry
Water Resources
Public Recreation (Dispersed)
Habitat
Materials
Resource Management
Special Management Zone
26N06W
S26N05W
S25N06W
S25N05W
RABIDEUX CREEK
TRAPPER CREEK
SAWMILL LAKE
AURORA LAKE
LONG LAKE
SAW MILL CREEK
NINEMILE CREEK
HWY
S PARKS
RABIDEUX CREEK
Data from MSB databases (not all waterbodies shown on USGS and aerial maps are included in the MSB databases), Forest Inventory Report Phase II, MSB Recreational Trails Plan, federal and state agencies, local resident knowledge, aerial photography (2004/2005) and USGS Quads.
Parks Hwy NRMU
Land Use Designations
Community Development/LMD April 2010
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PARKS HIGHWAY
Natural Resource Management Unit

General Information

The Parks Highway Unit has about 10,280 acres and is located along the Parks Highway, beginning approximately 1 mile north of the Susitna River Bridge (Parks Highway, approximately Milepost 107) and ending about 2 miles south of the Petersville Road (Parks Highway Milepost 113). The unit extends on either side of the Parks Highway, ranging from approximately 1/2 to 2 miles on either side.

The unit is in the Susitna lowlands, is generally flat with wetlands and poorly drained soils interspersed with some hilly areas with moderate to well drained soils. The area also has several meandering streams generally running north south through the unit.

Borough Tax Maps
Petersville 64, Talkeetna 5, 12, and 13

Current Land Use
The area has seen some timber harvest for birch and spruce. The area has variety of dispersed recreational uses.

Surrounding Land Use
The majority of the surrounding land is owned by the State of Alaska. A variety dispersed public recreation occurs on this land as well. There are also some scattered private lands. The private land is used for recreational cabins, private residences and some agricultural uses.

Community Council Area
Trapper Creek Community Council

Existing Land Use Plans

- Mat-Su Borough, *Multiple Use Forest Management Plan* (1989), which will be replaced by this Plan, when adopted
- Alaska Department of Natural Resources, *Susitna Area Plan* (1985); Petersville Unit: Rocky's Lake Subunit (6b) designated as Borough Land Bank with designated uses for forestry, public recreation, settlement, and wildlife habitat; Rabideux Subunit (7a and 7c) with designated uses for public recreation, settlement, wildlife habitat, water resources and secondary uses for forestry.
  The *Susitna Area Plan* is currently being revised as the *Susitna-Matanuska Area Plan* and will not apply to borough land. When the *Susitna-Matanuska Area Plan* is adopted it will replace the *Susitna Area Plan*.
- Mat-Su Borough, *Recreational Trails Plan* (2007).
- Mat-Su Borough, *Parks, Recreation and Open Space Plan* (2001), which is currently being updated.

The Trapper Creek Community is currently working on a Comprehensive Plan.

A Scenic Highways Plan is currently being developed along the Parks Highway starting at the Susitna River Bridge crossing and continuing north through Denali State Park. In October 2009 the George Parks Highway north from the Chulitna River Bridge was designated as a National Scenic Byway.

Existing Land Use Classification
Forest Management Lands

Summary of Resources and Uses

•
Agriculture and Grazing
A review of soil types, published by the Department of Agriculture, Natural Resources Conservation Service (http://websoilsurvey.ncrs.usda.gov/app/), indicates that there are some areas suitable for agricultural development or grazing within the unit. However, many of these areas are subject to flooding and erosion, thus not suitable for large or medium sized agricultural development.

Also, see *Soils* map at the beginning of this section.

Cultural Resources and Heritage Sites
There is one historical site known to exist in the unit. On the upper reaches of the east fork of Rabideux Creek (locally called Nine Mile Creek) in the extreme northeast portion of the unit is the remains of the Rabideux brother's cabins that date back to around 1910. The Rabideux brothers were pioneers to the area and the first to settle in the Trapper Creek area.

Additional field work may be required if any natural resource extraction or other development activities take place within the unit.

Fish and Wildlife Habitat and Resources
The area is used by moose as winter range and supports a moderate concentration of animals. The hardwood forest and riparian areas are important calving habitat for moose in late spring. Moderate numbers of furbearer species also occur throughout the region.

There are no known bear dens, Trumpeter Swans or eagle nests within the unit, but the habitat is such that they could exist in the unit. Additional fieldwork will be required prior to any natural resource extraction or other development activities taking place to verify this information.

Rabideux Creek and its tributaries are cataloged anadromous streams that support Chinook and Coho salmon rearing and spawning. Many of the unnamed clear water streams of the Susitna River are also known to be used by Chinook and Coho salmon as well. These same waterbodies support important resident fish populations of Rainbow trout, Dolly Varden and grayling.

Prior to any resource extraction projects, the anadromous fish distribution in any wetlands should be established, any additional anadromous or important resident fish waterbodies need to be identified and the Alaska Department of Fish and Game will need to verify the cataloged anadromous resident fish streams as described above.

The Alaska Department of Fish and Game will require fish Habitat Permits, accompanied by detailed project plans, prior to any planned resource extraction project adjacent to anadromous or resident waterbodies.

There are no commercial lodges or fish camps in the area.

Forest Resources

Even though this is a relatively large area (10,278 acres), the amount of operable timber is fairly low because the majority of the area is made up of large wetland areas interspersed with lineal islands of timbered land. The principal timber type is birch and spruce sawtimber greater than 80 years old.

Within the 10,278 acre unit, there is 3,159 acres (31% of the unit) is Commercial Forest Land, of which 1,534 acres (15% of the unit) is Operable Forest Land.

The 2009 Operable Forest Land Analysis Report found the following timber composition within the unit:

Stratum 1: Pole Timber – Closed Canopy	104 acres
Stratum 2: Pole Timber – Open Canopy	0 acres
Stratum 3: Hardwood Saw Timber – Closed Canopy	81 acres
Stratum 4: Hardwood Saw Timber – Open Canopy	143 acres
Stratum 5: Mixed Forest Saw Timber – Closed Canopy	710 acres
Stratum 6: Mixed Forest Saw Timber – Open Canopy	496 acres
TOTAL	1,534 acres

Also, see *Operable Forest Lands* map at the beginning of this section.

There has been recent interest expressed by some residents of the Talkeetna area that this unit and other local units are made available for supplying fuel wood for a wood-fired boiler for the new Su-Valley High School and possibly other public facilities. This would require approximately 300 cords of fuel wood per year (equivalent to approximately 15.6 acres). This equates to 27,000 cords or approximately the equivalent of 1,400 acres of fuel wood for an average of 90 years for a mixed rotation period of birch and spruce.

The Trapper Creek Community Council has requested that an area along the road system be designated as a wood lot for local residents to be able to cut firewood in this and other nearby Natural Resource Management Units (Chulitna River, Moose Creek, Rabideux and Susitna River Corridor).

Private Property
There is no private property within the unit. There is private property along the Parks Highway and within the exterior boundaries of the unit, but the private property has been excluded from the unit and is not subject to the provisions of this plan.

Public Recreation and Tourism
Because of the easy accessibility to the unit via the Parks Highway, the area experiences heavy use by moose and black bear hunters and anglers. Local residents also use the general area for trapping.

There is nothing of special interest that attracts tourists to this unit. However, because the unit lies on either side of the Parks Highway the area is seen by tourists on a regular basis. The Parks Highway north of the Susitna River crossing is being considered for addition to the Parks National Scenic Byway system.

Roads and Trails
The area has direct access from the Parks Highway that runs in a north/south direction through the unit.

The Rabideux Trail is primarily a winter trail that is located east of and generally parallels the Parks Highway, transecting the eastern portion of the unit.

Also, see the *Roads, Trails, Waterbodies, Wetlands and Riparian Areas* map at the beginning of this section.

Rock, Sand and Gravel
Soil mapping (see http://websoilsurvey.ncrs.usda.gov/app/) indicates that there may be rock, sand and gravel resources within the unit. There are some developed material sites along the Parks Highway outside of the unit. A more extensive field inventory will be necessary to determine the volume, extent and feasibility of possibly developing this resource.

Also, see the *Soils* map at the beginning of this section.

Unit Management Intent

The management intent for the Parks Highway Natural Resource Management Unit shall for general natural resources and uses, protecting water resources, meeting some wood product needs while improving wildlife habitat and not significantly reducing the recreational and other uses in the unit.

While not the best possible unit, but because of the units' location close to the Upper Susitna Middle/High School, the unit may also be used as a Forest Education and Improvement Study Area.

Land Use Designations

Parks Highway		
Designation	**Classification**	**Management Intent**
Primary		
Resource Management	Resource Management Lands	All upland areas, except those designated as water resources. Available for forest management and small timber harvests in those areas determined to be operable forest land and where it does not significantly reduce the areas recreational activities. Recognize and manage for the units recreational uses.
Water Resources	Watershed Lands	All waterbodies, riparian areas, and important wetlands. Any waterbodies, riparian areas or important wetlands determined after adoption of this plan to be anadromous, important for resident fish, or important wetlands for fish and wildlife shall also be similarly designated and classified[18].
Secondary		
None		

Also, see the *Land Use Designations* map at the beginning of this section.

Management Guidelines

See Volume I, Chapters 2 and 3 for area-wide guidelines for all Natural Resource Management Units. The remainder of this section presents unit-specific guidelines.

[18] Such designation and classification shall be considered as a "Minor Change" to the Plan (See Volume I, Chapter 4, *Procedures for Changes to the Plan, Goals, and Guidelines.*

Buffers and Special Management Zones

All flowing waterbodies, including lakes that are part of a flowing water system that are connected to creeks, streams, and rivers and associated riparian areas will be protected through the use of undisturbed natural vegetation buffers.

All wetlands over 40 acres and all smaller important wetland areas (see definition in *Definitions/Glossary* in Volume III) shall be protected with a Special Management Zone which shall include a 100-foot area around the wetland area. The Zone shall not allow disturbance of the wetland area, but some uses may be allowed. For example, winter time recreational use is allowed once sufficient snow cover exists to not harm the natural vegetation.

At such time that new activities are planned in the unit, all potentially impacted waterbodies and wetlands shall be assessed as to their habitat and water resource values. Depending on the assessment, the waterbodies and wetlands will be provided additional protection through the use of buffers or placed in a Special Management Zone, as appropriate.

The Parks Highway has a 150-foot no development undisturbed natural vegetation buffer from either side of the right-of way.

The Rabideux Trail shall be buffered.

Where the unit adjoins private property, the private property shall be protected through the use of an undisturbed natural vegetation buffer. These buffers may only be modified following the provisions in Volume I, Chapter 2, *Buffers* and MSB 23.20.070.

See *Roads, Trails, Waterbodies, Wetlands and Riparian Areas* map at the beginning of this section for, wetlands with a Special Management Zone, waterbodies and roads and trails with buffers.

Also, see Volume I, Chapter 2, *Buffers* and *Special Management Zones,* for additional information.

Forest Management

Small sized timber harvests are a permitted use and only when it does not significantly reduce the areas recreational and scenic values, and where it does not improve moose habitat that would draw moose into the Parks Highway corridor. Timber harvests should be limited to firewood, sawlog and specialty wood products.

Because of the units' highly visible location off the Parks Highway, and the abundance of wet soils and wetlands, timber harvest, except for personal use, shall be limited to the winter when the ground is sufficiently frozen and snow cover exists to avoid negative impact from heavy vehicles and equipment. Personal use harvesting may be permitted in areas where adverse impacts to the ground cover can be avoided or by using methods and means where adverse impacts will be avoided.

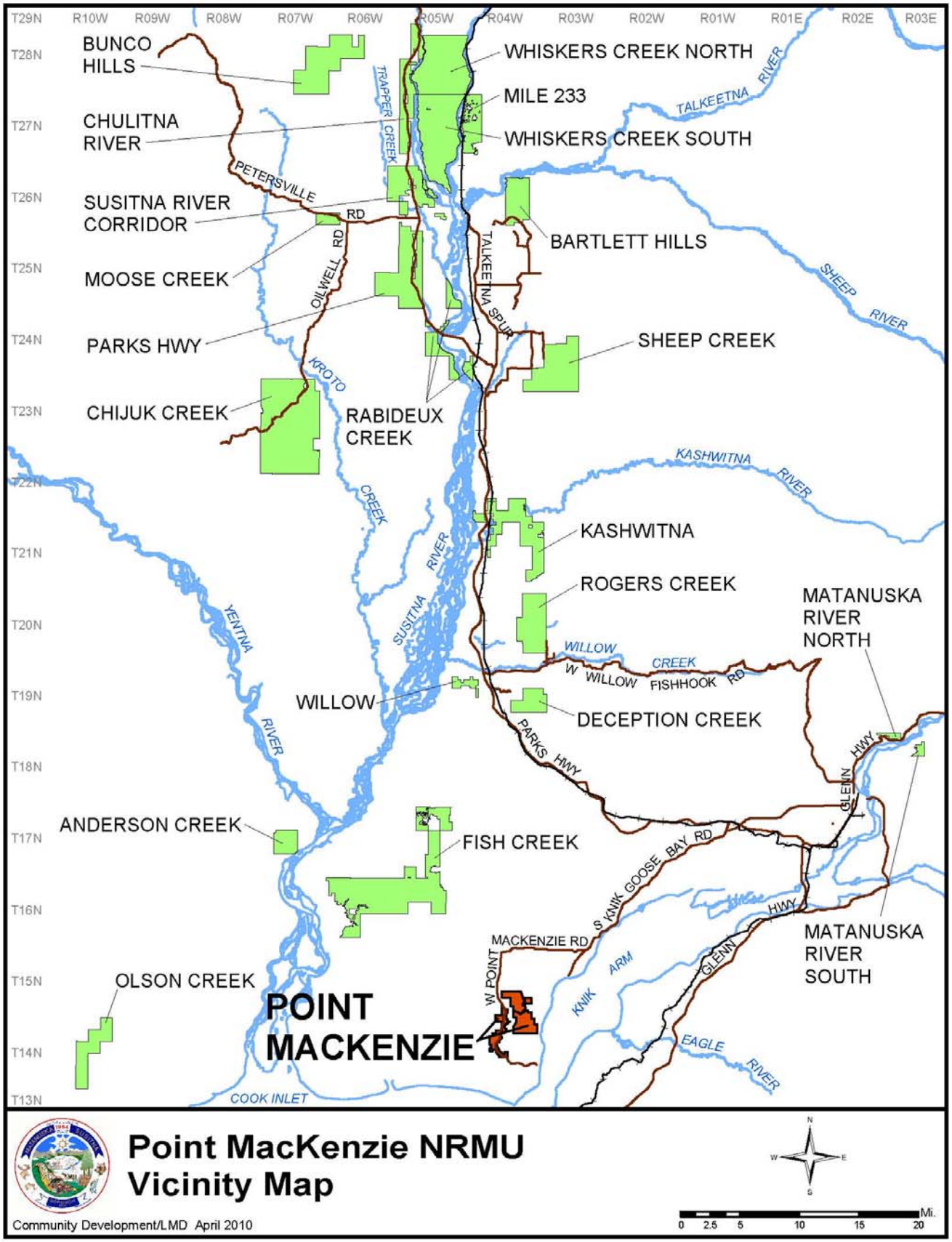
Consultation with the Alaska Department of Fish and Game on timber harvest areas and cutting units is required for all timber harvests to avoid or mitigate timber harvests in the unit that may improve moose habitat that would draw moose into the Parks Highway corridor.

This unit does not have sufficient Operable Forest volume for supplying fuel wood over a long-term basis for the Su Valley Middle/High School proposed wood-fired boiler or other similar commercial operation, plus meet other local needs. The Operable Forest land is broken into numerous parcels that do not readily lend itself to logical and progressive cutting units over a sustainable long-term basis.

Other Uses

While not the best unit because of its timber base, but because of the units location and easy access, this unit would also be suitable as a Forest Improvement Study Area, especially if the unit is used for supplying all or a majority of the fuel wood for the Su Valley High School proposed wood-fired boiler or a similar project (see Volume I, Chapter 3, *Forest Improvement Study Area(s),* for more information).

No additional unit-specific guidelines are needed for this unit. See Volume I, Chapters 2 and 3 for area-wide guidelines that apply to all Natural Resource Management Units.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SUSITNA RIVER CORRIDOR
MOOSE CREEK
PARKS HWY
CHIJUK CREEK
ANDERSON CREEK
OLSON CREEK
WHISKERS CREEK NORTH
MILE 233
WHISKERS CREEK SOUTH
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SHEEP CREEK
RABIDEUX CREEK
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ROGERS CREEK
WILLOW
DECEPTION CREEK
FISH CREEK
MATANUSKA RIVER NORTH
MATANUSKA RIVER SOUTH
POINT MACKENZIE
TRAPPER CREEK
PETERSVILLE RD
OILWELL RD
TALKEETNA SPUR
KROTO CREEK
SUSITNA RIVER
YENTNA RIVER
TALKEETNA RIVER
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KASHWITNA RIVER
WILLOW CREEK
W WILLOW FISHHOOK RD
PARKS HWY
GLENN HWY
S KNIK GOOSE BAY RD
MACKENZIE RD
W POINT
KNIK ARM
EAGLE RIVER
COOK INLET
Point MacKenzie NRMU
Vicinity Map
Community Development/LMD April 2010
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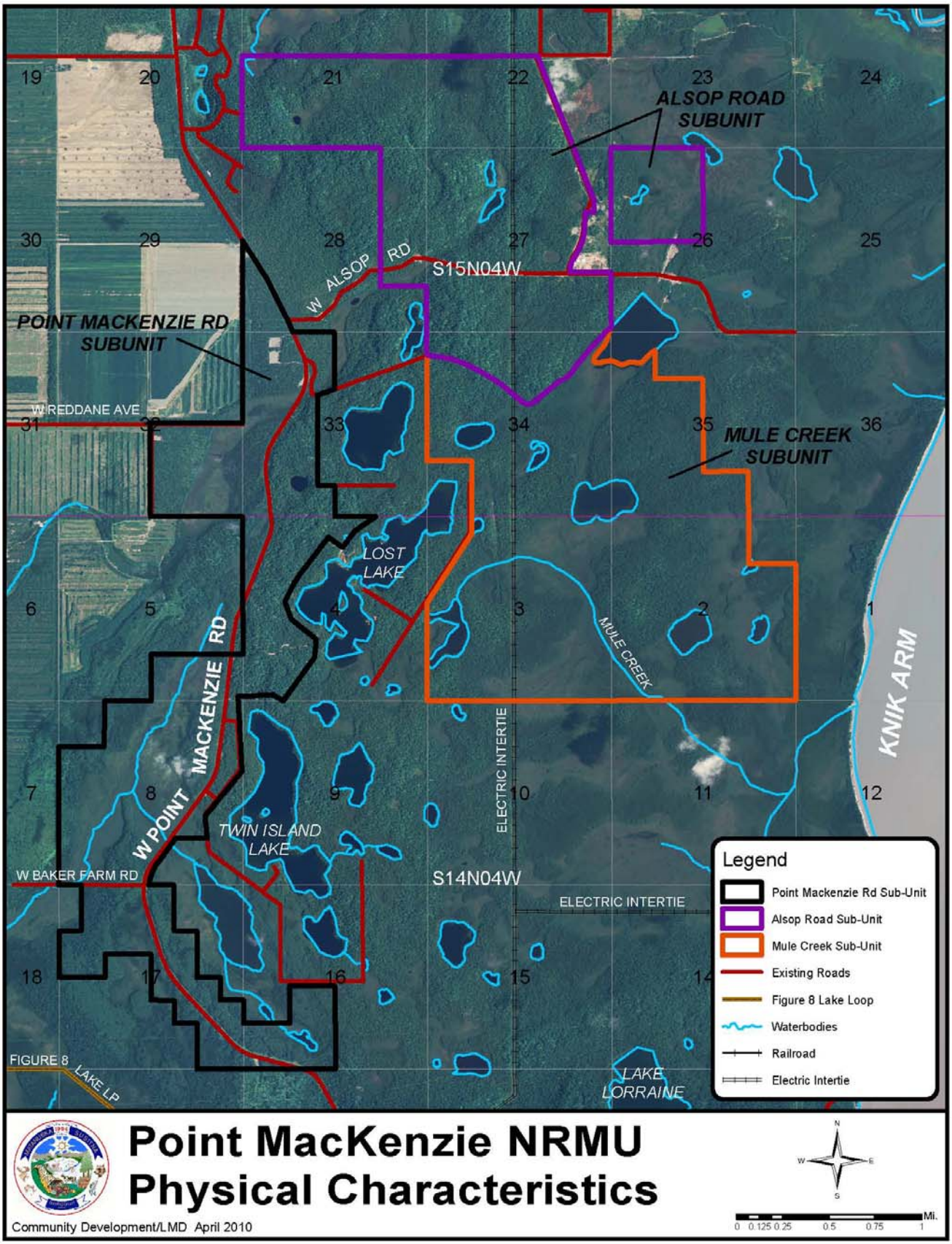
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MULE CREEK SUBUNIT
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W REDDANE AVE
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MULE CREEK
KNIK ARM
W POINT MACKENZIE RD
TWIN ISLAND LAKE
ELECTRIC INTERTIE
W BAKER FARM RD
S14N04W
FIGURE 8
LAKE LP
LAKE LORRAINE
Legend
Point Mackenzie Rd Sub-Unit
Alsop Road Sub-Unit
Mule Creek Sub-Unit
Existing Roads
Figure 8 Lake Loop
Waterbodies
Railroad
Electric Intertie
Point MacKenzie NRMU
Physical Characteristics
Community Development/LMD April 2010
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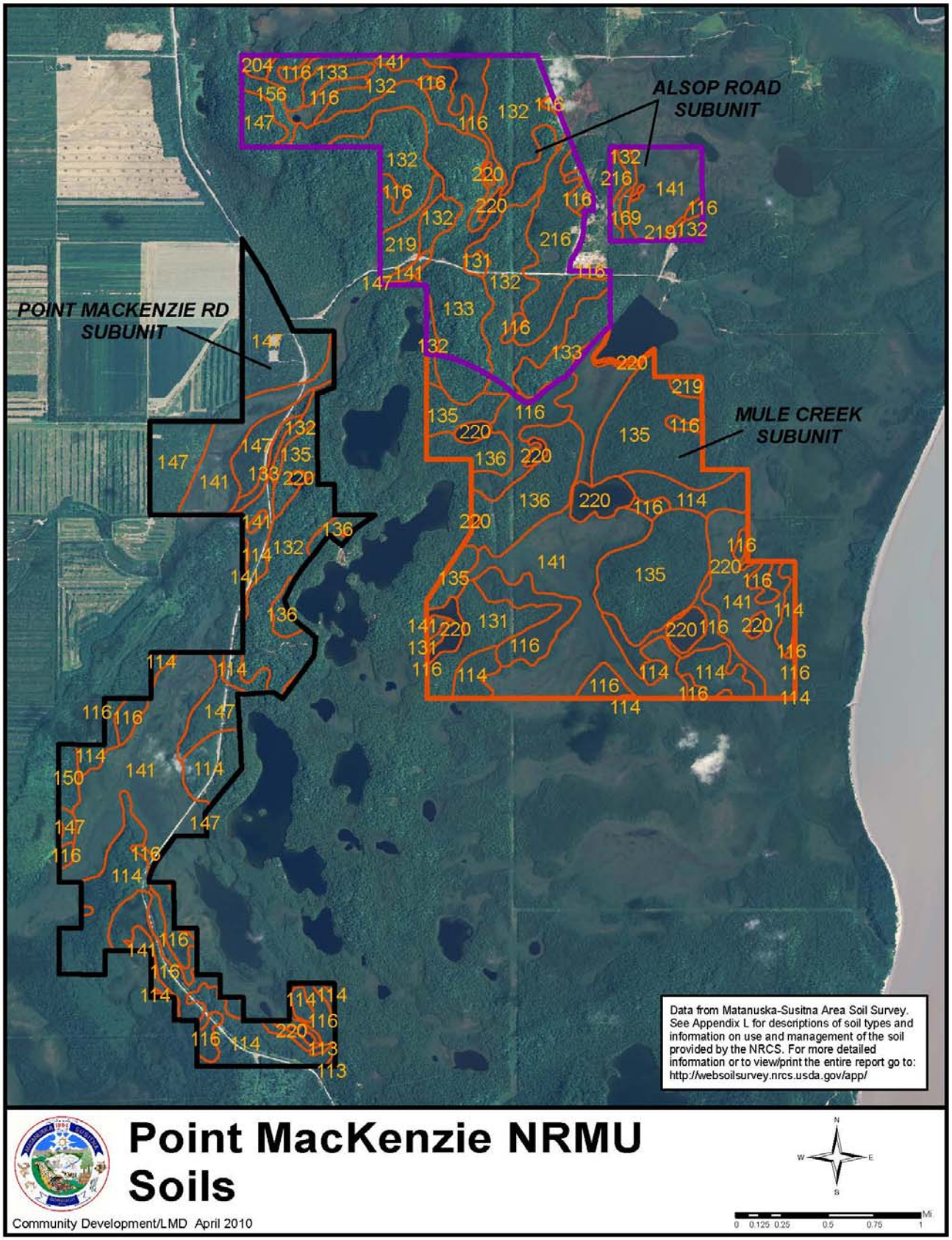
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POINT MACKENZIE RD SUBUNIT
MULE CREEK SUBUNIT
Data from Matanuska-Susitna Area Soil Survey. See Appendix L for descriptions of soil types and information on use and management of the soil provided by the NRCS. For more detailed information or to view/print the entire report go to: http://websoilsurvey.nrcs.usda.gov/app/
Point MacKenzie NRMU Soils
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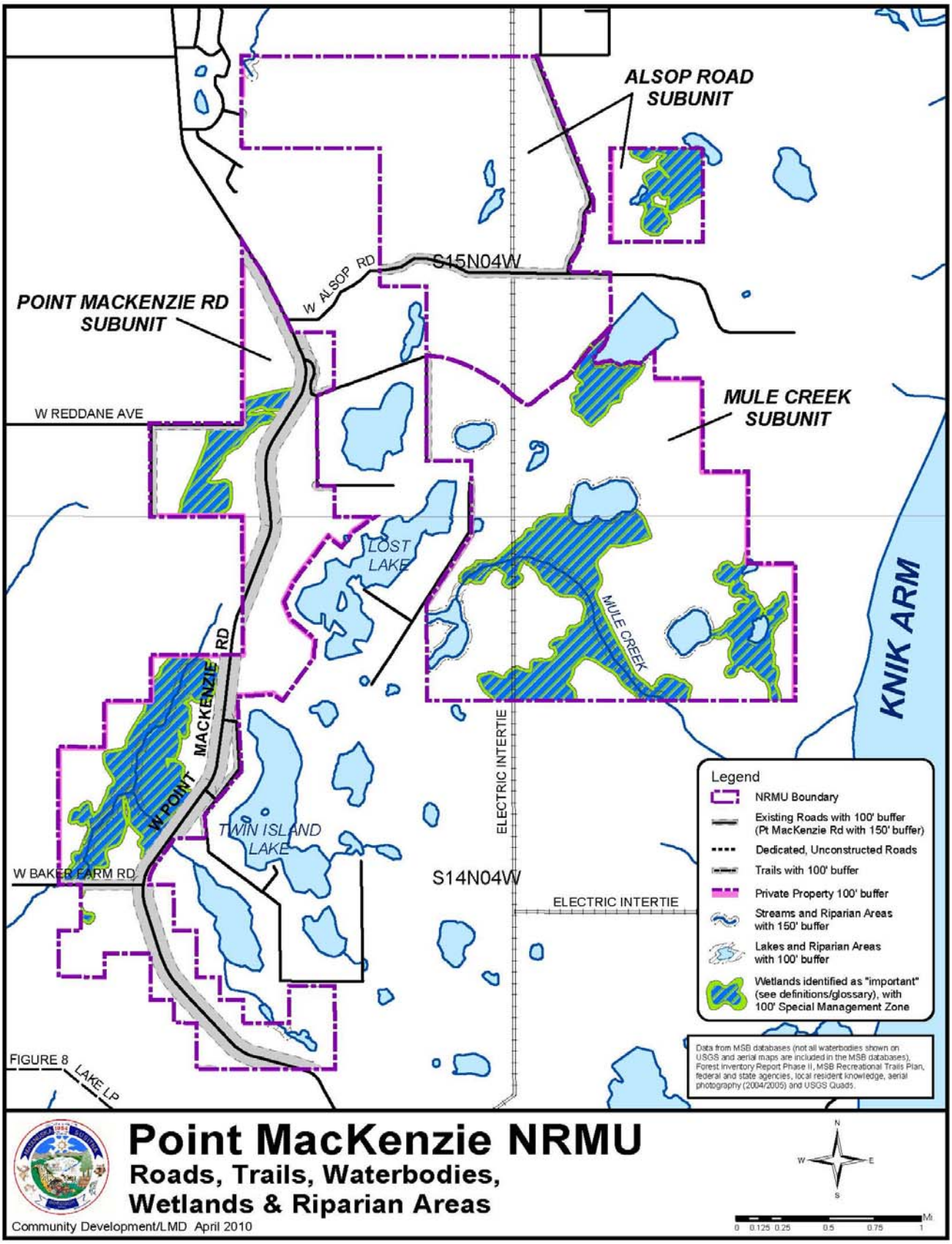
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W POINT MACKENZIE RD
TWIN ISLAND LAKE
ELECTRIC INTERTIE
W BAKER FARM RD
S14N04W
ELECTRIC INTERTIE
FIGURE 8
LAKE LP
Legend
NRMU Boundary
Existing Roads with 100' buffer (Pt MacKenzie Rd with 150' buffer)
Dedicated, Unconstructed Roads
Trails with 100' buffer
Private Property 100' buffer
Streams and Riparian Areas with 150' buffer
Lakes and Riparian Areas with 100' buffer
Wetlands identified as "important" (see definitions/glossary), with 100' Special Management Zone
Data from MSB databases (not all waterbodies shown on USGS and aerial maps are included in the MSB databases), Forest Inventory Report Phase II, MSB Recreational Trails Plan, federal and state agencies, local resident knowledge, aerial photography (2004/2005) and USGS Quads.
Point MacKenzie NRMU
Roads, Trails, Waterbodies, Wetlands & Riparian Areas
Community Development/LMD April 2010
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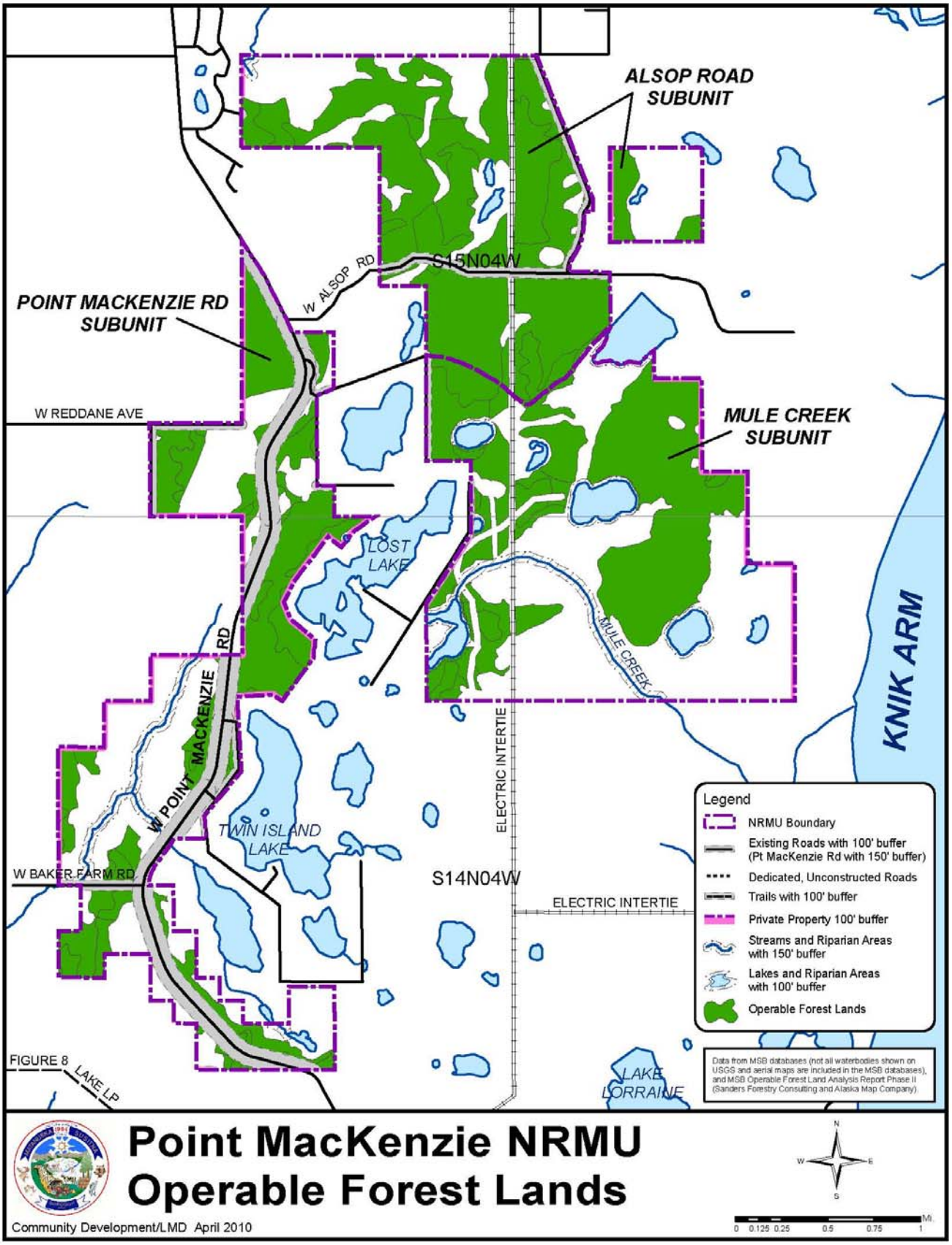
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LOST LAKE
MULE CREEK
KNIK ARM
W POINT MACKENZIE RD
TWIN ISLAND LAKE
ELECTRIC INTERTIE
W BAKER FARM RD
S14N04W
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FIGURE 8
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NRMU Boundary
Existing Roads with 100' buffer (Pt MacKenzie Rd with 150' buffer)
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Trails with 100' buffer
Private Property 100' buffer
Streams and Riparian Areas with 150' buffer
Lakes and Riparian Areas with 100' buffer
Operable Forest Lands
Data from MSB databases (not all waterbodies shown on USGS and aerial maps are included in the MSB databases), and MSB Operable Forest Land Analysis Report Phase II (Sanders Forestry Consulting and Alaska Map Company)
Point MacKenzie NRMU
Operable Forest Lands
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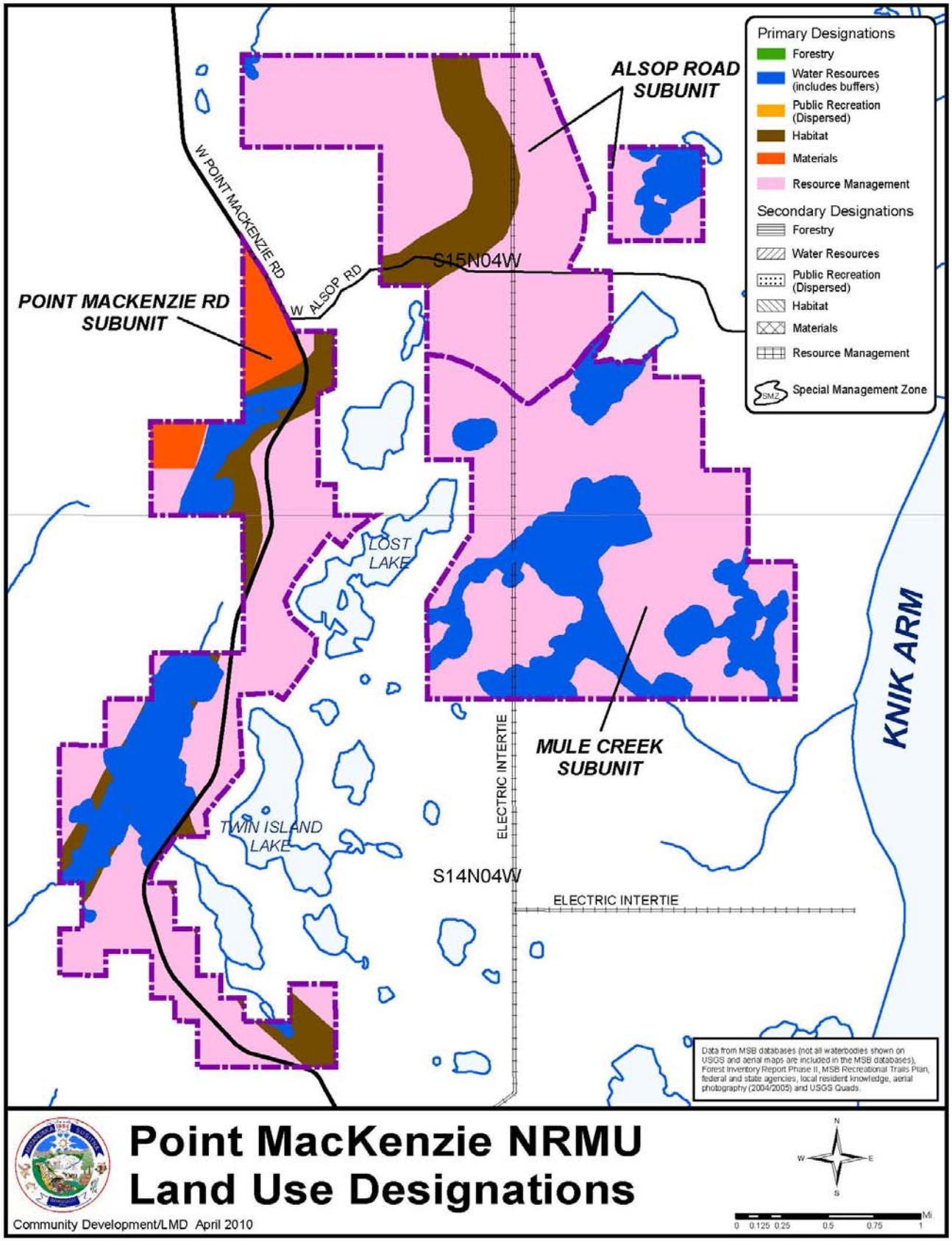
Primary Designations
Forestry
Water Resources (includes buffers)
Public Recreation (Dispersed)
Habitat
Materials
Resource Management
Secondary Designations
Forestry
Water Resources
Public Recreation (Dispersed)
Habitat
Materials
Resource Management
Special Management Zone
ALSOP ROAD SUBUNIT
POINT MACKENZIE RD SUBUNIT
MULE CREEK SUBUNIT
W POINT MACKENZIE RD
W ALSOP RD
S15N04W
S14N04W
LOST LAKE
TWIN ISLAND LAKE
ELECTRIC INTERTIE
ELECTRIC INTERTIE
KNIK ARM
Data from MSB databases (not all waterbodies shown on USGS and aerial maps are included in the MSB databases), Forest Inventory Report Phase II, MSB Recreational Trails Plan, federal and state agencies, local resident knowledge, aerial photography (2004/2005) and USGS Quads.
Point MacKenzie NRMU
Land Use Designations
Community Development/LMD April 2010
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POINT MACKENZIE
Natural Resource Management Unit

General Information

The Point MacKenzie Natural Resource Natural Resource Management Unit contains about 5,200 acres. The unit is located east of and along the Point MacKenzie Road beginning just north of Alsop Road and ending at the Port MacKenzie Port District near the southern terminus of the Point MacKenzie Road.

The unit is broken into three subunits.

The Alsop Road Subunit totals about 1,540 acres. It is comprised of two blocks of land includes all the borough land to the north of Alsop Road and the land approximately ½ mile south of Alsop Road (this distance is an average with the actual boundary following natural terrain features as shown on the Physical Features map at the beginning of this section). This subunit has 2 unconnected parcels. The Alsop Road Subunit is comprised of a mixture of flat poorly drained soils, with some hilly well drained areas.

The Mule Creek Subunit totals approximately 1,940 acres and is the remaining borough land south of the Alsop Road Subunit and north of the Port District. The subunit contains a mixture of flat poorly drained soils, with some hilly well drained soils.

The Point MacKenzie Road Subunit totals about 1,690 acres and lies on either side of the Point MacKenzie Road and generally parallels the Elmendorf Moraine Ridge. The terrain is comprised of a combination of wet and well drained soils. The subunit is generally flat except the land to the west of the Point MacKenzie Road which is hilly with shallow to moderately deep soils. Underneath these soils is a glacier moraine material (rock, sand, and gravel) which aids in the drainage of the soils.

<u>Borough Tax Maps</u>
Goose Bay 13 and 14, and Point MacKenzie 3 and 4.

<u>Current Land Uses</u>
The area has a variety of dispersed recreational uses.

<u>Surrounding Land Uses</u>
Numerous parcels of private property exist around the East Lake, Lost Lake, Twin Island Lakes and the other various lakes in the vicinity. Other private land, mostly undeveloped, also exists along Alsop Road, to the south of the unit. There are some dispersed residential and recreational cabins on the adjacent state land.

The Port MacKenzie Port District lies to the south of the unit. The entire District is classified for commercial and industrial purposes. Some timber harvest has occurred within the

District related to development of the District. The area around Lake Lorraine receives recreational use.

The majority of the remaining land outside of the exterior boundaries of the unit is owned by the State of Alaska. State agricultural tracts have been developed to the west of Point MacKenzie Road. The Goose Bay State Game Refuge is located immediately north of the unit. Although not immediately adjacent, the Susitna Flats State Game Refuge lies to the south and west. The new Goose Bay Correctional Facility is located on Borough land outside the northwest portion of the unit at the Point MacKenzie Road and Alsop Road intersection.

Except for the private land, and at the Goose Bay Correctional Facility site, dispersed recreation occurs in these areas as well.

Community Council Area
Point MacKenzie Community Council

The Port MacKenzie Port Commission has jurisdiction for the area within the Port MacKenzie Port District, which is outside the Point MacKenzie Natural Resource Management Unit.

Existing Land Use Plans

- Mat-Su Borough, *Multiple Use Forest Management Plan*, 1989, which will be replaced by this plan when adopted.
- Mat-Su Borough, *Recreational Trails Plan* (2007).
- Mat-Su Borough, *Parks, Recreation and Open Space Plan* (2001); which is currently being updated.
- Alaska Department of Natural Resources *Southeast Susitna Area Plan* (2008). This plan replaces portions of the *Susitna Area Plan (*1985) and all of the *Willow Sub-Basin Area Plan* (1982). Borough land is not included or subject to this plan.

The Point MacKenzie Community Council is currently working on a comprehensive plan.

Existing Land Use Classifications
Forest Management Lands except for an isolated 160 acre parcel on the eastern end of the unit and north of Alsop Road which is unclassified.

Another approximately 160-acre site north of Alsop Road and east of the Point MacKenzie Road where the Goose Bay Correctional Facility will be located is also unclassified.

Summary of Resources and Uses

Agriculture and Grazing
A review of soil types, published by the Department of Agriculture, Natural Resources Conservation Service (http://websoilsurvey.ncrs.usda.gov/app/), indicates that there are no known lands suitable for agricultural development or grazing within the unit. There is agricultural land located on state land to the west of the Point MacKenzie Road Subunit.

Also, see *Soils* map at the beginning of this section.

Cultural Resources and Heritage Sites

There are no documented historical or heritage sites within the unit. Some on-the-ground historic and cultural survey work has been conducted in the unit related to Port MacKenzie development, road construction, including possible routes for a Knik Arm Crossing, and railroad extension into the Port MacKenzie Port District from the Alaska Railroads main line between Anchorage and Fairbanks.

Additional field work may be required before any natural resource extraction or other development activities take place within the unit.

Fish and Wildlife Habitat and Resources

Moose are distributed across the area, and congregate in the fall and winter in areas that have seen timber harvest. Fur bearers also exist throughout the area. There are no known seasonal wildlife concentration areas within the unit.

There is a natural wildlife migration corridor that connects the Goose Bay State Game Refuge and the Susitna Flats State Game Refuge that proceeds generally north to south through the unit following natural waterways, drainages and wetland areas. The general location of this approximately ¼ mile wide corridor where it passes through the unit is shown on the *Land Use Designations* map at the beginning of this section.

Timbered areas on the Elmendorf Moraine provide habitat for breeding Great Gray Owls, Great Horned Owls, Red Tailed Hawks and possibly Bald Eagles.

There are no known bear dens, swan nesting areas or eagle nests within the unit, but there are areas within the unit that has suitable habitat for them to exist. Additional fieldwork will be required prior to any natural resource extraction or other development activities taking place to verify this information.

There are no cataloged or currently known anadromous fish streams in the unit. Prior to any resource extraction projects, the anadromous fish distribution in any wetlands should be established, any additional anadromous or important resident fish waterbodies need to be identified and the Alaska Department of Fish and Game will need to verify the cataloged anadromous resident fish streams as described above.

The Alaska Department of Fish and Game will require Fish Habitat Permits, accompanied by detailed project plans, prior to any planned resource extraction project adjacent to anadromous or resident waterbodies.

There are no commercial lodges or fish camps in the area.

Forest Resources

The principal timber type is mixed birch and spruce sawtimber with stand ages predominately greater than 80 years old except in those areas that have had timber harvest. Where timber harvest has occurred, the dominate species is birch of various age classes.

Within the 5,167 acre unit, 3,174 acres (61% of the unit) is commercial Forest Land, of which 2,631 acres (51% of the unit) is Operable Forest Land.

This entire unit was included in the 2009 *Operable Forest Land Analysis Phase II* report which found the following timber composition within the operable areas within the unit:

Stratum 1: Pole Timber – Closed Canopy	507 acres
Stratum 2: Pole Timber – Open Canopy	73 acres
Stratum 3: Hardwood Sawtimber – Closed Canopy	30 acres
Stratum 4: Hardwood Sawtimber – Open Canopy	369 acres
Stratum 5: Mixed Forest Sawtimber – Closed Canopy	1,291 acres
Stratum 6: Mixed Forest Sawtimber – Open Canopy	361 acres
TOTAL	2,631 acres

Also, see *Operable Forest Lands* map at the beginning of this section.

Private Property

There is no private property within the unit. There is a significant amount of private property adjacent to the exterior boundaries of the unit. The private property immediately surrounding and between the subunits is mostly private residences and recreational cabins. The land to the west of the Point MacKenzie Road Subunit is large private agricultural tracts.

Public Recreation and Tourism

There are a number of recreational opportunities at the various lakes that are located outside the unit, particularly at Twin Island Lakes, East Lake, Lost Lake and Lake Lorraine.

The primary recreational uses throughout the unit include snowmobiling, ATV's, trapping, hunting and fishing.

There are no specific resources or activities that draw significant numbers of tourists to the unit or the immediate surrounding area.

Roads and Trails

The Point MacKenzie Road runs north/south through the unit and then east/west through the southern part of the unit. Alsop Road runs east/west through the northern part of the unit.

One of the potential routes for the Knik Arm Crossing would roughly parallel Point MacKenzie Road in the southern part of the existing unit, eventually connecting with Point MacKenzie Road south of Twin Island Lakes.

The Figure 8 Lake Loop Trail runs east/west off of the Point MacKenzie Road in the southern part of the unit. This trail, where it crosses borough land in the area, is entirely located in the Port MacKenzie Port District.

Numerous trails and not dedicated pioneer type roads take off from the Point MacKenzie Road that are used for winter and summer recreation and hunting, or for access to private property.

All these trails, except for the Figure 8 Lake Loop Trail, are not dedicated and are not in the *Recreational Trails Plan*. The Figure 8 Lake Loop Trail is identified in the *Recreational Trails Plan,* but is currently not dedicated.

Also, see the *Roads, Trails, Waterbodies, Wetlands and Riparian Areas* map at the beginning of this section.

Rock, Sand and Gravel Resources

Portions of this unit and land MacKenzie Port District has been extensively researched and tested for material resources. Because of the geologic composition in the area along the Elmendorf Moraine, extensive quantities of rock, sand and gravel resources are known to exist. Some of these have been developed into active commercial pit operations.

Also, see the *Soils* map at the beginning of this section.

Unit Management Intent

Alsop Road Subunit

The Alsop Road Subunit shall be principally managed to support the direct and indirect development activities related to the Goose Bay Correctional Facility while protecting important habitat and watershed land. The development activities includes, but is not limited to, such things as sewer and water facilities for the correctional facility, public safety buildings and other public facilities, and any related commercial and residential development specifically approved by the Borough Assembly. Any land that the Assembly approves for commercial, industrial, residential or public facilities shall be reclassified and removed from the management subunit.

Rock, sand and gravel extraction and timber harvest is permitted in areas outside of the wildlife corridor and watershed areas. Timber harvests for specialty logs, sawlogs and firewood are allowed in the operable timber areas. Salvage of timber resources shall occur prior to any public facility, settlement, road, utility or similar construction.

Mule Creek Subunit

The Mule Creek Subunit shall be managed for resource management and watershed protection. Timber harvest is permitted in the operable timber areas. Timber harvests shall be coordinated with the Alaska Department of Fish and Game to protect important wildlife habitat areas and to provide additional habitat areas away from transportation corridors (Point MacKenzie Road Subunit) and development areas (Alsop Road Subunit) and in the Port MacKenzie Port District.

Point MacKenzie Road Subunit

The Point MacKenzie Road Subunit shall be managed for general resource management. The natural wildlife corridor/watershed area that roughly parallels the Point MacKenzie

Road (see Fish & Wildlife Habitat map) shall be protected and provisions made to protect its integrity with any transportation or utility crossings of the corridor.

The Point MacKenzie Road travels through the middle of this subunit and any activities must recognize the importance of this transportation corridor for the development of the Port MacKenzie Port District. Rock, sand and gravel extraction and timber harvest is permitted in areas needed to support transportation, utility related construction and development in the area. Impacts to the wildlife corridor and watershed areas shall be minimized, or if possible negated. Personal use and firewood sales are also allowed in the subunit except for in the wildlife corridor and watershed areas.

Land Use Designations

Point MacKenzie – Alsop Road Subunit		
Designation	**Classification**	**Management Intent**
Primary		
Habitat	Watershed Lands	The approximately ¼ mile wide wildlife corridor that connects the Goose Bay and Susitna Flats State Game Refuges.
Resource Management	Resource Management Lands	All upland areas, except those designated as water resources or habitat. Available for forest management and timber harvest in those areas determined to be operable forest land. Material sites may be developed in areas outside of the wildlife corridor and water resource land and needed to support other development in the immediate area. Land development, including commercial, industrial, residential and public facilities is permitted if specifically authorized by the Assembly. If approved, the land use classification shall

Point MacKenzie – Alsop Road Subunit		
Designation	**Classification**	**Management Intent**
		be changed and the area removed from the subunit.
Water Resources	Watershed Lands	All waterbodies, riparian areas, and important wetlands, including the buffers and Special Management Zones. Any waterbodies, riparian areas or important wetlands determined after adoption of this plan to be anadromous, important for resident fish, or important wetlands for fish and wildlife shall also be similarly designated and classified[19].
Secondary		
None		

[19] Such designation and classification shall be considered as a "Minor Change" to the Plan (See Volume I, Chapter 4, *Procedures for Changes to the Plan, Goals, and Guidelines.*

Point MacKenzie – Mule Creek Subunit		
Designation	**Classification**	**Management Intent**
Primary		
Resource Management	Resource Management Lands	All upland areas, except those designated as water resources. Available for forest management and timber harvest in those areas determined to be operable forest land. Potential material sites may be developed outside of water resource designated land to support development in the area.
Water Resources	Watershed Lands	All waterbodies, riparian areas, and important wetlands, including the buffers and Special Management Zones. Any waterbodies, riparian areas or important wetlands determined after adoption of this plan to be anadromous, important for resident fish, or important wetlands for fish and wildlife shall also be similarly designated and classified[20].
Secondary		
None		

[20] Such designation and classification shall be considered as a "Minor Change" to the Plan (See Volume I, Chapter 4, *Procedures for Changes to the Plan, Goals, and Guidelines.*

Point MacKenzie – Pt. MacKenzie Road Subunit		
Designation	**Classification**	**Management Intent**
Primary		
Habitat	Watershed Lands	The approximately ¼ mile wide wildlife corridor that connects the Goose Bay and Susitna Flats State Game Refuges. This same corridor shall be managed as a permanent Special Management Zone.
Material	Material Lands	Existing and potential material sites may be developed to support development in the area.
Resource Management	Resource Management Lands	All upland areas, except those designated as habitat, material or water resources. Limited timber harvests are permitted when related to transportation, utility, or material extractions. Personal use harvests are permitted except for in the wildlife corridor and watershed areas.
Water Resources	Watershed Lands	All waterbodies, riparian areas, and important wetlands, including the buffers and Special Management Zones. Any waterbodies, riparian areas or important wetlands determined after adoption of this plan to be anadromous, important for resident fish, or important wetlands for fish and wildlife shall also be similarly designated and classified[21].

[21] Such designation and classification shall be considered as a "Minor Change" to the Plan (See Volume I, Chapter 4, *Procedures for Changes to the Plan, Goals, and Guidelines.*

Point MacKenzie – Pt. MacKenzie Road Subunit		
Designation	Classification	Management Intent
Secondary		
None		

Also, see *Land Use Designations* map at the beginning of this section.

Management Guidelines

See Volume I, Chapters 2 and 3 for area-wide guidelines for all Natural Resource Management Units. Unless specifically stated, the following guidelines pertain to all the subunits in the Point MacKenzie Natural Resource Management Unit.

Buffers and Special Management Zones

All flowing waterbodies, including lakes that are part of a flowing water system that are connected to creeks, streams and rivers, and associated riparian areas will be protected through the use of undisturbed natural vegetation buffers.

All wetlands over 40 acres and all smaller important wetland areas (see definition in *Definitions/Glossary* in Volume III) shall be protected with a Special Management Zone which shall include a 100-foot area around the wetland area. The Zone shall not allow disturbance of the wetland area, but some uses may be allowed. For example, winter time recreational use is allowed once sufficient snow cover exists to not harm the natural vegetation.

At such time that new activities are planned in the unit, all potentially impacted waterbodies and wetlands shall be assessed as to their habitat and water resource values. Depending on the assessment, the waterbodies and wetlands will be provided additional protection through the use of buffers or placed in a Special Management Zone, as appropriate.

The approximately ¼ mile wide wildlife corridor that connects the Goose Bay and Susitna Flats State Game Refuges shall be a Special Management Zone as an undisturbed natural vegetation corridor and managed for watershed protection and habitat values.

The Point MacKenzie and Alsop Roads shall have a 150-foot natural vegetation buffer from either side of the right-of-way. Exceptions to the buffer are for access to private property, locating utilities, and for material extraction areas. After utilities have been installed and in material extraction areas, the area disturbed shall be reclaimed and natural vegetation allowed to grow, except for the minimal area needed to maintain any utilities.

Any material extraction sites shall be buffered with an undisturbed natural vegetation buffer. This buffer may only be modified following the provision in Volume I, Chapter 2, *Buffers* and MSB 23.20.070.

The Figure 8 Lake Loop Trail and any trails later dedicated and identified in the MSB Recreational Trails Plan shall be buffered.

Where the unit adjoins private property, the private property shall have an undisturbed natural vegetation buffer. These buffers may only be modified following the provisions in Volume I, Chapter 2, *Buffers* and MSB 23.20.070.

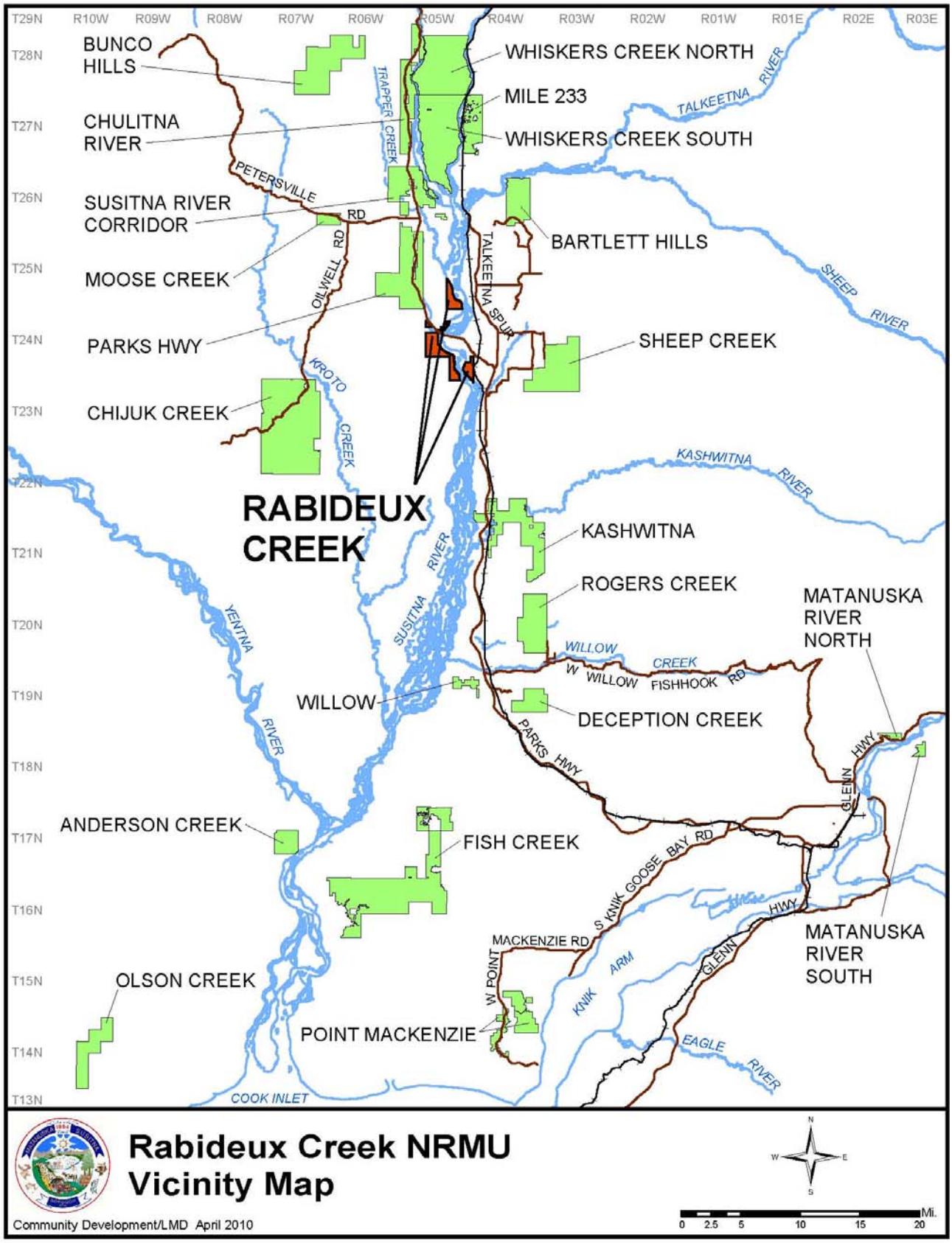
See *Roads, Trails, Waterbodies, Wetlands and Riparian Areas* map at the beginning of this section for, wetlands with a Special Management Zone, waterbodies and roads and trails with buffers.
Also, see Volume I, Chapter 2, *Buffers* and *Special Management Zones,* for additional information.

Forest Management
Timber harvest is a permitted use in the Alsop and Mule Creek Subunits on operable forest lands, and for salvage on any land prior to construction, material extraction and/or utility location, or related activities or for personal use. Timber harvest in the Pt. MacKenzie Road Subunit is permitted if related to road construction, material extraction and/or utility location.

Timber harvest shall be coordinated with the Alaska Department of Fish and Game to protect and/or enhance wildlife habitat and to create appropriate winter habitat areas away from developed and areas with roads in order to reduce moose mortalities and to protect public safety.

Rock, Sand and Gravel
Development and extraction of rock, sand and gravel resources may occur in all three subunits, provided the use is consistent with the other primary designations for the area. All developed sites shall be conducted pursuant to State law and Borough code. See Volume I, Chapter 2, *Sand and Gravel*, for more information.

Other Uses
No additional unit-specific guidelines are required for this unit. See Volume I, Chapters 2 and 3 for area-wide guidelines that apply to all Natural Resource Management Units.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Community Development/LMD April 2010
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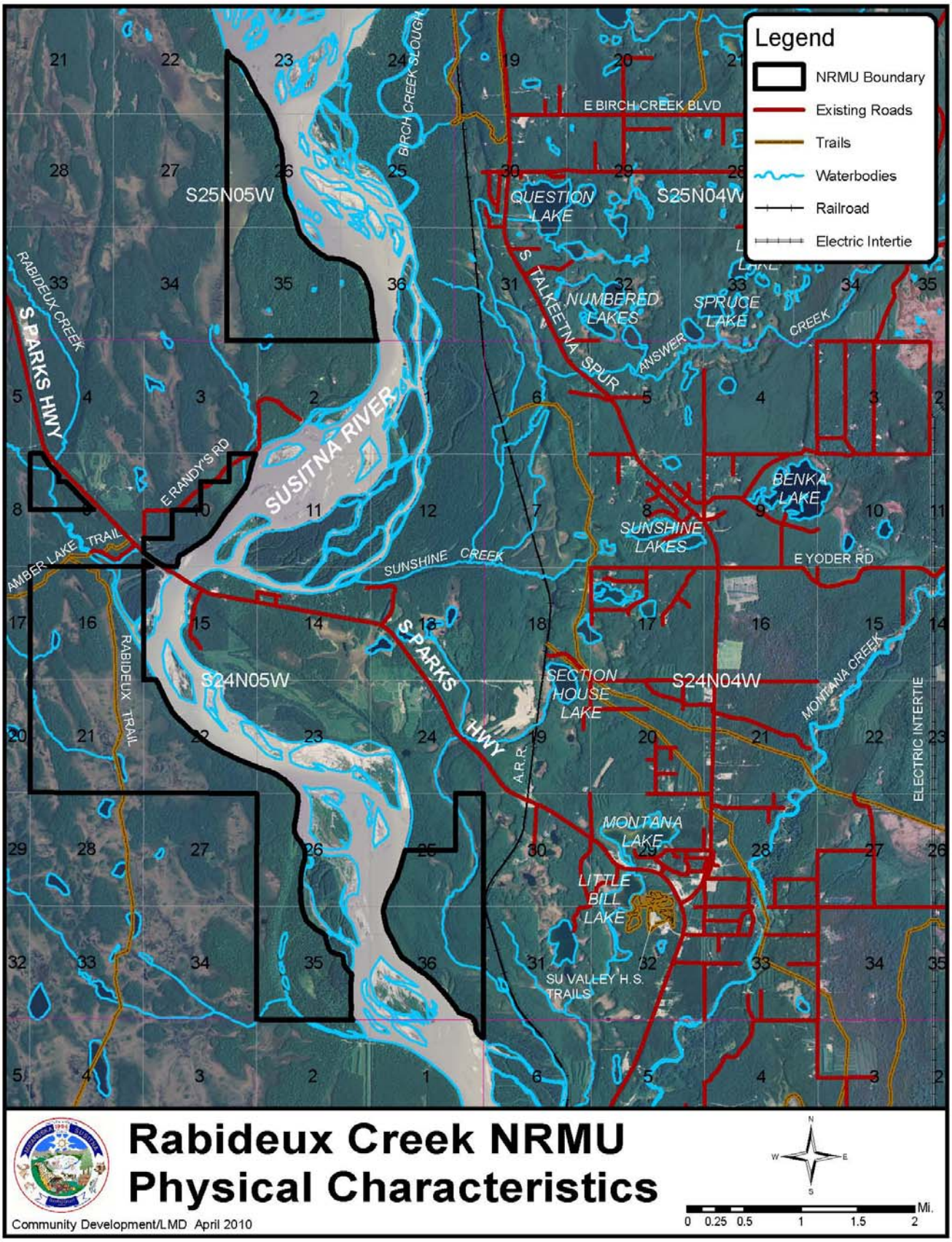
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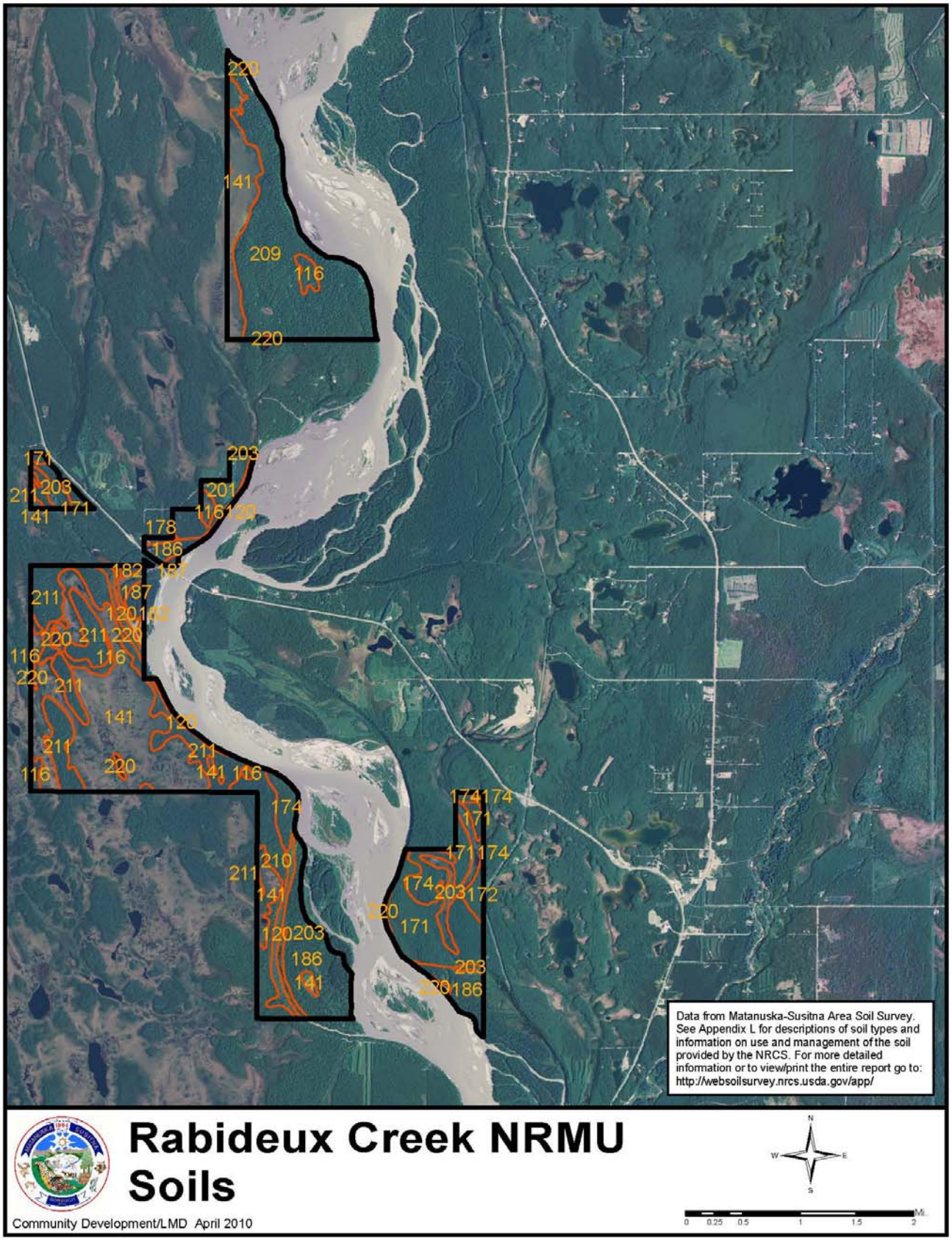
Data from Matanuska-Susitna Area Soil Survey. See Appendix L for descriptions of soil types and information on use and management of the soil provided by the NRCS. For more detailed information or to view/print the entire report go to: http://websoilsurvey.nrcs.usda.gov/app/
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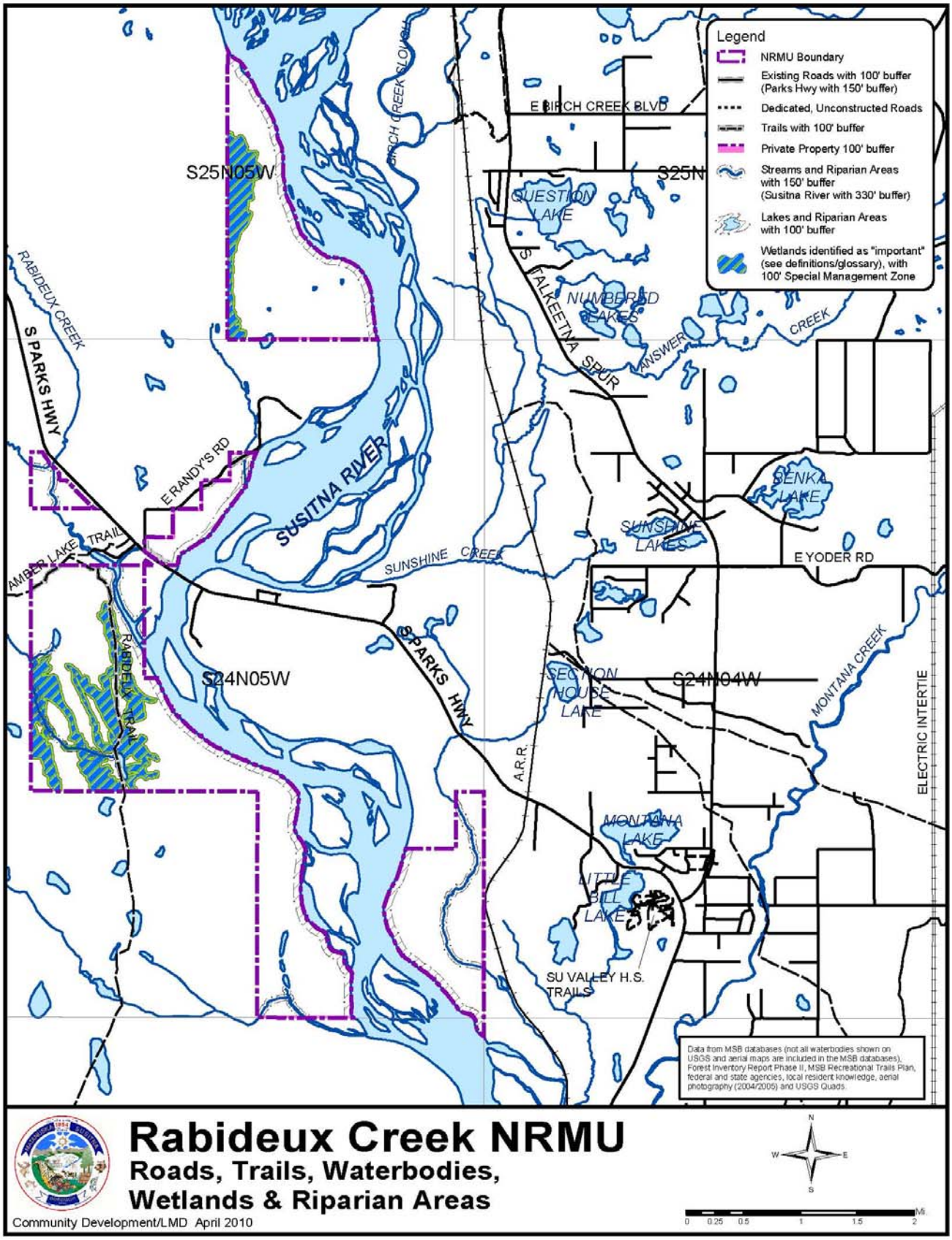
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NRMU Boundary
Existing Roads with 100' buffer (Parks Hwy with 150' buffer)
Dedicated, Unconstructed Roads
Trails with 100' buffer
Private Property 100' buffer
Streams and Riparian Areas with 150' buffer (Susitna River with 330' buffer)
Lakes and Riparian Areas with 100' buffer
Wetlands identified as "important" (see definitions/glossary), with 100' Special Management Zone
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Rabideux Creek NRMU
Roads, Trails, Waterbodies, Wetlands & Riparian Areas
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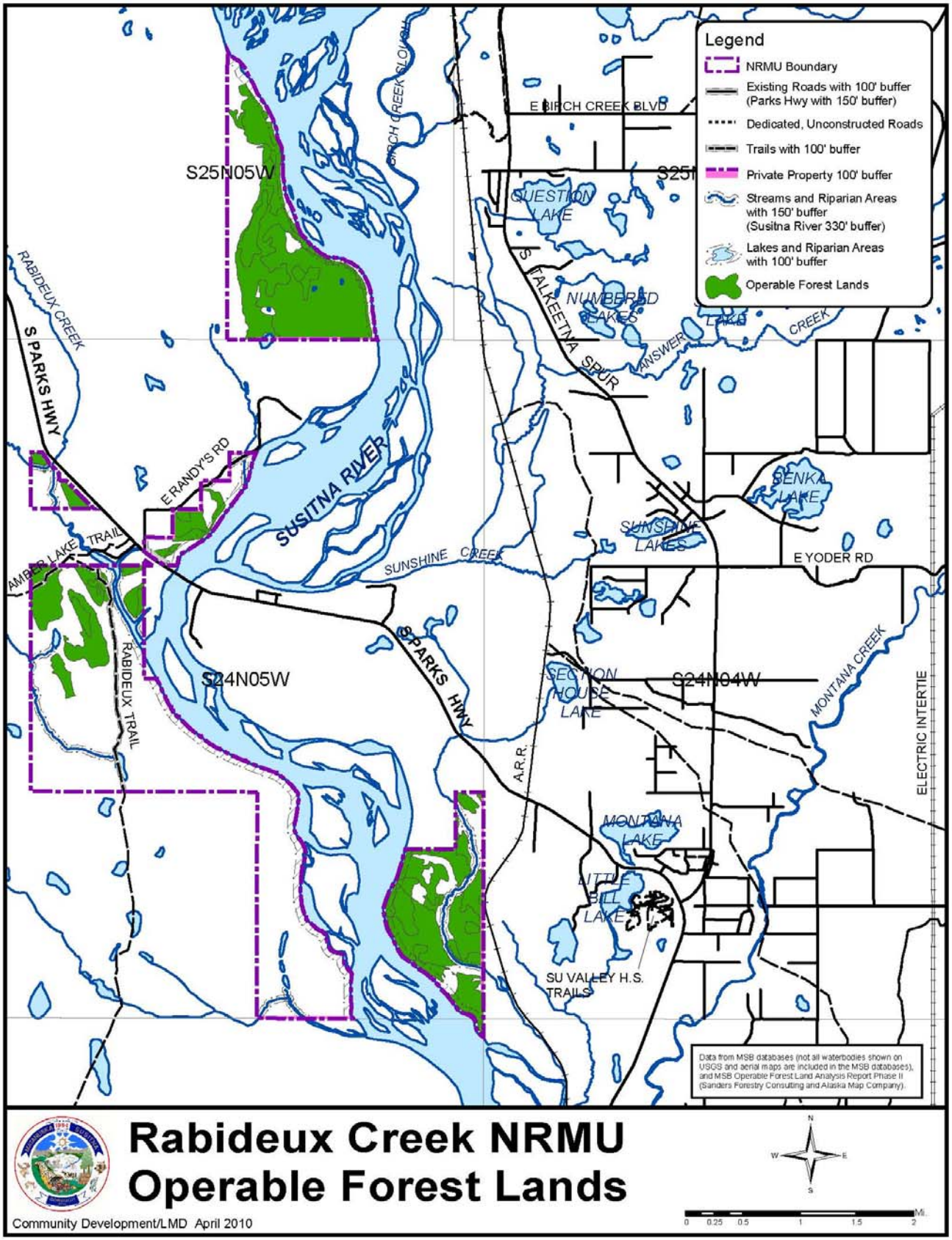
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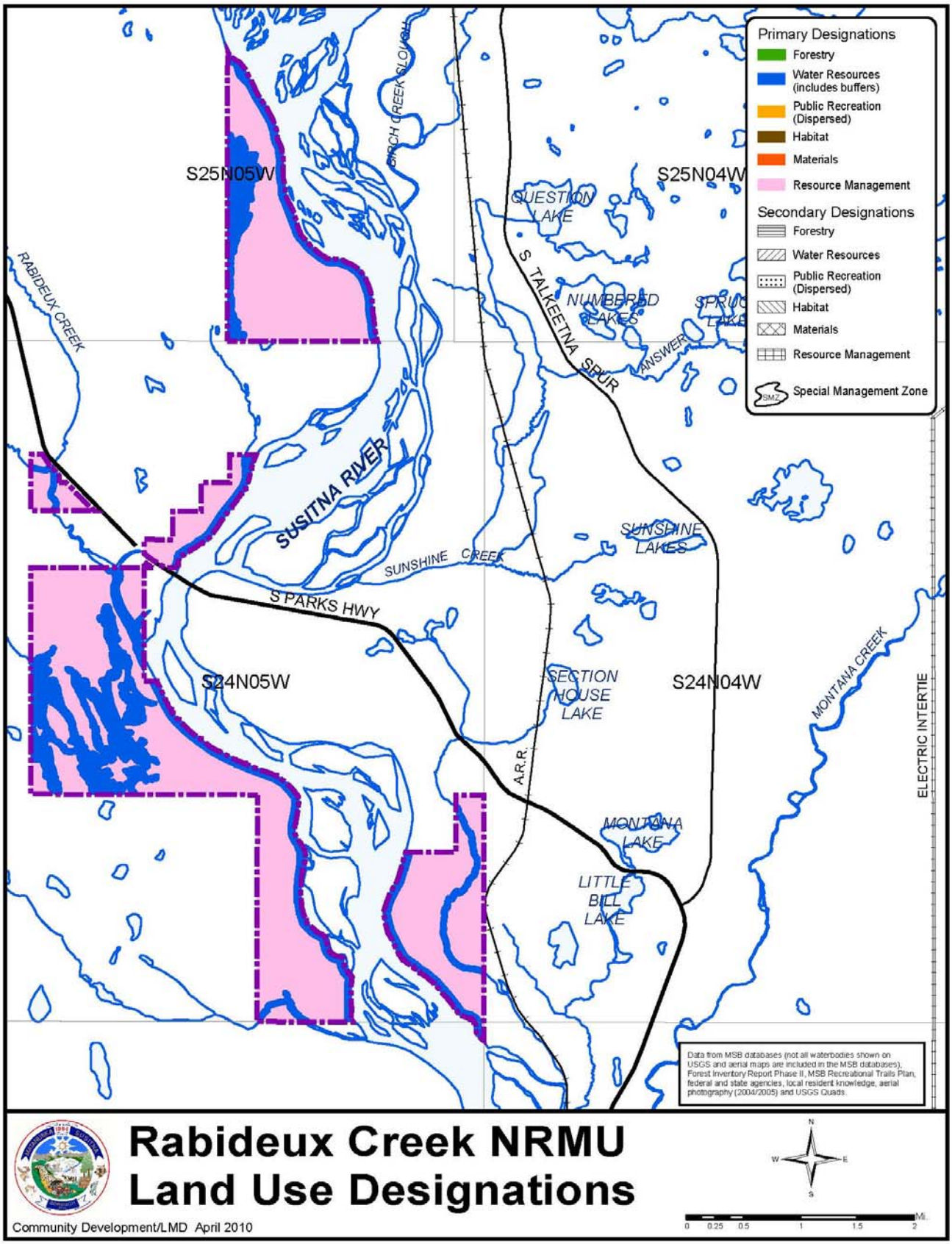
Primary Designations
Forestry
Water Resources (includes buffers)
Public Recreation (Dispersed)
Habitat
Materials
Resource Management
Secondary Designations
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Water Resources
Public Recreation (Dispersed)
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Rabideux Creek NRMU
Land Use Designations
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RABIDEUX CREEK
Natural Resource Management Unit

General Information

The Rabideux Creek Natural Resource Management Unit contains about 4,500 acres and the unit is located along the Parks Highway both north and south of the Parks Highway crossing of the Susitna River. The unit is made up of five separate blocks of borough land. One of the blocks of land is located east of the Susitna River and south of the Parks Highway. The remaining four blocks of land are located west of the Susitna River.

The entire unit is in the Susitna lowlands. The unit is generally flat with some moderate rolling terrain with a mix of moderately and poorly drained soils with some wetland areas.

Borough Tax Maps
Talkeetna 14 and Montana 3, 4, 5, and 6.

Current Land Use
Use of the area is generally dispersed recreation.

Surrounding Land Use
Land ownership adjacent to the unit is primarily state land. There are some areas that are privately owned in the general area. The primary use of these lands is also dispersed recreation.

Community Council Area
The majority of the unit is not within a community council area.

One parcel located west the Parks Highway and east of the Susitna River, is within the Susitna (formally "Y") Community Council area.

Another parcel, located east of the Parks Highway and west of the Susitna River, is within the Trapper Creek Community Council area.

Existing Land Use Plans

- Mat-Su Borough, *Multiple Use Forest Management Plan* (1989), which will be replaced by this plan.
- Alaska Department of Natural Resources, *Susitna Area Plan* (1985); Petersville Road Unit, Rocky's Lake Subunit (6 b and d); designated as Borough Land Bank with values for agriculture, forestry, water resources, public recreation, and wildlife habitat. This plan is currently being revised by the State, Department of Natural Resources and will be called the *Susitna-Matanuska Area Plan*. The *Susitna-Matanuska Area Plan* will replace the *Susitna Area Plan* once it is adopted. The *Susitna-Matanuska Area Plan* will not apply to borough-owned land.
- Mat-Su Borough, *Recreational Trails Plan* (2007).

- Mat-Su Borough, *Parks, Recreation and Open Space Plan* (2001), which is currently being updated.

A Scenic Highways Plan is currently being developed along the Parks Highway starting at the Susitna River Bridge crossing and continuing north through Denali State Park. In October 2009 the George Parks Highway north from the Chulitna River Bridge was designated as a National Scenic Byway.

The Trapper Creek Community is currently working on a comprehensive plan.

The *"Y" (Susitna) Comprehensive Plan* (2007) includes policies for:

- promoting timber harvest in a manner that helps create and maintain the rural lifestyle of the area
- reclamation requirements
- impacts on water and air quality
- lighting
- site standards for slope, natural vegetation, views
- commercial use of roads
- screening and buffers
- focused management plans for each harvest area
- reforestation requirements
- compliance and enforcement

Existing Land Use Classifications
Forest Management Lands for the majority of the unit.
Unclassified for the remainder.

Summary of Resources and Uses

Agriculture and Grazing
A review of soil types, published by the Department of Agriculture, Natural Resources Conservation Service (http://websoilsurvey.ncrs.usda.gov/app/), indicates that there are no known lands suitable for agricultural development or grazing within the unit.

Also, see *Soils* map at the beginning of this section.

Cultural Resources and Heritage Sites
There are no documented historical or heritage sites and no cultural survey has taken place within the unit. There is a likely possibility that there are undiscovered historic and prehistoric sites at the confluence of salmon bearing streams and the Susitna River.

Additional field work should be required if any natural resource extraction or other development activities take place within the unit.

Fish and Wildlife Habitat and Resources

The area has moose, black bear and fur bearers in various densities. The area is heavily used by moose as winter range and supports a moderate to high-density of animals. The hardwood forest and riparian habitat areas are also important calving habitat for moose in late spring.

There are no known bear dens, Trumpeter Swan or eagle nests within the unit, but the habitat is such that they could exist. Additional fieldwork will be required prior to any natural resource extraction or other development activities taking place to verify this information.

The Susitna River and Rabideux Creek are documented anadromous fish streams that support Coho salmon spawning and Coho and Chinook salmon rearing habitat. Although not fully documented, many of the clear water sloughs of the Susitna River are also used for spawning and rearing for Chinook and Coho salmon. Important resident fish such as Dolly Varden and grayling are also located in these same waterbodies.

Fieldwork will be required prior to any natural resource extraction or other development activities taking place to identify any additional anadromous and important resident fish waterbodies.

Prior to any resource extraction projects, the anadromous fish distribution in any wetlands should be established, any additional anadromous or important resident fish waterbodies need to be identified and the Alaska Department of Fish and Game will need to verify the cataloged anadromous resident fish streams as described above.

The Alaska Department of Fish and Game will require Fish Habitat Permits, accompanied by detailed project plans, prior to any planned resource extraction project adjacent to anadromous or resident waterbodies.

A roadside lodge exists just south of the Susitna River Bridge. No fish camps are known to be in the area.

Forest Resources

The principal timber type is mixed birch and spruce sawtimber stands with ages ranging from 60 years to greater than 100 years.

Within the 4,477-acre unit, 2,681 acres (60% of the unit) is Commercial Forest Land, of which 1,584 acres (35% of the unit) is Operable Forest Land.

The 2009 Operable Forest Land Analysis Report found the following timber composition within the unit:

Stratum 1: Pole Timber – Closed Canopy	509 acres
Stratum 2: Pole Timber – Open Canopy	69 acres
Stratum 3: Hardwood Saw Timber – Closed Canopy	10 acres
Stratum 4: Hardwood Saw Timber – Open Canopy	47 acres
Stratum 5: Mixed Forest Saw Timber – Closed Canopy	741 acres
Stratum 6: Mixed Forest Saw Timber – Open Canopy	208 acres
TOTAL	**1,584 acres**

Also, see *Operable Forest Lands* map at the beginning of this section.

There has been recent interest expressed by some residents of the Talkeetna area that portions of this unit and other local units are made available for supplying fuel wood for a proposed wood-fired boiler for the new Su Valley Middle/High School and possibly other public facilities. Supplying the school would require approximately 300 cords of fuel wood per year (equivalent to approximately 15.6 acres). This equates to 27,000 cords or approximately the equivalent of 1,400 acres of fuel wood over 90 years (mixed rotation period of birch and spruce).

The Trapper Creek Community Council has requested that an area along the road system be designated as a wood lot for local residents to be able to cut firewood in this and other nearby Natural Resource Management Units (Chulitna River, Moose Creek, Parks Highway and Susitna River Corridor).

Private Property

There is no private property within the unit. There is some private property adjacent to the exterior boundaries of the unit.

Public Recreation and Tourism

Because the unit is easily accessible by both road and boat, the area sees heavy hunting and fishing. The Rabideux and Amber lake Trails are used in the winter for dog mushing, cross-country skiing and snowmobiling. The Amber Lake Trail is also used to access private property to the west of the unit.

There is no specific resource or activity that draws tourists to this area in any significant numbers. Tourists driving or riding on the Parks Highway do see the areas general scenic values which exists throughout the entire area.

Roads and Trails

The Parks Highway and Alaska Railroad provide general access to the unit.

The Rabideux Trail runs north/south and intersects briefly the western area of the unit. The Amber Lake Trail runs east/west and briefly intersects the western area of the unit. This trail is a main corridor for access to lakes and recreational cabins outside of the unit to the west.

Also, see the *Roads, Trails, Waterbodies, Wetlands and Riparian Areas* map at the beginning of this section.

Rock, Sand and Gravel Resources
Soil mapping (see http://websoilsurvey.ncrs.usda.gov/app/) indicates that there may rock, sand and gravel resources within the unit. There are no developed rock, sand or gravel extraction areas within the unit. A more extensive field inventory will be necessary to determine the volume, extent and feasibility of possible developing this resource.

Also, see the *Soils* map at the beginning of this section.

Unit Management Intent

The management intent for the Rabideux Creek Natural Resource Management Unit is to protect water resource areas, to meet some wood product needs, encourage continued recreational uses, and other natural resource uses and values. Timber harvest is a permitted use in operable timber areas and may take place if the harvest does not significantly reduce the recreational uses within the unit.

Because of the units' location close to the Upper Susitna Middle/High School, the unit, particularly the portion of the unit east of the Susitna River and west of the Parks Highway may also be used as a Forest Education and Improvement Study Area.

Land Use Designations

Rabideux Creek		
Designation	**Classification**	**Management Intent**
Primary		
Resource Management	Resource Management Lands	All upland areas, except those designated water resources. Available for forest management and timber harvest in those areas determined to be operable forest land and where it does not significantly reduce the areas recreational activities. Protect and improve important wildlife habitat areas. Recognize and manage for the units recreational uses.

Rabideux Creek (continued)		
Designation	Classification	Management Intent
Water Resources	Watershed Lands	All waterbodies, riparian areas, and important wetlands. Any waterbodies, riparian areas or important wetlands determined after adoption of this plan to be anadromous, important for resident fish, or important wetlands for fish and wildlife shall also be similarly designated and classified[22].
Secondary		
None		

Also, see the *Land Use Designations* map at the beginning of this section.

Management Guidelines

See Volume I, Chapters 2 and 3 for area-wide guidelines for all Natural Resource Management Units. The remainder of this section presents unit-specific guidelines.

Buffers and Special Management Zones

All flowing waterbodies, including lakes that are part of a flowing water system that are connected to creeks, streams, and rivers, and associated riparian areas will be protected through the use of undisturbed natural vegetation buffers.

All wetlands over 40 acres and all smaller important wetland areas (see definition in *Definitions/Glossary* in Volume III) shall be protected with a Special Management Zone which shall include a 100-foot area around the wetland area. The Zone shall not allow disturbance of the wetland area, but some uses may be allowed. For example, winter time recreational use is allowed once sufficient snow cover exists to not harm the natural vegetation.

At such time that new activities are planned in the unit, all potentially impacted waterbodies and wetlands shall be assessed as to their habitat and water resource values. Depending on the assessment, the waterbodies and wetlands will be provided additional protection through the use of buffers or placed in a Special Management Zone, as appropriate.

[22] Such designation and classification shall be considered as a "Minor Change" to the Plan (See Volume I, Chapter 4, *Procedures for Changes to the Plan, Goals, and Guidelines.*

The Parks Highway shall have a 150-foot undisturbed natural vegetation buffer from either side of the right-of way.

The Amber Lake and Rabideux Trails shall be buffered.

Where the unit adjoins private property, the private property shall be protected through the use of an undisturbed natural vegetation buffer. These buffers may only be modified following the provisions in Volume I, Chapter 2, *Buffers* and MSB 23.20.070.

See *Roads, Trails, Waterbodies, Wetlands and Riparian Areas* map at the beginning of this section for waterbodies that shall have buffers, wetlands with a Special Management Zone, private property, roads and trails with buffers.

Also, see Volume I, Chapter 2, *Buffers* and *Special Management Zones,* for more information.

Forest Management

Small timber harvests are a permitted use and when it does not significantly reduce the areas recreational uses and water resource values. Timber harvests should generally be shall be limited to woodlots for firewood, sawlogs and specialty wood products. Timber harvest shall be small in volume in the amount harvested per year. The Alaska Department of Fish and Game does not recommend timber harvests (medium to large acreage) in this unit that will improve moose habitat that would draw moose into the Parks Highway corridor.

Because of the units' location along the Parks Highway and the location of the operable forest areas, timber harvest and transportation within the unit shall be limited to winter time and only when there the ground is sufficiently frozen and snow cover exists to not significantly damage the vegetative bed.

This unit is the closest Natural Resource Management Unit to the Su Valley Middle/High School. The unit as a whole has sufficient operable timber to meet the projected needs for schools proposed wood-fired boiler. The closest area would be on the east side of the Susitna River which may be difficult to access because of the Alaska Railroad right-of-way and stream crossings. A good share of the operable timber of the west side of the Susitna River is also not easily accessible, and some of the spruce may be of high quality which is not appropriate to be used for firewood. The projected need of 27,000 cords of wood (equivalent to approximately 1,400 acres of fuel wood over an average of 90 years for a mixed rotation period of birch and spruce, may use all of the available operable forest area in the unit.

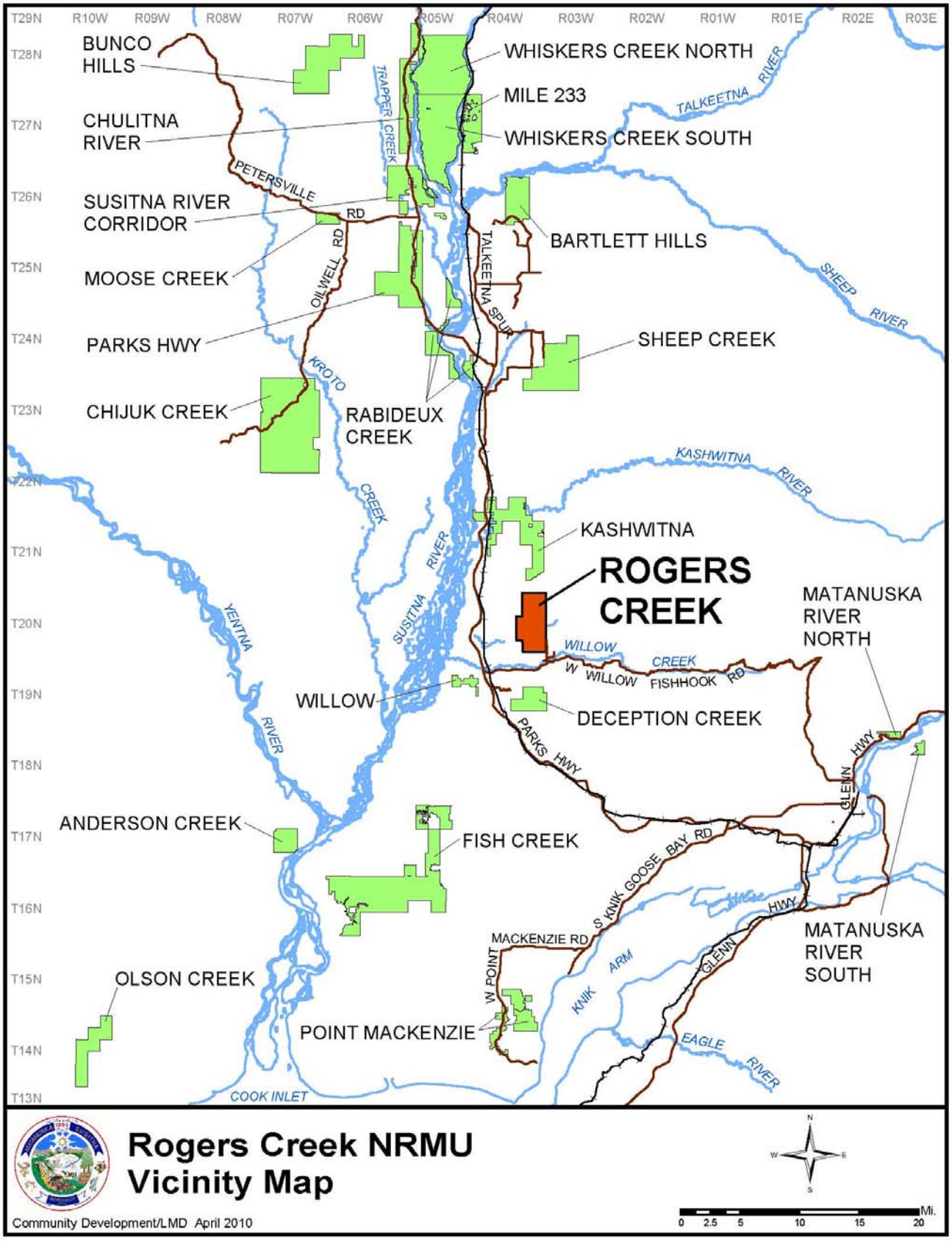
This unit should not be the only unit utilized for supplying fuel wood over a long-term basis for the Su Valley Middle/High School proposed wood fired boiler. Portions of this unit could be used to meet this need if combined with harvest(s) from other nearby Natural Resource Management Units. The unit could be used for some of the fuel wood requirements, but only if it is compatible with the other primary designations and Alaska Department of Fish and Game concerns for creating moose habitat close to the Parks Highway.

Portions of the area accessible to the Parks Highway and close to the Su Valley Middle/High School would also be suitable as a Forest Improvement Study Area (see Volume I, Chapter 3, *Forest Improvement Study Area(s),* for more information).

Other Uses

Because of the units' close proximity to the Upper Susitna Middle/High School, this unit, particularly that portion east of the Susitna River and west of the Parks Highway could be designated as a Special Management Area for the purpose of establishing a Forest Education and Improvement Study Area. (See Volume I, Chapter 3; *Forest Education and Improvement Study Area(s)* for additional information.)

No additional unit-specific guidelines are required for this unit. See Volume I, Chapters 2 and 3 for area-wide guidelines that apply to all Natural Resource Management Units.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CHIJUK CREEK
WHISKERS CREEK NORTH
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WHISKERS CREEK SOUTH
BARTLETT HILLS
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RABIDEUX CREEK
KASHWITNA
ROGERS CREEK
MATANUSKA RIVER NORTH
WILLOW
DECEPTION CREEK
ANDERSON CREEK
FISH CREEK
MATANUSKA RIVER SOUTH
OLSON CREEK
POINT MACKENZIE
TRAPPER CREEK
PETERSVILLE RD
OILWELL RD
TALKEETNA SPUR
KROTO CREEK
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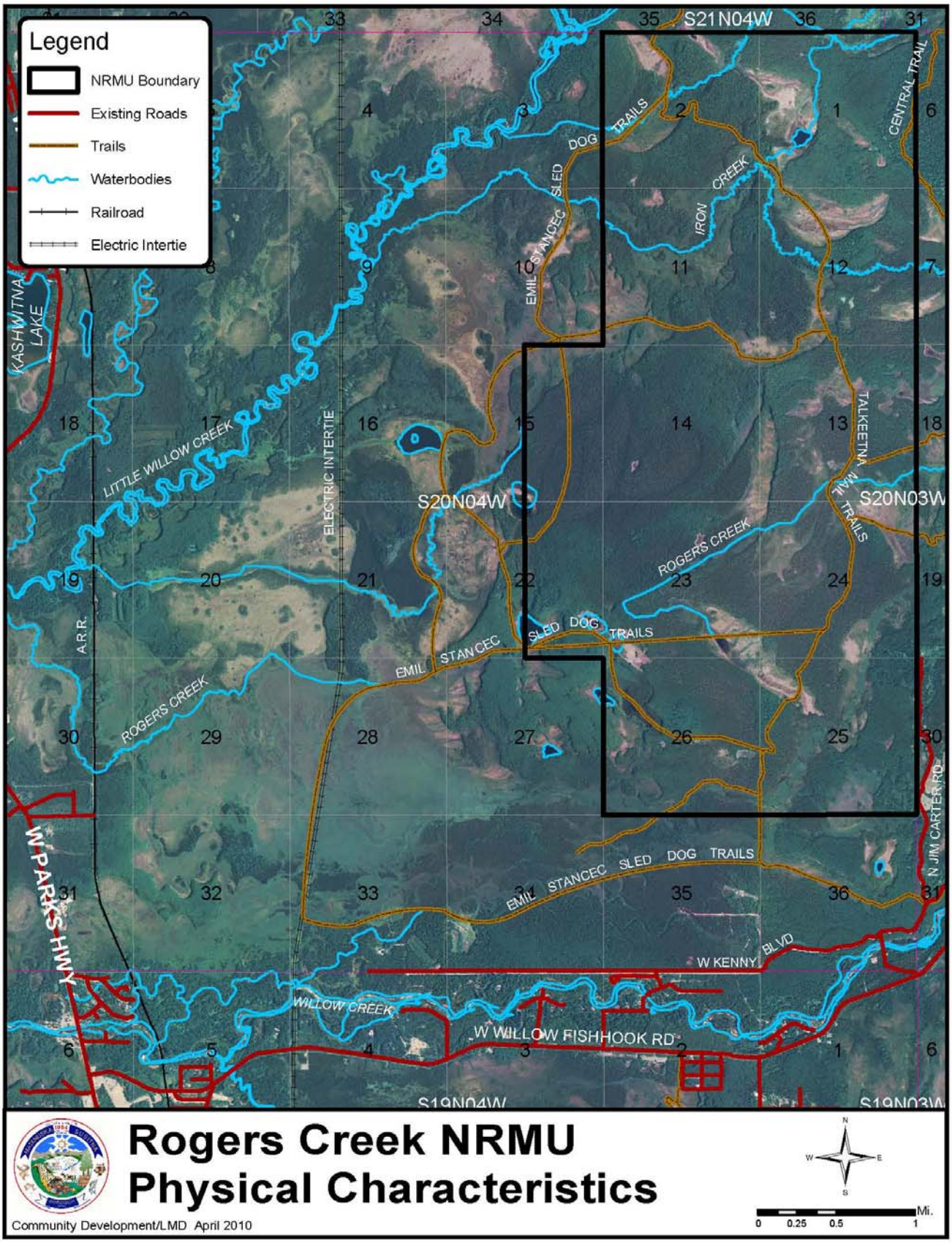
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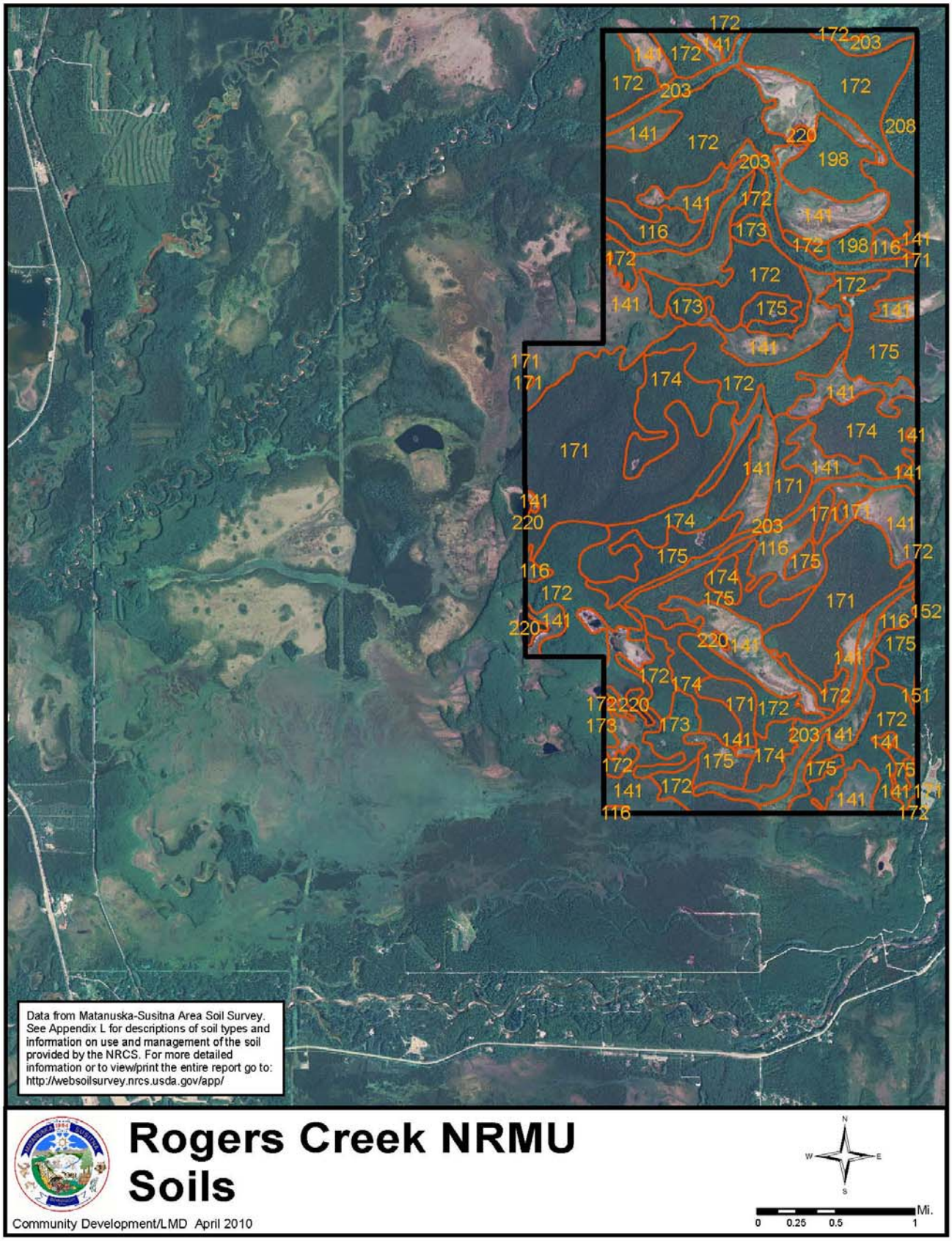
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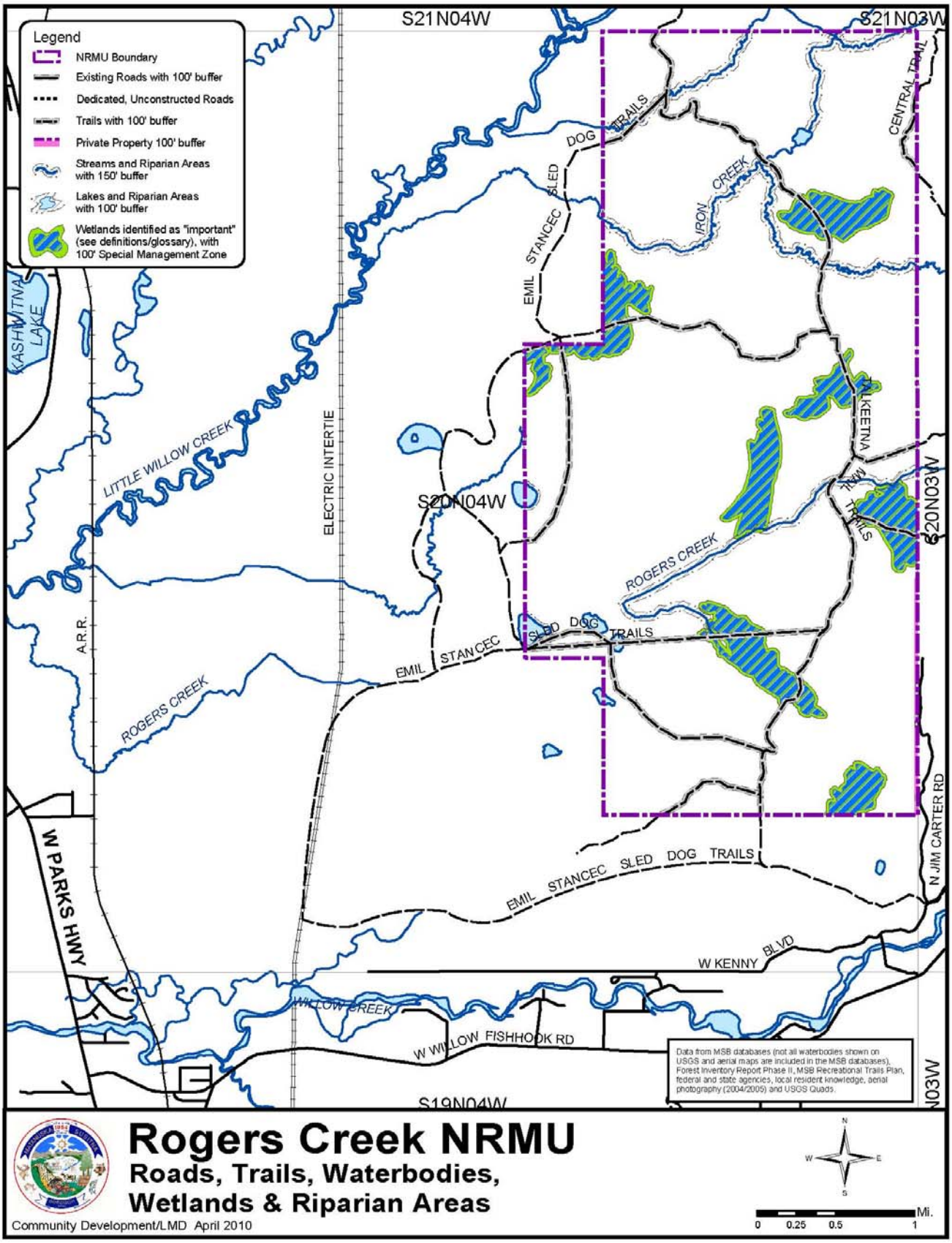
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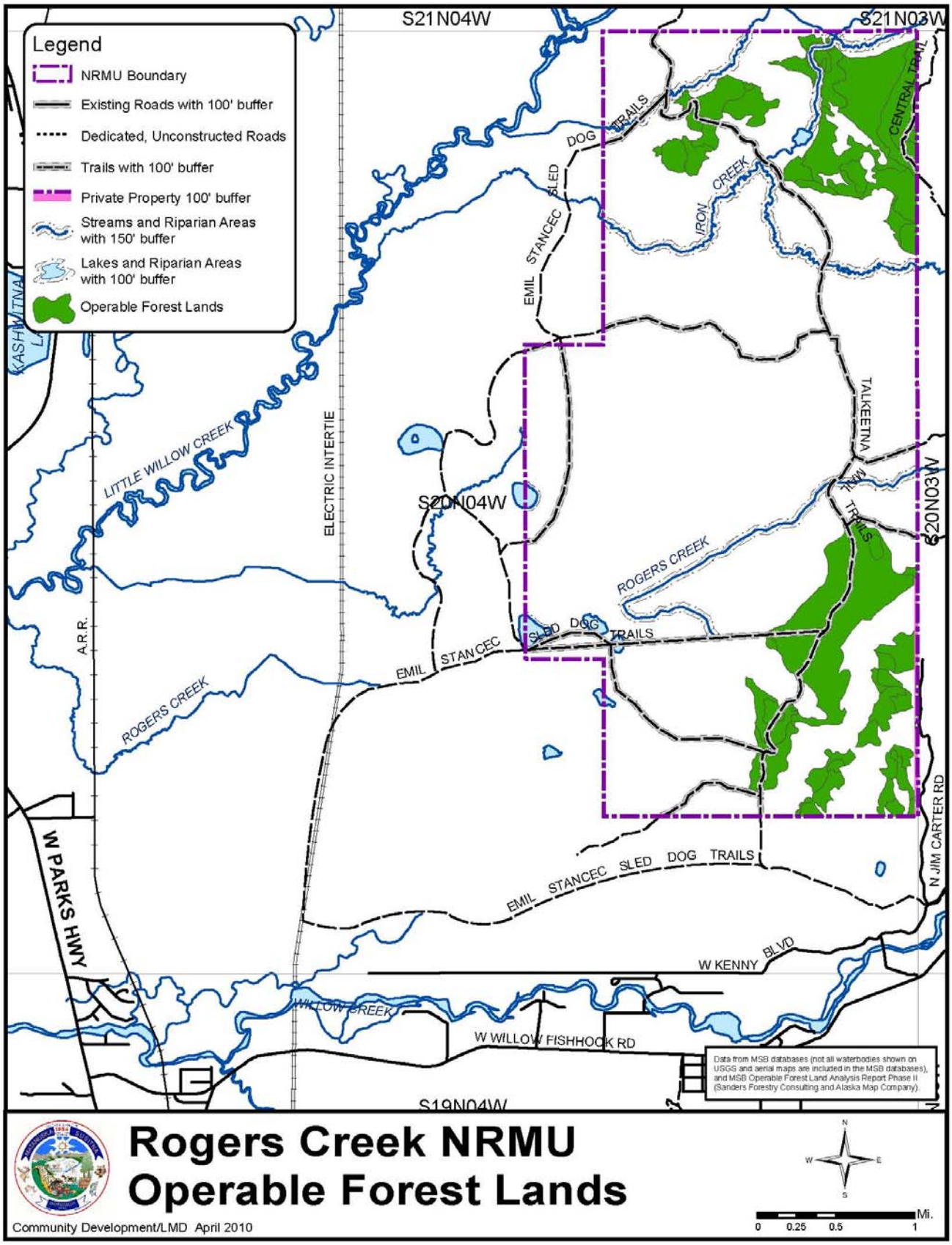
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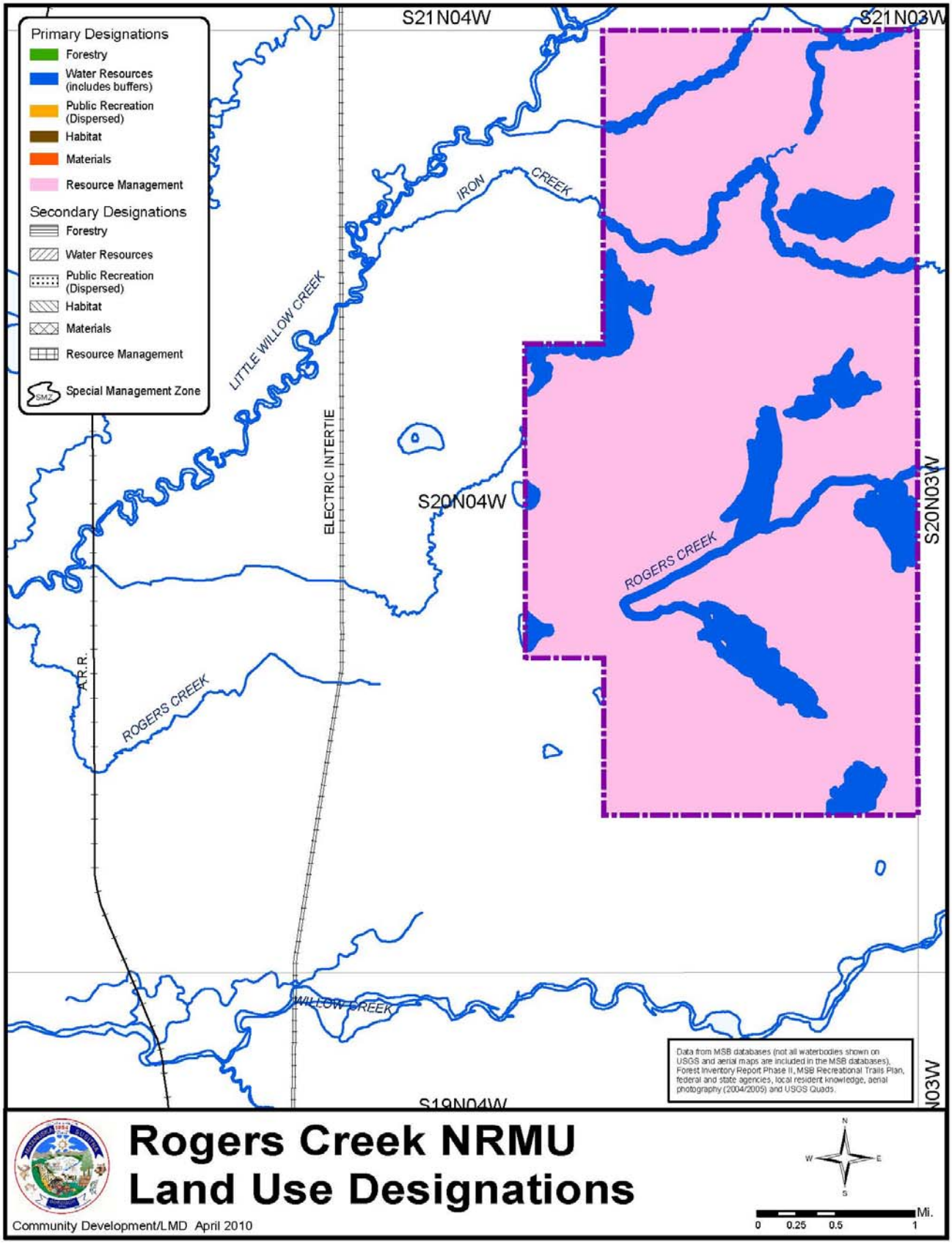
Primary Designations
Forestry
Water Resources (includes buffers)
Public Recreation (Dispersed)
Habitat
Materials
Resource Management
Secondary Designations
Forestry
Water Resources
Public Recreation (Dispersed)
Habitat
Materials
Resource Management
Special Management Zone
S21N04W
S21N03W
IRON CREEK
LITTLE WILLOW CREEK
ELECTRIC INTERTIE
S20N04W
S20N03W
ROGERS CREEK
A.R.R.
ROGERS CREEK
WILLOW CREEK
S19N04W
Data from MSB databases (not all waterbodies shown on USGS and aerial maps are included in the MSB databases), Forest Inventory Report Phase II, MSB Recreational Trails Plan, federal and state agencies, local resident knowledge, aerial photography (2004/2005) and USGS Quads.
Rogers Creek NRMU
Land Use Designations
Community Development/LMD April 2010
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ROGERS CREEK
Natural Resource Management Unit

General Information

The Rogers Creek Natural Resource Management Unit contains about 7,040 acres. The community of Willow is located approximately five-miles to the southwest, Willow Fishhook Road is near the southern boundary, and Little Willow Creek is slightly north of the northern boundary. The Parks Highway and Alaska Railroad are located approximately five-miles west of the unit.

This unit is located at the base of the Talkeetna Mountains, has rolling terrain with many hills and steep ridges. The majority of the land is moderately to well drained, although there are some poorly drained soils and wetland areas.

Borough Tax Maps
Willow 1 and 8

Current Land Use
The unit receives a variety of uses, mainly dog mushing, snowmobiling, fishing, hunting and trapping.

Surrounding Land Use
The adjoining land is owned by the State of Alaska where the same uses occur. There have also been timber harvests in the area to the east of the proposed unit. Scattered private land is also located throughout the surrounding area.

Community Council Area
Willow Area Community Organization

Existing Land Use Plans

- Mat-Su Borough, *Multiple Use Forest Management Plan*, 1989, which will be replaced with this plan.
- Alaska Department of Natural Resources, *Southeast Susitna Area Plan* (2008), Kashwitna-Willow Uplands Region: designated primarily for forestry, fish and wildlife habitat, and public recreation. This plan replaced the *Susitna Area Plan* (1985).
- Mat-Su Borough, *Recreational Trails Plan* (2007).
- Mat-Su Borough, *Parks, Recreation and Open Space Plan* (2001), which is currently being updated.

The community of Willow is currently working on a comprehensive plan.

Existing Land Use Classifications
The northern one-third of the unit is classified as Forest Management Lands. The remainder of the unit is unclassified.

Summary of Resources and Uses

Agriculture and Grazing
A review of soil types, published by the Department of Agriculture, Natural Resources Conservation Service (http://websoilsurvey.ncrs.usda.gov/app/), indicates that there are no known lands suitable for agricultural development or grazing within the unit.

Also, see *Soils* map at the beginning of this section.

Cultural Resources and Heritage Sites
There are no documented historical or heritage sites and no cultural survey is known to have taken place within the unit.

Additional field work may be required if any natural resource extraction or other development activities take place within the unit.

Fish and Wildlife Habitat and Resources
The area supports a moderate diversity of wildlife species. The area is used on a year-round basis by moose, brown and black bear, and a number of furbearer species, upland game birds and small game species.

There are no documented bear dens, although the habitat in the area is capable of supporting such a use. There is no documented Trumpeter Swan nesting areas or eagle nests within the unit. Additional fieldwork will be required prior to any natural resource extraction or other development activities taking place to verify this information.

The unit includes several cataloged anadromous fish streams. Little Willow Creek, Rogers Creek and Iron Creek are important Chinook and Coho salmon spawning and rearing systems. These water bodies also support important resident species of rainbow trout, grayling and Dolly Varden char.

Prior to any resource extraction projects, the anadromous fish distribution in any wetlands should be established, any additional anadromous or important resident fish waterbodies need to be identified and the Alaska Department of Fish and Game will need to verify the cataloged anadromous resident fish streams as described above.

The Alaska Department of Fish and Game will require Fish Habitat Permits, accompanied by detailed project plans, prior to any planned resource extraction project adjacent to anadromous or resident waterbodies.

There are no commercial lodges or fish camps in the area.

Forest Resources

The principal timber type is mixed birch and spruce timber stands of varying size, class, age and density. Within the 7,040 acre unit, 5,481 acres (78% of the unit) is Commercial Forest Land, of which 1,025 acres (15% of the unit) was determined to be Operable Forest Land in 2009.

The 2009 Operable Forest Land Analysis Report found the following timber composition within the unit:

Stratum 1: Pole Timber – Closed Canopy	788 acres
Stratum 2: Pole Timber – Open Canopy	2 acres
Stratum 3: Hardwood Saw Timber – Closed Canopy	67 acres
Stratum 4: Hardwood Saw Timber – Open Canopy	6 acres
Stratum 5: Mixed Forest Saw Timber – Closed Canopy	105 acres
Stratum 6: Mixed Forest Saw Timber – Open Canopy	57 acres
TOTAL	**1,025 acres**

Also, see *Operable Forest Lands* map at the beginning of this section.

Public Recreation and Tourism

The Talkeetna Mail (Herning) Trail and the logging road (extension of Willer-Kash Road) run through the unit and are used by ATV riders, mushers and snowmobilers. Fishing, moose and bear hunting are also popular in the area.

There is nothing of special interest that attracts tourists to this unit in any significant numbers.

Private Property

There is no private property within the unit. There is scattered private property located in the general area outside of the units' boundaries.

Roads and Trails

Direct access to the unit is available from the Willer-Kash Road and Jim Carter Road. Both Roads are accessed via the Shirley Town Bridge which is off the Willow Fishhook Road which is in the southeast corner of the unit.

The Talkeetna Mail (Herning) Trail (RST 1691), Central Trail and the Iron Creek Trail generally run north/south through the unit. The Emil Stancec Sled Dog Trails meander throughout the entire unit.

The Willow Area Trails Plan, adopted b the Willow Area Community Organization in 2006, documents historical and current trails and their uses in the unit.

Also, see the *Roads, Trails, Waterbodies, Wetlands and Riparian Areas* map at the beginning of this section.

Rock, Sand and Gravel Resources
Soil mapping (see http://websoilsurvey.ncrs.usda.gov/app/) indicates that there may rock, sand and gravel resources within the unit. There are no developed rock, sand or gravel extraction areas within the unit. A more extensive field inventory will be necessary to determine the volume, extent and feasibility of possibly developing this resource.

Also, see the *Soils* map at the beginning of this section.

Unit Management Intent

The management intent for the Rogers Creek Natural Resource Management Unit shall for general natural resources and uses, protecting water resources and meeting some wood product needs while improving wildlife habitat.

Land Use Designations

Rogers Creek		
Designation	**Classification**	**Management Intent**
Primary		
Resource Management	Resource Management Lands	All upland areas, except those designated water resources. Available for forest management and timber harvest in those areas determined to be operable forest land and where it does not significantly reduce the areas recreational activities. Recognize and manage for the units recreational uses.
Water Resources	Watershed Lands	All waterbodies, riparian areas, and important wetlands. Waterbodies or important wetlands determined after adoption of this plan to be anadromous, important for resident fish, or important wetlands for fish and wildlife.

Rogers Creek		
Designation	Classification	Management Intent
		shall also be similarly designated and classified[23].
Secondary		
None		

Also, see the *Land Use Designations* map at the beginning of this section.

Management Guidelines

See Volume I, Chapters 2 and 3 for area-wide guidelines for all Natural Resource Management Units. The remainder of this section presents unit-specific guidelines.

Buffers and Special Management Zones
All flowing waterbodies, including lakes that are part of a flowing water system that are connected to creeks, streams, and rivers, and associated riparian areas will be protected through the use of undisturbed natural vegetation buffers.

All wetlands over 40 acres and all smaller important wetland areas (see definition in *Definitions/Glossary* in Volume III) shall be protected with a Special Management Zone which shall include a 100' area around the wetland area. The Zone shall not allow disturbance of the wetland area, but some uses may be allowed. For example, winter time recreational use is allowed once sufficient snow cover exists to not harm the natural vegetation.

Jim Carter Road shall be buffered where it crosses into the unit.

The Central Trail, Emil Stancec Sled Dog Trails, Iron Creek Trail and Talkeetna Mail Trail shall be buffered.

See *Roads, Trails, Waterbodies, Wetlands and Riparian Areas* map at the beginning of this section for waterbodies that shall have buffers, wetlands with a Special Management Zone, and roads and trails with buffers.

Also, see Volume I, Chapter 2, *Buffers* and *Special Management Zones*, for additional information.

Forest Management
Timber harvesting is permitted when it does not significantly reduce from the units recreational and watershed values.

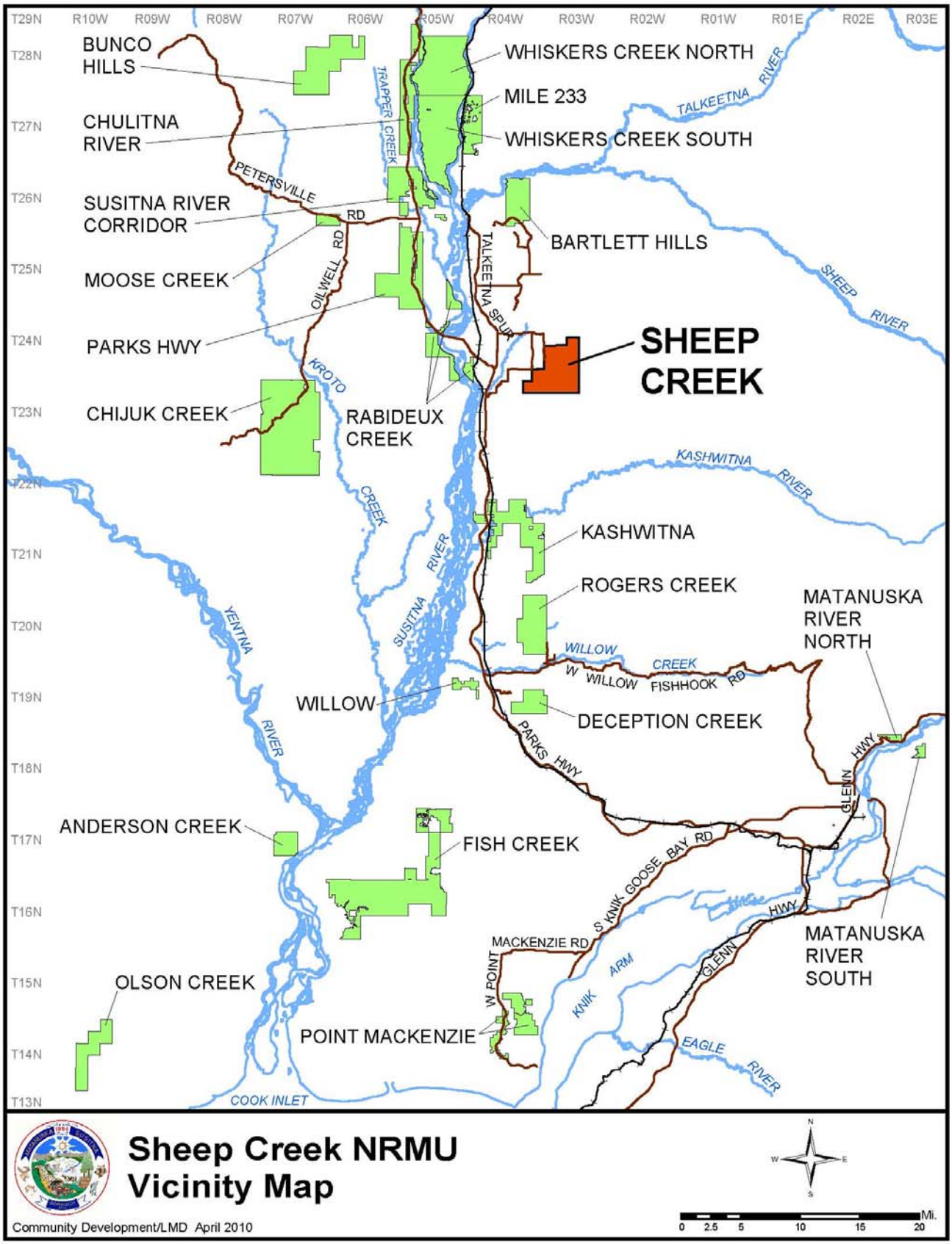
[23] Such designation and classification shall be considered as a "Minor Change" to the Plan (See Volume I, Chapter 4, *Procedures for Changes to the Plan, Goals, and Guidelines.*

Timber harvest shall be managed for improving forest health and providing forest products utilizing professionally accepted practices. Timber harvests should be for firewood, sawlog, and specialty wood products.

Timber harvests shall only be held after consultation with the Alaska Department of Fish and Game. Harvest units should be laid out to improve wildlife habitat, especially winter habitat for moose to reduce transportation related fatalities and to improve public safety.

Other Uses

No additional unit-specific guidelines are required for this unit. See Volume 1, Chapters 2 and 3 for area-wide guidelines that apply to all Natural Resource Management Units.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CHULITNA RIVER
SUSITNA RIVER CORRIDOR
MOOSE CREEK
PARKS HWY
CHIJUK CREEK
WHISKERS CREEK NORTH
MILE 233
WHISKERS CREEK SOUTH
BARTLETT HILLS
SHEEP CREEK
RABIDEUX CREEK
KASHWITNA
ROGERS CREEK
MATANUSKA RIVER NORTH
WILLOW
DECEPTION CREEK
ANDERSON CREEK
FISH CREEK
MATANUSKA RIVER SOUTH
OLSON CREEK
POINT MACKENZIE
TRAPPER CREEK
PETERSVILLE RD
OILWELL RD
TALKEETNA SPUR
KROTO CREEK
SUSITNA RIVER
YENTNA RIVER
TALKEETNA RIVER
SHEEP RIVER
KASHWITNA RIVER
WILLOW CREEK
W WILLOW FISHHOOK RD
PARKS HWY
GLENN HWY
S KNIK GOOSE BAY RD
MACKENZIE RD
W POINT
KNIK ARM
EAGLE RIVER
COOK INLET
Sheep Creek NRMU
Vicinity Map
Community Development/LMD April 2010
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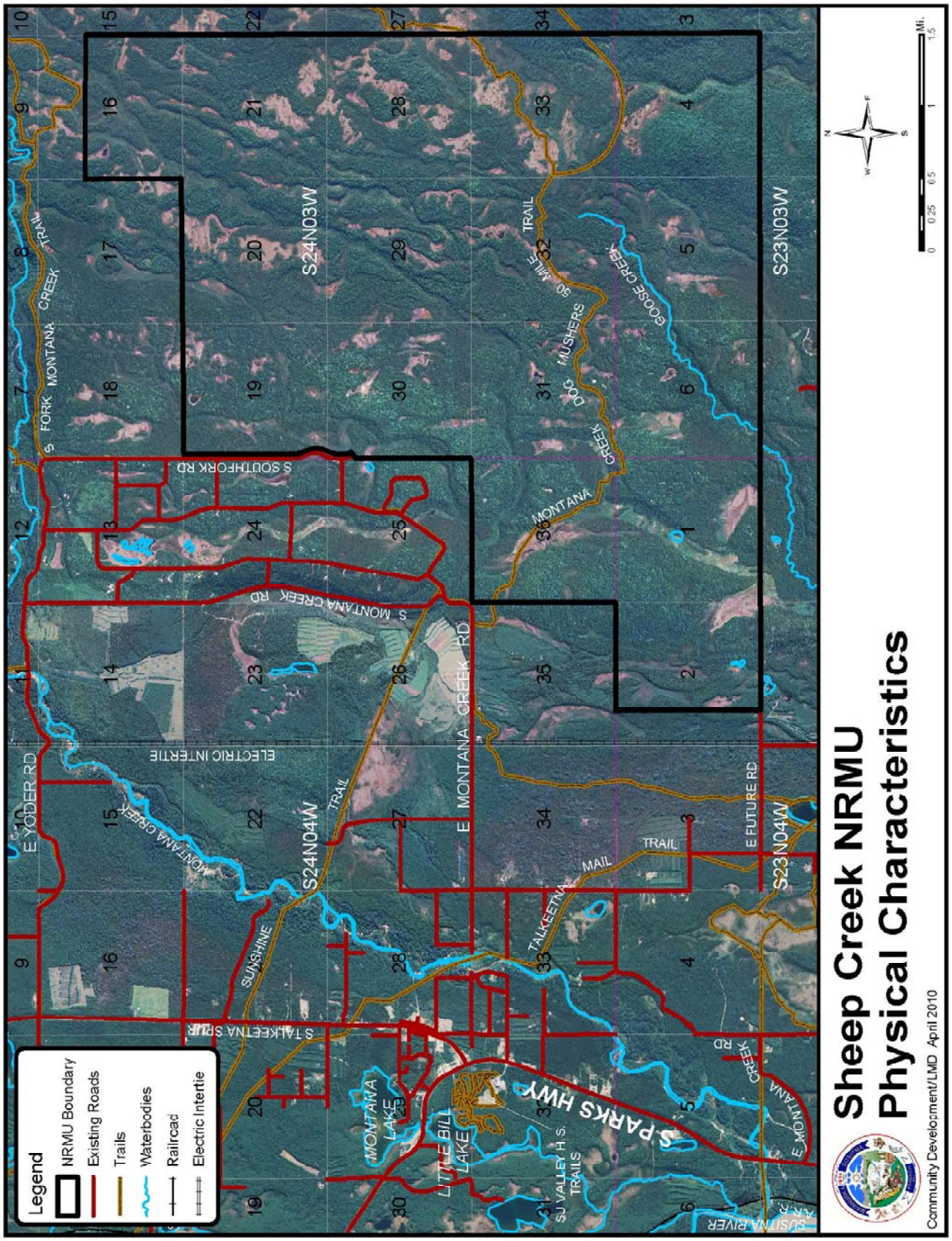
Legend
NRMU Boundary
Existing Roads
Trails
Waterbodies
Railroad
Electric Intertie
S24N03W
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S24N04W
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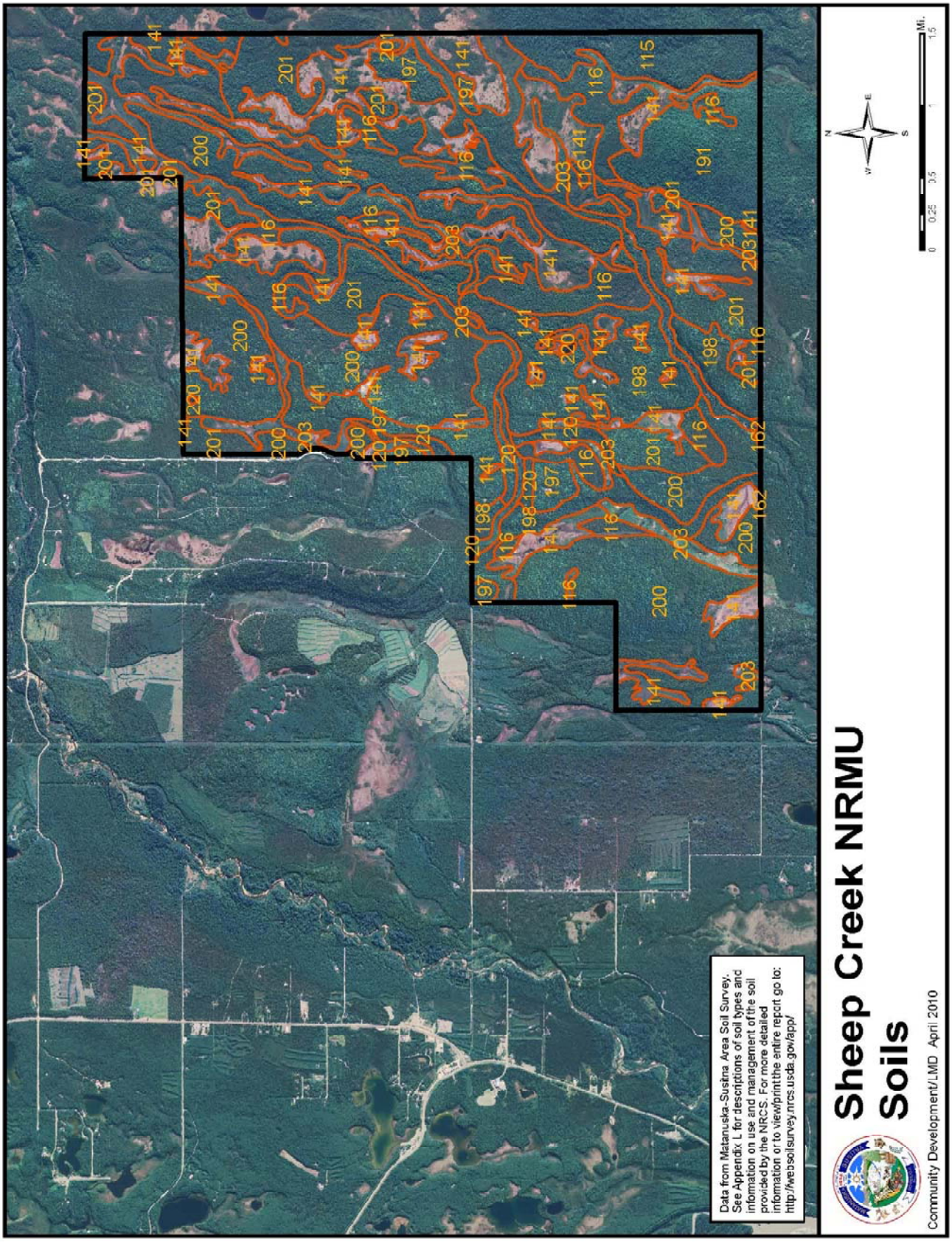
S SOUTHFORK RD
S MONTANA CREEK RD
E MONTANA CREEK RD
E YODER RD
E FUTURE RD
S PARKS HWY
ELECTRIC INTERTIE
S FORK MONTANA CREEK TRAIL
MONTANA CREEK
S TALKEETNA SPUR
SUNSHINE
TALKEETNA
MAIL
TRAIL
GOOSE CREEK
DOG MUSHERS
MONTANA LAKE
LITTLE BILL LAKE
SU VALLEY H.S. TRAILS
SUSITNA RIVER
Sheep Creek NRMU
Physical Characteristics
Community Development/LMD April 2010


Data from Matanuska-Susitna Area Soil Survey. See Appendix L for descriptions of soil types and information on use and management of the soil provided by the NRCS. For more detailed information or to view/print the entire report go to: http://websoilsurvey.nrcs.usda.gov/app/
Sheep Creek NRMU
Soils
Community Development/LMD April 2010
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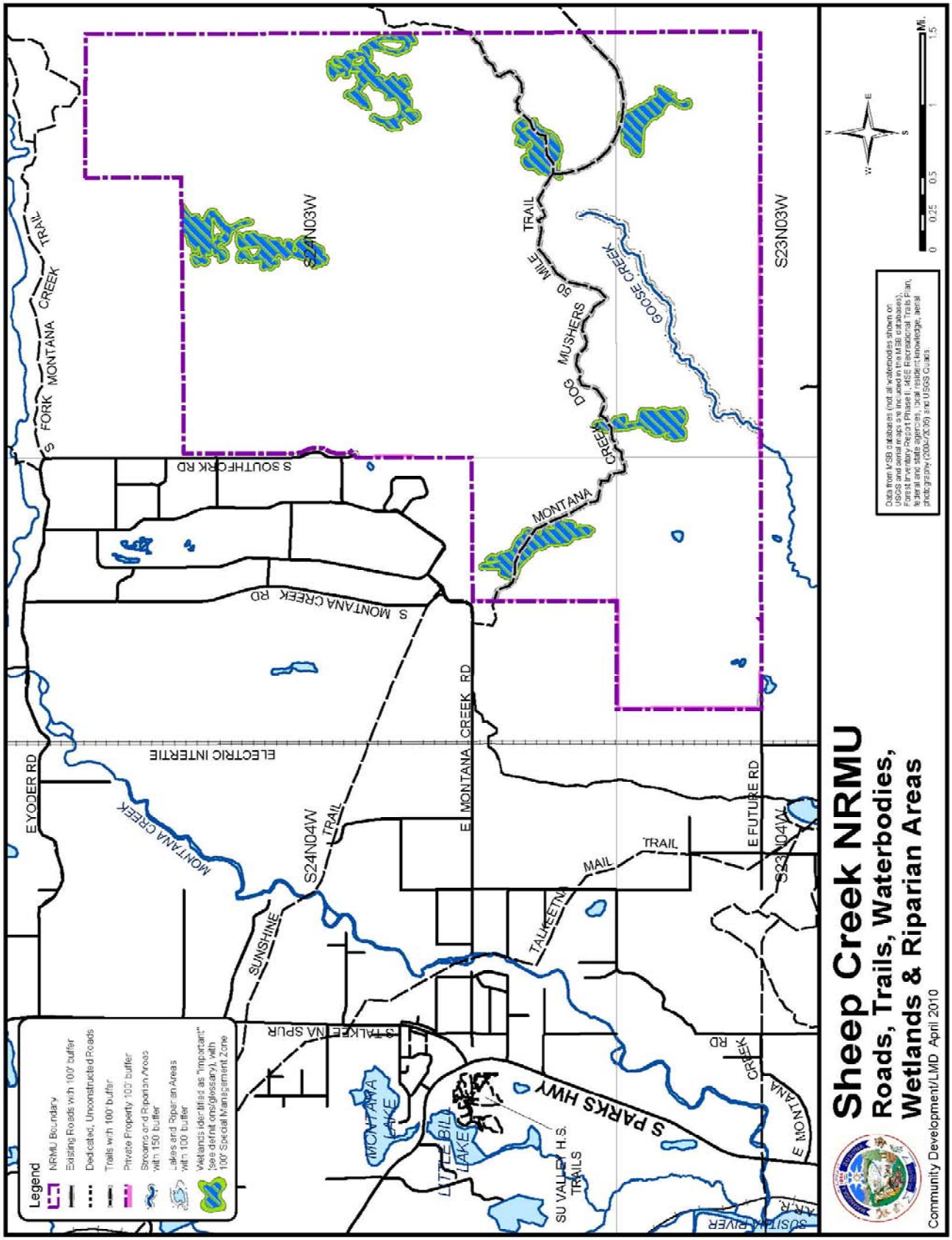
Sheep Creek NRMU
Roads, Trails, Waterbodies, Wetlands & Riparian Areas
Community Development/LMD April 2010
Legend
NRMU Boundary
Existing Roads with 100' buffer
Dedicated, Unconstructed Roads
Trails with 100' buffer
Private Property 100' buffer
Streams and Riparian Areas with 150' buffer
Lakes and Riparian Areas with 100' buffer
Wetlands identified as "important" (see definitions/glossary), with 100' Special Management Zone
Data from MSB databases (not all waterbodies shown on USGS and aerial maps are included in the MSB databases); Forest Inventory Report Phase II, MSE Recreational Trails Plan, federal and state agencies, local resident knowledge, aerial photography (2004-2006) and USGS Quads
S24N03W
S23N03W
S24N04W
S23N04W
S FORK MONTANA CREEK TRAIL
S SOUTHFORK RD
S MONTANA CREEK RD
ELECTRIC INTERTIE
E YODER RD
MONTANA CREEK
E MONTANA CREEK RD
E FUTURE RD
SUNSHINE
TALKEETNA
MAIL TRAIL
S TALKEETNA SPUR
S PARKS HWY
MONTANA LAKE
LITTLE BIG LAKE
SU VALLEY H.S. TRAILS
DOG MUSHERS 50 MILE TRAIL
GOOSE CREEK
E MONTANA CREEK RD
SUSITNA RIVER
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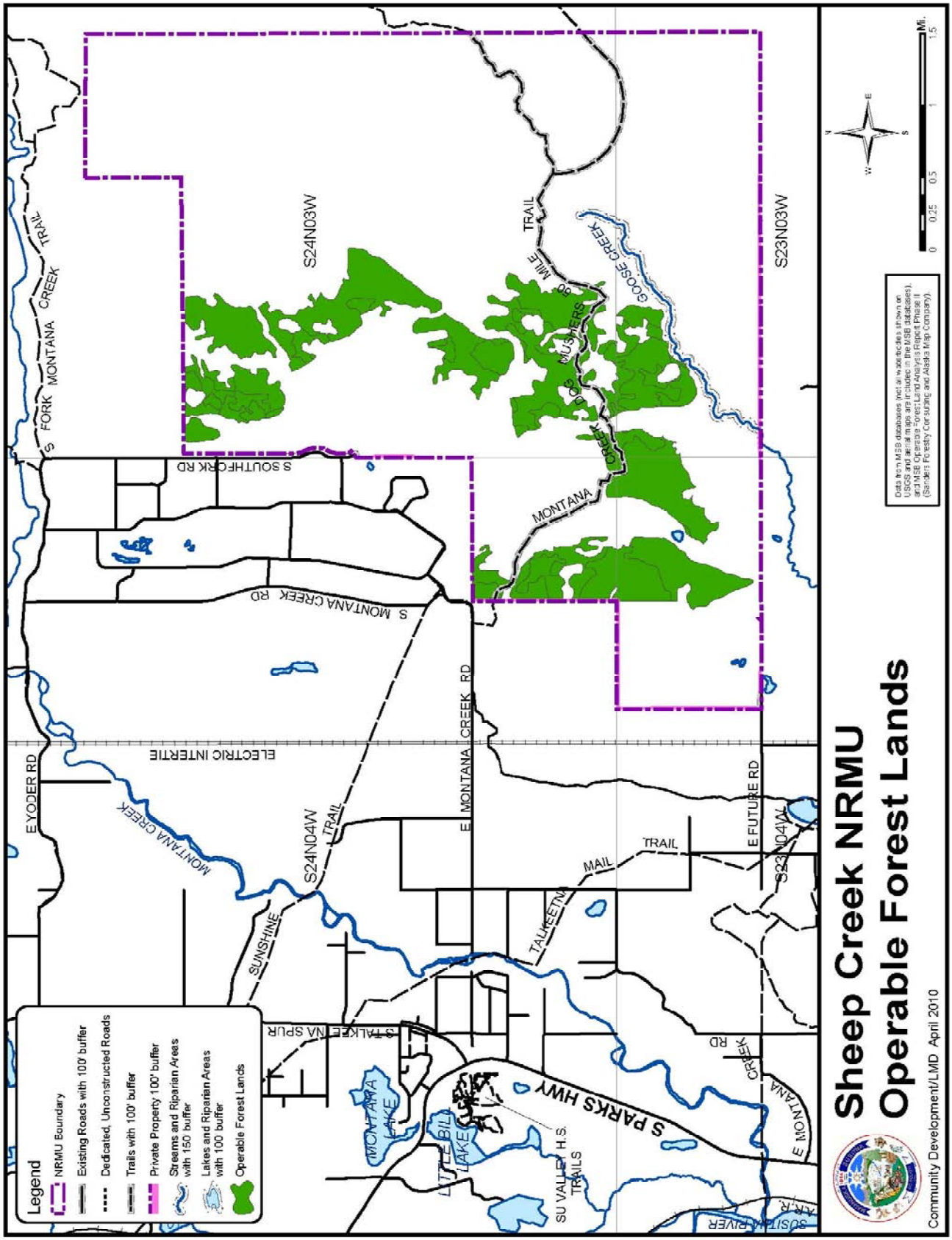
Sheep Creek NRMU
Operable Forest Lands
Community Development/LMD April 2010
Legend
NRMU Boundary
Existing Roads with 100' buffer
Dedicated, Unconstructed Roads
Trails with 100' buffer
Private Property 100' buffer
Streams and Riparian Areas with 150 buffer
Lakes and Riparian Areas with 100 buffer
Operable Forest Lands
S24N03W
S23N03W
S24N04W
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S FORK MONTANA CREEK TRAIL
S SOUTHFORK RD
S MONTANA CREEK RD
ELECTRIC INTERTIE
E YODER RD
MONTANA CREEK
SUNSHINE
S TALKEETNA SPUR
E MONTANA CREEK RD
TALKEETNA
MAIL TRAIL
E FUTURE RD
S PARKS HWY
MONTANA LAKE
LITTLE BIG LAKE
SU VALLEY H.S.
TRAILS
E MONTANA CREEK RD
SUSITNA RIVER
MILE 96
MUSHERS
GOOSE CREEK
Data from MSB databases (not all waterbodies shown on USGS and aerial maps are included in the MSB databases) and MSB Operable Forest Land Analysis Report Phase II (Sanders Forestry Consulting and Alaska Map Company).
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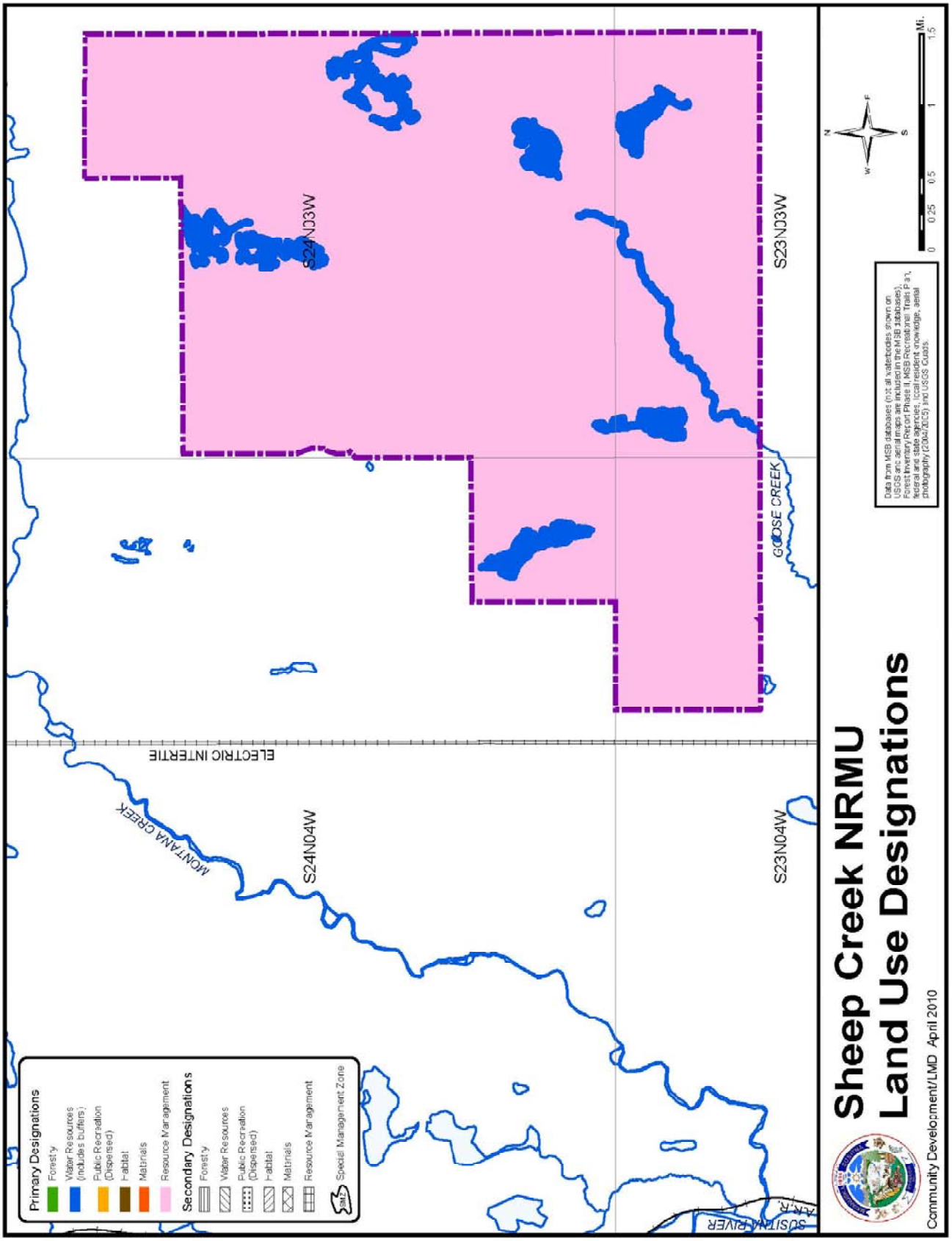

Primary Designations
Forestry
Water Resources (includes buffers)
Public Recreation (Dispersed)
Habitat
Materials
Resource Management
Secondary Designations
Forestry
Water Resources
Public Recreation (Dispersed)
Habitat
Materials
Resource Management
Special Management Zone
S24N04W
S23N04W
S24N03W
S23N03W
MONTANA CREEK
ELECTRIC INTERTIE
GOOSE CREEK
SUSITNA RIVER
Data from MSB databases (not all waterbodies shown on USGS arc aerial maps are included in the MSB databases), Forest Inventory Report Phase II, MSB Recreational Trails Plan, federal and state agencies, local resident knowledge, aerial photography (2004/2005) and USGS Quads.
0 0.25 0.5 1 1.5 Mi.
Sheep Creek NRMU
Land Use Designations
Community Development/LMD April 2010

SHEEP CREEK
Natural Resource Management Unit

General Information

The Sheep Creek Natural Resource Management Unit contains about 9,700 acres. This unit is located approximately four (4) miles east of the Susitna River and between Sheep Creek to the south and the North Fork of Montana Creek to the north. The area is accessed from the Parks Highway and Montana Creek Road.

The unit is comprised of mostly rolling terrain intermixed with rugged terrain, narrow steep gullies and some poorly drained areas.

Borough Tax Maps
Montana 8 and 9, Kashwitna 6 and Bald Mountain 00.

Current Land Uses
There are a variety of dispersed recreational uses occurring within the unit. A Borough timber harvest area was logged within the last five (5) years.

Surrounding Land Uses
Both state and private land surround the unit. On the state land general dispersed recreational use occurs. The private land is a mix of native land where logging has occurred and other private land that has residential, cabins, and agricultural uses.

Community Council Area
Susitna (formerly "Y") Community Council

Existing Land Use Plans

- Mat-Su Borough, *Multiple Use Forest Management Plan*, 1989, which shall be replaced with this Plan.
- Alaska Department of Natural Resources, *Southeast Susitna Area Plan* (2009), Kashwitna Uplands Region (southern portion); designated primarily for fish and wildlife habitat, forestry, public recreation, settlement, and water resources. The *Southeast Susitna Area Plan* does not apply to borough owned land
- Alaska Department of Natural Resources, *Susitna Area Plan* (1985), Goose Creek (11) Subunit. The unit has a primary designation of forestry and wildlife habitat, with a secondary designation of public recreation. The *Susitna Area Plan* is currently being revised and will be called the *Susitna-Matanuska Area Plan*. When this plan is completed it will replace the *Susitna Area Plan*. The *Susitna-Matanuska Area Plan* does not apply to borough owned land.
- Mat-Su Borough, *Recreational Trails Plan* (2007).
- Mat-Su Borough, *Parks, Recreation and Open Space Plan* (2001), which is currently being updated.

The *Susitna ("Y") Comprehensive Plan* (2007) includes policies for:

- promoting timber harvest in a manner that helps create and maintain the rural lifestyle of the area
- reclamation requirements
- impacts on water and air quality
- lighting
- site standards for slope, natural vegetation, views
- commercial use of roads
- screening and buffers
- focused management plans for each harvest area
- reforestation requirements
- compliance and enforcement

Existing Land Use Classifications
Forest Management Lands

Summary of Resources and Uses

Agriculture and Grazing
A review of soil types, published by the Department of Agriculture, Natural Resources Conservation Service (http://websoilsurvey.ncrs.usda.gov/app/), indicates that there are no known lands suitable for agricultural development or grazing within the unit. There is a significant amount of agricultural and grazing activity occurring adjacent to, and in the vicinity of this unit.

Also, see *Soils* map at the beginning of this section.

Cultural Resources and Heritage Sites
There are no documented historical or heritage sites and no cultural survey is known to have taken place within the unit. Additional fieldwork may be required prior to any natural resource extraction or other development activities taking place.

Fish and Wildlife Habitat and Resources
The area supports a moderate diversity of wildlife species. The area is used on a year-round basis by moose, brown and black bear, and a number of furbearer species, upland game birds and small game species. Based on past research studies, seasonal concentrations of moose have been observed in the southeast portions of the unit. Concentrations of moose have also been documented in the southwest portion of the unit where trees were harvested in the recent past and new forest growth is occurring.

These seasonal concentration areas will need protection through the use of a temporary Special Management Zone during any periods of natural resource extraction or other development activities.

There are no known bear dens, Trumpeter Swan nesting areas or eagle nests within the unit. Additional fieldwork will be required prior to any natural resource extraction or other development activities taking place to verify this information.

There are several small streams and creeks located throughout the unit. Goose Creek and No Name Creek are catalogued anadromous fish streams.

Prior to any resource extraction projects, the anadromous fish distribution in any wetlands should be established, any additional anadromous or important resident fish waterbodies need to be identified and the Alaska Department of Fish and Game will need to verify the cataloged anadromous resident fish streams as described above.

The Alaska Department of Fish and Game will require Fish Habitat Permits, accompanied by detailed project plans, prior to any planned resource extraction project adjacent to anadromous or resident waterbodies.

There are no commercial lodges or fish camps in the area.

Forest Resources

The principal timber type is old growth (greater than 100 years old) mixed birch and spruce sawtimber. There is 139 acres of recent timber harvest in the southwest corner of the unit. The significant amount of inoperable forest land (3,351 acres is due to low value timber isolated by rugged terrain.

Within the 9,703 acre unit, 4,924 acres (51% of the unit) is Commercial Forest Land, of which 1,549 acres (16% of the unit) is Operable Forest Land.

The 2009 Operable Forest Land Analysis Report found the following timber composition within the unit:

Stratum 1: Pole Timber – Closed Canopy	54 acres
Stratum 2: Pole Timber – Open Canopy	11 acres
Stratum 3: Hardwood Saw Timber – Closed Canopy	109 acres
Stratum 4: Hardwood Saw Timber – Open Canopy	21 acres
Stratum 5: Mixed Forest Saw Timber – Closed Canopy	1,121 acres
Stratum 6: Mixed Forest Saw Timber – Open Canopy	233 acres
TOTAL	**1,549 acres**

Also, see *Operable Forest Lands* map at the beginning of this section.

There has been recent interest expressed by some residents of the Talkeetna area that portions of this unit and other local units are made available for supplying fuel wood for a proposed wood-fired boiler for the new Su Valley Middle/High School and other possibly other public facilities. This would require approximately 300 cords of fuel wood per year (equivalent to approximately 15.6 acres). This equates to 27,000 cords or approximately

the equivalent of 1,400 acres of fuel wood over 90 years (mixed rotation period of birch and spruce).

Private Property

There is no private property within the unit. There is some dispersed private property adjacent to, and in the general vicinity of the exterior boundaries of the unit.

Public Recreation and Tourism

Because moose are fairly abundant, they attract a comparatively large number of hunters. The Sunshine Creek and S. Fork Loop Trails are used all year around, particularly by local residents for snowmobiling, dog mushing, Nordic skiing, and for riding ATV's.

There are no significant scenic or other resources that attract tourists in significant numbers to the unit or the immediate surrounding area.

Roads and Trails

The Montana Creek Road provides access to the edge of the unit on the west side.

The Sunshine Creek and Montana Creek Dog Mushers 50-mile Trails are located within the unit. The S. Fork Montana Creek Trail is adjacent to the northern boundary of the unit.

Also, see the *Roads, Trails, Waterbodies, Wetlands and Riparian Areas* map at the beginning of this section.

Rock, Sand and Gravel Resources

Soil mapping (see http://websoilsurvey.ncrs.usda.gov/app/) indicates that there may rock, sand and gravel resources within the unit. There are no developed rock, sand or gravel extraction areas within the unit. A more extensive field inventory will be necessary to determine the volume, extent and feasibility of possibly developing this resource.

Also, see the *Soils* map at the beginning of this section.

Unit Management Intent

The management intent for the Sheep Creek Natural Resource Management Unit shall for general natural resources and uses, protecting water resources, continued recreational uses (including hunting and trapping), and meeting some wood product needs while improving wildlife habitat.

Land Use Designations

Sheep Creek		
Designation	**Classification**	**Management Intent**
Primary		
Resource Management	Resource Management Lands	All upland areas, except those designated water resources. Available for forest management and timber harvest in those areas determined to be operable forest land and where it does not significantly reduce the areas recreational activities. Protect and improve important wildlife habitat areas. Recognize and manage for the units recreational uses.
Water Resources	Watershed Lands	All waterbodies, riparian areas, and important wetlands. Any waterbodies, riparian areas or important wetlands determined after adoption of this plan to be anadromous, important for resident fish, or important wetlands for fish and wildlife shall also be similarly designated and classified[24].
Secondary		
None		

Also, see the *Land Use Designations* map at the beginning of this section.

[24] Such designation and classification shall be considered as a "Minor Change" to the Plan (See Volume I, Chapter 4, *Procedures for Changes to the Plan, Goals, and Guidelines.*

Management Guidelines

See volume I, Chapters 2 and 3 for area-wide guidelines for all Natural Resource Management Units. The remainder of this section presents unit-specific guidelines.

Buffers and Special Management Zones

All flowing waterbodies, including lakes that are part of a flowing water system that are connected to creeks, streams, and rivers, and associated riparian areas will be protected through the use of undisturbed natural vegetation buffers.

All wetlands over 40 acres and all smaller important wetland areas (see definition in *Definitions/Glossary* in Volume III) shall be protected with a Special Management Zone which shall include a 100-foot area around the wetland area. The Zone shall not allow disturbance of the wetland area, but some uses may be allowed. For example, winter time recreational use is allowed once sufficient snow cover exists to not harm the natural vegetation.

At such time that new activities are planned in the unit, all potentially impacted waterbodies and wetlands shall be assessed as to their habitat and water resource values. Depending on the assessment, the waterbodies and wetlands will be provided additional protection through the use of buffers or placed in a Special Management Zone, as appropriate.

The Montana Creek Dog Mushers 50 Mile Trails and Sunshine Creek Trail shall be buffered.

Where the unit adjoins private property, the private property shall be protected through the use of an undisturbed natural vegetation buffer. These buffers may only be modified following the provisions in Volume I, Chapter 2, *Buffers* and MSB 23.20.070.

See *Roads, Trails, Waterbodies, Wetlands and Riparian Areas* map at the beginning of this section for, wetlands with a Special Management Zone, waterbodies and roads and trails with buffers.

Also, see Volume I, Chapter 2, *Buffers* and *Special Management Zones* for additional information.

Forest Management

Timber harvesting is an authorized use. Timber harvests, harvest units and cutting areas shall protect the water resource values and not significantly reduce the areas recreational opportunities.

Timber harvests shall only be held after consultation with the Alaska Department of Fish and Game. Harvest units should be laid out to improve wildlife habitat, especially winter habitat for moose to reduce transportation related fatalities in the area and improve public safety.

This unit as a whole has sufficient operable timber to meet the projected needs for the Su Valley Middle/High School proposed wood-fired boiler, although a majority of the timber is

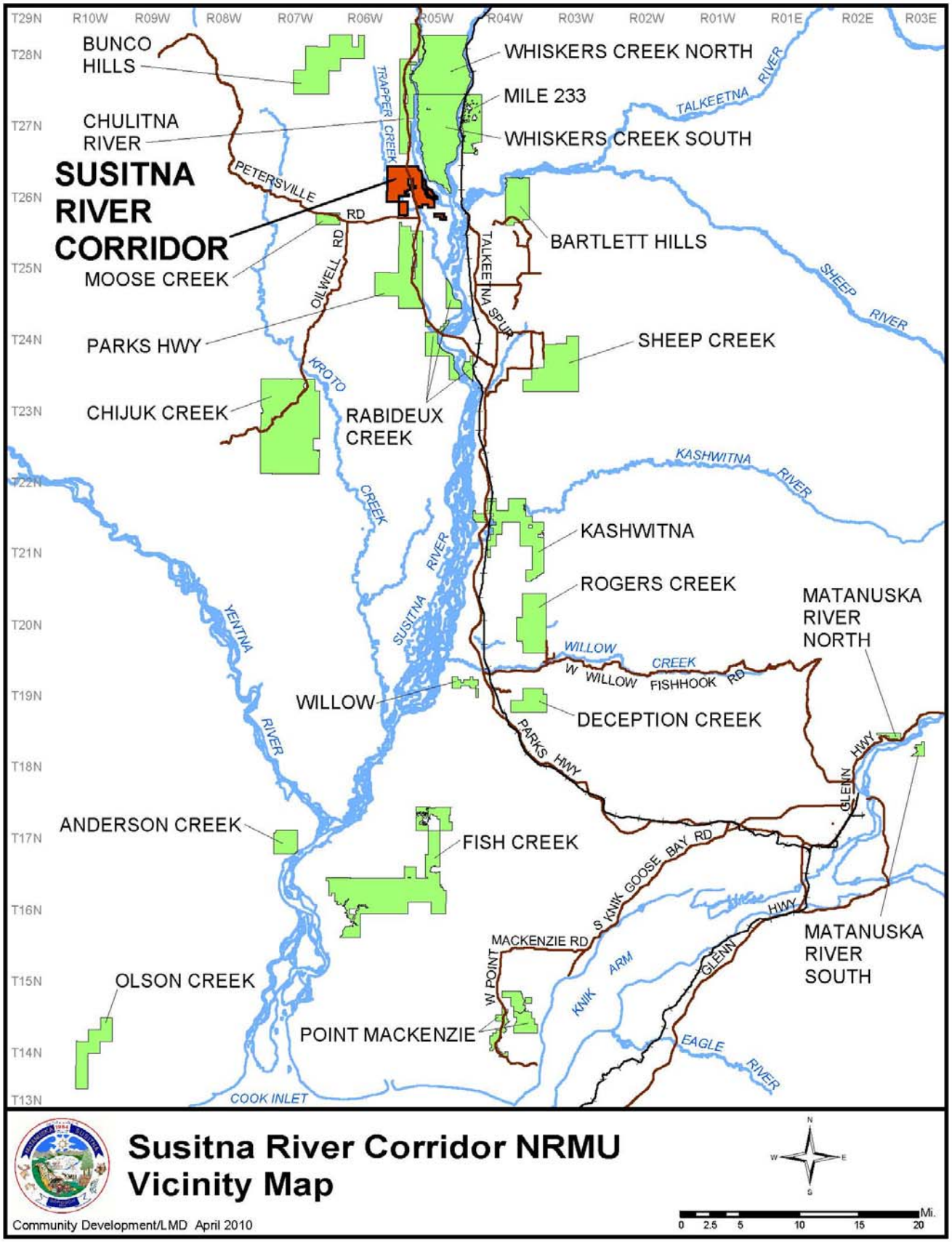
better utilized for purposes other than for just utility wood harvests. In addition, access to suitable timber for just utility use is problematic because of the terrain within the unit.

Some of the operable timber in this unit, combined with harvests from other nearby Natural Resource Management Units, may meet the long-term needs for the wood fired boiler or another similar project.

Other Uses

Because of the units location, this unit could also be designated as a Special Management Area and designated as a suitable as a Forest Education and Improvement Study Area, especially if the unit is used for supplying some of the fuel wood for the Su Valley Middle/High School proposed wood-fired boiler or similar project (see Volume I, Chapter 3, *Forest Education and Improvement Study Area(s),* for more information). While suitable, there are other units with better access and located closer to the Su Valley Middle/High School that might serve this purpose better.

No additional unit-specific guidelines are required for this unit. See Volume I, Chapters 2 and 3 for area-wide guidelines that apply to all Natural Resource Management Units.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CHULITNA RIVER
SUSITNA RIVER CORRIDOR
MOOSE CREEK
PARKS HWY
CHIJUK CREEK
ANDERSON CREEK
OLSON CREEK
WHISKERS CREEK NORTH
MILE 233
WHISKERS CREEK SOUTH
BARTLETT HILLS
SHEEP CREEK
RABIDEUX CREEK
KASHWITNA
ROGERS CREEK
WILLOW
DECEPTION CREEK
FISH CREEK
POINT MACKENZIE
MATANUSKA RIVER NORTH
MATANUSKA RIVER SOUTH
TRAPPER CREEK
PETERSVILLE RD
OILWELL RD
TALKEETNA SPUR
KROTO CREEK
YENTNA RIVER
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MACKENZIE RD
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COOK INLET
Susitna River Corridor NRMU
Vicinity Map
Community Development/LMD April 2010
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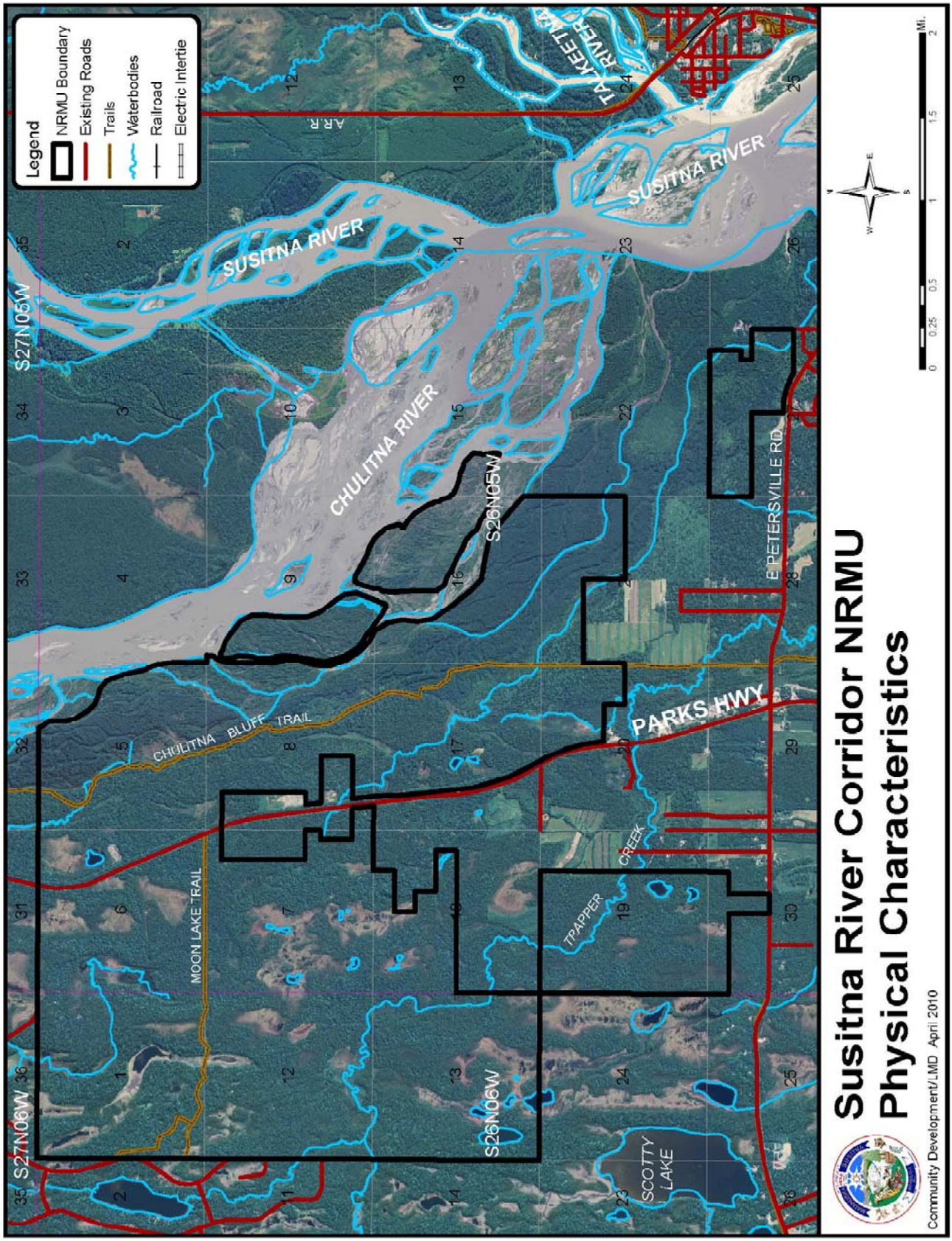
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NRMU Boundary
Existing Roads
Trails
Waterbodies
Railroad
Electric Intertie
SUSITNA RIVER
CHULITNA RIVER
TALKEETNA RIVER
SUSITNA RIVER
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CHULITNA BLUFF TRAIL
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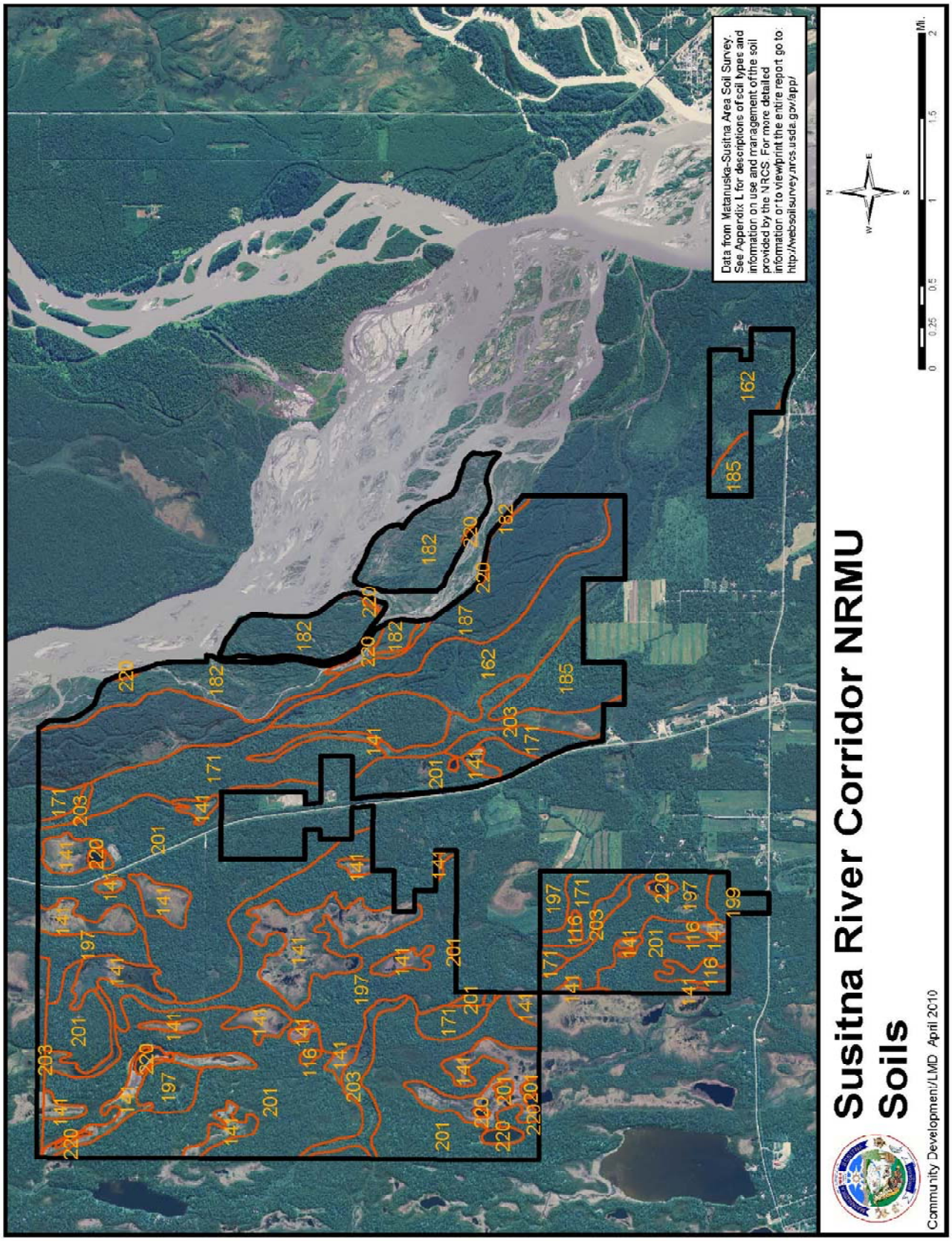
Susitna River Corridor NRMU
Physical Characteristics
Community Development/LMD April 2010


Data from Matanuska-Susitna Area Soil Survey. See Appendix L for descriptions of soil types and information on use and management of the soil provided by the NRCS. For more detailed information or to view/print the entire report go to: http://websoilsurvey.nrcs.usda.gov/app/
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Community Development/LMD April 2010
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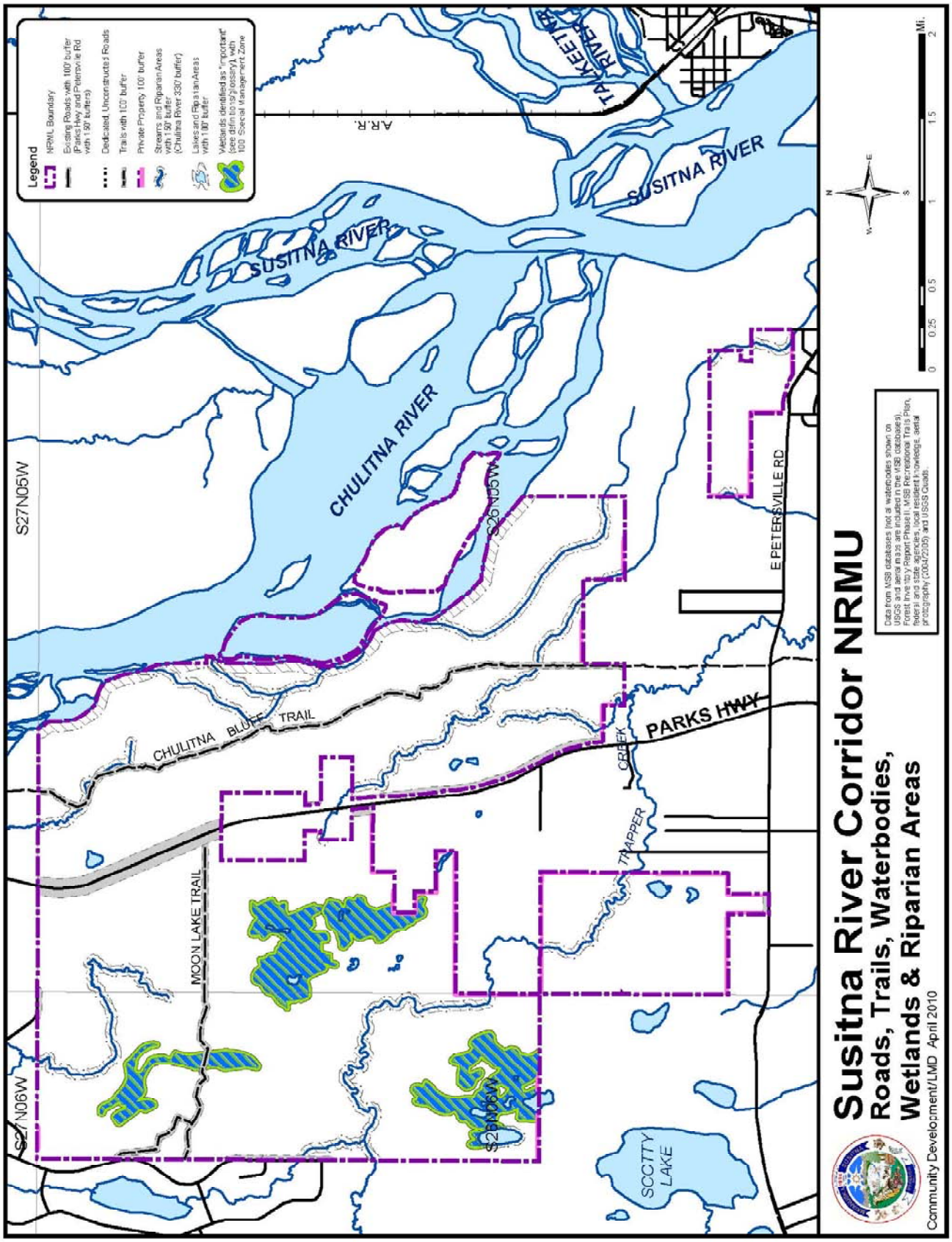
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NRMU Boundary
Existing Roads with 100' buffer (Parks Hwy and Petersville Rd with 150' buffers)
Dedicated, Unconstructed Roads
Trails with 100' buffer
Private Property 100' buffer
Streams and Riparian Areas with 150' buffer (Chulitna River 330' buffer)
Lakes and Riparian Areas with 100' buffer
Wetlands identified as "important" (see definition glossary), with 100 Special Management Zone
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SUSITNA RIVER
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PARKS HWY
TRAPPER CREEK
MOON LAKE TRAIL
S27N06W
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SCOTTY LAKE
Susitna River Corridor NRMU
Roads, Trails, Waterbodies, Wetlands & Riparian Areas
Data from MSB databases (not all waterbodies shown on USGS and aerial maps are included in the MSB database), Forest Inventory Report Phase II, MSB Recreational Trails Plan, federal and state agencies, local resident knowledge, aerial photography (2004/2005) and USGS Quads.
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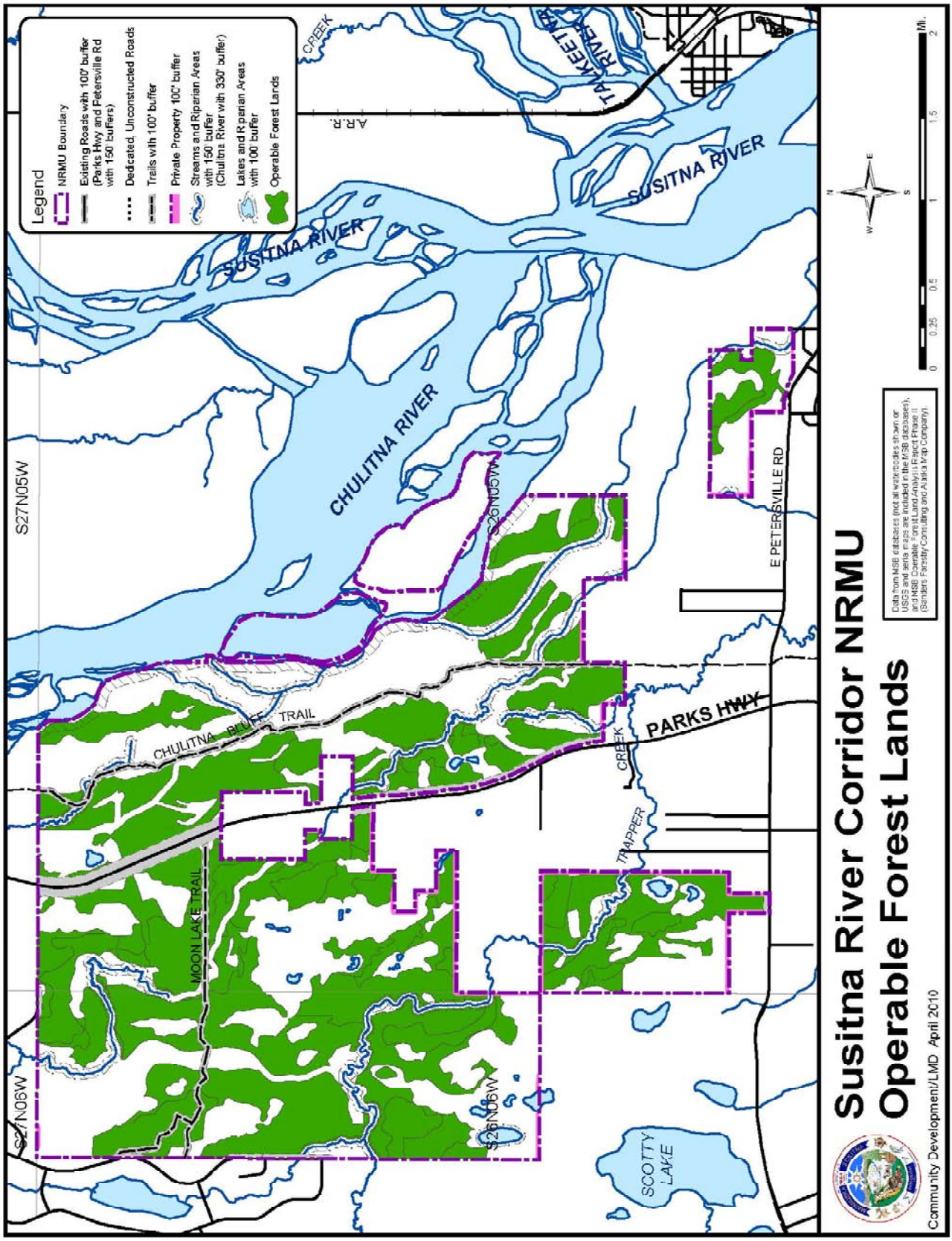
Community Development/LMD April 2010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Lakes and Riparian Areas with 100' buffer
Operable Forest Lands
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CHULITNA BLUFF TRAIL
MOON LAKE TRAIL
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TRAPPER CREEK
SCOTTY LAKE
Susitna River Corridor NRMU
Operable Forest Lands
Data from MSB databases (not all waterbodies shown on USGS and aerial maps are included in the MSB databases), and MSB Operable Forest Land Analysis Report Phase II (Sanders Forestry Consulting and Alaska Map Company)
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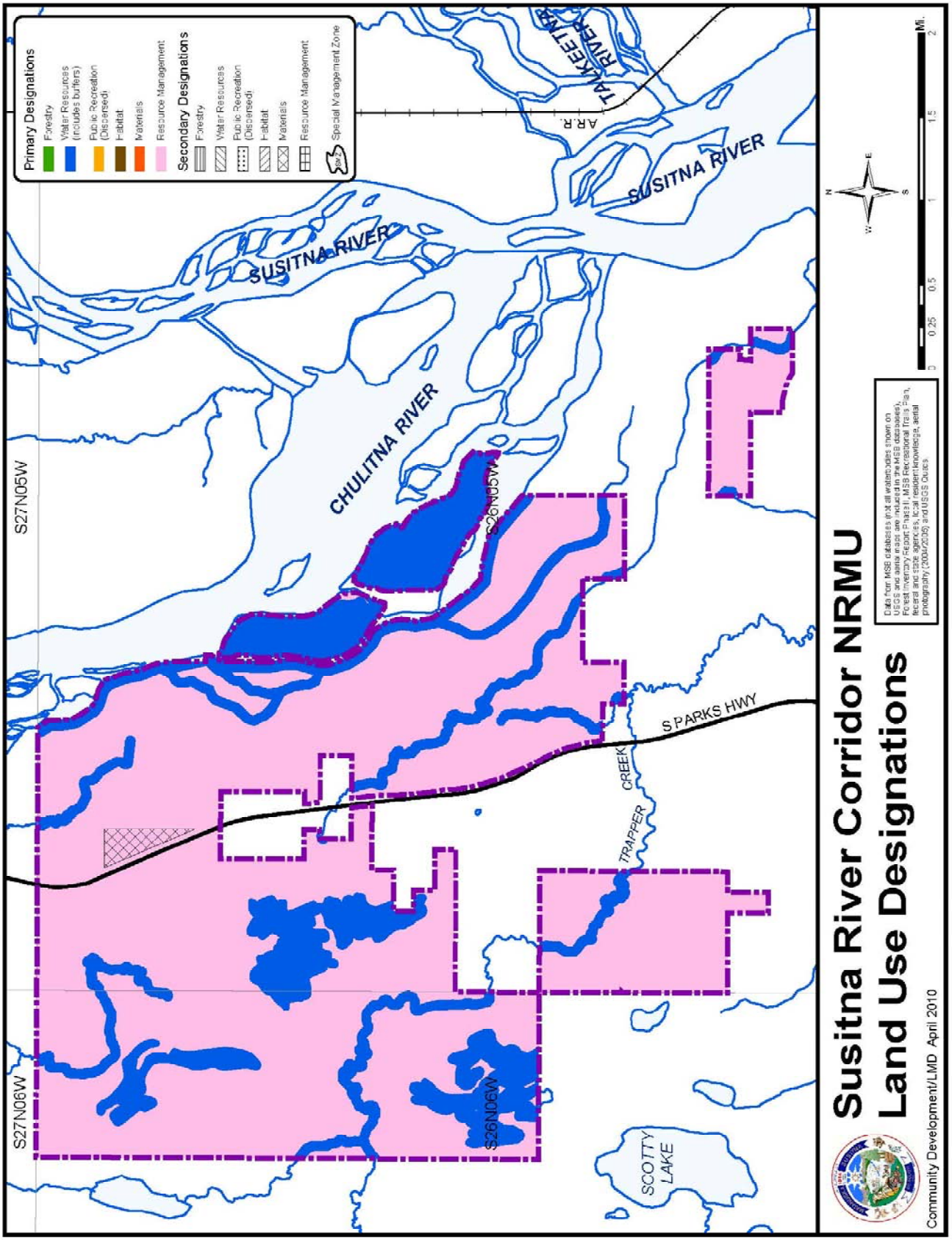
Community Development/LMD April 2010


Primary Designations
Forestry
Water Resources (includes buffers)
Public Recreation (Dispersed)
Habitat
Materials
Resource Management
Secondary Designations
Forestry
Water Resources
Public Recreation (Dispersed)
Habitat
Materials
Resource Management
Special Management Zone
SUSITNA RIVER
CHULITNA RIVER
TALKEETNA RIVER
A.R.R.
SUSITNA RIVER
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Susitna River Corridor NRMU
Land Use Designations
Community Development/LMD April 2010

SUSITNA RIVER CORRIDOR
Natural Resource Management Unit

General Information

The Susitna River Corridor Natural Resource Management Unit is comprised of about 6,700 acres. The unit area is located on both sides of the Parks Highway and west of the western meander of the Chulitna River beginning at the Petersville Road (Mile 115 Parks Highway) and ending at approximately Mile 119.5 of the Parks Highway. The unit consists of five separate blocks of land that are in close proximity to each other. Of these, two are islands in the Chulitna River.

The entire unit is in the Susitna lowlands which are generally flat with some moderate rolling terrain that becomes hillier in the northern portion of the unit. The unit has a mix of moderate and well drained soils.

Borough Tax Maps
Talkeetna 3, 4, 5, 6, and Petersville 33.

Current Land Use
The unit area has had some timber harvest for birch and spruce in the last 3 – 5 years. Both The Parks Highway and Petersville Road provide year around access to the area. The Chulitna Bluff Trail is a winter-only trail used primarily by snowmobilers. Because of the easy access, the area receives a significant amount of general dispersed recreational use.

Surrounding Land Use
The majority of the surrounding land is owned by the State of Alaska. A variety of dispersed public recreation also occurs on this land. There are also some scattered private lands. The private land is used for recreational cabins, private residences, and some agricultural uses.

Community Council Area
Trapper Creek Community Council

Existing Land Use Plans

- Mat-Su Borough, *Multiple Use Forest Management Plan* (1989), which will be replaced with this plan when adopted.
- Alaska Department of Natural Resources, *Susitna Area Plan* (1985); Petersville Unit, Rabideux Creek Subunit (6 and 7) which are designated for forestry, public recreation, water resources, and wildlife habitat. The *Susitna Area Plan* is currently being revised and will be called the *Susitna-Matanuska Area Plan*. When this plan is completed it will replace the *Susitna Area Plan*. The *Susitna-Matanuska Area Plan* does not apply to borough owned land.
- Mat-Su Borough, *Recreational Trails Plan* (2007).
- Mat-Su Borough, *Parks, Recreation and Open Space Plan* (2001), which is currently being updated.

The Trapper Creek Community is currently working on a Comprehensive Plan.

A Scenic Highways Plan is currently being developed along the Parks Highway starting at the Susitna River Bridge crossing and continuing north through Denali State Park. In October 2009 the George Parks Highway north from the Chulitna River Bridge was designated as a National Scenic Byway.

Existing Land Use Classification

The majority of the area is currently classified as Forest Management Lands. There are a few areas that are unclassified. There is one tract of approximately 230 acres in the southern portion of the unit (Section 27, T. 25 N., R. 5 W., S.M.) that is classified Resource Management.

Summary of Resources and Uses

Agriculture and Grazing

A review of soil types, published by the Department of Agriculture, Natural Resources Conservation Service (http://websoilsurvey.ncrs.usda.gov/app/), indicates that there are some areas within the unit that may suitable for small to medium agricultural or grazing use. However, soil types and conditions make contiguous farming plots difficult to establish and many of the areas may be subject to high water tables and occasional flooding.

Also, see *Soils* map at the beginning of this section.

Cultural Resources and Heritage Sites

There are no documented historical or heritage sites and no cultural survey has taken place within the entire unit. Because of its proximity to the Susitna River, the area has a high probability of having some evidence of historical use.

Additional fieldwork should take place prior to any natural resource extraction or other development activities.

Fish and Wildlife Resources

Moose, black bear and some brown bear inhabit the area, both in and outside of the unit. The area is used by moose as winter range and supports a moderate to high density of animals. The hardwood and riparian areas provide calving habitat for moose in late spring. Furbearer species also occur throughout the general area.

There are no known bear dens, Trumpeter Swan nesting areas or eagle nests within the unit. However, because of the units' location along the Susitna River and other habitat in the unit swan nesting areas and eagle nests could exist in the unit. Additional fieldwork will be required prior to any natural resource extraction or other development activities taking place to verify this information.

Trapper Creek flows through the unit and supports Coho Salmon rearing and spawning. Many of the unnamed clear water streams and sloughs of the Susitna River and Chulitna

Rivers are used by Chinook and Coho salmon for rearing and spawning. Important resident fish (Rainbow trout, grayling, and Dolly Varden Char) also are found in these waterbodies.

Prior to any resource extraction projects, the anadromous fish distribution in any wetlands should be established, any additional anadromous or important resident fish waterbodies need to be identified and the Alaska Department of Fish and Game will need to verify the cataloged anadromous resident fish streams as described above.

The Alaska Department of Fish and Game will require Fish Habitat Permits, accompanied by detailed project plans, prior to any planned resource extraction project adjacent to anadromous or resident waterbodies.

There are no commercial lodges or fish camps in the area.

Forest Resources

The unit consists primarily of old growth mixed spruce and birch sawtimber stands greater than 80 years old occupying the sites west of the river flood plains. Cottonwood and spruce timber types of varying composition size, age, and density are found and between the braided stream channels of the Chulitna River. Hardwood timber makes up the majority of the timber in the unit.

Within the 6,707 acre unit, 4,737 acres (71% of the unit) is Commercial Forest Land, of which 3,132 acres (47% of the unit) is Operable Forest Land.

The 2009 Operable Forest Land Analysis Report found the following timber composition within the unit:

Stratum 1: Pole Timber – Closed Canopy	358 acres
Stratum 2: Pole Timber – Open Canopy	43 acres
Stratum 3: Hardwood Saw Timber – Closed Canopy	7 acres
Stratum 4: Hardwood Saw Timber – Open Canopy	230 acres
Stratum 5: Mixed Forest Saw Timber – Closed Canopy	1,596 acres
Stratum 6: Mixed Forest Saw Timber – Open Canopy	898 acres
TOTAL	**3,132 acres**

Also, see *Operable Forest Lands* map at the beginning of this section.

There has been recent interest expressed by some residents of the Talkeetna area that portions of this unit and other local units are made available for supplying fuel wood for a proposed wood-fired boiler for the new Su Valley High School and other possibly other public facilities. Supplying the school would require approximately 300 cords of fuel wood per year (equivalent to approximately 15.6 acres). This equates to 27,000 cords or approximately the equivalent of 1.400 acres of fuel wood over 90 years (mixed rotation period of birch and spruce).

The Trapper Creek Community Council has requested that an area along the road system be designated as a wood lot for local residents to be able to cut firewood in this and other nearby Natural Resource Management Units (Chulitna River, Moose Creek, Parks Highway and Rabideux).

Private Property

There is no private property within the unit. There is private property adjacent to the exterior boundaries of the unit and throughout the general area.

Public Recreation and Tourism

Because of the easy accessibility to the unit via the Parks Highway, Trapper Creek Road and the Chulitna and Susitna River, the area experiences heavy use by moose and black bear hunters and anglers. Local residents also use the general area for trapping. The Chulitna Bluff Trail is popular trail for dog mushers and snowmobilers.

Other than the trails in the unit, there are no particular scenic or recreational resources that attract a significant number of tourists directly to this unit. However, because the Parks Highway passes through or is adjacent to portions of the unit, tourists do see the general scenic resources in the area. There is also some flight-seeing aircraft that pass over this unit.

Roads and Trails

The majority of the unit has direct access from the Parks Highway that runs in a north/south direction, generally through the center of unit. The Petersville and East Petersville Roads run east/west and provide road access to the southern portion of the unit.

The Chulitna Bluff Trail is located east of, and generally parallels the Parks Highway. The proposed Petersville Roadside Trail is located north and parallels the Petersville and East Susitna River Roads in the southern portion of the unit. The Moon Lake Trail heads west from the Parks Highway at about Mile 118.5.

Also, see the *Roads, Trails, Waterbodies, Wetlands and Riparian Areas* map at the beginning of this section.

Rock Sand and Gravel Resources

At the present time there are no developed rock, sand or gravel extraction areas within the unit. Soil mapping (see http://websoilsurvey.ncrs.usda.gov/app/) indicates that there are rock, sand, and gravel resources within the unit. Inventory work indicates there is a material site located in Section 6 SE1/4 east of the Parks Highway, T. 26 N, R. 5 W., SM.

There may be more potential material sites in the unit that can only be found through more extensive field inventory work to determine the volume, extent and feasibility of possibly developing this resource.

Also, see the *Soils* map at the beginning of this section.

UNIT MANAGEMENT INTENT

The management intent for the Susitna River Corridor Natural Resource Management Unit shall be to for general resource management and uses while protecting water resources, providing for some wood harvests and material (rock, sand, and gravel) extraction while not significantly reducing from the recreational and other uses in the unit.

Land Use Designations

Susitna River Corridor		
Designation	**Classification**	**Management Intent**
Primary		
Resource Management	Resource Management Lands	All upland areas, except those designated water resources. Available for forest management and small to medium timber harvests in those areas determined to be operable forest land and where it does not significantly reduce the areas recreational activities. Available for material extraction in those areas outside of the Parks Highway and Trapper Creek Road right-of-way and buffer. Recognize and manage for the units recreational uses.

Susitna River Corridor (continued)		
Designation	Classification	Management Intent
Primary		
Water Resources	Watershed Lands	All waterbodies, riparian areas, and important wetlands. Any waterbodies, riparian areas or wetlands determined after adoption of this plan to be anadromous, important for resident fish, or important wetlands for fish and wildlife shall also be similarly designated and classified[25].
Secondary		
None		

Also, see the *Land Use Designations* map at the beginning of this section.

Management Guidelines

See volume I, Chapters 2 and 3 for area-wide guidelines for all Natural Resource Management Units. The remainder of this section presents unit-specific guidelines.

<u>Buffers and Special Management Zones</u>
All flowing waterbodies, including lakes that are part of a flowing water system that are connected to creeks, streams, and rivers, and associated riparian areas will be protected through the use of undisturbed natural vegetation buffers.

All wetlands over 40 acres and all smaller important wetland areas (see definition in *Definitions/Glossary* in Volume III) shall be protected with a Special Management Zone which shall include a 100-foot area around the wetland area. The Zone shall not allow disturbance of the wetland area, but some uses may be allowed. For example, winter time recreational use is allowed once sufficient snow cover exists to not harm the natural vegetation.

At such time that new activities are planned in the unit, all potentially impacted waterbodies and wetlands shall be assessed as to their habitat and water resource values. Depending on the assessment, the waterbodies and wetlands will be provided additional protection through the use of buffers or placed in a Special Management Zone, as appropriate.

[25] Such designation and classification shall be considered as a "Minor Change" to the Plan (See Volume I, Chapter 4, *Procedures for Changes to the Plan, Goals, and Guidelines.*

The Parks Highway and Petersville Road shall each have an undisturbed natural vegetative 150-foot buffer either side of their respective rights-of-way.

The Chulitna Bluff Trail and Moon Lake Trail shall be buffered. The proposed Petersville Roadside Trail shall be buffered in any location where it may be located outside of the Petersville Road and the roads 150-foot buffer.

Where the unit adjoins private property, the private property shall be protected through the use of an undisturbed natural vegetation buffer. These buffers may only be modified following the provisions in Volume I, Chapter 2, *Buffers* and MSB 23.20.070.

See *Roads, Trails, Waterbodies, Wetlands and Riparian Areas* map at the beginning of this section for wetlands with a Special Management Zone, private property, and waterbodies, roads and trails with buffers.

Also, see Volume I, Chapter 2, *Buffers* and *Special Management Zones* for additional information.

Forest Management

Small to medium timber harvesting is an authorized use on Operational Timber Lands. Timber harvests, harvest units and cutting areas shall not significantly reduce the areas recreational opportunities, significantly impact rural resident's lifestyles, and shall not impact the units' watershed values.

The Alaska Department of Fish and Game shall be consulted prior to any timber harvests. The Alaska Department of Fish and Game does not recommend timber harvests in this unit that will improve moose habitat that would draw moose into the Parks Highway corridor.

Because of the units' highly visible location off the Parks Highway and poorly drained soils, timber harvest, except for personal use, shall be limited to the winter when the ground is sufficiently frozen and sufficient snow cover exists to not unnecessarily disturb the vegetative bed. Personal use harvests should be located where they can be easily accessed and limited to methods and means to avoid or minimize disturbance to the vegetative bed.

Unlike some of the other nearby Natural Resource Management Units, this unit has more than sufficient operable timber to meet the projected needs for the Su Valley High School proposed wood-fired boiler, or other similar commercial opportunities, and still provides timber for other local uses. The majority of the operable timber is located a short distance from existing all-season roads.

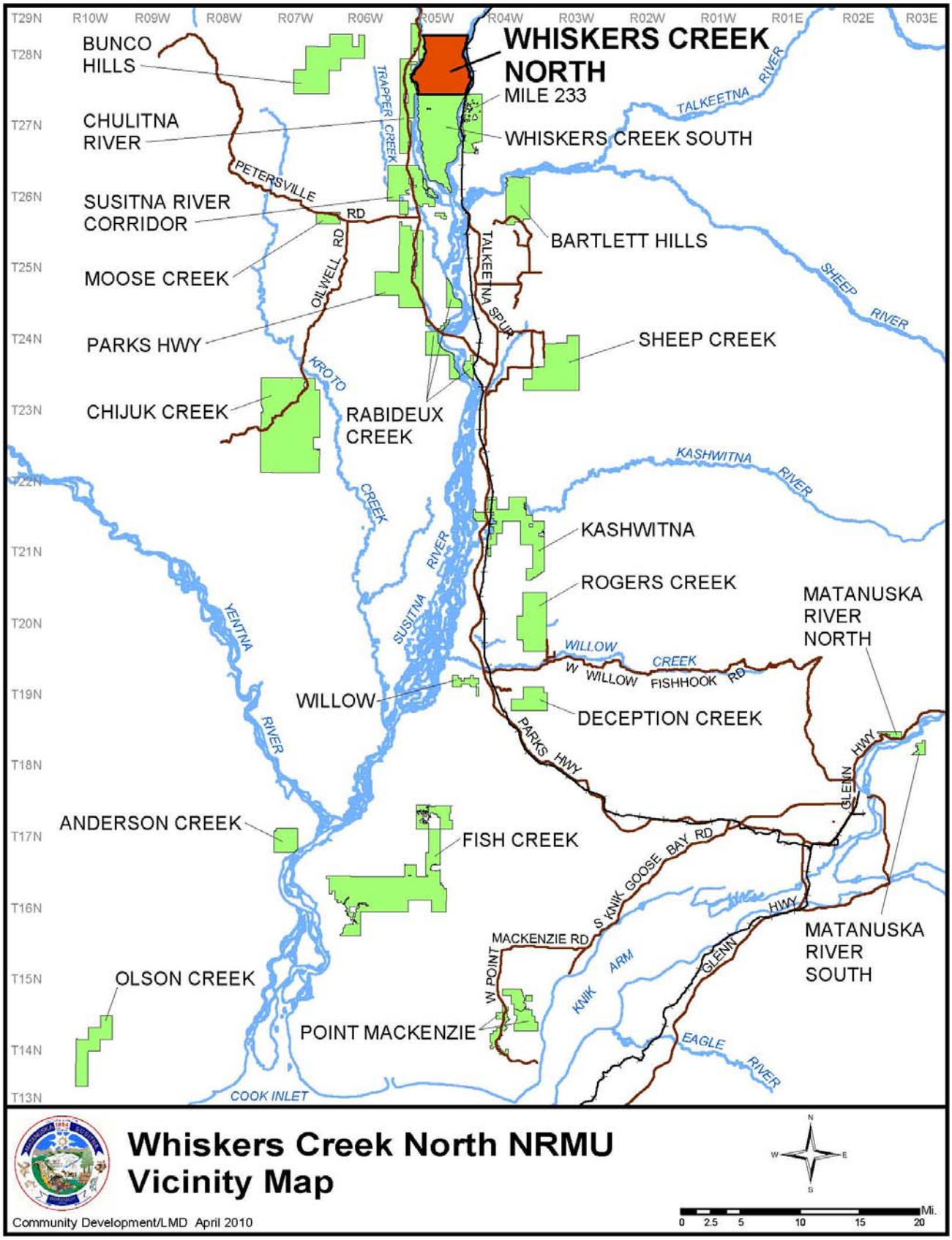
Materials Management

Extraction of rock, sand and gravel resources is a permitted activity outside of buffered areas, and if the extraction and operations do not significantly detract from the primary designations for the unit. Any material exploration and development shall follow State law and Borough code requirements.

Other Uses

Because of the units location and easy access, this unit could be designated as a Special Management Area for the purpose of being a Forest Education and Improvement Study Area, especially if the unit is used for supplying all or a majority of the fuel wood for the Su Valley Middle/High School proposed wood-fired boiler or a similar project (see Volume I, Chapter 3, *Forest Improvement Study Area(s),* for more information).

No additional unit-specific guidelines are required for this unit. See Volume I, Chapters 2 and 3 for area-wide guidelines that apply to all Natural Resource Management Units.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Whiskers Creek North NRMU
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Community Development/LMD April 2010
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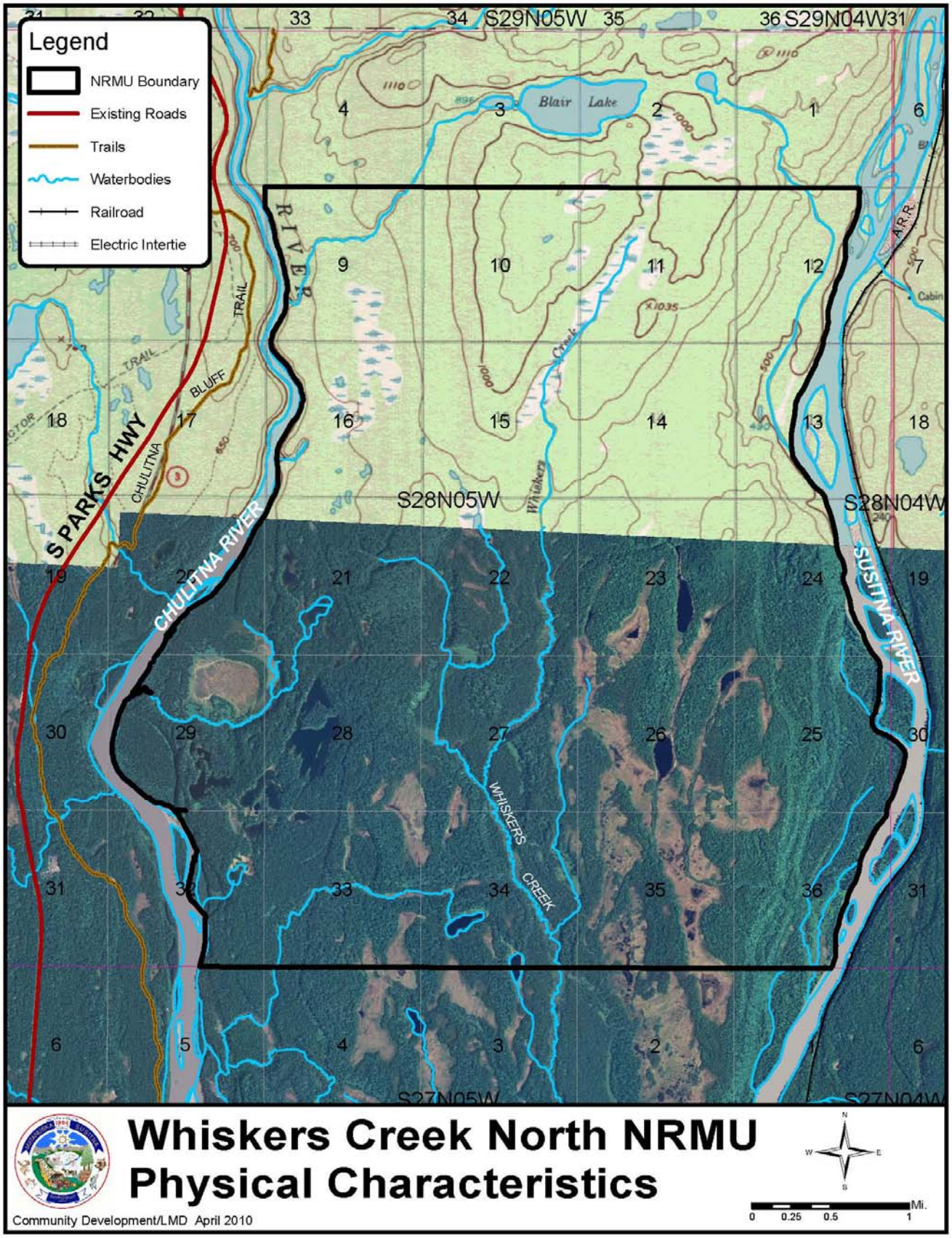
Legend
NRMU Boundary
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Trails
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SUSITNA RIVER
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Physical Characteristics
Community Development/LMD April 2010
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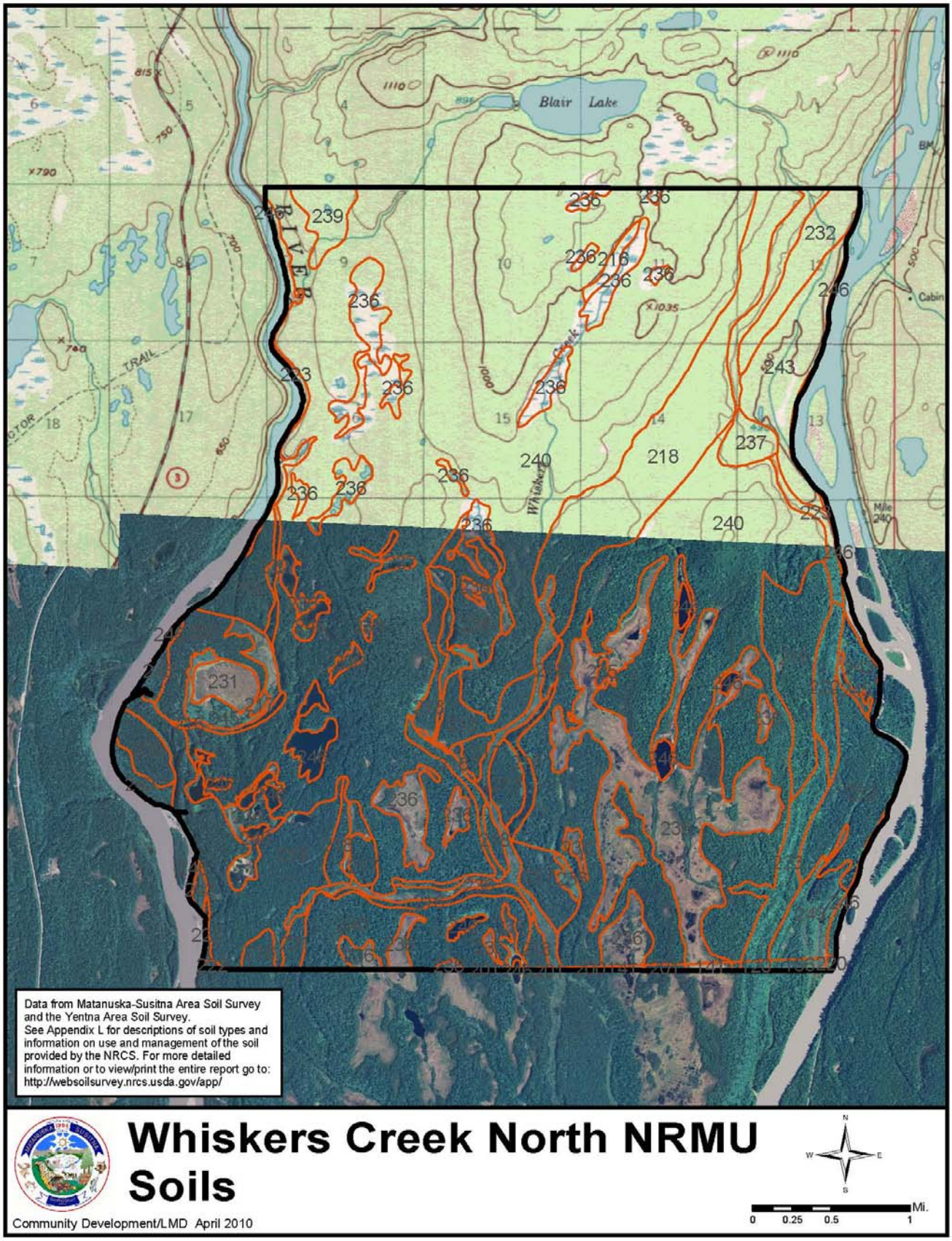
Blair Lake
Data from Matanuska-Susitna Area Soil Survey and the Yentna Area Soil Survey.
See Appendix L for descriptions of soil types and information on use and management of the soil provided by the NRCS. For more detailed information or to view/print the entire report go to: http://websoilsurvey.nrcs.usda.gov/app/
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Community Development/LMD April 2010
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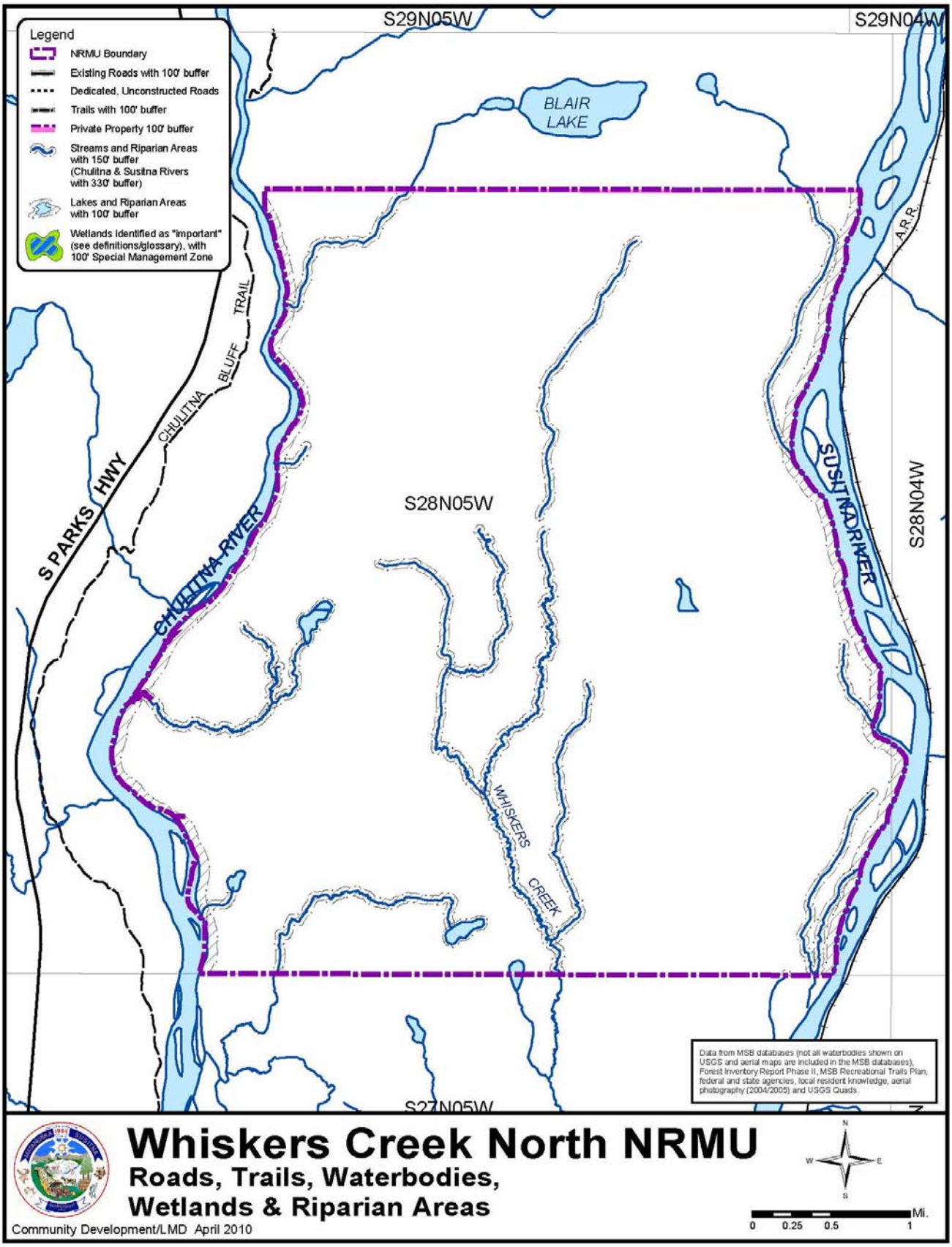
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Wetlands identified as "important" (see definitions/glossary), with 100' Special Management Zone
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S28N05W
SUSITNA RIVER
S28N04W
WHISKERS CREEK
S27N05W
Data from MSB databases (not all waterbodies shown on USGS and aerial maps are included in the MSB databases). Forest Inventory Report Phase II, MSB Recreational Trails Plan, federal and state agencies, local resident knowledge, aerial photography (2004/2005) and USGS Quads.
Whiskers Creek North NRMU
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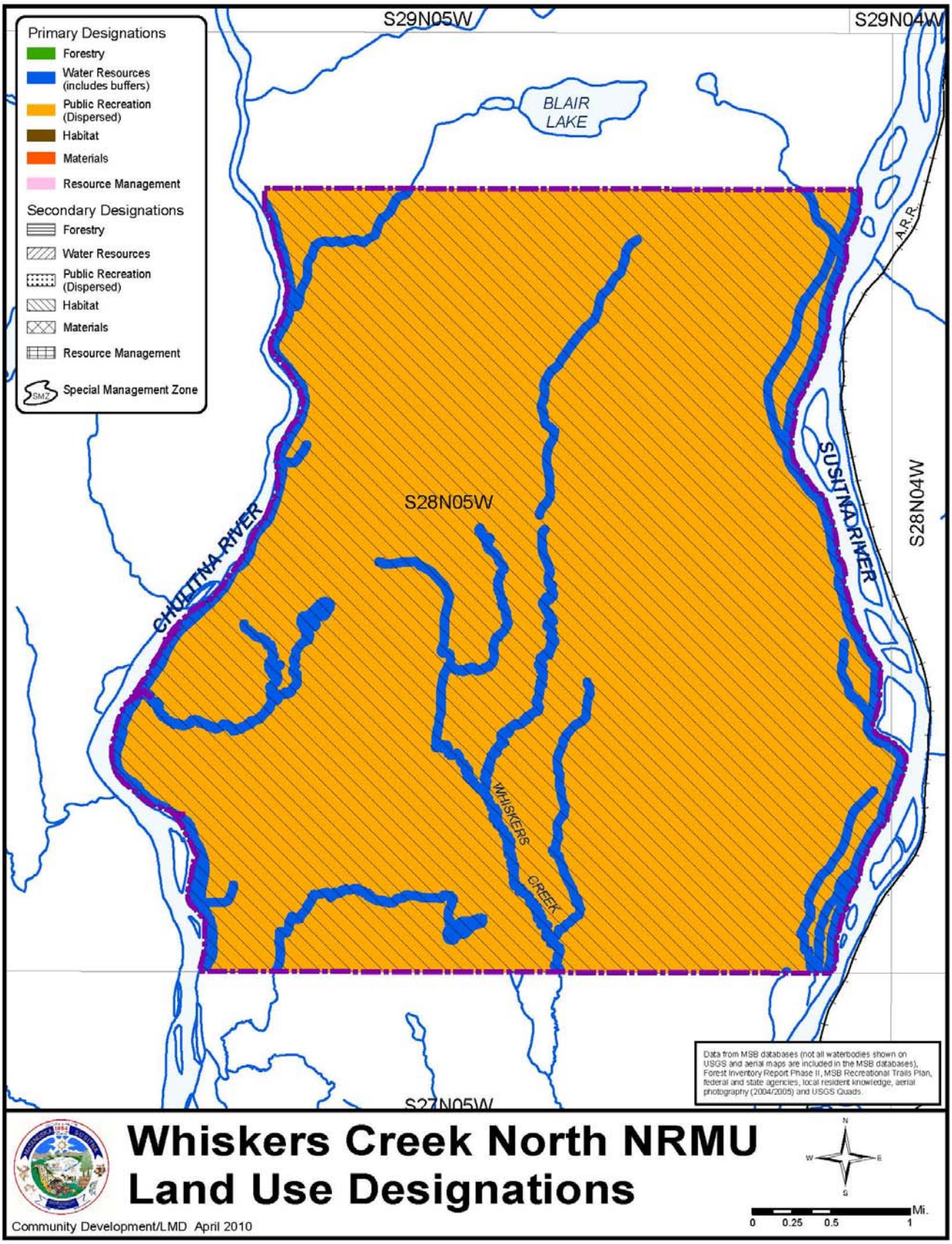
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Forestry
Water Resources (includes buffers)
Public Recreation (Dispersed)
Habitat
Materials
Resource Management
Secondary Designations
Forestry
Water Resources
Public Recreation (Dispersed)
Habitat
Materials
Resource Management
Special Management Zone
S29N05W
S29N04W
BLAIR LAKE
A.R.R.
S28N05W
S28N04W
CHULITNA RIVER
SUSITNA RIVER
WHISKERS CREEK
S27N05W
Data from MSB databases (not all waterbodies shown on USGS and aerial maps are included in the MSB databases), Forest Inventory Report Phase II, MSB Recreational Trails Plan, federal and state agencies, local resident knowledge, aerial photography (2004/2005) and USGS Quads.
Whiskers Creek North NRMU
Land Use Designations
Community Development/LMD April 2010
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WHISKERS CREEK NORTH
Natural Resource Management Unit

General Information

The Whiskers Creek North Natural Resource Management Unit contains approximately 12,760 acres. The unit is located south of land conveyed to the Boy Scouts of Alaska, Great Alaska Council, which is adjacent to Denali State Park and between the Susitna and Chulitna Rivers. The Boy Scout land lies adjacent to and south of Denali State Park.

Another Natural Resource Management Unit, Whisker Creek South, is adjacent and south of the Whiskers Creek North Unit. The Whiskers Creek Unit North and South combined are often referred to as the "Chulitna, Denali, Susitna Triangle" or simply "The Triangle." Whiskers Creek North is located east of Chulitna River between roughly Mileposts 126 and 131 of the Parks Highway.

Whiskers Creek North has alpine tundra on its north end and a mixed birch and spruce forest on its southern end. The area is quite hilly and has numerous steep ridges and valleys.

Borough Tax Maps
Chase 3, 4, 5 and 6

Current Land Uses
The area has a variety of dispersed recreational uses. This use is very low because of the very limited access into the unit. The main activities are hunting, trapping and cross-country skiing.

Surrounding Land Uses
The Boy Scouts of America, Great Alaska Council, own approximately 2,200 acres north of the unit around Blair Lake for a High Adventure Camp. North of the Boy Scout Property is Denali State Park. As of the winter 2009-2010, The "High Adventure Scout Base Camp" has not been built, although a development plan has been adopted, fund raising efforts are underway and plans are to open the camp by 2011 (Boy Scouts of America, Great Alaska Council website).

Random public recreational activities take place in the unit, particularly around the unnamed lakes in Sections 28, 29, 32 and 33 of T. 28 N., R. 5 W., S.M.

Community Council Area
None

Existing Land Use Plans

- Mat-Su Borough, *Multiple Use Forest Management Plan*, 1989, which will be replaced with this Plan when adopted.

- Alaska Department of Natural Resources, *Susitna Area Plan* (1985); South Parks Highway, Whiskers Creek Subunit (5d). The area is designated as Borough Land Bank with values for forestry, public recreation, settlement and wildlife habitat. The *Susitna Area Plan* is currently being revised and will be called the *Susitna-Matanuska-Area Plan*. When this plan is completed it will replace the *Susitna Area Plan*. The *Susitna-Matanuska Area Plan* does not apply to borough owned land.
- Mat-Su Borough, *Recreational Trails Plan* (2007).
- Mat-Su Borough, *Parks, Recreation and Open Space Plan* (2001), which is currently being updated.

Existing Land Use Classifications
Forest Management for the majority of the unit. The areas that were obtained through a land exchange with the State of Alaska in 2006 are unclassified.

Summary of Resources and Uses

Agriculture and Grazing
A review of soil types, published by the Department of Agriculture, Natural Resources Conservation Service (http://websoilsurvey.ncrs.usda.gov/app/), indicates that there are no areas within the unit suitable for agricultural or grazing use.

Also, see *Soils* map at the beginning of this section.

Cultural Resources and Heritage Sites
There are no documented historical or heritage sites and no cultural survey has taken place within the unit. However, because of the units location between the Chulitna and Susitna Rivers there is a possibility that there are undiscovered archaeology sites, particularly where fresh water streams enter the two rivers.

Additional fieldwork should be required to identify any historical or heritage sites prior to any resource extraction activity or a there is a significant change to the use patterns in the unit.

Fish and Wildlife Habitat and Resources
The Whiskers Creek watershed has moderate to heavy use by moose, both summer and winter. Moose are commonly seen breeding the north-central portion of the unit in and around Sections 10 and 11, T. 28 N., R. 5 W., S.M. Black bears are common with brown bears using the upper elevations in the unit. Local residents have also reported seeing black and brown bear dens roughly ½ mile inland of the Chulitna and Susitna Rivers. Moderate numbers of furbearer species are present throughout the region.

There is no known Trumpeter Swan nesting areas or eagle nests within the unit. However, local residents have reported seeing them present, particularly in riparian areas along the Chulitna and Susitna Rivers.

Additional field work will be required to identify and document any bear denning areas, swan nesting areas or eagle nests within the unit.

Whiskers Creek supports Coho and pink salmon rearing and spawning. It also has resident populations of rainbow trout, grayling and Dolly Varden char. There are also many small streams and creeks in the unit that drain into both the Susitna and Chulitna Rivers. These streams may support anadromous and important resident fish.

Prior to any resource extraction projects, the anadromous fish distribution in any wetlands should be established, any additional anadromous or important resident fish waterbodies need to be identified and the Alaska Department of Fish and Game will need to verify the cataloged anadromous resident fish streams as described above.

The Alaska Department of Fish and Game will require Fish Habitat Permits, accompanied by detailed project plans, prior to any planned resource extraction project adjacent to anadromous or resident waterbodies.

A commercial lodge exists approximately six (6) miles to the north of the northwest corner of the unit. There are no known fish camps in the area.

Forest Resources

No timber inventory has been conducted within this unit. A review of aerial photographs and soils data (see http://websoilsurvey.ncrs.usda.gov/app/ and *Soils* map at the beginning of this section) indicate that some commercial timber may exist in the southern portions of the unit.

Private Property

There is no private property within the unit. The Boy Scouts of America High Adventure Camp is adjacent to the northern boundary of the unit.

Public Recreation and Tourism

The unit is considered a relatively good area for hunting. Because access is limited into the area, the unit is not heavily utilized for recreational activities. The unnamed lakes in Sections 28, 29, 32, and 33, T. 28 N., R. 5 W., S.M. is the area used most for recreation in the unit. The lakes are used for overnight camping and canoe portage trips.

The larger lakes are accessible by float or ski plane. The lakes are also relatively close to the Chulitna River and in a location where the banks are not as steep as other portions of the Chulitna River that are adjacent to the unit where access by water craft may be possible during certain times of the year. There is nothing that would attract tourists in significant numbers to the unit. However, because the unit is relatively close to Talkeetna, flight seeing does take place over the unit because it in a direct flight path to Denali National Park and Preserve, which is the principal attraction in the area.

During the public comment period during Phase I of developing this plan, comments were strongly in support of designating this area for public recreation.

Roads and Trails

There are no dedicated roads or trails within the unit.

Also, see the *Roads, Trails, Waterbodies, Wetlands and Riparian Areas* map at the beginning of this section.

Rock, Sand and Gravel

Soil mapping (see http://websoilsurvey.ncrs.usda.gov/app/) indicates that there are no rock, sand and gravel resources within the unit. In addition, because the unit is inaccessible by an all-season road, development of rock, sand and gravel resources would not be feasible. Sufficient quantities of rock, sand and gravel can be found in other areas along the Parks Highway.

Also, see the *Soils* map at the beginning of this section.

Unit Management Intent

The management intent for the Whiskers Creek North Natural Resource Management Unit shall be for water resource and public recreation purposes, while also protecting existing wildlife habitat.

The unit has limited access because of its location between the Susitna and Chulitna Rivers. The area has scenic qualities, is on a direct flight seeing line to Denali National Park and Preserve, and is located in very close proximity to Denali State Park and within 6-miles of where the new South Denali Visitors Center will be located. The unit lacks any one or more other specific resources or resource uses.

Land Use Designations

Whiskers Creek North		
Designation	Classification	Management Intent
Primary		
Public Recreation - Dispersed	Public Recreation Lands	All upland areas, except those designated water resources.
Water Resources	Watershed Lands	All waterbodies, riparian areas, and important wetlands. Any waterbodies, riparian areas or wetlands determined after adoption of this plan to be anadromous, important for resident fish, or important wetlands for fish and wildlife shall also be similarly designated and classified[26].
Secondary		
Habitat		

Also, see the *Land Use Designations* map at the beginning of this section.

Management Guidelines

See volume I, Chapters 2 and 3 for area-wide guidelines for all Natural Resource Management Units. The remainder of this section presents unit-specific guidelines.

<u>Buffers and Special Management Zones</u>
All flowing waterbodies, including lakes that are part of a flowing water system that are connected to creeks, streams, and rivers, and associated riparian areas will be protected through the use of undisturbed natural vegetation buffers.

All wetlands over 40 acres and all smaller important wetland areas (see definition in *Definitions/Glossary* in Volume III) shall be protected with a Special Management Zone which shall include a 100-foot area around the wetland area. The Zone shall not allow disturbance of the wetland area, but some uses may be allowed. For example, winter time recreational use is allowed once sufficient snow cover exists to not harm the natural vegetation.

[26] Such designation and classification shall be considered as a "Minor Change" to the Plan (See Volume I, Chapter 4, *Procedures for Changes to the Plan, Goals, and Guidelines.*

At such time that new activities are planned in the unit, all potentially impacted waterbodies and wetlands shall be assessed as to their habitat and watershed values. Depending on the assessment, the waterbodies and wetlands shall be provided additional protection through the use of buffers or placed in a Special Management Zone, as appropriate.

The Chulitna and Susitna Rivers shall both have a 330-foot buffer within the unit.

See *Roads, Trails, Waterbodies, Wetlands and Riparian Areas* map at the beginning of this section for waterbodies that shall have buffers and wetlands with a Special Management Zone.

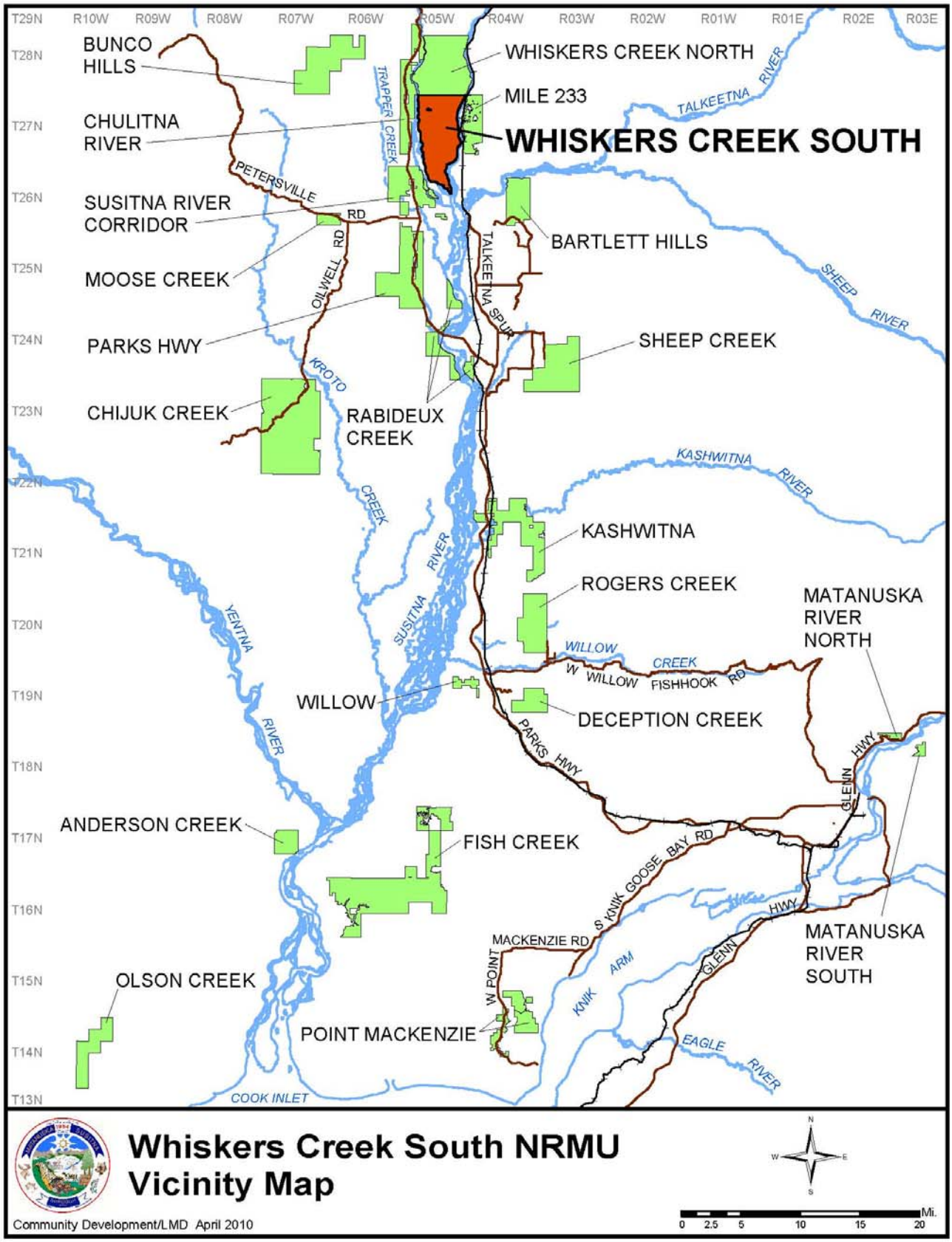
Also, see Volume I, Chapter 2, *Buffers* and *Special Management Zones* for additional information.

Other Uses

No additional unit-specific guidelines are required for this unit. See Volume I, Chapters 2 and 3 for area-wide guidelines that apply to all Natural Resource Management Units.

Other Recommendation

Because of the units proximity to Denali State Park and the users of the Boy Scout's Denali High Adventure Scout Base that will likely utilize both the land to the north (Denali State Park) and to the south (Whiskers Creek North Natural Resource Management Unit), the borough may want to exchange this unit for other state land with revenue producing values. Such an exchange should only occur if the area will be added to Denali State Park or managed by the state under a similar management regime.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BUNCO HILLS
CHULITNA RIVER
SUSITNA RIVER CORRIDOR
MOOSE CREEK
PARKS HWY
CHIJUK CREEK
WHISKERS CREEK NORTH
MILE 233
WHISKERS CREEK SOUTH
BARTLETT HILLS
SHEEP CREEK
RABIDEUX CREEK
KASHWITNA
ROGERS CREEK
MATANUSKA RIVER NORTH
WILLOW
DECEPTION CREEK
ANDERSON CREEK
FISH CREEK
MATANUSKA RIVER SOUTH
OLSON CREEK
POINT MACKENZIE
TRAPPER CREEK
PETERSVILLE RD
OILWELL RD
TALKEETNA SPUR
TALKEETNA RIVER
SHEEP RIVER
KROTO CREEK
KASHWITNA RIVER
SUSITNA RIVER
YENTNA RIVER
WILLOW CREEK
W WILLOW FISHHOOK RD
PARKS HWY
GLENN HWY
S KNIK GOOSE BAY RD
MACKENZIE RD
W POINT
KNIK ARM
EAGLE RIVER
COOK INLET
Whiskers Creek South NRMU
Vicinity Map
Community Development/LMD April 2010
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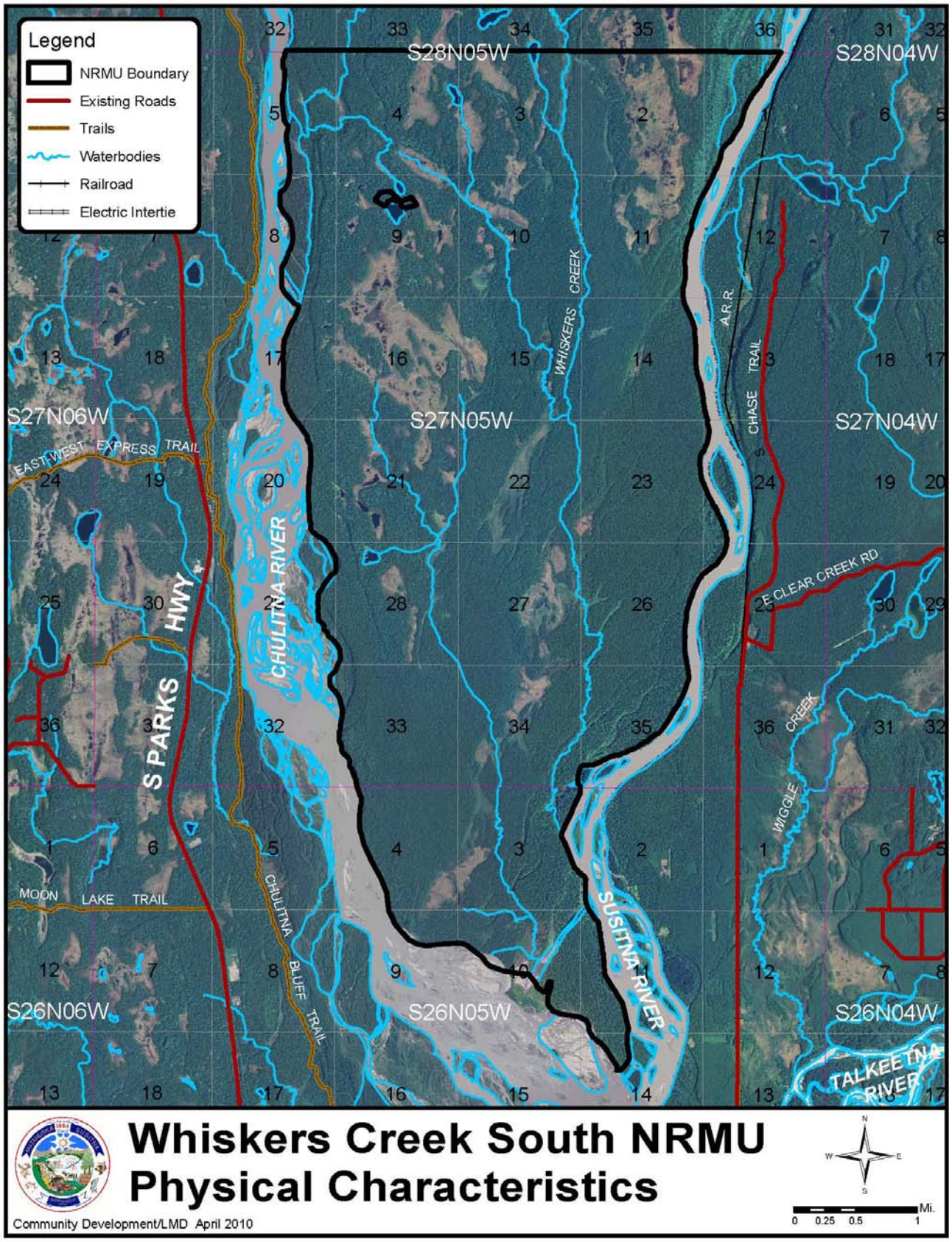
Legend
NRMU Boundary
Existing Roads
Trails
Waterbodies
Railroad
Electric Intertie
S28N05W
S28N04W
S27N06W
S27N05W
S27N04W
S26N06W
S26N05W
S26N04W
EAST WEST EXPRESS TRAIL
S PARKS HWY
CHULITNA RIVER
WHISKERS CREEK
A.R.R.
CHASE TRAIL
E CLEAR CREEK RD
WIGGLE CREEK
MOON LAKE TRAIL
CHULITNA BLUFF TRAIL
SUSITNA RIVER
TALKEETNA RIVER
Whiskers Creek South NRMU
Physical Characteristics
Community Development/LMD April 2010
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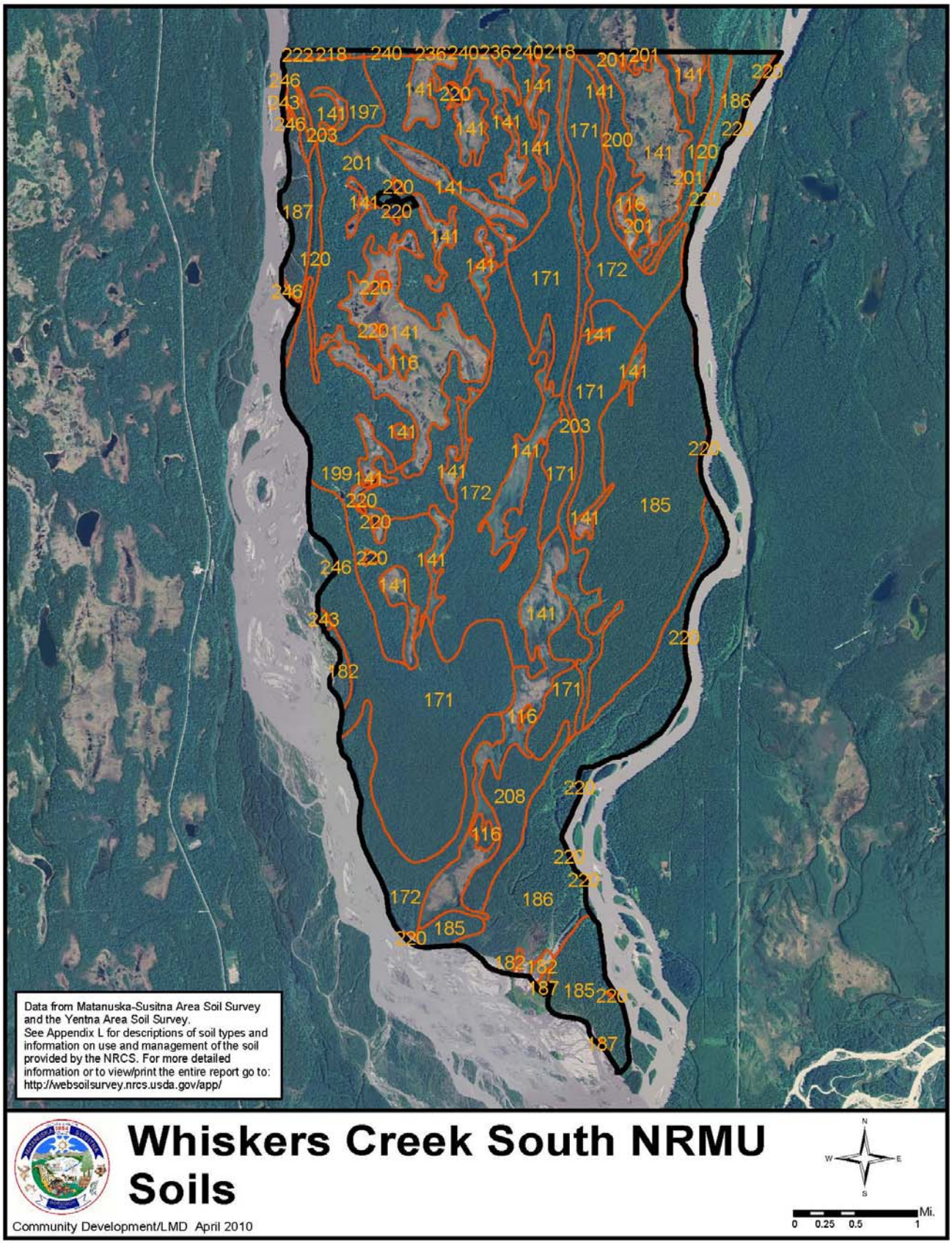
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See Appendix L for descriptions of soil types and information on use and management of the soil provided by the NRCS. For more detailed information or to view/print the entire report go to: http://websoilsurvey.nrcs.usda.gov/app/
Whiskers Creek South NRMU
Soils
Community Development/LMD April 2010
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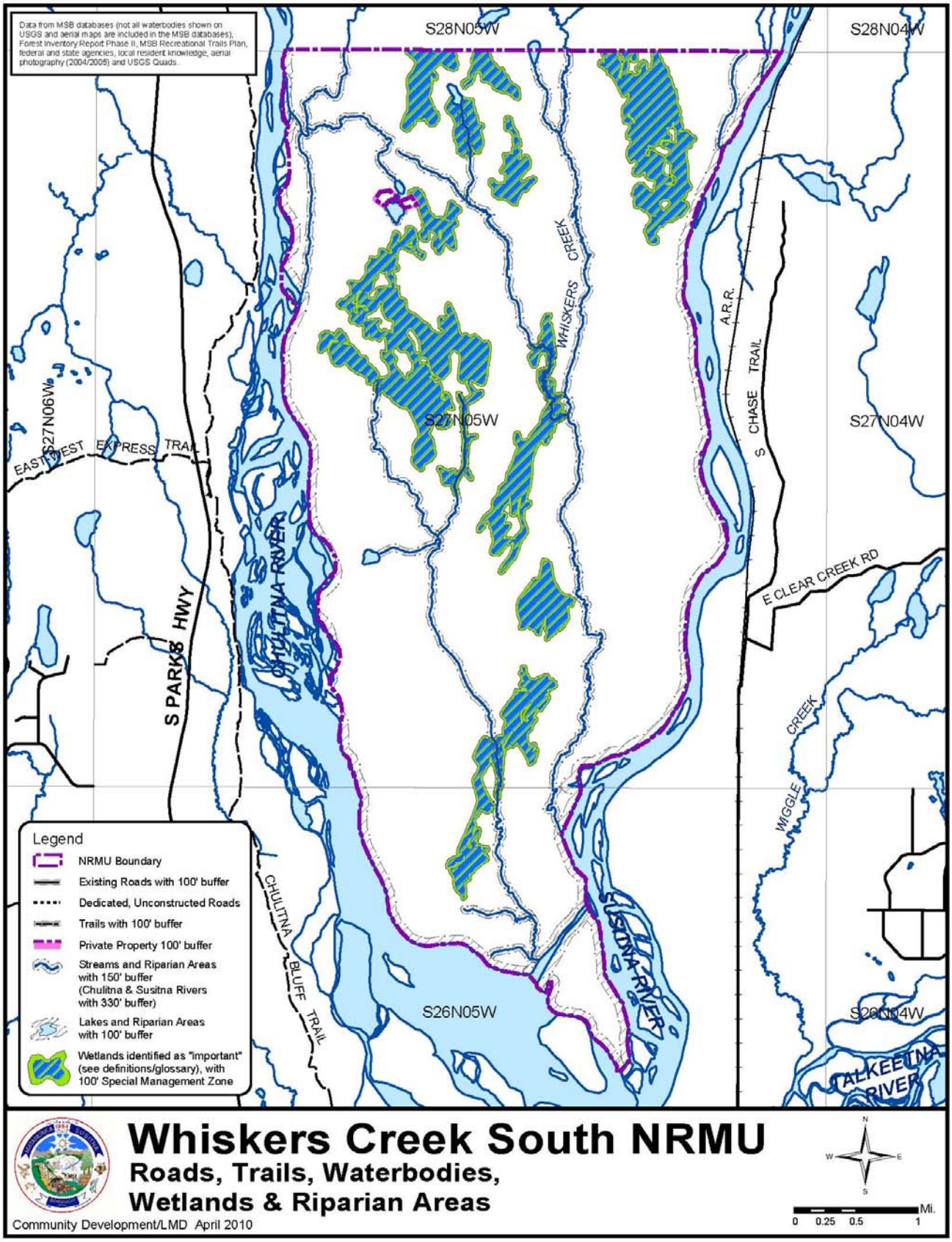
Data from MSB databases (not all waterbodies shown on USGS and aerial maps are included in the MSB databases), Forest Inventory Report Phase II, MSB Recreational Trails Plan, federal and state agencies, local resident knowledge, aerial photography (2004/2005) and USGS Quads.
S28N05W
S28N04W
S27N06W
S27N05W
S27N04W
S26N05W
S26N04W
EAST WEST EXPRESS TRAIL
S PARKS HWY
CHULITNA RIVER
WHISKERS CREEK
A.R.R.
S CHASE TRAIL
E CLEAR CREEK RD
WIGGLE CREEK
CHULITNA BLUFF TRAIL
SUSITNA RIVER
TALKEETNA RIVER
Legend
NRMU Boundary
Existing Roads with 100' buffer
Dedicated, Unconstructed Roads
Trails with 100' buffer
Private Property 100' buffer
Streams and Riparian Areas with 150' buffer (Chulitna & Susitna Rivers with 330' buffer)
Lakes and Riparian Areas with 100' buffer
Wetlands identified as "important" (see definitions/glossary), with 100' Special Management Zone
Whiskers Creek South NRMU
Roads, Trails, Waterbodies, Wetlands & Riparian Areas
Community Development/LMD April 2010
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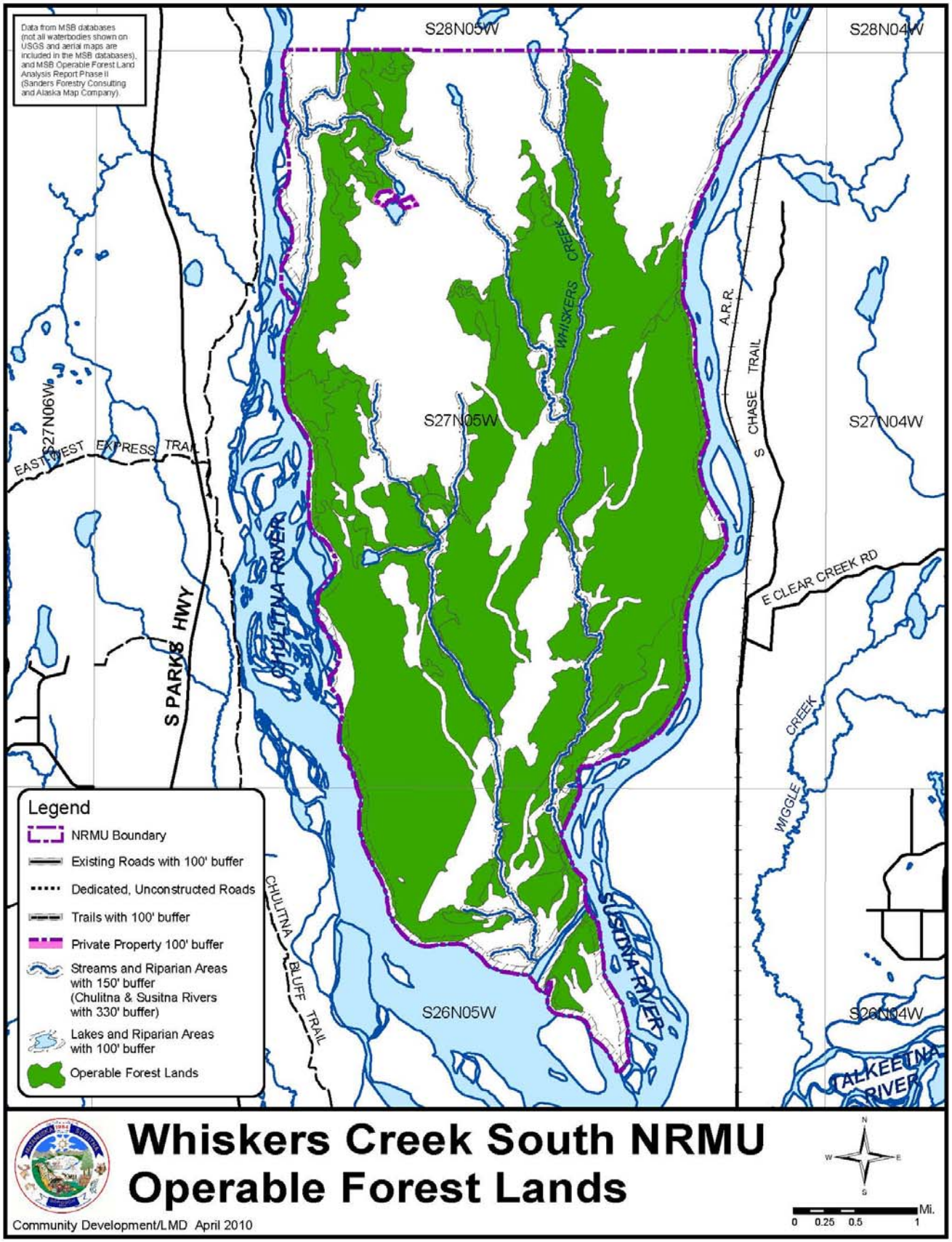
Data from MSB databases (not all waterbodies shown on USGS and aerial maps are included in the MSB databases), and MSB Operable Forest Land Analysis Report Phase II (Sanders Forestry Consulting and Alaska Map Company).
S28N05W
S28N04W
S27N06W
S27N05W
S27N04W
S26N05W
S26N04W
EAST WEST EXPRESS TRAIL
S PARKS HWY
CHULITNA RIVER
WHISKERS CREEK
A.R.R.
S CHASE TRAIL
E CLEAR CREEK RD
WIGGLE CREEK
SUSITNA RIVER
CHULITNA BLUFF TRAIL
TALKEETNA RIVER
Legend
NRMU Boundary
Existing Roads with 100' buffer
Dedicated, Unconstructed Roads
Trails with 100' buffer
Private Property 100' buffer
Streams and Riparian Areas with 150' buffer (Chulitna & Susitna Rivers with 330' buffer)
Lakes and Riparian Areas with 100' buffer
Operable Forest Lands
Whiskers Creek South NRMU
Operable Forest Lands
Community Development/LMD April 2010
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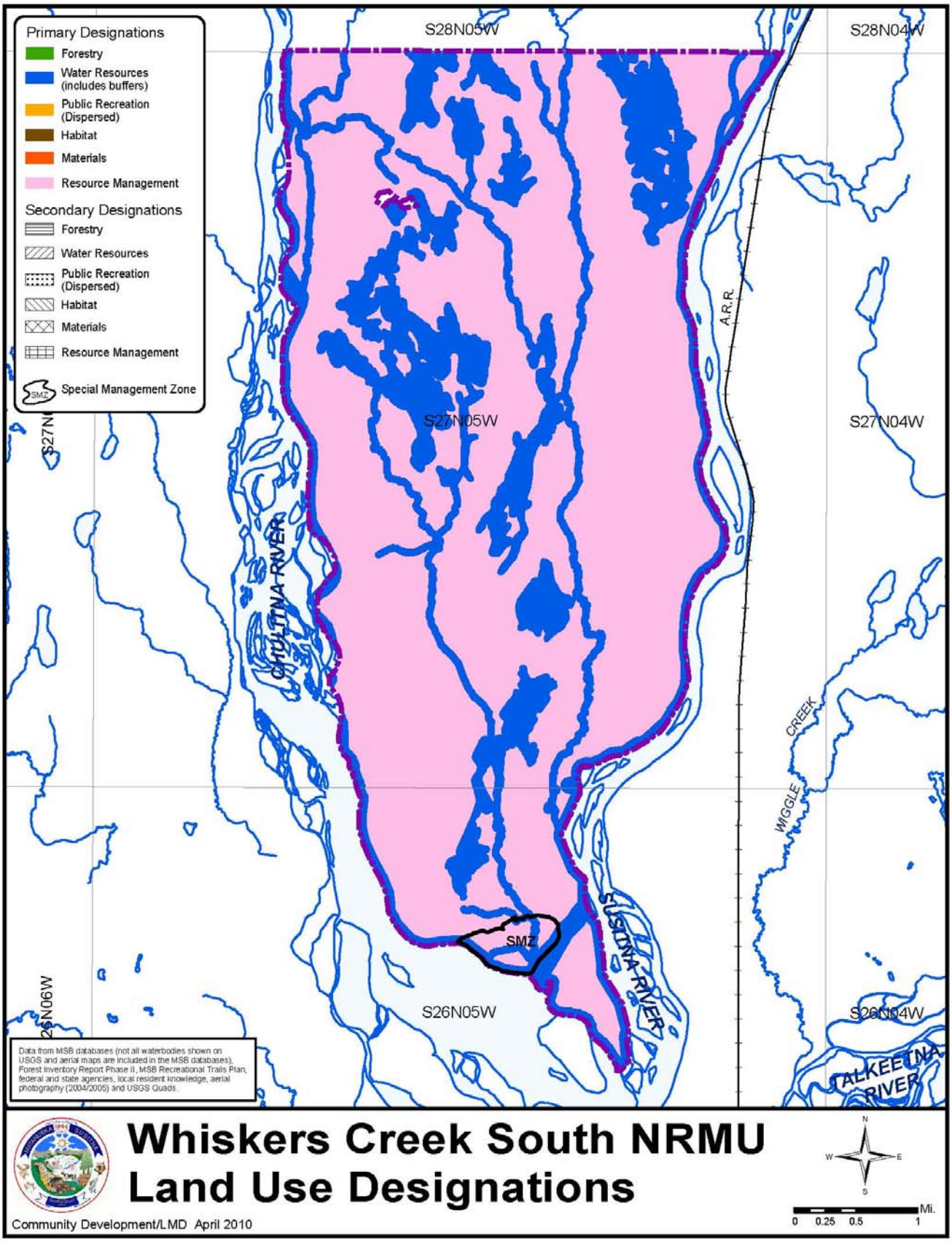
Primary Designations
Forestry
Water Resources (includes buffers)
Public Recreation (Dispersed)
Habitat
Materials
Resource Management
Secondary Designations
Forestry
Water Resources
Public Recreation (Dispersed)
Habitat
Materials
Resource Management
Special Management Zone
S28N05W
S28N04W
S27N05W
S27N04W
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S26N04W
S26N06W
A.R.R.
CHULITNA RIVER
SUSITNA RIVER
WIGGLE CREEK
TALKEETNA RIVER
SMZ
Data from MSB databases (not all waterbodies shown on USGS and aerial maps are included in the MSB databases), Forest Inventory Report Phase II, MSB Recreational Trails Plan, federal and state agencies, local resident knowledge, aerial photography (2004/2005) and USGS Quads.
Whiskers Creek South NRMU
Land Use Designations
Community Development/LMD April 2010
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WHISKERS CREEK SOUTH
Natural Resource Management Unit

General Information

The Whisker Creek South Natural Resource Management Unit contains about 13,970 acres. Another Unit, Whiskers Creek North is located directly north of this unit.

Whiskers Creek South is located between the Susitna and Chulitna Rivers, beginning where the two rivers merge just north of the community of Talkeetna and proceeding approximately 8 miles north to where it meets the southern boundary of the Whiskers Creek North Unit. The Whiskers Creek North and South Units combined are often referred to as the "Chulitna, Denali, Susitna Triangle" or simply "The Triangle." The Triangle is located between Milepost 117 and 131 of the Parks Highway. Whiskers Creek South is located between approximately Milepost 117 and 126.

Whiskers Creek South has mixed birch and spruce interspersed with alder on its northern end and ends in a flood plain with mixed alder and other riparian vegetation at the southern tip. The area is quite hilly and has numerous ridges and narrow valleys. The southern end is highly susceptible to erosion where the Chulitna and Susitna Rivers converge.

Borough Tax Maps

Chase 11, 12, 13, 14, and Talkeetna 3 and 4.

Current Land Uses

The area has a variety of dispersed recreational uses. This use is low because of the very limited access into the unit. Hunting, trapping and cross-country skiing are the main activities.

Surrounding Land Uses

The only surrounding land is the adjacent borough owned property, Whiskers Creek North, which also is used for general dispersed recreational purposes.

Community Council Area

None

Existing Land Use Plans

- Mat-Su Borough, *Multiple Use Forest Management Plan*, 1989, which will be replaced with this Plan when adopted.
- Alaska Department of Natural Resources, *Susitna Area Plan* (1985); South Parks Highway Unit, Whiskers Creek Subunit (5d). The area is designated as Borough Land Bank with values for forestry, public recreation, settlement and wildlife habitat. The *Susitna Area Plan* is currently being revised and will be called the *Susitna-Matanuska-Area Plan*. When this plan is completed it will replace the *Susitna Area Plan*. The *Susitna-Matanuska Area Plan* does not apply to borough owned land.
- Mat-Su Borough, *Recreational Trails Plan* (2007).

- Mat-Su Borough, *Parks, Recreation and Open Space Plan* (2001), which is currently being updated.

Existing Land Use Classifications
Forest Management for the majority of the unit. The areas that were obtained through a land exchange with the State of Alaska in 2006 are unclassified.

Summary of Resources and Uses

Agriculture and Grazing
A review of soil types, published by the Department of Agriculture, Natural Resources Conservation Service (http://websoilsurvey.ncrs.usda.gov/app/), indicates that there are no areas within the unit suitable for agricultural or grazing use.

Also, see *Soils* map at the beginning of this section.

Cultural Resources and Heritage Sites
There are no documented historical or heritage sites and no cultural survey has taken place with the unit. However, because of the units location between the Chulitna and Susitna Rivers there is a strong possibility that there are undiscovered archaeology sites, particularly where fresh water streams enter into the two rivers and in the low lying upland areas at the confluence of the Chulitna and Susitna Rivers.

Should any resource extraction activities occur or if the uses of the area change significantly, additional fieldwork should take place to identify any historical or heritage sites.

Fish and Wildlife Habitat and Resources
The Whiskers Creek watershed has moderate to heavy use by moose, both summer and winter. Black bears are common with brown bears using the upper elevations in the unit. Moderate numbers of furbearer species, including wolves and wolverine are present throughout the region.

Black and brown bear dens are known to exist in the unit, particularly ½-mile inland of the Chulitna and Susitna Rivers.

There are no documented Trumpeter Swan or eagle nests in the unit. However, local residents have reported that the lower peninsula or "delta" area (confluence of the Susitna and Chulitna Rivers) draw many species of birds including Eagle's and migratory birds, including Sandhill Cranes, and Trumpeter Swans. Various waterfowl and Arctic Terns also nest there in abundance as well.

Additional field work will be required to identify any bear denning areas, swan nesting areas or eagle nests within the unit.

Whiskers Creek supports Coho and pink salmon rearing and spawning. It also has resident populations of rainbow trout, grayling and Dolly Varden char. There are also many small streams and creeks in the unit that drain into both the Susitna and Chulitna Rivers. Local

residents report that these streams support anadromous (Chinook, Coho, Pink and Sockeye salmon) and important resident fish.

Prior to any resource extraction projects, the anadromous fish distribution in any wetlands should be established, any additional anadromous or important resident fish waterbodies need to be identified and the Alaska Department of Fish and Game will need to verify the cataloged anadromous resident fish streams as described above.

The Alaska Department of Fish and Game will require Fish Habitat Permits, accompanied by detailed project plans, prior to any planned resource extraction project adjacent to anadromous or resident waterbodies.

There are no commercial lodges or known fish camps in the area.

Forest Resources

The unit consists primarily of old growth mixed spruce and birch sawtimber stands greater than 80 years old. Hardwood timber (primarily birch) represents 75% of the timber in the unit.

Within the 13,965 acre unit, 10,241 acres (73% of the unit) is Commercial Forest Land, of which 7,519 (54% of the unit) is Operable Forest Land.

The 2009 Operable Forest Land Analysis Report found the following timber composition within the unit:

Stratum 1: Pole Timber – Closed Canopy	134 acres
Stratum 2: Pole Timber – Open Canopy	84 acres
Stratum 3: Hardwood Saw Timber – Closed Canopy	0 acres
Stratum 4: Hardwood Saw Timber – Open Canopy	137 acres
Stratum 5: Mixed Forest Saw Timber – Closed Canopy	6,008 acres
Stratum 6: Mixed Forest Saw Timber – Open Canopy	1,156 acres
TOTAL	7,519 acres

Also, see *Operable Forest Lands* map at the beginning of this section.

Private Property

There are two parcels of private land within the outer boundaries of unit. There are two contiguous 5 acre parcels located on an unnamed lake in the northwestern portion of the unit. These parcels are not subject to the provisions of this plan.

Public Recreation and Tourism

The unit is considered a relatively good area for hunting. Because access is limited into the area, the unit is not heavily utilized for recreational activities.

There is nothing in this unit that would attract tourists in significant numbers to the unit. However, because the unit is relatively close to Talkeetna, flight seeing does take place over the unit because it is on a direct flight path to Denali National Park and Preserve, which is

the principal attraction in the area. Mahay's River Boat Service has a long-term land use permit on the west bank of the Susitna River in Section 26, T. 27 N., R. 5 W., S.M. that brings many tourists into the general area.

During the public comment period during Phase I of developing this plan, comments were supportive of designating this area for public recreation.

Roads and Trails

There are no dedicated roads or trails within the unit. A bridge crossing the Chulitna River would be needed to provide for year around access into the unit. Winter access for highway vehicles may be possible across the Chulitna River via an ice bridge about mid-way through the unit.

Also, see the *Roads, Trails, Waterbodies, Wetlands and Riparian Areas* map at the beginning of this section.

Rock, Sand and Gravel

Soil mapping (see http://websoilsurvey.ncrs.usda.gov/app/) indicates that there are no rock, sand and gravel resources within the unit. In addition, because the unit is inaccessible by an all-season road, development of rock, sand and gravel resources would not be feasible. Sufficient quantities of rock, sand and gravel can be found in other areas along the Parks Highway.

Also, see the *Soils* map at the beginning of this section.

Unit Management Intent

The management intent for the Whiskers Creek South Natural Resource Management Unit shall be for public recreation, water resource and habitat protection, and some very limited timber harvest opportunities.

Land Use Designations

Whiskers Creek South		
Designation	**Classification**	**Management Intent**
Primary		
Resource Management	Resource Management Lands	All upland areas, except those designated water resources. Available for forest management and limited occasional timber harvest in those areas determined to be operable forest land and where it does not significantly reduce the areas recreational activities and important habitat areas. Protect and improve important wildlife habitat areas. Recognize and manage for the units recreational uses.
Water Resources	Watershed Lands	All waterbodies, riparian areas, and important wetlands. Any waterbodies, riparian areas or important wetlands determined after adoption of this plan to be anadromous, important for resident fish, or important wetlands for fish and wildlife shall also be similarly designated and classified[27].
Secondary		
None		

Also, see the *Land Use Designations* map at the beginning of this section.

[27] Such designation and classification shall be considered as a "Minor Change" to the Plan (See Volume I, Chapter 4, *Procedures for Changes to the Plan, Goals, and Guidelines.*

Management Guidelines

See volume I, Chapters 2 and 3 for area-wide guidelines for all Natural Resource Management Units. The remainder of this section presents unit-specific guidelines.

Buffers and Special Management Zones

All flowing waterbodies, including lakes that are part of a flowing water system that are connected to creeks, streams, and rivers, and associated riparian areas will be protected through the use of undisturbed natural vegetation buffers.

All wetlands over 40 acres and all smaller important wetland areas (see definition in *Definitions/Glossary* in Volume III) shall be protected with a Special Management Zone which shall include a 100-foot area around the wetland area. The Zone shall not allow disturbance of the wetland area, but some uses may be allowed. For example, winter time recreational use is allowed once sufficient snow cover exists to not harm the natural vegetation.

At such time that new activities are planned in the unit, all potentially impacted waterbodies and wetlands shall be assessed as their habitat and watershed values. Depending on the assessment, the waterbodies and wetlands will be provided additional protection through buffers or placed in a Special Management Zone, as appropriate.

The Chulitna and Susitna Rivers shall have a 330-foot buffer within the unit.

Where the unit adjoins private property, the private property shall be protected through the use of an undisturbed natural vegetation buffer. These buffers may only be modified following the provisions in Volume I, Chapter 2, *Buffers* and MSB 23.20.070.

See *Roads, Trails, Waterbodies, Wetlands and Riparian Areas* map at the beginning of this section for waterbodies that shall have buffers, wetlands with a Special Management Zone, and private property buffers.

Also, see Volume I, Chapter 2, *Buffers* and *Special Management Zones* for additional information.

Forest Management

Timber harvesting is an authorized use but only when it does not significantly reduce the units' recreational, habitat, scenic, and water resource values.

Timber harvests shall be small and should be held sporadically, spread out over a number of years. The areas offered and harvested, if possible, should also be dispersed. Timber harvests shall be limited to firewood and specialty wood products including house logs.

Harvest areas shall be designed to minimize temporary road construction and all roads shall be put to bed (closed to any other uses) and re-forested/vegetated with natural vegetation as soon as possible following any timber harvest.

Harvesting and removal of timber shall only occur in the winter and when the ground is frozen and snow conditions are sufficient to prevent damage to the underlying vegetation.

Timber harvests shall only be held after consultation with the Alaska Department of Fish and Game. Harvest areas and cutting units should be laid out to improve wildlife and to avoid existing important habitat areas.

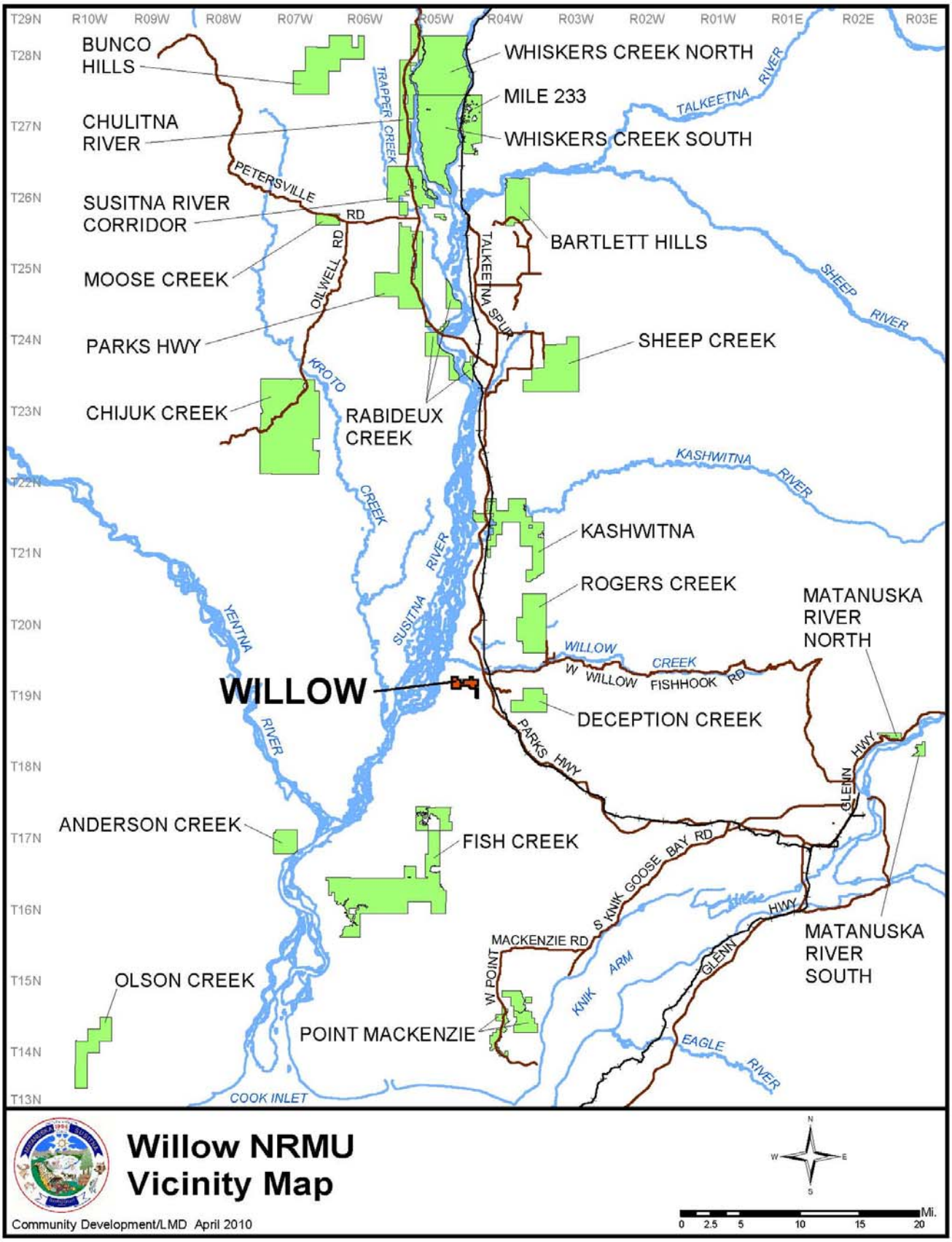
Other Uses

No additional unit-specific guidelines are required for this unit. See Volume I, Chapters 2 and 3 for area-wide guidelines that apply to all Natural Resource Management Units.

Other Recommendation

If the borough or state enters into a land exchange or other agreement regarding the Whiskers Creek North Unit, both parties should consider adding the Whiskers Creek South Unit to the exchange or agreement. Both units are geographically isolated because of the Susitna and Chulitna Rivers with no road access. Management of the entire "Triangle" by one jurisdiction appears to make the most sense.

Such an exchange or agreement should only occur if the area will be added to Denali State Park or managed by the state under a similar management regime.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BUNCO HILLS
CHULITNA RIVER
SUSITNA RIVER CORRIDOR
MOOSE CREEK
PARKS HWY
CHIJUK CREEK
WHISKERS CREEK NORTH
MILE 233
WHISKERS CREEK SOUTH
BARTLETT HILLS
SHEEP CREEK
RABIDEUX CREEK
KASHWITNA
ROGERS CREEK
MATANUSKA RIVER NORTH
WILLOW
DECEPTION CREEK
ANDERSON CREEK
FISH CREEK
OLSON CREEK
POINT MACKENZIE
MATANUSKA RIVER SOUTH
TRAPPER CREEK
PETERSVILLE RD
OILWELL RD
TALKEETNA SPUR
TALKEETNA RIVER
SHEEP RIVER
KROTO CREEK
KASHWITNA RIVER
SUSITNA RIVER
YENTNA RIVER
WILLOW CREEK
W WILLOW FISHHOOK RD
PARKS HWY
GLENN HWY
S KNIK GOOSE BAY RD
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W POINT
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COOK INLET
Willow NRMU
Vicinity Map
Community Development/LMD April 2010
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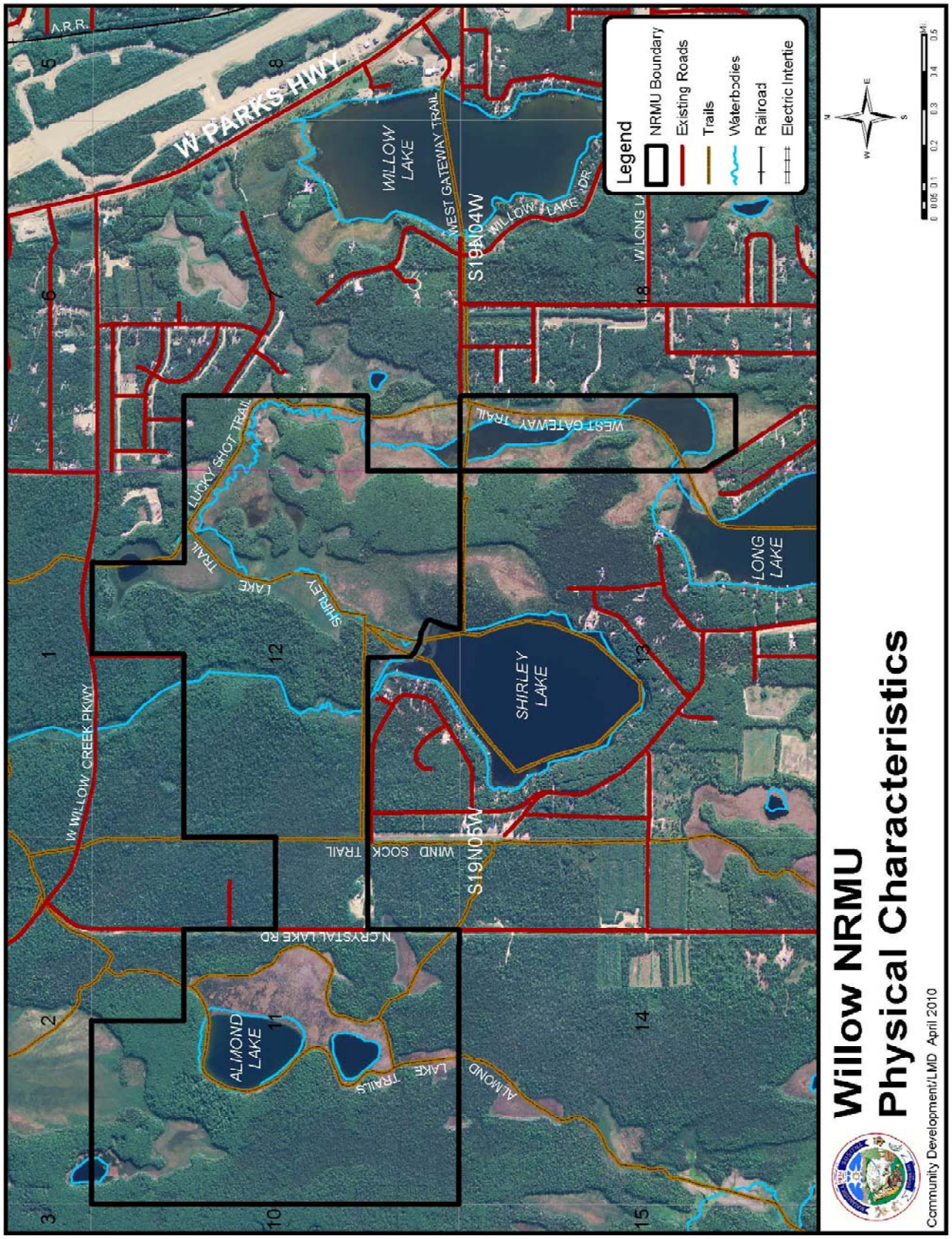
Willow NRMU
Physical Characteristics
Community Development/LMD April 2010
Legend
NRMU Boundary
Existing Roads
Trails
Waterbodies
Railroad
Electric Intertie
W PARKS HWY
A.R.R.
WILLOW LAKE
WEST GATEWAY TRAIL
WILLOW LAKE DR
S19N04W
W LONG L
LUCKY SHOT TRAIL
SHIRLEY LAKE TRAIL
SHIRLEY LAKE
LONG LAKE
W WILLOW CREEK PKWY
WIND SOCK TRAIL
S19N05W
N CRYSTAL LAKE RD
ALMOND LAKE
ALMOND LAKE TRAILS
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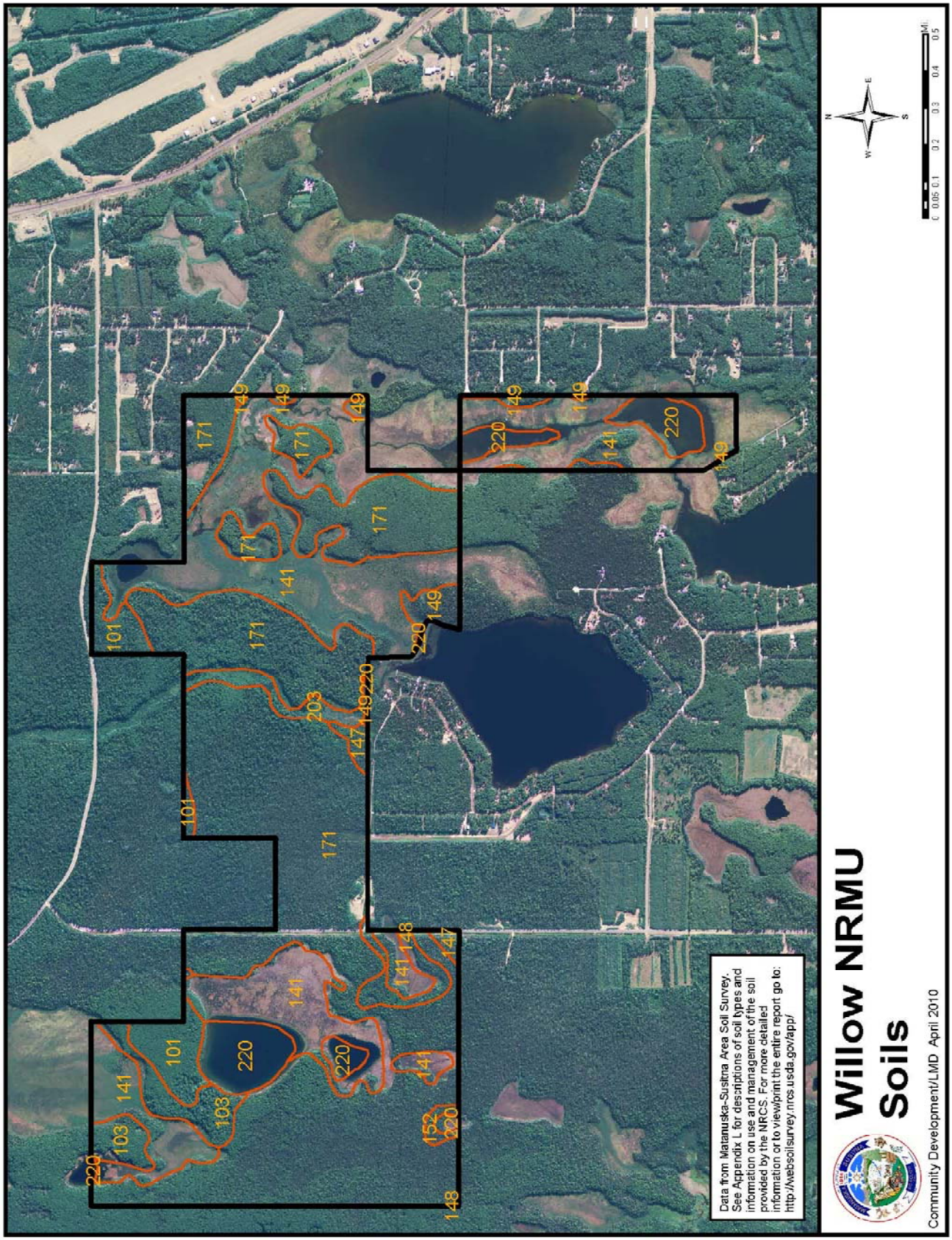
Willow NRMU
Soils
Community Development/LMD April 2010
Data from Matanuska-Susitna Area Soil Survey.
See Appendix L for descriptions of soil types and
information on use and management of the soil
provided by the NRCS. For more detailed
information or to view/print the entire report go to:
http://websoilsurvey.nrcs.usda.gov/app/
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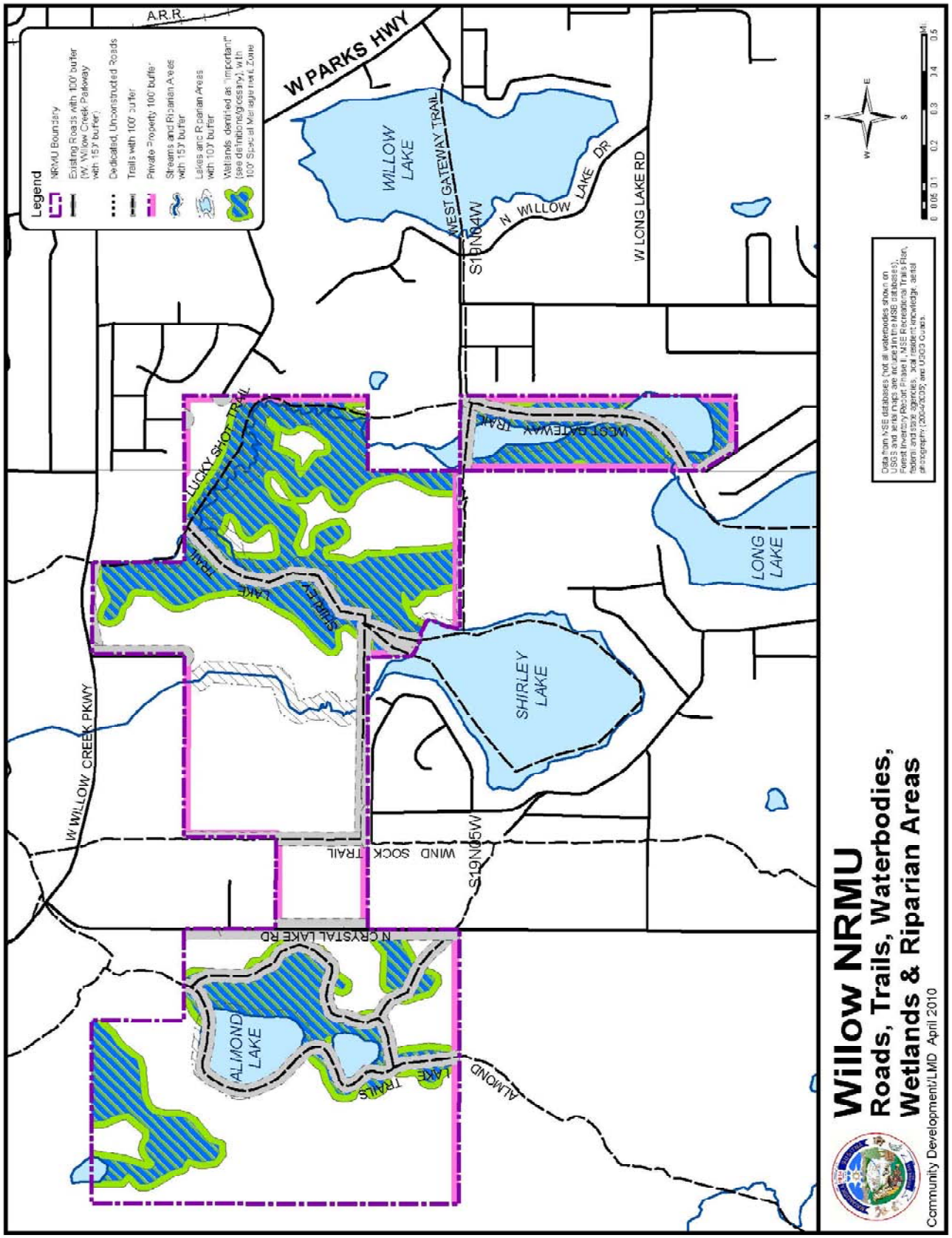
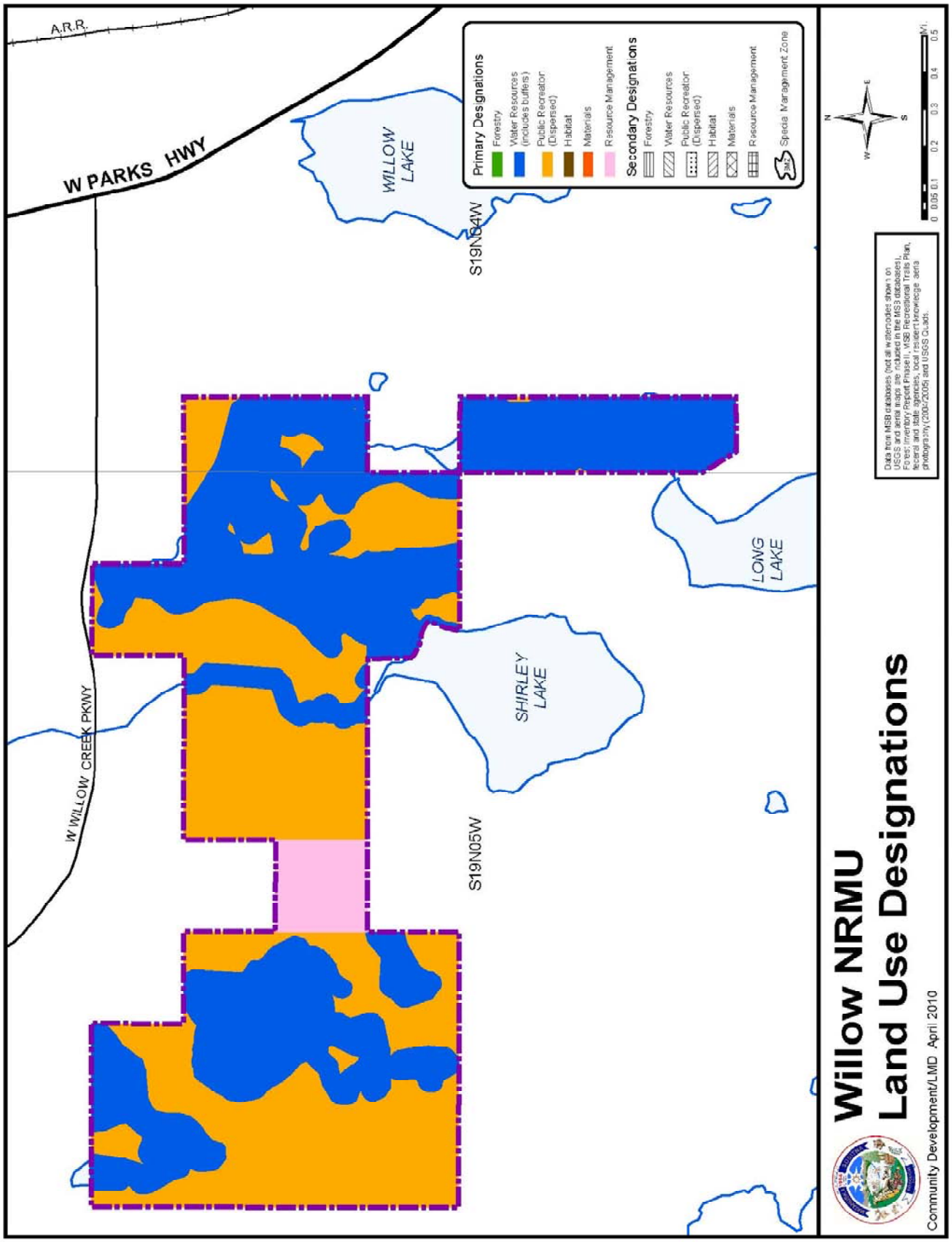

Legend
NRMU Boundary
Existing Roads with 100' buffer (W. Willow Creek Parkway with 150' buffer)
Dedicated, Unconstructed Roads
Trails with 100' buffer
Private Property 100' buffer
Streams and Riparian Areas with 150' buffer
Lakes and Riparian Areas with 100' buffer
Wetlands identified as "important" (see definitions/glossary), with 100' Special Management Zone
A.R.R.
W PARKS HWY
WILLOW LAKE
WEST GATEWAY TRAIL
S19N04W
N WILLOW LAKE DR
W LONG LAKE RD
LUCKY SHOT TRAIL
WEST GATEWAY TRAIL
SHIRLEY LAKE TRAIL
LONG LAKE
SHIRLEY LAKE
W WILLOW CREEK PKWY
WIND SOCK TRAIL
S19N05W
N CRYSTAL LAKE RD
ALMOND LAKE
ALMOND LAKE TRAILS
Data from NSB databases (not all waterbodies shown on USGS and aerial maps are included in the NSB databases), Forest Inventory Report Phase II, NSB Recreational Trails Plan, federal and state agencies, local resident knowledge, aerial photography (2004/2005), and USGS Quads.
Willow NRMU
Roads, Trails, Waterbodies, Wetlands & Riparian Areas
Community Development/LMD April 2010


A.R.R.
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W WILLOW CREEK PKWY
WILLOW LAKE
SHIRLEY LAKE
LONG LAKE
S19N04W
S19N05W
Primary Designations
Forestry
Water Resources (includes buffers)
Public Recreation (Dispersed)
Habitat
Materials
Resource Management
Secondary Designations
Forestry
Water Resources
Public Recreation (Dispersed)
Habitat
Materials
Resource Management
Special Management Zone
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Data from MSB databases (not all waterbodies shown on USGS and aerial maps are included in the MSB databases), Forest Inventory Report Phase II, MSB Recreational Trails Plan, federal and state agencies, local resident knowledge, aerial photography (2006/2008) and USGS Quads.
Willow NRMU
Land Use Designations
Community Development/LMD April 2010

WILLOW
Natural Resource Management Unit

General Information

The Willow Natural Resource Management Unit contains about 1,080 acres. The unit located two (2) miles west of Willow proper, ½ mile west of the Parks Highway at Mile 70. Willow Lake is ½ mile to the east, Shirley Lake borders the southern portion of the unit and Almond Lake is within the western portion of the unit.

The unit is comprised of lakes, streams and associated poorly drained riparian areas, intermixed with some mixed birch and spruce forested areas.

Borough Tax Maps
Willow 10 and 11

Current Land Use
Various activities including general dispersed public recreation, Nordic skiing, bird watching, dog mushing and snowmobiling.

Surrounding Land Use
Much of the surrounding land is in private ownership, especially around the numerous lakes in the area. The State of Alaska, and the Borough, also own land in the vicinity that is used for dispersed public recreation and trail use, with some smaller Borough parcels reserved for future community expansion and public facility needs. The unit is adjacent to the Willow Creek State Recreation Area.

Community Council Area
Willow Area Community Organization

Existing Land Use Plans

- Mat-Su Borough, *Multiple Use Forest Management Plan*, 1989, which will be replaced by this plan.
- Alaska Department of Natural Resources, *Southeast Susitna Area Plan* (2009). This plan replaced the *Willow Sub-Basin Area Plan* (1982). The *Southeast Susitna Area Plan* does not apply to borough owned land. The small amount of state land in the immediate Willow area is designated for public recreation purposes.
- Mat-Su Borough, *Recreational Trails Plan* (2007).
- Mat-Su Borough, *Parks, Recreation and Open Space Plan* (2001); which is currently being updated.

The Willow Community is currently working on a Comprehensive Plan for their area.

Existing Land Use Classifications
Forest Management Lands except for one 40-acre parcel, about in the center of the unit, which is classified as Material Lands.

Summary of Resources and Uses

Agriculture and Grazing
A review of soil types, published by the Department of Agriculture, Natural Resources Conservation Service (http://websoilsurvey.ncrs.usda.gov/app/), indicates that there are no known lands suitable for agricultural development or grazing within the unit.

Also, see *Soils* map at the beginning of this section.

Cultural Resources and Heritage Sites
There are no documented historical or heritage sites and it is unknown whether a cultural survey has taken place within the unit. Additional field work may be required if any natural resource extraction or other development activities take place or use of the unit changes significantly.

Fish and Wildlife Habitat and Resources
The area is of moderate value to moose, but moose are fairly common throughout this area following a migratory route to and from riparian habitats along the Susitna River and Willow Creek. Some calving activity occurs in May and early June. Other wildlife species such as black bear and some of the furbearer species use the area, but they are not abundant.

There are no known bear dens, Trumpeter Swans or eagle nests within the unit. Additional fieldwork will be required prior to any natural resource extraction or other development activities taking place to verify this information.

A tributary of Willow Creek, which bisects the unit, is a cataloged anadromous fish stream provides rearing habitat for Coho salmon. Shirley and Almond Lakes and other named and unnamed lakes in the area have resident rainbow trout, grayling, and Dolly Varden char.

Prior to any resource extraction projects, the anadromous fish distribution in any wetlands should be established, any additional anadromous or important resident fish waterbodies need to be identified and the Alaska Department of Fish and Game will need to verify the cataloged anadromous resident fish streams as described above.

The Alaska Department of Fish and Game will require Fish Habitat Permits, accompanied by detailed project plans, prior to any planned resource extraction project adjacent to anadromous or resident waterbodies.

There are no commercial lodges or fish camps are known to be in the area. A popular fishing and camping area is located at the mouth of Willow Creek and the Susitna River approximately three (3) miles northwest of the unit.

Forest Resources
The unit has not been inventoried for commercial timber. However, the unit is known to contain birch and spruce stands of varying age, size and density.

The area has very limited potential for any commercial forestry uses because of its location in a central residential area of Willow, the location of the trail systems, lakes, streams and wetland areas. The area could be used for personal-use timber needs, and possibly some small-scale commercial timber harvests for select species and sizes.

Private Property
There is no private property within the unit. There is a significant amount of private property surrounding the unit, mostly used for private residences and recreational uses.

Public Recreation and Tourism
Easy access to the entire unit provides local residents with opportunities for hunting, fishing, trapping, Nordic skiing, snowmobiling, ATV's, dog mushing and other recreational opportunities. Because of the soil conditions, the majority of the unit is more accessible in the winter than summer.

The Iditarod Trail Committee has moved the Iditarod Sled Dog Race restart to Willow which draws thousands of tourists to the area in March. The entire Willow area does have a significant amount of dog mushing activity, some of which also does draw tourists into the general area.

Roads and Trails
Willow Creek Parkway runs east/west and provides access to the northern part of the unit. Crystal Lake Road runs north/south and provides access through the central part of the unit.

There are several dedicated trails in and adjacent to the unit. The Almond Lake Trails run north/south through the western portion of the unit. Windsock Trail also runs north/south and is located through the central portion of the unit. The Shirley Lake and Lucky Shot Trails circle within the western portion of the unit. The West Gateway Trail travels east/west from the far western portion of the unit. This trail also has a north/south connector route. Some of these trails are part of the Willow Winter Carnival Trail System.

The *Willow Area Trails Plan* was adopted by the Willow Area Community Organization in 2006. This Plan documents historical and current trails and their uses in the unit.

Also, see the *Roads, Trails, Waterbodies, Wetlands and Riparian Areas* map at the beginning of this section.

Rock, Sand and Gravel Resources
Soil mapping (see http://websoilsurvey.ncrs.usda.gov/app/) indicates that there may rock, sand and gravel resources within the unit. There are no developed rock, sand or gravel extraction areas within the unit. There is a 40 acre parcel (Section 11 NE1/4SE1/4, T.19 N., R.5 W., S.M.) that was classified for material use in 1989. A small amount of this site has

been opened and used for local road construction and maintenance. There are no other developed rock, sand or gravel extraction areas within the unit. A more extensive field inventory would be necessary to determine the volume, extent and feasibility of developing this resource.

Also, see the *Soils* map at the beginning of this section.

Unit Management Intent

The management intent for the Willow Natural Resource Management Unit shall be to protect water resources and public recreation uses of the area. The existing material site described under "Rock, Sand and Gravel Resources" above, shall be allowed to continue to be used as a secondary activity to support local projects, but shall only occur when its use and development does not significantly impact the primary designations of the unit.

Land Use Designations

Willow		
Designation	**Classification**	**Management Intent**
Primary		
Public Recreation - Dispersed	Public Recreation Lands	All upland areas in the subunit, except those designated as water resources and resource management.
Resource Management	Resource Management Lands	The 40 acre parcel located in the NE1/4SE1/4 of Section 11, T.19 N.,R.5 W., S.M.
Water Resources	Watershed Lands	All waterbodies, riparian areas, and important wetlands. Any waterbodies, riparian areas or wetlands determined after adoption of this plan to be anadromous, important for resident fish, or important wetlands for fish and wildlife shall also be similarly designated and classified[28].
Secondary		
None		

[28] Such designation and classification shall be considered as a "Minor Change" to the Plan (See Volume I, Chapter 4, *Procedures for Changes to the Plan, Goals, and Guidelines.*

Also, see the *Land Designations* map at the beginning of this section.

Management Guidelines

See Volume I, Chapters 2 and 3 for area-wide guidelines for all Natural Resource Management Units. The remainder of this section presents unit-specific guidelines.

Buffers and Special Management Zones

All flowing waterbodies, including lakes that are part of a flowing water system that are connected to creeks, streams, and rivers, and associated riparian areas will be protected through the use of undisturbed natural vegetation buffers.

All wetlands over 40 acres and all smaller important wetland areas (see definition in *Definitions/Glossary* in Volume III) shall be protected with a Special Management Zone which shall include a 100-foot area around the wetland area. The Zone shall not allow disturbance of the wetland area, but some uses may be allowed. For example, winter time recreational use is allowed when sufficient snow cover exists to not harm the natural vegetation.

Willow Creek Parkway shall have a 150-foot natural vegetation buffer along the south side of the right-of-way if and where it crosses into the unit.

The Almond Lake, Wind Sock, Shirley Lake, Lucky Shot, West Gateway Trails shall be buffered.

See *Roads, Trails, Waterbodies, Wetlands and Riparian Areas* map at the beginning of this section for waterbodies that shall have buffers, wetlands with a Special Management Zone, and roads and trails with buffers.

See Volume I, Chapter 2, *Buffers* and *Special Management Zones* for additional information.

Other Uses

No additional unit-specific guidelines are needed for this unit. See Volume I, Chapters 2 and 3 for area-wide guidelines that apply to all Natural Resource Management Units.

Matanuska-Susitna Borough

Asset Management Plan:
Natural Resource Management Units

Volume III

Definitions/Glossary
Bibliography
Appendices

Prepared by; RWS Consulting
Contributions by; Alaska Map Company
Matanuska-Susitna Borough Staff
Northern Economics
Sanders Forestry Consulting
State of Alaska, Division of Forestry

Funded by; Matanuska-Susitna Borough

Adopted: September 21, 2010

Asset Management Plan:

Natural Resource Management Units

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Definitions/Glossary

- **AAC**. Alaska Administrative Code.
- **Acceptable Stocking**. Vigorous, healthy and well distributed seedlings of commercial tree species that have survived on site for a minimum of two years and must average at least 450 trees per acre within seven years of harvest.
- **Active Road**. A road being actively used for natural resource management activities.
- **Advanced Growth**. A live seedling or sapling that has grown on the site prior to harvesting activities. To be counted as established it must exhibit the following characteristics:
    1. The seedling or sapling shows reasonable growth and vigor, and is undamaged and capable of becoming a harvestable tree during the next stand entry.
    2. The established seedling has a well-defined stem.
    3. Live crown is at least one-half the total tree height.
- **Adverse Grade**. The uphill road or trail gradient in the direction of travel of a loaded vehicle.
- **Age Class**. (1) One of the intervals into which the age range of trees is divided for classification or use. (2) A distinct aggregation of trees originating from a single natural event or regeneration activity, or a grouping of trees, e.g. 1-year age class, as used in inventory or management.
- **ACMP**. Alaska Coastal Management Plan.
- **ADEC** (also referred to as DEC). State of Alaska, Department of Environmental Conservation.
- **ADF&G** (also referred to as F&G). State of Alaska, Department of Fish and Game.
- **ADMLW** (also referred to as DMLW). State of Alaska, Department of Natural Resources, Division of Mining, Land and Water.
- **ADOF.** State of Alaska, Department of Natural Resources, Division of Forestry.
- **DPOR.** State of Alaska, Department of Natural Resources, Division of Parks and Outdoor Recreation.
- **ADOT/PF** (also referred to as DOT). State of Alaska, Department of Transportation and Public Facilities.
- **ADNR** (also referred to as DNR). State of Alaska. Department of Natural Resources.
- **Agricultural Land.** Lands which, because of physical, climatic, and vegetative conditions, are suitable and intended for present or future agricultural uses.
- **Alaska Forest Resources and Practices Act (FRPA).** That section of Alaska Statute (AS 41.17.010-955) that deals with the use, management, and protection of forest resources within the State of Alaska.
- **All Season Road**. A road constructed and intended to be used in all seasons of the year.
- **Allowable Use**. A use that is allowed within a specific geographic area. Also see 'Prohibited Use'.

- **Amendment** (also called 'Plan Amendment'). An amendment permanently changes the guidelines by adding to or modifying the basic management intent for one or more of the plan's management units, or a portion thereof, or by changing its allowed or prohibited policies or guidelines for a unit.
- **Anadromous Water Body**. A river, lake, or stream from its mouth to its uppermost reach including all sloughs and backwaters adjoining the listed water, and that portion of the streambed or lakebed covered by ordinary high water used by anadromous fish. Some, but not all anadromous waters are shown in "The Atlas to the Catalog of Waters Important for Spawning, Rearing, or Migration of Anadromous Fishes" (referred to as the Anadromous Waters Catalog (AWC)) compiled by ADF&G. Anadromous water bodies also include fresh water bodies or estuarine areas that have been determined to contain or exhibit evidence of anadromous fish in which event the anadromous portion of the water body extends up to the first point of physical blockage.
- **Annual Allowable Cut.** The average volume of timber that may be cut from a forest annually or periodically that will maintain a balance between net growth and harvest while meeting the management intent for the forest land. Also see MSB 23.20.040.
- **Appropriate.** An action suitable and proper according to existing circumstances and warranted in light of potential effects on public resources.
- **AS.** Alaska Statutes.
- **Area Control.** An indirect method of controlling (and roughly determining) the amount of forest products to be harvested, annually or periodically, on the basis of stocked area.
- **Artificial Regeneration.** The renewal of a tree crop by direct seeding or planting.
- **ATV.** See Off-Highway Vehicles.
- **Best Interest Finding.** A written document that is used as the basis for decisions involving land and natural resource interests. Best Interest Finding conclusions and decisions are based on the criteria of overall best interest of the public and/or borough or state.
- **Best Management Practices,** (also referred to as BMP's). Methods, techniques, processes and activities that have been determined to be the most effective and practical means (including technological, economic, and institutional considerations) that are the most efficient (least amount of effort) and effective way (best results) of accomplishing a task, based on procedures that have proven themselves over time.
- **Biological Diversity.** The variety and abundance of species, their genetic composition, and communities, ecosystems and landscapes in which they occur. It also refers to ecological structures, functions, and processes at all these levels. Biological diversity occurs at spatial scales that range from local through regional to global.
- **Board Feet.** Board-foot log rules are estimates of the amount of lumber that can be cut from the log. There are multiple methods of doing this, only two of which are applicable for this plan.

    1. Log Scale, or Scribner Log Scale: The Scribner Log Rule was based on diagrams of lumber sawn within the cylinder of the log. The Scribner Log Rule has been the standard used in the western states and Alaska by the Forest Service and industry. For the borough inventory and this plan, the Scribner

Log Rule – variable log lengths was utilized to estimate the highest valued product recognized in the standing tree.

2. Lumber Tally Scale – Nominal (also known as American Standard): This is the measurement most commonly recognized by the public outside of the forest, i.e., retail sales for finished product. It is a unit of measure equal to a block of wood one-foot square and one inch thick (1" x 12" x 12"). Unlike the lumber tally method, the nominal size is different from the tally size; 2" x 4" Tally Size is 1.75" x 3.5" Nominal Size.

- **Borough or borough.** See Matanuska-Susitna Borough.
- **Breast Height.** A standard height from ground level, generally 4.5 feet, for recording diameter, circumference (girth), or basal area of a tree. The measurement is usually taken on the uphill side of the tree.
- **Broadcast Burning.** The management technique of burning slash or other vegetation within an area for the purpose of enhancement of forest regeneration, fire hazard reduction, or habitat improvement.
- **Broadcast Chemicals.** Includes pesticides, herbicides, fungicides, fertilizers, poisons, and any other substances used for silvicultural management or related purposes, not native to the ecosystem in which they are being applied, and having a potential adverse impact on the environment and human health.
- **Buffer.** An area of land between two activities or resources managed and used to reduce the effect of one activity upon another. Unless specifically authorized to the contrary, the buffer must remain in its undisturbed natural vegetative state.
- **Burn plan.** A document providing a fire prescription and an assessment of likely impacts to air quality, water quality, and other resources such as wildlife habitat and recreation. A burn plan also specifies measures for controlling the proposed burn.
- **Cable Yarding.** Taking logs from the stump area to a landing using an overhead system of winch-driven cables to which logs are attached with chokers. This method is commonly used in steep terrain.
- **Canopy.** A plant canopy consists of one or more plant crowns growing in a given area.
- **Classification.** See Land Use Classification.
- **Clearcutting or Clearcuts.** A regeneration or harvest method which removes all of the trees in a cutting unit, generally 5-acres or greater in size at one time. It is used principally in even-aged forest stands and is considered essential to reforestation of species that are not shade tolerant, such as white spruce. Cuts where all trees are harvested within the cutting unit.
- **Closed Forest.** Forest lands on which tree crowns cover more than 50% of the surface area.
- **Commercial Forest Land.** Forested land capable of supplying timber or timber products for commercial uses. Uses include such products such as saw logs, house logs, or fiber material. Operable and Inoperable forest land combined add up to, or constitute the entirety of commercial forest land. See also "Merchantable Forest Land" below.
- **Commercial Timber Harvest or Operation**. An operation and/or harvest that provides enough timber to produce a profit for a commercial operator. Generally this requires timber stands to contain not less than 800 cubic feet per acre and capable of

producing 20 cubic feet per acre per year of wood products. An operation or harvest with an annual production in excess of 10,000 board feet (3,850 cubic feet) of wood products for sale must comply with the Alaska Forest Resources and Practices Act.

- **Commercial Tree Species**. Any species that is capable of producing a stand of timber with a commercial value including a Christmas tree or ornamental tree-growing operation.
- **Codominant trees.** Trees with crowns which form the general level of the forest canopy and receive full light from above but relatively little from the sides.
- **Consultation.** Processes followed 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.
- **Co-primary Use**. Designation where more than one use is a primary use. Co-primary uses must be managed to be compatible with each other, and where all uses have equal status; no co-primary use is more important than the others.
- **Cordwood** or **Firewood.** Wood used for heating purposes for homes and warming fires for camping. Cordwood and Firewood generally consists of various species of trees and may include tops and defective portions of a tree.
- **Cover Habitat**. Cover habitat includes hiding cover, snow interception cover, and thermal cover. See the individual definitions for these terms.
- **Critical Habitat**. See Habitat.
- **Critical Protection Area or Sites**. The highest level of wildfire suppression. It is a suppression action provided on a wildland fire that threatens human life, inhabited property, and designated physical developments and structural resources such as those designated as National Historic Landmarks. The suppression objective is to provide complete protection to identified sites and control the fire at the smallest acreage reasonably possible. The allocation of suppression resources to fires threatening critical sites is given the highest priority.
- **Crowns**. The crown of a tree or woody plant is the branches, leaves, and reproductive structures extending from the trunk or main stems. Major functions include light energy assimilation via photosynthesis, energy release by respiration, and movement of water to the atmosphere by transpiration.
- **Cultural Resources**. Cultural resources include prehistoric resources, Native American resources (associated with ancestors of living Native Americans), and historic resources (after Euro-American contact and settlement). Prehistoric resources are physical properties resulting from human activities that predate written records and are generally identified as isolated finds or sites. Prehistoric resources can include village sites, temporary camps, lithic scatters (stone tools) roasting pits/hearths, milling features, petroglyphs (rock are), rock features, and burials. Native American resources are sites, areas, and materials important to living Native Americans for religious, spiritual, or traditional reasons. Historic resources can include archaeological remains and architectural structures.
- **Cutting Unit**. An area within a timber sale from which trees are actually removed.
- **Dominant Timber Type.** The dominant timber species in a commercial timber area.
- **Decking**. The piling of logs.

- **Designated Personal Use Area.** See personal use.
- **Designation.** See land use designation.
- **Diameter Breast Height (DBH).** The diameter of a tree at breast height (usually four and one-half feet).
- **Eagle Nesting Sites.** Nesting sites mapped by the U.S. Fish and Wildlife Service from their bald eagle surveys or by the Alaska, Department of Fish and Game in their research reports, or identified in the area by a site survey and reported to the U.S. Fish and Wildlife Service.
- **Easement.** An interest in land owned by another that entitles its holder to a specific limited use.
- **Ecosystem.** An ecosystem includes living organisms; the climate, soil, water, and air of the place where organisms live; and all the interactions for the living organisms with each other and their physical environment.
- **End Hauling.** The removal and transportation of excavated material, pit or quarry overburden, or landing or road cut material from an excavation site to a deposit site not adjacent to the point of removal.
- **Established Seedling.** A healthy, undamaged seedling of a tree species that has grown in its present location for no fewer than two winters and exhibits growth.
- **Estuarine Area.** The area at the mouth of a steam where fresh and salt water mix; the landward extent of an estuary is the limit of salt-tolerant vegetation, and the seaward extent is a steam's delta at the mean lower low water mark.
- **Experimental Forest.** Forest land retained for forest research that involves site manipulation or long-term observation (e.g., timber management or habitat enhancement research).
- **Feasible.** Capable of being accomplished in a successful manner within a reasonable period of time, taking into account economic, environmental, technical, and safety factors (11 AAC 95.900(29).
- **Feasible and Prudent.** Consistent with sound technical practice and not causing environmental, social or economic problems that outweigh the public benefit to be derived from compliance with a plan guideline.
- **Fire Management.** The use of fire to meet land management goals and objectives.
- **Fire Prescription.** A document stating the objectives of a proposed burn (for example, the amount of slash to be removed and the intensity of the burn), and identifies the weather conditions needed to meet the objectives.
- **Fish.** See fish and wildlife.
- **Fish Bearing Waters.** Waters containing anadromous or high-value resident fish at any time during the year.
- **Fish and Wildlife.** Any species of aquatic fish, invertebrates, and amphibians, in any stage of their life cycle, and all species of birds and mammals, including feral domestic animals, found or that may be introduced in Alaska, except domestic birds and mammals.
- **Floodplain:** Flat land bordering a stream or river onto which a flood will spread. The underlying materials are typically unconsolidated and derived from past stream transporting activity. The extent of the flood plain varies according to the volume of water, and is thus defined by a specified flood size (e.g., a fifty-year floodplain would

be defined by the largest flood that would, on average, occur once within a fifty-year period, estimated from historic stream flow records.

- **Forestry or Forest Management**. Includes all activities related to attaining the goal of a healthy and sustainable forest. Forestry and forest management considers ecosystem and social values, including healthy fish and wildlife populations, water quality and quantity. fire and pests; harvest of timber and other forest products; and utilizing silvicultural practices necessary to enhance multiple uses of the forest.
- **Forest Health.** The condition of a forest area which may consider stand composition (species, age, size, and condition); growth and mortality rates, susceptibility to damage from insects, disease, or fire; incidence of rot, frost cracks, or other damage; or any other factors which affect forest growth and the ability of the forest to support the use to which it is committed. Professional assessment of forest health is factored into determining harvest rates or other silvicultural practices in the area such as pre-commercial thinning, reforestation, pruning, or brush abatement.
- **Forest Land.** Land that is or has been forested and is suited for long-term forest management because of its physical, climate, and vegetative conditions.
- **Full Cut**. See Clearcutting or Clearcuts.
- **FRPA.** See Alaska Forest Resources and Practices Act.
- **Full Protection Area**. The second highest category of wildfire suppression that is provided on a wildland fire that threatens uninhabited private property, high-valued natural resource areas, and other high-valued areas such as identified cultural and historical sites. The suppression objective is to control the fire at the smallest acreage reasonably possible. The allocation of suppression resources to fires receiving the full protection option is second in priority only to fires threatening a critical protection area.
- **Generally Allowed Uses**. Refers to uses allowed on state land under 11 AAC 96.020. Such uses do not require a permit. Uses allowed on state land may differ from those that may be allowed on Borough or other public land.
- **General Use**. A plan designation that provides for some combination of settlement, timber, recreation, habitat, or other values. When used in a land or resource use plan, this designation refers to areas where resource information is insufficient to warrant a specific designation, development is unlikely during the planning period, or where a number of uses can be accommodated within a management unit.
- **Goal**. A general statement of intent, usually not quantifiable and not having a specified date of completion. Goals identify desired long-range conditions.
- **Guideline**. A specific course of action that must be followed when a state or borough resource manager authorizes use of borough or state land. Some guidelines state the intent that must be followed and allow flexibility in achieving it. Guidelines range from giving general guidance for decision-making or identifying factors to consider, to setting detailed standards for on-the-ground decisions.
- **Grub or Grubbing**. To remove stumps or shrubs from the ground by hand or machine, typically prior to road building or regeneration.
- **Habitat.** Generally there are three categories of fish and wildlife habitat:
    1. **Critical Habitat Areas** are those areas that are essential to the conservation of specific animal, bird and fish species. Some animals, birds and fish species in this category are on the endangered or threatened species list. In Alaska

these areas are generally protected permanently by federal or state laws that have established special land use protection areas such as, but not limited to, wildlife refuges, parks, and critical habitat areas. There are no lands in this category subject to Natural Resource Management Unit Plan's.

2. **Important Habitat Areas** are those areas that are important, but have not been designated as "critical", to the life cycle of animals, birds and fish. They serve as a concentrated use area for fish and wildlife species during a sensitive life history stage where alteration of the habitat and/or human disturbance could result in a loss of healthy and diverse local populations. This designation, when used, applies to localized areas having particularly valuable or sensitive habitat within the planning boundary. The designation does not preclude human uses that are compatible with natural resources being managed for the benefit of fish and wildlife.
3. **General Habitat Areas** are those areas where animals, birds and fish are commonly located at some or all seasons of the year. For the most part, all land within Natural Resource Management Units fall within this category.

- **Hardwood.** A general term for a broad-leafed or deciduous (loses all its leaves during some time of year) tree in contrast to an evergreen or coniferous tree (needles with seeds produced by cones), which are soft woods.
- **Harvest Unit.** One or more cutting units plus the uncut areas between them.
- **Hiding Cover.** Hiding cover is vegetation capable of hiding 90% of a standing adult moose from view of a human distance of 200 feet. Generally, hiding cover is provided by vegetation that is at least 13 to 20 feet high.
- **High Value Resident Fish.** Resident fish populations that are used for recreational, personal use, commercial, or subsistence purposes.
- **Historic Properties.** Historic properties may include districts, sites, buildings, structures, or objects.
- **Ice Bridge.** A bridge of ice across a lake, river, or stream, either natural or constructed to a specified thickness to safely accommodate specified vehicle loads.
- **Inactive Road.** A road on which commercial hauling of natural resources is discontinued for one or more seasons, and the landowner desires continuation of access for fire control, natural resource management activities, occasional or incidental use for natural resource extraction or similar activities.
- **Infestation.** The attack and invasion by macroscopic organisms in considerable concentration.
- **Inoperable Forest Land.** That part of the commercial forest land that cannot be harvested because of regulatory reasons (buffers, riparian areas, etc.) or containing timber volumes and values that are not economically or technically capable of being accessed and harvested under commercial timber sale agreements using currently available timber harvest technology and methods. Inoperable forest lands are not part of the timber base for purposes of calculating annual allowable cut.
- **Invasive Species.** An invasive species is when a species is both nonnative to the ecosystem in which it is found and capable of causing environmental, economic, or human harm. Invasive species often compete so successfully in new ecosystems that they displace native species and disrupt important ecosystems processes. Plants, fish, insects, mammals, birds, and diseases all can be invasive. Simply being

nonnative in an ecosystem does not mean that a species will become invasive. It must possess certain characteristics that ideally suit it for colonization in a particular area. It is possible for a species to be invasive in one ecosystem, but non-invasive in another. This can be due to a variety of factors, such as the presence of a predator species or less-than-ideal habitat conditions.

- **Jurisdictional Wetlands.** See "Wetlands".
- **Landing.** A cleared area in the woods to which logs are yarded for loading onto trucks for shipment to a processing or shipment area.
- **Land Use Classifications.** Land classification identifies the general purposes for which state or borough land will be managed. Most classification categories are for multiple uses; and not all uses may be appropriate or permitted within a classification. Land use designations further specify primary, secondary uses and, in some cases, prohibited uses.
- **Land Use Conversion.** A bona fide land use conversion to another use that is incompatible with the present use of the site. For example, forest management land to settlement, industrial, commercial, or agricultural land.
- **Land Use Designations.** Category of land allocation used to implement the management intent for specific areas or parcels of land as determined by a land use or management plan. Designations identify the primary and, sometimes, the secondary uses of land. Other land uses can occur as long as they don't significantly detract or impair from the designated use(s). For example, public recreation can occur on land designated for forest management or water resources.
- **Land Use Plan.** A plan that determines management intent, designations, and guidelines for borough land. Also see Natural Resource Management Plan.
- **Large woody debris.** Any large piece of relatively stable woody material having a least diameter of greater than 4 inches and a length greater than 3.3 feet that intrudes into a steam channel.
- **Legislatively Designated Area** (also referred to as LDA). An area set aside by the state legislature for special management actions and retained in public ownership. Examples are State Game Refuges and State Recreation Areas.
- **Limited Action Area.** The lowest level of wildfire suppression provided on a wildland fire in areas where values to be protected do not justify the expense of a higher level of protection, and where opportunities can be provided for fire to help achieve land and resource protection objectives. The suppression objective is to minimize suppression costs without compromising protection of higher-valued adjacent resources. The allocation of suppression resources to fires receiving the limited protection option is of the lowest priority. Surveillance is an acceptable suppression response as long as higher valued adjacent resources are not threatened.
- **Management Guidelines.** Specific standards or procedures used to implement management designation that are found in land use plans and are to be followed in the issuance of permits, leases, or other authorizations for the use of land or resources. Guidelines range in their level of specificity, providing detailed management direction, general guidance, or the identification of factors that need to be considered in decision making.
- **Management Intent.** Statements found in land use plans that define near and long-term management objectives and the methods to achieve those objectives. These

statements generally have a specific geographic scope and time. They pertain to specific management units or to larger geographic areas, usually at a regional scale.

- **Matanuska-Susitna Borough also referred to as MSB or borough).** The government or geographic area of the Matanuska-Susitna Borough.
- **Material Extraction Site.** An excavation site and its limits of development where material, such as gravel, are extracted.
- **Mature.** Pertaining to a tree or stand that is capable of sexual reproduction (other than precocious reproduction), has attained most of its potential height and canopy growth, or has reached merchantability standards. Within uneven-aged stands, individual trees may become mature but the stand itself consists of trees of diverse ages and stages of development.
- **Merchantable.** Natural resource products, such as trees, sand, gravel, rocks and agricultural products, having the size, quality, and condition suitable for marketing under a given economic condition, even if not immediately accessible for utilization. For example, merchantable timber is that timber that could be currently sold because it is economical to harvest and there is a current market for the product (i.e. fire wood).
- **Minimize.** To limit to the extent feasible after exhausting available and feasible options. Does not include the requirement of improving naturally existing conditions.
- **Minor Change.** A change to a land use plan that does not modify or add to the guidelines basic intent, and that serves only to clarify the guidelines, make them consistent, or facilitate their implementation, or make technical corrections. (See Volume I, Chapter 4; *Implementation and Recommendations).*
- **Modified Action Area.** The third highest category of wildfire suppression provided on a wildland fire in areas where values to be protected do not justify the expense of full protection. The suppression objective is to reduce overall suppression costs without compromising protection of higher-valued adjacent resources. The allocation of suppression resources to fires receiving the modified protection option is of a lower priority than those in critical and full protection areas. A higher level of protection may be given during the peak burning periods of the fire season tan early or late in the fire season.
- **Multiple-use.** Multiple-use means the management of all the various renewable surface resources on land so that they are utilized in a combination which will best meet citizen needs. The term also means that some land may be used for less than all of the resources; and that harmonious and coordinated management of the various resources, each with the other, without significant impairment of the productivity of the land and water, with consideration being given to the relative values of the various resources, and not necessarily the combination of uses that will give the greatest dollar return or the greatest unit output.
- **Natural Regeneration.** The renewal of a tree crop by natural seeding or sprouting; tree crop is self-grown.
- **Natural Resource Management Unit**. An Assembly designated geographic area of borough owned land that has, and is managed, for multiple-use values. This includes, land classified or with management intent for; important fish and wildlife habitat areas, forest management, material, mineral, public recreation, watershed, and wetlands. A Natural Resource Management Unit Plan or other land use asset

management plan describes how the land that is located in a Natural Resource Management Unit shall be managed. These plans are not in force on private land within or adjacent to the unit and do not contain land classified for agricultural, commercial, industrial, private recreation, or residential purposes.

- **Non-Commercial Forest Land.** Land incapable of yielding a specified volume of wood per unit area of commercial species, or land incapable of producing commercial tree species.
- **Non-Stockable.** Areas that contain a soil depth insufficient to accept the chosen seedling stock root system, is at least one-half water or bare rock, or is an active or past road surface or landing.
- **Off-Highway Vehicles**. A vehicle designed or adopted for cross-country operation over unimproved terrain, ice, or snow, and, which has been determined by the Alaska Department of Transportation and Public facilities to be unsuitable for general highway use.
- **Off-Road Vehicles.** Same as off-highway vehicle.
- **Open Forest.** Forest land on which trees cover 10% to 50% of the surface area.
- **Operable Forest Land.** Operable forest land is a sub-set of commercial forest land capable of supporting access and timber harvest systems commonly used in the region. It is that part of a commercial forest that contains timber volumes and values that are economically and technically capable of being accessed using currently available timber harvest technology and methods.
- **Operations Area.** The area currently being used for timber harvesting operations. This includes active cutting units, staging and log storage areas.
- **Ordinary High Water Mark.** The mark along the bank or shore up to which the presence and action of the tidal or non-tidal water are so common and usual, and so long continued in all ordinary years, as to leave a natural line impressed on the bank or shore and indicated by erosion, shelving, changes in soil characteristics, destruction of terrestrial vegetation or other distinctive physical characteristics.
- **Over Mature.** A tree or even-aged stand that has reached that stage of development when it is declining in vigor and health and reaching the end of its natural life span, or a tree or even-aged stand that has begun to lessen in marketability value because of size, age, decay, or other factors. The term has little applicability to uneven-aged stands, which consist of trees of diverse ages and stages of development.
- **Overrun.** Actual lumber recovered from a log will likely vary from predicted board feet. Generally, due to thinner saws and more efficient equipment, more limber will be sawn. The increased amount is called overrun and can reach 140% of predicted board footage. A reasonable figure within the Matanuska and Susitna valleys is 110% due to saw blade thickness, small log size, and smaller mills.
- **Partial Cut.** The removal of only part of a stand of trees within a cutting unit.
- **Periodic Sustained Yield.** See Sustained Yield.
- **Personal Use (timber harvest).** Timber harvest for use by the harvester. Wood harvested for personal use may not be sold, bartered, or used for commercial purposes. Personal use wood may not be used to build lodges or other commercial facilities or to heat these faculties during the period of commercial operation. Harvest of wood for personal use may be authorized in designated personal use harvest areas. Generally, personal use areas are located near road access, or near

areas of concentrated remote private recreation or settlement parcels. Designated personal use timber harvest areas may be open for more than one personal use permittee.

- **Pesticide.** Any chemical or biological agent intended for use as an insecticide, herbicide, rodenticide, fungicide, or other biocide.
- **Physical Blockage.** A natural feature or an unauthorized artificial structure that prevents upstream migration of fish.
- **Plan Amendment.** An amendment to a land use plan that permanently changes the plan by adding to or modifying the basic management intent for one or more of the plan's management units or by changing its allowed or prohibits uses, polices, or guidelines for a unit. (See Volume I, Chapter 4; *Implementation and Recommendations*).
- **Planning Period.** The period of time that a land use plan uses for its land uses and resources. In a plan, planning periods are usually 10 to 20 years; however, the plan remains valid until revised.
- **Policy.** An intended course of action or a principle for guiding management actions. Polices are adopted in order to provide specific directions and are adopted by ordinance or resolution. They can also be included (if specifically stated) in land use plans that are adopted by the Assembly.
- **Prescribed Fire.** To deliberately burn wildland fuels in either their natural or their modified state and under specified environmental conditions, which allows the fire to be confined to a predetermined area and produces the fire line intensity and rate of spread required to attain planned resource management objectives.
- **Primary Use**. A designated, allowed use of major importance in a particular management area or unit. Resources in the unit will be managed to encourage, develop or protect this use. Where a unit has two or more designated primary uses, the management intent statement and guidelines for the unit, together with existing laws, ordinances and policies, will direct how resources are managed to avoid or minimize conflict between these primary uses.
- **Prohibited Area**. An area where a use is not allowed.
- **Prohibited Use.** A use not allowed because of conflicts with management intent, designated primary or secondary uses, or management guidelines. Uses not specifically prohibited nor designated as primary or secondary uses. Uses are allowed if compatible with primary and secondary uses, the management intent statements for the unit, and plan guidelines.
- **Put-To-Bed**. A process to stabilize and/or terminate all the use of a road, trail, or other means of access by highway and/or off highway vehicles.
- **Recreation**. Any activity or structure for recreational purposes, including but not limited to hiking, boating, sightseeing, snowmobiling, sport hunting and fishing. Does not refer to subsistence hunting or fishing.
- **Reforest or Reforestation**. The successful reestablishment of commercial tree species following timber harvest.
- **Reforestation Unit or Area.** An area to be reforested by a common system (seedlings, planting, scarification, etc.) that has been separated from adjacent units on the basis of environmental differences which influence the establishment and growth of seedlings.

- **Rehabilitate or Rehabilitation.** Controlling and stabilizing erodible material to the extent feasible, through construction of a control structure, revegetation, or other method.
- **Research Natural Area.** Ecologically representative or unique site maintained in a natural state for education, long-term observation research, and environmental monitoring.
- **Residual Trees.** A commercial tree species left standing in a harvest unit, or other specified area completion of a harvest, which are at least 5 inches diameter at breast height.
- **Residual Stocking Survey.** Is an inventory of commercial tree species that will remain after a timber harvest to determine stocking levels for regeneration requirements and post harvest site preparations such as scarification. A residual stocking survey is required by the State of Alaska in a Detailed Plan of Operations and is performed before harvest begins.
- **Riparian Area:** The area related to and adjacent to a water body. Although used primarily for anadromous waterbodies, this term applies to all waterbodies.
- **Riparian Management Area.** The area managed by the state or borough for the protection, on a long-term basis, of riparian areas. Riparian management standards are found in both land use plans and in the Alaska Forest Resources and Practices Act. These standards apply to all state and borough land unless otherwise excepted.
- **Roads.** There are a wide range of categories and types of roads located in the borough. The definitions that follow are not comprehensive, but do cover the types of roads that could provide access to or within Natural Resource Management Units. For more information, also see Volume I, Chapter 2; *Transportation,* and Volume III, Appendix "H"; *Resource Extraction Roads and Standards.*
  A. Road Categories
     1. Mainline Road. A permanent, year-round road built to provide access to major or important geographic areas. Examples include highways and major arterial roads.
     2. Primary Road. A permanent road provides access to, among other things, within five miles of a Natural Resource Management Unit. Primary roads connect secondary roads to mainline roads. Examples include major collector and minor arterial roads.
     3. Secondary Road. A road constructed and maintained to standards sufficient for resource transportation that, among other uses, provide access to natural resource extraction areas. Secondary roads connect spur roads to primary roads. Examples include minor and local connectors.
     4. Spur Road. As defined by the *Alaska Forest Resources and Practices Act*, is a road constructed for access with a timber or material extraction area. These roads are temporary roads and generally less than one-mile in length. Spur roads connect the cutting units or pits to secondary or occasionally primary roads.
  B. Road Types
     1. Permanent Road. As defined by the *Forest Resources and Practices Act* is a road or structure (bridge, culvert, or other stream crossing structure) that will be left in place for at least seven-years from the date of original construction.

2. Temporary Roads. A road or structure (bridge, culvert, or other stream crossing structure) that will be left in place for a period of less than seven-years from the date of original construction.
3. Winter Road. A temporary road constructed and intended for winter use only when the ground is frozen and snow depth is greater than a specified minimum.

- **Rotation.** The period of years required to establish and grow timber to a specified condition of maturity.
- **Salvage Cutting.** A harvest of trees killed or injured to recover as much useable wood as possible prior to deterioration and decomposition.
- **Sapling.** A live tree 1.0 inch to 5.0 inches in Diameter Breast Height.
- **Saw Timber.** Trees that yield logs suitable in size and quality for the production of lumber. Spruce must be at least 9 inches and hardwoods 11 inches diameter at breast height.
- **Scarification.** Mechanical process of exposing mineral soil on the forest floor in order to enhance the establishment and development of a new forest crop.
- **Seasonal Wildlife Concentration Area.** See Wildlife Concentration Area.
- **Secondary Use.** A designated, allowed use considered important but intended to receive less emphasis than a primary use because it:
    1. has less potential than a primary use or contributes less to achieving the management intent of the unit than a primary use; or
    2. occurs only on limited sites.

  In those very site-specific situations where a secondary use has a higher value than a primary use, the secondary use may take precedence over the primary use but only for a limited area of the management unit. Management for a secondary use will recognize and protect primary uses through application of guidelines, regulations, and procedures. However, if a secondary use cannot take place without detrimentally affecting a primary use in the management unit as a whole, the secondary use will not be allowed. If more than one secondary use is identified in a unit or subunit, the uses are co-secondary. Co-secondary uses must be managed to be compatible with each other.
- **Seed Tree Harvesting.** A harvesting system in which most trees are removed from a stand and openings are created. Openings are similar in size to clear cuts but about 5 – 10 of the best mature trees are left standing grouped appropriately to maximize regeneration effectiveness to provide a genetically high quality seed source for forest regeneration.
- **Seedling.** A live tree less than 1.0 inches in Diameter at Breast Height, or under 10 feet tall.
- **Selective Harvest.** Removal of mature timber, usually the oldest or largest trees, either as single scattered trees or in small groups at relatively short intervals (commonly 5 to 20 years), and possibly repeated by rotating to different areas so that the continuous establishment of natural reproduction is encouraged and an uneven-aged stand is maintained. Selective harvest may also be done prior to clear cutting to remove the higher revenue producing, and/or product specific (veneer, bowls, flooring, house logs, etc.) trees. Selective harvesting includes both single-tree selection and group selection harvesting.

- **Settlement.** Refers to the sale, leasing, or permitting of land to allow private recreational, residential, commercial, or industrial use. Settlement designation refers to the designation of settlement for an area determined to be appropriate for present or future settlement.
- **Shall.** Requiring a course of action or a set of conditions to be achieved. A guideline modified with the word "shall" is required to be followed by resource managers or users. If a guideline constrained by the term "shall" is not complied with, a written decision justifying the variation is required.
- **Shelterwood.** A timber harvesting system in which a series of two or more cuttings are used to ensure regeneration while keeping some cover on the site at all times. Cuttings may be in strips, blocks, or dispersed throughout the harvest area.
- **Should.** Stating intent for a course of action or a set of conditions to be achieved. A guideline modified by the word "should" states the intent of the guideline and allows a resource manager to use judgment and discretion in deciding either:
    1. the specific means for best achieving the intent; or
    2. whether particular circumstances justify deviation from the intended action or set of conditions.

  A woody, perennial plant differing from a perennial A guideline may include criteria for deciding whether such a deviation is justified.
- **Shrub.** herb in its persistent and woody stem, and less definitely from a tree in its lower stature and the general absence of a well-defined main stem.
- **Significantly Reduce.** Making a major versus a minor impact to a use or activity in a management unit or area by not following plan guidelines and / or accepted professional practices that could result in long-term negative impacts to such things, but not limited to, existing wildlife habitat, water resources, and recreational experiences.
- **Silvics.** The study of the life history and general characteristics of forest trees and stands, with particular reference to environmental factors, as a basis for the practice of silviculture.
- **Silvicultural Practices.** The art and science of producing and tending a forest, the application of the knowledge of Silvics in the treatment of a forest, and the theory and practice of controlling and managing forest establishment, composition and ensures the long-term continuity of essential ecologic functions.
- **Single-Tree Selection**. A harvesting system in which harvested trees are selected on the basis of the characteristics of individual trees, such as size, form, and health. Stands managed by single-tree selection have trees of many ages and sizes. Openings in stands managed by single-tree selection are small, usually created by harvesting an individual tree or a few adjacent trees. Single tree harvest is used to remove the highest revenue producing, and/or product specific (veneer, bowls, flooring, house logs, etc.) trees.
- **Site Preparation**. Any activity to prepare land for an activity. Activities could include preparing an area for a campground, public facility, or scarification to prepare a seedbed for natural or artificial seeding.
- **Site Stratification**. The process of dividing harvested, burned or other disturbed land areas into reforestation units based on major environmental characteristics (e.g. site

index, logging method). Areas within the site having the same characteristics receive similar basic management treatment.

- **Skid or Skid Trail**. A route used by tracked or wheeled skidders to move logs to a landing or road.
- **Slash**. Debris left after logging; also, large accumulations of debris after wind or fire. It includes logs, chunks, bark, branches stumps, and broken understory or brush.
- **Snags**. Dead standing trees or portions thereof.
- **Snow Interception Cover**. Snow interception cover is vegetation that reduces snow depths on the ground. Shallower snow reduces and energy needed for wildlife movement. In southcentral Alaska, stands with 70% coniferous trees with a mean height of 35 feet provide optimal snow interception cover. Forest stands with lower proportions of coniferous trees offer proportionally less snow interception cover.
- **Social Resources**. Social elements of the environment, including population, housing, community facilities, religious institutions, social and employment services, cultural and social institutions, government, military installations, and neighborhood cohesion.
- **Softwood.** A general term for a evergreen or coniferous tree (needles with seeds produced by cones) in contrast to a broad-leafed or deciduous tree (lose all their leaves during some time of the year) which are hardwoods.
- **Sound Cull.** A tree that because of rot, curves, or other defects is not suitable for lumber but can be used for pulp and fiber.
- **Special Exception.** A special exception to a land use plan does not permanently change the provisions of the guidelines. Instead, it allows a one-time, limited-purpose variance of the guidelines, without changing their general intent. For example, a special exception might be used to allow a specific timber harvest in a buffer closed to harvesting to control a forest disease or if the Alaska Department of Fish and Game requested the harvest to benefit wildlife habitat.
- **Special Management Zones**. Land within a Natural resource Management Unit or sub-unit where special resource protections are put in place for a specific reason, yet allowing some activities to occur with restrictions. For example, Special Management Zones can be used for wetland protection (allowing some uses to occur when adequate snow cover exists), seasonal wildlife concentration areas, season trumpeter swan staging areas, brown bear denning areas, protecting cultural resources and historical sites, or designating specific areas for certain timber harvest methods and means. Resource extraction and use activities, such as timber harvesting, can occur in these zones conditionally, such as by imposing seasonal restrictions or requiring specific operational methods and means. When creating a Special Management Zone, the management intent and management guidelines for the zone must be clearly defined.
- **Spoil**. Excess material removed as overburden or generated during road or landing construction that is not used within the limits of construction.
- **Stand.** A contiguous group of trees sufficiently uniform in age-class distribution, composition, and structure, and growing on a site of sufficiently uniform quality, to be a distinguishable unit.
- **Standing Water.** A water body, one half acre or larger, that has defined banks but no surface outlet.

- **Stocked Plot.** Any plot or defined area containing one or more established seedlings or advanced growth.
- **Stream.** A perennial flow of water along a defined channel, or an intermittent flow of water along a defined channel that is significant for protection of downstream water quality and productivity.
- **Subunit.** Areas of land that is generally homogeneous with respect to resources, topography, land ownership, and land uses.
- **Sustained Yield.** Is the achievement and maintenance in perpetuity of a high-level annual or regular periodic output of the various renewable resources without significant impairment of their productivity.
- **Thermal Cover.** Thermal cover is vegetation that moderates adverse climatic conditions by providing summer shade and trapping radiant energy I the winter. In south-central Alaska, stands with 70% coniferous trees with a mean height of 35-feet provide optimal thermal cover. Forest stands with lower proportions of coniferous trees offer proportionally less thermal cover.
- **Timber.** A tree, log, pole, bolt, or other wood product.
- **Timber Base.** Borough owned land that has been determined to be Operable Timber Land.
- **Timber Harvest Sizes.**

  A. Small-size timber harvest could produce up to about 100 cords of firewood; or about 13,000 cubic feet of timber. This volume is comparable to what might, on an average, occur on about 10 acres of land.

  B. Medium-size timber harvest could produce up to around 500 cords, or less, of firewood; or 64,000 cubic feet, or less, of timber. This volume is comparable to what might, on an average, occur on up to about 40 acres of land.

  C. Large-size timber harvest would generally be over 500 cords of firewood, or over 64,000 cubic feet of wood. These volumes are comparable to what might, on an average, occur on more than 40 acres of land.
- **Timber Sale.** An agreement or contract authorizing the harvest of timber.
- **Timber Salvage Sale.** The sale of timber resources from borough-owned land scheduled for construction projects, clearing for a public facility or right-of-way, or in an area affected by, but not limited to insects, windstorm, snow breakage, or wildfire.
- **Trap Tree.** Trap trees are living, large diameter spruce which are felled to attract spruce bark beetle. Spruce beetles prefer downed material which they attack more extensively and at a greater mean attack density than they do standing spruce. Trap trees felled into the shade and left unbuckled and unlimbed may absorb up to 10 times the number of beetles a standing tree will. Trap trees will effectively attract beetles from up to ¼ mile away, and less effectively for up to ½ mile away.
- **Tree.** A woody perennial plant, typically large and with a well-defined stem or stems carrying a more or less definite crown.
- **Trumpeter Swan Nesting Sites.** Trumpeter swan nesting sites, including those mapped by the U.S. Fish and Wildlife Service.
- **Upland.** Land that generally has a higher elevation than the adjacent alluvial plain or low steam terrace, or land above the foot-slope zone on a hill-slope continuum.

- **Utility Wood.** Wood not suitable or is not used specialty products (bowls, veneer, cabinets, etc.) or saw logs (lumber, house logs, flooring, etc.) Utility wood includes fire wood, pellets, chips, etc.
- **Value Added.** For forestry, value added is to increase the overall net economic value of forest products through incremental application of additional processes to the forest product that increase its value.
- **Water Bar.** A shallow channel or raised barrier of soil or other material laid diagonally across the surface of a road or skid trail to lead water off the road and prevent soil erosion. Often used to put a road to bed.
- **Well-Distributed**. The distribution of established seedlings or advanced growth over an area of land such that the trees are evenly spaced over the entire area.
- **Wetlands.** Although federal agencies, sates, and text book authors vary in the way in which they define wetlands, in general terms, wetlands are lands on which water covers the soil or is present either at or near the surface of the soil or within the root zone, all year or for varying periods of time during the year, including during the growing season.

  A. Clean Water Act. As defined by Section 404 of the *Clean Water Act* wetlands are "those areas that are inundated or saturated by surface or ground water (hydrology) at a frequency and duration sufficient to support, and that under normal circumstances do support, a prevalence of vegetation (hydrophytes) typically adopted for life in saturated soil conditions (hydric soils). Wetlands generally include swamps, marshes, bogs, and similar areas (40 CFR 232.2(r)".

  B. Jurisdictional Wetlands. Jurisdictional wetlands are those that are regulated by the U.S Army Corps of Engineers[1]. These wetlands must exhibit:

  1. at least periodically, the land supports predominantly hydophytes; and
  2. the substrate is predominantly undrained hydric soil; and
  3. the substrate is non-soil and is saturated with water or covered by shallow water at some time during the growing season of each year.

  C. Important Wetlands. Wetland areas that exhibit one or more of the three attributes of Jurisdictional Wetlands and that are proven to be important for fish and wildlife.
- **Wildlife.** See Fish and Wildlife.

[1] Wetlands in this category must exhibit all three characteristics: hydrology, hydrophytes, and hydric soils. It is important to understand that some areas that function as wetlands ecologically, but exhibit only one or two of the three characteristics, do not currently qualify as Corps of Engineers jurisdictional wetlands. Such wetlands may perform valuable functions. While not "jurisdictional", the Environmental Protection Agency uses the same definition. The U.S. Fish and Wildlife Service defines wetlands as having one or more of the attributes as anyone or more of the attributes could serve as an ecological unit.

- **Wildlife Concentration Area**. Area in which the density of animals of a given species exceeds the density of that species in the surrounding area and is necessary for the health and perpetuation of the local population.
- **Wildlife Corridors**. Defined corridors, similar to transportation corridors that are reserved or protected for the movement of wildlife.
- **Wildlife Species of Concern**. Wildlife, such as, but not limited to, brown bears, martin, eagles and trumpeter swans. Wildlife Species of Concern may be identified by the Alaska Department of Fish and Game on an area or site specific basis. The definition also includes important habitat for the species.
- **Will.** Used interchangeably with and meaning the same as "shall" (see definition above).
- **Yarding.** The process of pulling or skidding logs to a centralized point or landing where they are piled prior to loading or hauling away.
- **Years 1 – 5**. In the Five-Year Timber harvest Schedule, year 5 is the fifth year and year 1 is the first year proposed timber harvests appear on the schedule. No timber harvests can occur unless they are on the Five-Year Timber Harvest Schedule as approved by the Borough Assembly, although harvests may occur in any year as long as the area being harvested for more than one-year.

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Appendix A

Land Use Classifications and Designations

Land Use Classifications

The following are land-use classifications, contained in Borough Code (MSB 23.05.100), and are available for use in classifying various types of land designated for various purposes. Changes are proposed to some of these definitions in this plan (See Volume I, Chapter 4; *Implementation and Recommendations*).

- "**Agricultural lands**" are those lands which, because of soils, location, physical or climatic features, or adjacent development, are presently or potentially valuable for the production of agricultural crops.

- "**Commercial lands**" are those lands which, because of location, physical features, or adjacent development, are presently or potentially valuable for trade and commerce.

- "**Forest management lands**" are those lands which, because of physical, climatic, and vegetative conditions, are presently or potentially valuable for the production of timber and other forest products. Forest management shall emphasize the multiple use concept.

- "**General purpose lands**" are those lands, which, because of physical features, adjacent development, location, or size of the area, may be suitable for a variety of uses, or which do not lend themselves to more limited classification under other land designations.

- "**Grazing lands**" are lands which have physical and climatic features which make it primarily useful for the pasturing of domestic or semi-domestic livestock.

- "**Homestead lands**" are lands made available for personal residential use under the borough's homestead program.

- "**Industrial lands**" are lands which, because of location, physical features, or adjacent development, are presently or potentially valuable for industrial, manufacturing, or warehousing purposes.

- "**Land bank lands**" are those lands for which specific long-term uses have not yet been determined but, due to the land's surface and sub-surface resources, are suitable for management utilizing the multiple use concept during the near term.

- "**Material lands**" are those lands which are chiefly valuable for earth materials, including, but not limited to, sand, gravel, soil, peat moss, sphagnum, stone, pumice, cinders, and clay, where the removal of the material would seriously interfere with utilization of the lands for other purposes.

- "**Mineral lands**" are those lands which are chiefly valuable for minerals, including, but not limited to, coal, phosphate, oil, shale, sodium, sulphur, and potash, where the removal of the material would seriously interfere with the use of surface of the land.

- "**Private recreation lands**" are those lands which, because of location, physical features, or adjacent development, are presently or potentially valuable as outdoor recreational areas and may be best utilized by private development.

- "**Public recreation lands**" are those lands which, because of location, physical features, or adjacent development, are presently or potentially valuable to the public as natural or developed recreational or historic areas.

- "**Reserve use lands**" are those lands which have been transferred, assigned, or designated for present or future public use, or for use by a government or quasi-government agency, or for future development of new town sites, or for future expansion of existing public uses.

- "**Residential lands**" are those lands, which, because of location, physical features, or adjacent development, are presently or potentially valuable for either single family or multifamily dwellings.

- "**Resource management lands**" are lands which, because of surface or subsurface resources contained within the land or in connection with adjacent lands, are presently or potentially valuable to multiple use management. Such management may be accomplished in whole or in part pursuant to an interagency agreement.

- "**Watershed lands**" are lands that may be forested at a high or moderate relief which will direct water to low lying areas covered or saturated by surface or groundwater sufficient to normally support vegetation found in areas such as riparian, swamps, marshes, bogs, estuaries, and similar area.

- "**Wetland bank lands**" are lands which, because of location and physical features, are presently or potentially valuable for wetland mitigation banking.

Land Use Designations

Land use designations are categories of land determined though a land use plan. Land use designations can be for either a primary or secondary use.

- **Agriculture (Ag)** Land that is agricultural or that, by reason of its climate, physical features, and location, is suitable for present or future agricultural cultivation or development and that is intended for present or future agricultural use.

- **Forestry (F)** Land that is or has been forested and is suited for long-term forest management because of its physical, climatic, and vegetative conditions. This land will remain in public ownership.

- **Habitat (Ha)** Those areas that are important, but have not been designated as "critical" to the life cycle of animals, birds and fish. They serve as a concentrated use area for fish and wildlife species during a sensitive life history state where alteration of the habitat and/or human disturbance could result in a loss of healthy and diverse local populations. This designation, when used, applies to localized areas having particularly valuable or sensitive habitat. The designation does not preclude human uses that are compatible with natural resources being managed for the benefit of fish and wildlife.

- **Materials (Ma)** Sites suitable for extraction of materials, which include common varieties of sand, gravel, rock, peat, pumice, pumicite, cinders, clay, and sod. This land will remain in public ownership until the material on the site is no longer required for public purposes (such as road construction and maintenance, materials storage, and public facilities) after which these lands may be used for alternative purposes. These lands cannot be sold and cannot be used for an alternative use without redesignation and reclassification.

- **Public Recreation-Concentrated (PRc)** Areas used by concentrations of recreationists or tourists relative to the rest of the planning area or areas with a high potential to attract concentrations of people who recreate and tourists. These areas offer localized attractions or ease of access, and in some instances may include semi-developed facilities. Examples include scenic overlooks, road-accessible locations that are used for picnicking, sports fishing, etc. The recreation and tourism uses for which these units are designated may be either public or commercial. This land will remain in public ownership unless otherwise noted in the management intent for the unit. The primary management intent for these sites is to protect the opportunity of the public to use these sites, and their public values for recreation. Many of these sites require additional management attention because of the use they are receiving.

- **Public Facilities-Developed (PRde)** These sites are reserved for a specific infrastructure to serve public interests. Examples include developed campgrounds, lodges, visitor centers, ski lodges and lifts, etc. These units are usually classified as Reserved Use Land and shall remain in public ownership.

- **Public Recreation-Dispersed (PRdi)** This designation applies to those areas that offer or have a high potential for dispersed recreation or tourism and where desirable recreation conditions are scattered or widespread rather than localized. Developed facilities are generally not necessary other than trails, trail signs, primitive campsites, and other minor improvements. This land will be retained in public ownership.

- **Resource Management (Rm)** Land that contains one or more resource values, none of which is of sufficiently high value to merit designation as a primary use, or, because size of the parcel, a variety of uses can be accommodated with appropriate siting an design controls. Resource management may also apply where there is a lack of resource, economic, or other information with which to assign a specific land use designation, and/or the lack of current demand implies that development is unlikely within the planning period.

- **Settlement (Se)** This designation applies to uplands suitable for sale, leasing, or permitting to allow private recreational or residential use. This designation will generally be used for areas appropriate for land offerings for residential or private recreational uses. Unsettled or unsold land in the unit will be managed for uses compatible with settlement. This may include uses such as selling additional lots, laying out new subdivisions, identifying greenbelts through subdivisions, reserving materials sites for subdivision roads and building lots, placing easements on access routes, or reserving lots for community facilities and open space.

- **Water Resources (Wr)** This designation applies to areas of important water sources and watersheds. The intent is to retain these lands in public ownership and to maintain them in an undisturbed, natural state. This land will be retained in public ownership. Authorizations within areas designated Water Resources are not to be considered appropriate unless necessary for public health and safety. Utilities and roads may be appropriate with appropriate design if wetland and water resource functions can be maintained. Seasonal (winter) activities may be permitted to occur once sufficient snow cover is present.

- **Wetlands (Wt)** This designation applies to areas determined to be important wetlands. Important wetlands are those areas that exhibit one or more of the following attributes, and that are proven to be important for fish and wildlife:
    1. at least periodically, the land supports predominantly hydrophytes; or
    2. the substrate is predominantly undrained hydric soil; or
    3. the substrate is non-soil and is saturated with water or covered by shallow water at some time during the growing season of each year.

These lands shall be retained in public ownership with the intent to maintain them in an undisturbed, natural state. Authorizations within areas designated Wetlands are not be considered appropriate unless necessary for public health and safety. Utilities and roads may be appropriate with appropriate design if wetland resource functions can be maintained. Seasonal (winter) activities may be permitted to occur once sufficient snow cover is present.

Appendix B

Best Interest Finding General Format

The following outline is the general format that may be used for decision relating to a land or natural resource decision. A similar format may be used for a decisions relating to a policy, guideline, special exception, minor change, or other discretionary decisions, deleting the property site factors unless necessary for making a decision.

I. Summary of Proposed Action
II. Property Site or Issue Factors
    A. Location
    B. Legal Descriptions
    C. Land Status
    D. Restrictions
        1. Land Classification
        2. Land Use Plans
        3. Title Restrictions
        4. Covenants
        5. Zoning
        6. Easements & Other Reservations
    E. Current Land Use
    F. Surrounding Land Use
    G. Existing Infrastructure
    H. Soils & Terrain
    I. Coastal Management
    J. Resources
    K. Assessment
IV. Public Review Comments
V. Analysis and Discussion
VI. Preliminary Recommendation
VII. Board and Commission Comments & Recommendations
VII. Final Recommended Decision

Appendix C

1990 Forest Management Units

Forest Management Units, are those included in the "Multiple-Use Forest Management Plan Including Land Classification Report" (July 1989) which was adopted by the Borough Assembly in 1990 (Ordinance Serial No. 90-020 and AM 90-071). These areas are shown on the map on the following page of this appendix.

Since the 1989 plan was adopted, some of the land within these original Forest Management Units were re-classified for other uses. In addition, some of these areas are no longer in Borough ownership.

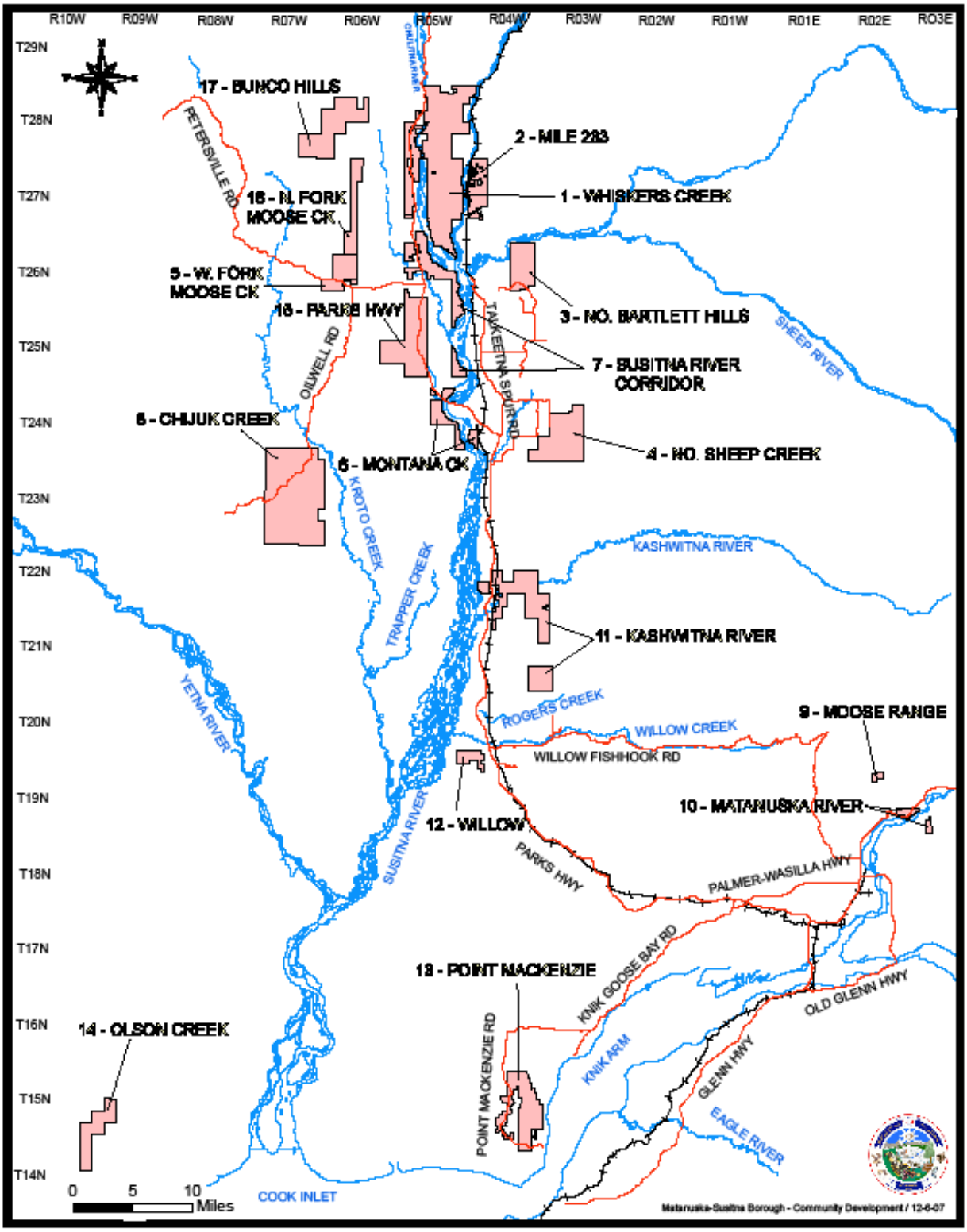
The land in Unit 9 (Moose Range containing approximately 80 acres) and Unit 16 (Moose Creek containing approximately 7,200 acres) were placed by the Alaska State Legislature into Legislatively Designated Areas; Matanuska Valley Moose Range and Susitna Basin Recreational Rivers respectively. As part of a land exchange with the State of Alaska, the borough classified these lands as "Reserved Use/Public Recreation" and conveyed them to the state.

Approximately 2,000 acres on the northern end of the Whiskers Creek Forest Management Unit (Unit 1) was sold and conveyed to the Great Alaska Council of the Boy Scouts of America for use as a High Adventure Boy Scout Camp.

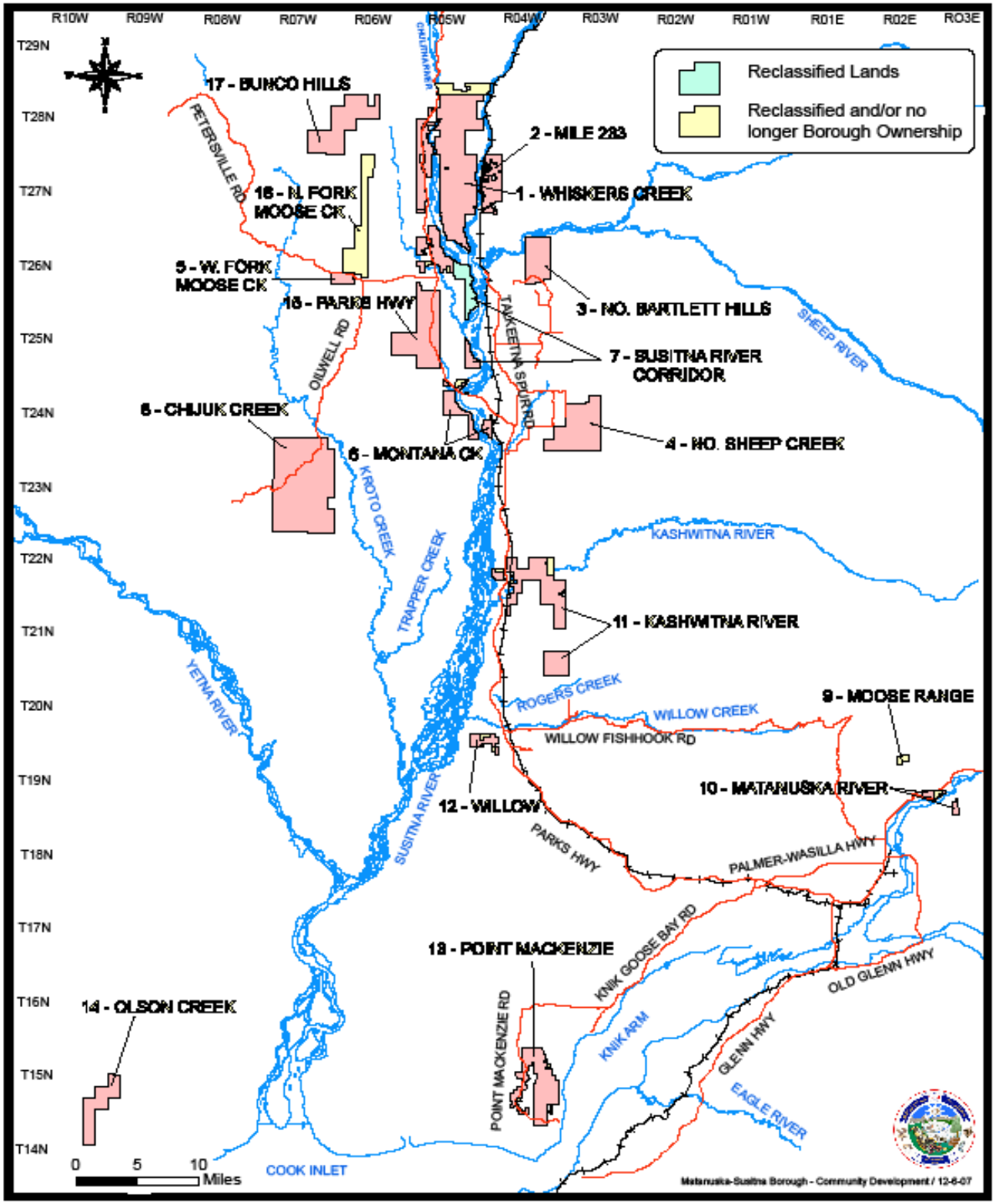
Another 2,000-acre tract of land along the Susitna River in the southern portion of the Susitna River Corridor Unit (unit 7) was re-classified as "Reserved Use/Public Recreation" to be managed for their historic and high-use public recreation values.

The map on page 25 (Current Status of Original Forest Management Units) shows the general location of these areas.

There are other smaller parcels of land within the 1990 Forest Management Units that have been re-classified as well.

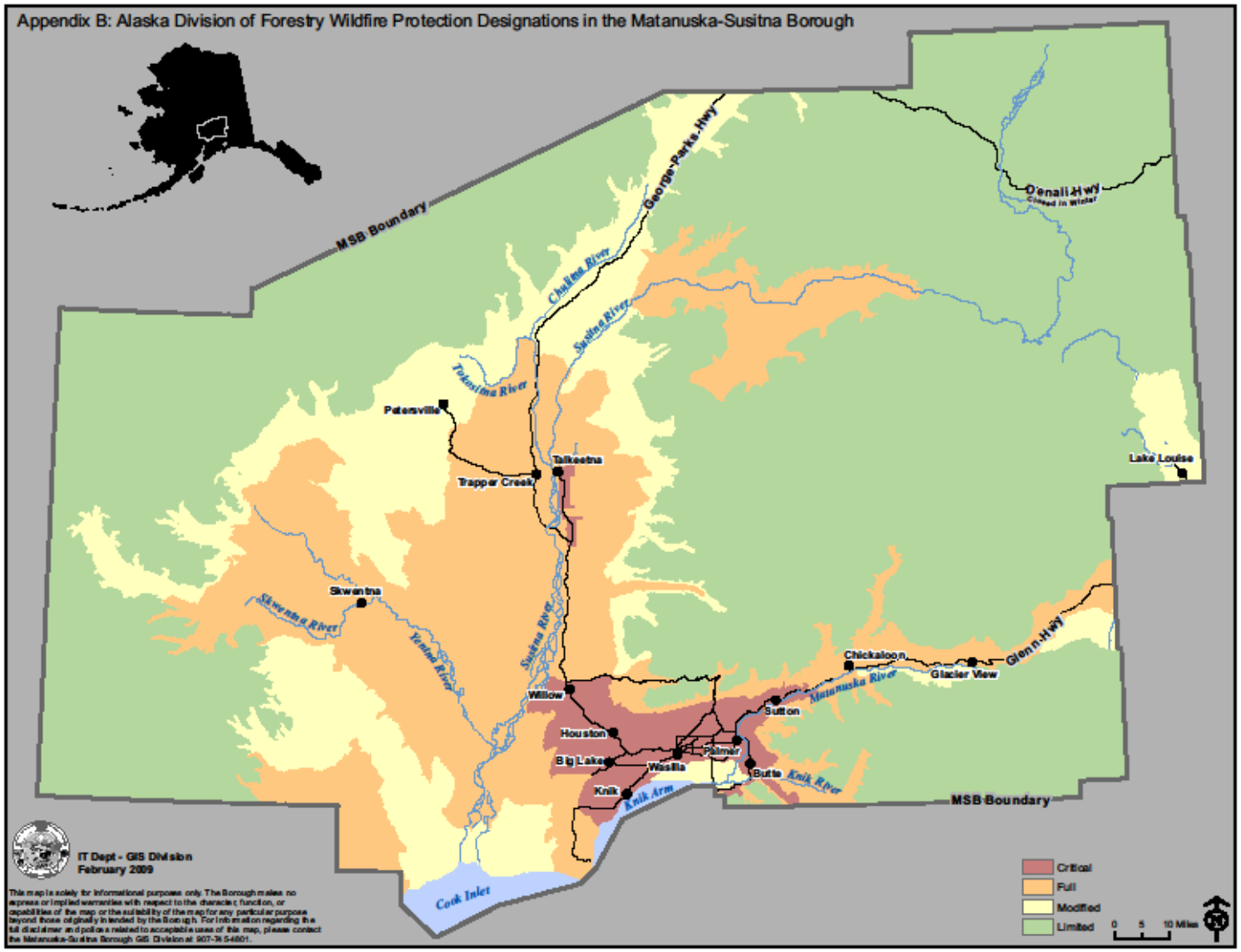


ORIGINAL FOREST MANAGEMENT UNITS



Current Status of Original Forest Management Units

Appendix D
Fire Protection Zones in the Mat-Su Borough



Appendix E

Riparian Buffers

The following is a compilation and diagrams of the mandatory riparian buffers for Region II (includes all of the Matanuska-Susitna Borough) that are required by the Forest Resources and Practices Act as of June 2007, and when this plan was adopted. See AS 41.17.119, AS 41.17.118(2)(A)-(F), and 11 AAC 95.260-.280 for current requirements. Besides for timber harvest, these buffers shall apply to all land where natural resource extraction or other development activities occur on all borough-owned land within Natural Resource Management Units covered by this plan.

1. Along a Type II-A water body, harvest of timber may not be undertaken within 150 feet of the water body; additionally, harvest of timber may not be undertaken along outer bends subject to erosion within 225 feet of the water body or to the terrace top break, whichever is smaller.

A type II-A water body is a non-glacial stream greater than 50 feet wide that has anadromous or high value resident fish and that has an unconfined and dynamic channel; and that typically has point bars, islands, scour planes, active or recent side channels, and areas of obvious bank erosion.

2. Along a Type II-B water body, harvest of timber may not be undertaken within 150 feet of the water body; additionally, harvest of timber may not be undertaken along outer bends subject to erosion within 325 feet of the water body or to the terrace top break, whichever is smaller.

A type II-B water body is a glacial stream that has anadromous or high value resident fish and that is not a glacial Type II-C water body.

3. Along a Type II-C water body, harvest of timber may not be undertaken within 100 feet of the water body.

A type II-C water body is a water body that has anadromous or high value resident fish that A) is a non-glacial water body greater than 3' wide and ≤ 50' wide at ordinary high water mark that has an unconfined and dynamic channel; B) is a non-glacial water body greater than 3' wide at ordinary high water that has a confined channel; OR C) is a lake or pond (defined as a confined fresh water body with perennial water, defined shorelines, and an identifiable inlet and outlet; and a confined fresh

water body with perennial standing water and defined shorelines, and without an identifiable inlet or outlet, if the water body contains a population of anadromous or high value resident fish).

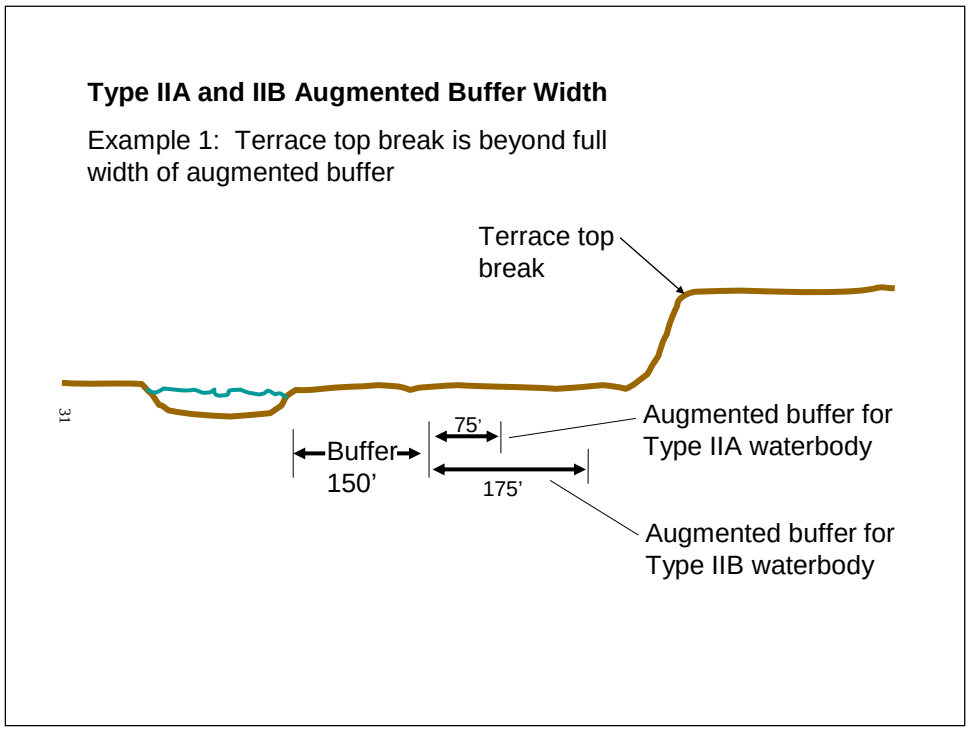
4. Along a Type II-D water body, a 100-foot riparian area, harvest of timber may not be undertaken within 50 feet of the water body.

A type II-C water body is a non-glacial stream that is ≤ 3' at ordinary high water that has anadromous or high value resident fish.

5. The length of the augmented buffer along an outer bend subject to erosion in (1) or (2) above must be equal to a distance eight times the steam width measured on a reach between bends at a point not widened by a point bar or channel movement; the augmented buffer must be located so that three steam widths are upstream and five steam widths are down steam of the point opposite the apex of the point bar.

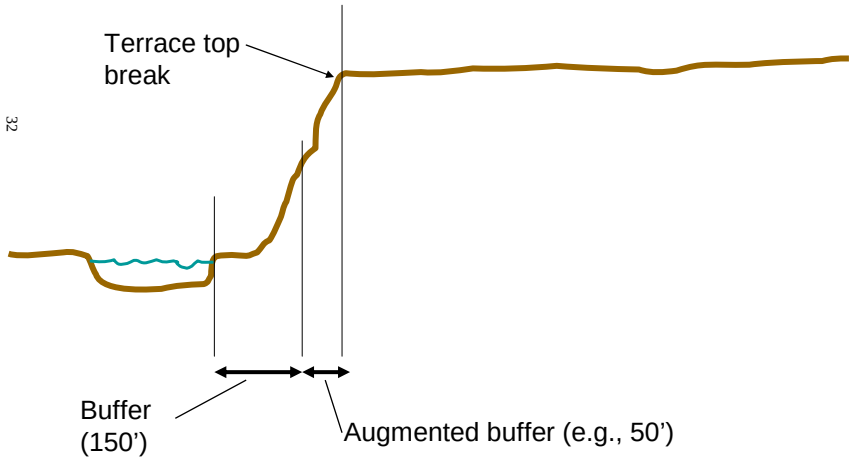
6. Where an estuarine area is adjacent to an anadromous or high value resident fish water body, the riparian retention area for the adjacent water body applies to the estuarine area.

7. Along type II-A, II-B, II-C, and II-D water bodies, harvest of timber may occur between the landward extent of the riparian retention area and 300 feet from the water body, consistent with the maintenance or enhancement of important wildlife habitat as determined by the state forester with due deference to the deputy commissioner.



Type IIA and IIB Augmented Buffer Width

Example 2: Terrace top break is within augmented buffer - buffer ends at terrace top



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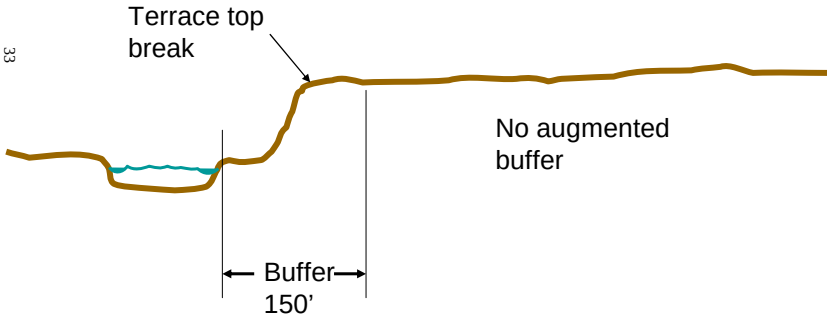
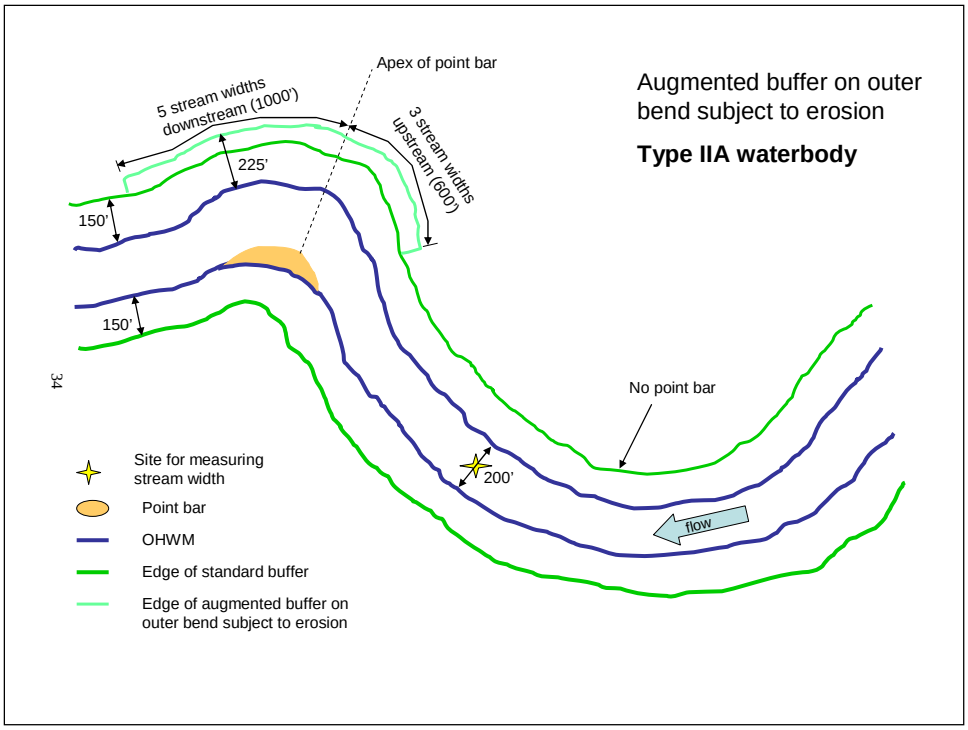
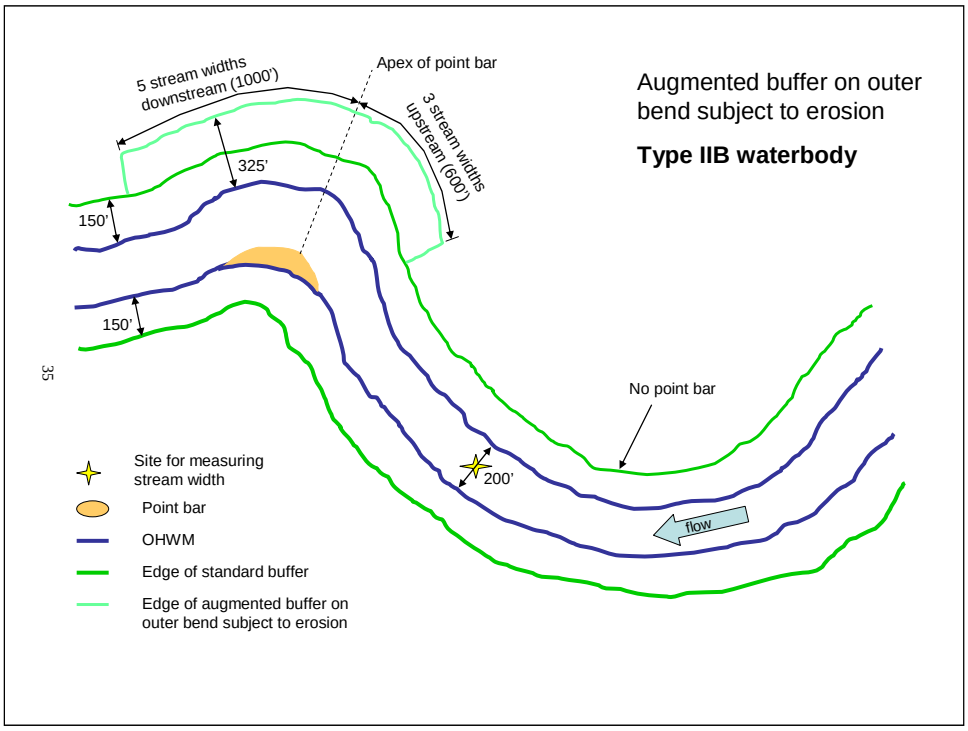
Type IIA and IIB Augmented Buffer Width

Example 3: Terrace top break within buffer – no augmented buffer



33


Augmented buffer on outer bend subject to erosion
Type IIA waterbody
Apex of point bar
5 stream widths downstream (1000')
3 stream widths upstream (600')
225'
150'
150'
No point bar
200'
flow
Site for measuring stream width
Point bar
OHWM
Edge of standard buffer
Edge of augmented buffer on outer bend subject to erosion
34


Augmented buffer on outer bend subject to erosion
Type IIB waterbody
Apex of point bar
5 stream widths downstream (1000')
3 stream widths upstream (600')
325'
150'
150'
No point bar
200'
flow
Site for measuring stream width
Point bar
OHWM
Edge of standard buffer
Edge of augmented buffer on outer bend subject to erosion
35

Appendix F

Recreational Opportunities Spectrum

Borough owned Natural Resource Management Units offer opportunities for recreation in a variety of settings. The major types of opportunities are described below. The type of opportunity available may vary by season. For example, an area intensively used during the hunting season may get little use during the rest of the year. This area would offer a semi-traditional opportunity during the busy hunting season and traditional opportunities in the summer. As can be seen from the examples below, a wide variety of activities can take place in each setting.

CHARACTERISTICS	EXAMPLES OF AREAS OFFERING THIS OPPORTUNITY	EXAMPLES OF ACTIVITIES IN THIS SETTING
TRADITIONAL		
• Little modification to the natural environment. • Low levels of encounters with other people and signs of human use. • No facilities for human use. • Highest levels of physical challenge and risk. • Highest outdoor skill levels needed. • Much of the recreation uses motorized access. • No roads.	Most of the remote Natural Resource Management Units.	Snowmobiling. Fly-in or hike-in fishing and hunting. Dispersed hiking, cross-country skiing, dog mushing.

CHARACTERISTICS	EXAMPLES OF AREAS OFFERING THIS OPPORTUNITY	EXAMPLES OF ACTIVITIES IN THIS SETTING
SEMI-TRADITIONAL		
• Little modification to the natural environment. • Moderate levels of encounters with other people and signs of human use. • Limited facilities for human use (portage trails, bridges, pit toilets). • High levels of physical challenge and risk. • Much of the recreation uses motorized access. • No roads.	Boatable rivers. Trail systems. Areas near access by Glenn Highway, Parks Highway and Petersville Road.	Boating and rafting. Hiking, skiing, and dog mushing on trail systems. Snowmobiling. Hunting and fishing. Flight seeing. Fly-in lodges.
SEMI-PRIMITIVE		
• Little modification to the natural environment. • Moderate levels of encounters with other people and signs of human use. • Limited facilities for human use (portage trails, bridges, pit toilets, scattered lodges). • High levels of physical challenge and risk. • High outdoor skill levels needed. • Recreation use during the busiest season is non-motorized, except for drop off by airplane. • No roads	Rivers and streams that can be boated, floated or canoed such as the Susitna River, Chulitna River, Moose Creek, etc.	Canoeing and rafting. Hiking, skiing, and mushing on trail systems. Fly-in or hike-in fishing. Flight seeing. Fly-in lodges.

CHARACTERISTICS	EXAMPLES OF AREAS OFFERING THIS OPPORTUNITY	EXAMPLES OF ACTIVITIES IN THIS SETTING
ROADED NATURAL		
• Isolated resource development present (seasonal or year-round roads, mining, timber harvesting, oil and gas wells). • High levels of encounters with other people and signs of human use. • Some facilities for convenience of users. • Moderate to low levels of physical challenge and risk. • Low outdoor skill levels needed.	Petersville and Oilwell road corridors. Montana Creek Road and connecting road corridors. Portions of Parks Highway north of Willow. Developed recreation sites. Alaska Railroad north of Willow.	Sightseeing. Picnicking Swimming. Walking, skiing, snowmobiling on seasonal roads. Bicycling. Fishing and hunting on road accessible streams. RV and tent camping in campgrounds. Railroad or bus tours.
• Intensively developed (year round roads, residential and commercial areas). • Highest levels of encounters with other people and signs of human use. • Many facilities for user convenience and comfort. • Lowest levels of physical challenge and risk. • Lowest outdoor skill levels needed.	Residential and commercial areas along Parks and Glenn Highways. Agricultural areas. Communities. Borough or city parks.	Sightseeing. Souvenir shopping. Bus tours. Waterskiing, jet skiing, and boating. Walking in residential areas and developed parks.

Appendix G

Resource Extraction Road Standards

There shall be no permanent roads constructed without prior approval from the Matanuska-Borough Assembly. The Matanuska-Susitna Borough's Public Works Department and the Borough's Subdivision Manual shall be consulted if any permanent roads are to be built.

The following road standards are provided for constructing temporary[2] roads[3] used for various resource management and extraction activities immediately to and within Natural Resource Management Units.

While these standards are not "rules" that must be followed, they do provide guidance for roads planned to be used for resource extraction or development activities. While in the field, best management practices may be used if the following standards are not feasible and prudent.

	Temporary All-Season Road Secondary Road	Temporary All-Season Spur Road	Temporary Secondary Winter Road	Temporary Winter Spur Road
Level of Use	Light to moderate. Year round.	Light.	Light to moderate.	Light to moderate.
Curve Radius	100' normal design. 60' minimum[4].	Same as temporary all-season road.	Same as temporary all season road.	Same as temporary all season road.
Grade	15% maximum favorable. 10 % maximum adverse.	20% maximum.	Same as temporary all- season road.	Same as temporary all- season road.
Drivable Surface	12' – 16' width.	10' – 16' width	Same as temporary all- season secondary road.	Same as temporary all season spur road

[2] The Alaska Forest Resources & Practices Act allows temporary roads for up to 7-years to allow for timber harvest reforestation operations and monitoring. Temporary roads for other resource extraction activities, such as sand and gravel, shall be "put to bed" immediately after extraction activities and reclamation has occurred.
[3] It is expected that only secondary and spur roads will be used. A secondary road provides access to natural resource extraction areas. Secondary roads connect spur roads to primary rods. Examples include minor and local connectors. Spur roads are temporary roads, generally less than one-mile in length. Spur roads connect the cuttings units or pits to secondary or occasionally primary roads.
[4] To be applied only under topographically limiting conditions.

	Temporary All-Season Road Secondary Road	Temporary All-Season Spur Road	Temporary Secondary Winter Road	Temporary Winter Spur Road
Turnouts	Not required if at least 18' width drivable surface. Otherwise: 1,000' maximum interval; intervisible, 25' ingress and 50' egress . 12' width.	Not required.	Same as temporary all-season road.	Not required.
Cut and Fill	Fill slope castings 1 ½ : 1 angle maximum. Cut slopes at 1:1 angle maximum, except that loess soils may be cut vertically. (Also see 11 AAC 95.290(c).	Avoid where feasible. Exceptions will be identified in Plan of Operations and Forest Land Use Plan.	Avoid where feasible. Exceptions will be identified in Plan of Operations and Forest Land Use Plan.	Avoid where feasible. Exceptions will be identified in Plan of Operations and Forest Land Use Plan.
Clearing[5]	5' beyond cuts or fills, or minimum of 30' width. Merchantable timber cut and decked ahead of construction.	Minimum 12'. Merchantable timber cut and decked ahead of construction.	Minimum 12'. Merchantable timber cut and decked ahead of construction.	Minimum 12'. Merchantable timber cut and decked ahead of construction.
Grubbing	Removal of stumps, roots, and organics from the road bed to outside of ditches unless top of stumps under 2' of fill.	Under drivable surface.	Same as temporary all-season spur road.	Under drivable surface.
Debris Disposal	If at least 2' beyond ditches, may be windrowed or placed in push-outs. If closer, buried under at least 1' of fill.	Use windrowing or push-out techniques as appropriate.	Same as temporary all-season spur road.	Same as temporary all-season spur road.
Permafrost and Ice Lenses	Avoid exposing thaw-unstable permafrost of ice lenses through routing or using raised fill construction. If exposed, minimize sedimentation with effective erosion control measures (also see 11 AAC 95.290(c).	Avoid expose of thaw unstable permafrost and ice lenses. If exposed, stabilize by treating with effective and appropriate measures such as recovering exposed soils, seeding, drainage structures, and settling basins. (See also 11 AAC 95.290 (c), (g); 295(g)	Same as temporary all-season spur road.	Same as temporary all-season spur road.

[5] Minimum is used for safety and snow storage reasons.

	Temporary All-Season Road Secondary Road	Temporary All-Season Spur Road	Temporary Secondary Winter Road	Temporary Winter Spur Road
Ditches	Block ditch on downhill side of culvert inlet where needed.	As needed.	None.	None.
Culverts	Minimum diameter 12' except as stated in 11 AAC 95.295. Installed at natural stream gradient.	Same as temporary all-season road.	Same as temporary all-season road.	None.
Maintenance	Maintained per 11 AAC 95.315. Grading and ditching as necessary. Closed after use.	Maintained per 11 AAC 95.315. Grading and ditching as necessary. Closed after use.	Maintained per 11 AAC 95.315 (c) after active logging use. Open drainages before breakup.	Maintained per 11 AAC 95.315. Grading and ditching as necessary. Closed after use.

Appendix H

Forest Research and Study Areas

The following are identified sites where data is currently being collected for scientific research.

- Matanuska Experiment Farm

The Matanuska Experiment Farm includes 800 acres of forest land dedicated to forest research or demonstration. The Farm is located off Trunk Road. Contact: Phyllis Craig, Palmer, Alaska.

- Various Mat-Su Forest Areas

Project involves long-term forest growth and yield research including 54 plots (162 sub-plots) located throughout the MSB. MSB permits have been issued for all plot locations. Research areas need to be mapped so they can be protected and preserved for the duration of the project. Contact: Tom Malone, Research Forester, University of Alaska, Fairbanks, Alaska.

- Willer-Kash Area

A long-term forest practices effectiveness monitoring study has been established to evaluate riparian zone management and water quality protection associated with commercial timber harvest on State of Alaska lands. Four field study areas are located in Section 25, T21N, R3W and Sections 8, 17, T20N, R3W, Seward Meridian. Study participants include the Alaska DNR Division of Forestry, Alaska Department of Environmental Conservation, and Aquatic Restoration and Research Institute, a private consulting firm located in Talkeetna, Alaska. Contact: Laura K. Eldred, Alaska Department of Environmental Conservation, Anchorage, Alaska.

- Petersville Area

A white spruce and alder growth study area was established approximately ½ mile south of mile 5 on the Petersville Road (62°18’32”N, 150°22’53”W). The original purpose of the study has been completed, but planted white spruce trees and alder shrubs exist on-site and are available for future monitoring of growth and survival. The study was conducted by USDA State and Private Forestry. Contact: Forest Ecologist, State and Private Forestry, Fairbanks, Alaska.

- Willow Experimental Forest

Research includes long-term reforestation and tree thinning studies conducted by the Alaska DNR, Division of Forestry. The Forest contains 320 acres located in E1/2 Section 25, T18N, R2W, Seward Meridian. Contact: Jeff Graham, Forest Stewardship Coordinator, Alaska DNR, Division of Forestry, Palmer, Alaska.

- Mike Peacock Demonstration Forest

Research includes long-term reforestation studies conducted by the Alaska DNR, Division of Forestry. Research/study areas are located east of the Parks Highway, off of the Zero Lake Road. Contact: Jeff Graham, Forest Stewardship Coordinator, Alaska DNR, Division of Forestry, Palmer, Alaska.

- Palmer Hayflats Area

A long-term alder die-back study area is located west of the Glenn Highway and north of Rabbit Slough Road. Research is conducted by USDA State and Private Forestry. Contact: Pathologist, USDA State and Private Forestry, Anchorage, Alaska.

- Cook Inlet Basin Area

Permanent forest inventory plots are located at various points within the borough. Research is conducted by the US Forest Service Pacific Northwest Research Station, Forestry Sciences Laboratory. Plots are re-visited approximately every 10 years. Contact: Willem W. S. van Hees, Team Leader, Alaska Resource Analysis, Pacific Northwest Research Station, Forestry Sciences Laboratory, Anchorage, Alaska.

- Previous MSB Timber Sale Areas

Sample plots have been established in areas harvested under previous Borough timber sales, GPS locations for the plots will be mapped so plots can be protected and preserved for future study. Term of the study is at least until Alaska Forest Resources and Practices Act regeneration requirements are fulfilled. Contact: Debby Broneske, Resource Management Specialist, Community Development Department, Matanuska-Susitna Borough, Palmer, Alaska.

Appendix I

Timber and Lumber Conversions with Examples

The following conversions are approximate, and in many cases were generated from field studies and inspections, manufacturing results, and reports from loggers, scalers and builders. In some cases the numbers given were derived from averages over a representative sample.

Volumes

- Cord = 128 Cubic/Feet of split wood stacked 4' x 4' x 8', includes voids. The cubic/foot of actual wood varies (approximately 100 cubic feet).
- Cord = 100 cubic/feet of solid logs
- Cubic/foot = 2.6 board feet
- 429 Cubic/feet(average) = 2,000 pounds (short ton)
- Cunit = 100 cubic/feet of solid wood

Weights

- Aspen = 50 pounds per cubic/foot
- Birch = 55 pounds per cubic/foot
- Black Spruce = 45 pounds per cubic/foot
- Cottonwood/Poplar = 50 pounds per cubic/foot
- White Spruce= 33 pounds per cubic/foot
- Average all species = 47 pounds per cubic/foot

Logging Truck Loads

- 22 to 25 short tons of wood
- 7 - 9 cords of firewood
- About 35 pieces of white spruce (with 25 to 50 normal variation) or 35 pieces of birch (more variable due to poor form of boles and varying defect.
- MSB forests average approximately 1,700 cubic/feet on a typical acre; or approximately 17 cunits (one cunit equals 100 cubic/feet); or 18 to 19 cords of wood. Most cords in the borough have 80 to 90 cubic feet of solid wood (and bark) within the 4' x 4' x 8' = 128 gross cubic/feet per cord.
- Averaging all species of wood, approximately 1.69 truck loads would be needed to haul the equivalent of 1 acre of forest products
- Loggers contacted in 2009 were willing to quote log truck load values at $900 to $1,200 per load for birch and spruce. Depending on species, location, and overall sale volumes (e.g., a single load usually was quoted higher than ten truck loads). Currently there is no commercial market for significant quantities of aspen, cottonwood/poplar and black spruce so no truck load quotes were available.
- If a load of birch measures 1,000 cubic feet of wood, and is quoted at $1,000 per truck load, this is a value of $1 per cubic foot of solid wood (plus bark).
- A load of spruce sawlogs quoted at $1,000 is $250 per MBF (4 MBF per truck, in the forest).
- Transportation costs are generally quoted by the hour or driving mile. A truck renting for $120 per hour with an operator and fuel, driving an average speed of 50 miles per hour results in a cost of $2.40 per driving mile.

General Examples

16' x 16' x 8' log house or cabin (no floor, no ceiling or roof and no windows) requires 20 ft. logs (12' small end and 16" long end). Such a house or cabin would require 44 logs at 21 cubic/feet per log or a total of 960 cubic/feet. With an average of 7 spruce per acre it would take roughly 6 acres to produce the necessary trees.

Framing the walls (no floor, no ceiling or roof and no windows) using (2" x 6") construction for a similar sized 256 square foot house or cabin would require 736 lineal feet of 2" x 6" 's or 736 board feet (61 cubic feet).

Appendix J

Silvics of North America

Although there are numerous publications by federal, state, local, and private sources, one of the most commonly used "encyclopedias" of silvicultural characteristics is published by the U.S. Forest Service and commonly called the Silvics Manual. Its more proper title is:

Silvics of North America
Department of Agriculture, Forest Service
Agriculture Handbook #654 – 2 volumes
Superintendent of Documents – 1990

This is an expensive document for most libraries, so you may be better served by viewing it online. The following instructions should get you there.

1. On your browser enter: http://www.na.fs.fed.us

2. On the left side of the resulting screen, in the search box, enter "silvics manual".

3. The document is in two volumes.

The first entry on the list you will see is silvics manual-volume 2-Hardwoods. For the borough *Forest Management Plan,* you will find information about Paper Birch, Cottonwood, and Aspen in this volume.

The second entry on the list will be silvics manual-volume 1 – softwoods. For the borough *Forest Management Plan* you will find information about Black and White Spruce in this volume.

4. For example, if you want to the information about Paper Birch (Betula papyrifera). click on the first entry on the list. The table of contents will then appear.

5. Select Betula papyferia or Paper Birch.

The following pages are a download copy of what you will find for Paper Birch, including the bibliography.

As you become more familiar with the layout of the Silvics Manual you will find listings by common name and more.

Betula papyrifera Marsh.

Paper Birch[6]

Betulaceae – Birch family

L. O. Safford, John C. Bjorkbom, and John C. Zasada

Typical paper birch *(Betula papyrifera* var. *papyrifera),* also called white birch, canoe birch, or silver birch, and the other five intergrading geographical varieties, western paper birch *(B.papyrifera* var. *commutata* (Regel) Fern.), mountain paper birch *(B. papyrifera* var. *cordifolia*(Regel) Fern.), Kenai birch *(B. papyrifera* var. *kenaica (W.* H. Evans) Henry), Alaska paper birch *(B. papyrifera* var. *neoalaskana* (Sarg.) Raup), and northwestern paper birch *(B.papyrifera* var. *subcordata* (Rydb.) Sarg.) are the most widely distributed birches in North America, mostly in Canada. These medium-sized, fast-growing trees develop best on well drained, sandy loams on cool moist sites. They are commonly found in the mixed hardwood conifer forests but may form nearly pure stands where they pioneer areas disturbed by fires or logging. Paper birch is short-lived and rarely lives more than 140 years. Commercially the lumber is used for veneer, pulpwood, and many specialty items. The handsome foliage and showy white bark make the trees attractive for landscaping. They are important browse plants for animals, and the seeds, buds, and bark are also eaten by wildlife.

Habitat

Native Range

The range of paper birch closely follows the northern limit of tree growth from Newfoundland and Labrador west across the continent into northwest Alaska; southeast from Kodiak Island in Alaska to British Columbia and Washington; east in the mountains of northeast Oregon, northern Idaho, and western Montana with scattered outliers in the northern Great Plains of Canada, Montana, North Dakota, the Black Hills of South Dakota, Wyoming, Nebraska, and the Front Range of Colorado; east in Minnesota and Iowa, through the Great Lakes region into New England. Paper birch also extends down the Appalachian Mountains from central New York to western North Carolina (46,58,97,112).

Climate

Paper birch is a northern species adapted to cold climates. Its range is bounded on the north by the 13° C (55° F) July isotherm and in the south, it seldom grows naturally where average July temperatures exceed 21° C (70° F). In Alaska, paper birch is found on the cooler north and east aspects and aspen on the warm south and west aspects. The variety *cordifolia* in the east generally grows in the cooler habitats-upper elevations on mountains near tree line in the southern part of the range and on cooler north aspects and in depressions toward the northern part of its range.

[6] Silvics of North America, Department of Agriculture, Forest Service, Agriculture Handbook #654, Volume 1, pp 341-359.

Paper birch tolerates wide variations in the patterns and amounts of precipitation. In Alaska, annual precipitation averages only about 300 mm (12 in); more than half of this as rain in summer and fall. At higher elevations in eastern mountains, precipitation averages as high as 1520 mm (60 in). In general, the climate where paper birch is found has short cool summers and long cold winters during which the ground is covered with snow for long periods (39,46,67,97).

Soils and Topography

As might be expected from its wide range and genetic diversity, paper birch grows on almost any soil and topographic situation ranging from steep rocky outcrops of the mountains to flat muskegs of the boreal forest (Histosols). Best development and growth are on the deeper well drained to moderately well-drained Spodosols, Inceptisols, and Entisols common to glacial deposits throughout its range. In Alaska, best development occurs on Inceptisols developed on loess deposits. Paper birch was found in all habitats described for the White Mountains of New Hampshire and occurred in 50 percent or more of the plots in six of these habitats. Poorest site-index values were obtained for the driest and wettest sites of the range sampled, whereas higher values were obtained for the moist and nutrient enriched habitats (56).

In New England, paper birch tends to be more abundant on the dry sites than on the wet or poorly drained soils (46,63). In Alaska, where paper birch and aspen *(Populus tremuloides)* occur in mixed stands, birch predominates on the cooler, moister sites, and aspen on the warmer, drier sites. Birch also can be found with black spruce *(Picea mariana)* on north facing slopes (67). Typical soil temperatures of birch stands in the Fairbanks region of Alaska range from 9° to ll ° C (48° to 52° F) at a 10 cm (4 in) depth during the June to August growing season (112).

Paper birch grows best in soils free of shallow permafrost. But on north slopes, vigorous sapling birches have been observed where the annual depth of thaw in permafrost was only 64 to 76 cm (25 to 30 in) (67). Paper birch litter contributes to the nutrient status of the forest floor. When compared with red pine *(Pinus resinosa),* litter under birch was found to be enriched with calcium, potassium, magnesium, phosphorus, and boron and reduced in manganese, aluminum, iron, and zinc. Enrichment extended into the top 3 cm (1.2 in) of the mineral soil where concentrations of calcium, nitrogen, phosphorus, magnesium, potassium, and volatile matter and pH were increased. These increases resulted from the more rapid rate of decomposition of litter under birch than under red pine (93). In Alaska, biomass averaged 60 to 70 t/ha (27 to 31 tons/acre) with an annual litter fall of 4 to 8 t/ha (1.8 to 3.6 tons/acre). In birch stands, rain in the form of throughfall contained from one-half to one-third the calcium and magnesium and twice as much manganese as throughfall under aspen (112). Acidity of precipitation decreased as it passed through crowns of paper birch and other species in New Brunswick, Canada. However, acidity of stemflow increased for paper birch, red pine, white pine, red spruce, and black spruce, where as acidity of sternflow decreased for aspen, red maple, and white spruce (60). Total forest floor biomass and content of magnesium, iron, and manganese were greater and calcium was less under birch than aspen (95).

Soils under birch and aspen tend to be warmer but drier than soils under the softwoods. Consequently, CO^2 production is limited by lack of moisture under these two hardwoods and by low temperature under the conifers (82).

Paper birch tolerates fairly high levels (up to 80 mg/l) of aluminum in nutrient solution with no reduction of root growth (64). This tolerance varies significantly among provenances with some tolerating much higher levels (up to 120 mg/l) (90). Radicle elongation of paper birch seed germinated on filter paper treated with I to 5 mg/l of copper, nickel, or cobalt was reduced about 25 percent. Higher concentrations of these elements (up to 100 mg/l) were required for reduction of radicle elongation on mineral or organic soil. Conifer seeds were less sensitive than paper birch to the same treatments (71).

Associated Forest Cover

Paper birch is a common associate of 39 northern forest types. In the east and central regions, it is a major component of two forest cover types (29): Paper Birch (Society of American Foresters Type 18) and Paper Birch-Red Spruce-Balsam Fir (Type 35). In Alaska and western North America, it is an integral member in three types: Paper Birch (Type 252), White Spruce-Paper Birch (Type 202), and Black Spruce-Paper Birch (Type 254).

Paper birch forms either pure stands or mixtures of varying proportions in all regions. Pure stands are generally succeeded by other species (57), but some remnant birch can be maintained in openings in stands of other species thought to be climax for a given locality (47). In other instances, intimate mixtures with long-lasting types are characteristic. On the Laurentian highlands of eastern Canada, aspen and birch stands establish within 30 years following fire. Pure stands of conifers-jack pine or black spruce-follow. As the conifers age and openings occur, paper birch re-enters the stands, becoming a younger component of the mature conifer forests. Fire returns at about 130-year intervals (20).

Shrubs commonly associated with paper birch in the eastern part of its range are beaked hazel *(Corylus cornuta),* common bearberry *(Arctostaphylos uva-ursi),* dwarf bush-honeysuckle *(Diervilla lonicera),* wintergreen *(Gaultheria procumbens),* wild sarsaparilla *(Aralia nudicaulis),* blueberries *(Vaccinium spp.),* raspberries and blackberries *(Rubus* spp.), American and redberry elder *(Sambucus canadensis* and *S. callicarpa),* and hobblebush *(Viburnum alnifolium).*

Shrubs common to the Alaskan interior paper birch type are American green alder *(Alnus crispa),* Scouler willow *(Salix scouleriana),* highbush cranberry *(Viburnum edule),* Labradortea *(Ledum groenlandicum),* raspberry *(Rubus spp.),* and roses *(Rosa spp.).*

Life History

Reproduction and Early Growth

Flowering and Fruiting- Paper birch flowers from mid-April through early June depending on location. The flowers are monoecious (8). In the late summer, staminate flowers are preformed in aments (catkins) 2 to 2.5 cm (0.75 to 1 in) long at the ends of twigs and lateral shoots. These mature and grow in length to 4 to 10 cm (1.5 to 4 in) in the following spring. Pistillate flowers are borne in cylindrical aments (catkins) 2.5 to 5 cm (1 to 2 in) long and 8 mm (0.33 in) in diameter on the same tree. Two or three (rarely four) aments cluster on lateral spur shoots and disintegrate when mature. Fruits are winged nutlets 1.5 mm (0.06 in) long by 0.8 mm (0.03 in) wide with styles 0.8 mm (0.03 in) long. The shape of bracts of the pistillate catkins is characteristic for the species, and variations are useful in distinguishing varieties. The seeds ripen from early August until mid-September. Seed dispersal begins soon after ripening and occurs earlier in injured trees than in healthy trees (46). Some seeds fall as early as July as a result of birds feeding on the developing catkins.

Seed Production and Dissemination- Under normal conditions, paper birch begins

producing seeds at about 15 years of age, and optimum seed-bearing age is 40 to 70 years. However, seedlings grown in pots for one extended growing season in a greenhouse produced viable seeds (66 percent germination capacity) during the second season of growth under natural conditions out-of-doors (79). In mature stands, good seed crops occur every other year on the average, but some seeds are produced in most areas every year. Seed years vary with locality, so information specific to the area of interest is required for planning regeneration treatments. Some information can be gained by observing male catkins the fall before a seed year. An abundance of male catkins may mean a potentially good seed year, because both biotic and abiotic factors can destroy a potentially good crop. Lack of male catkins means a poor seed year. In average seed years, nearly 2.5 million seeds per hectare (1 million/acre) are produced and bumper years have 86 million or more seeds per hectare (35 million/acre). In a mature stand in Alaska, total dry weight of catkins was 6.8 kg (15 lb) per tree, yielding almost 9 million seeds (106). Discolored and empty seeds make up 14 to 47 percent of the crop, the lowest proportion of empty and discolored seeds occurs in the best seed years (4,7,8,63,108).

Some paper birch seeds may be collected from August through the following spring, but most are dispersed during the months of September through November in both the eastern and western portions of the range (4,107). In Alaska, some seeds were caught in seed traps every month. The rate was less than 10 million/ha (4 million/acre) for December through August whereas it averaged 70 to 90 million/ha (28 to 36 million/acre) for September through November (106). Time of dispersal does not depend on size of seed crop (7) but varies among stands and from year to year depending upon weather conditions. Seeds that fall in late fall and winter has higher germination capacity than those that fall early (4).

Extremely heavy seed crops can result in crown deterioration and reduced growth. In an Ontario stand, foliage was dwarfed or missing; buds in terminal portions of branches did not develop; and terminal growth and diameter growth were reduced when an extremely heavy seed crop was produced (41).

The light, winged paper birch seeds (3 million/kg or 1.4 million/lb) are dispersed readily by the wind, and some seeds travel great distances, particularly when blown across the surface of snow. However, the majority of seeds fall within the stand where they are produced, and seedfall drops off rapidly with distance from the stand edge into clearcut openings. When seedfall within an undisturbed stand was compared with seed fall in a clearcut, seed catch was reduced by 40 percent at the stand edge and 90 percent at the center of the 100-m (330-ft) square opening. On the basis of these observations, it was estimated that a seed crop of 5 million/ha (2 million/acre) would be required to regenerate openings as large as 50 m (165 ft) wide (4). Similar results were obtained in Alaska where 30 to 40 million seeds per hectare (12 to 16 million/acre) were estimated at 40 m (132 ft) from the stand edge, and 0.5 to 0.7 million/ha (0.2 to 0.3 million/acre) were estimated at 100 m (330 ft) (106). Seed crops in interior Alaska are adequate for regeneration of clearcuts as wide as 30 m (100 ft) at least 1 in every 4 years (108).

Under test conditions, paper birch seeds need no pretreatment for germination if tested under light at 20° to 25° C (68° to 77° F) (8,26,104). Seeds germinate in the dark if given either a prechilling or red light treatment; the red light effect can be reversed by far-red light, indicating that germination readiness is phytochrome mediated (2). Germination at low temperatures 5° to 10° C (41° to 50° F) under light is also enhanced by prechilling (26).

In the field, germination generally follows one of two patterns: either germination starts as soon as environmental conditions are suitable and continues until all viable seed have germinated (19); or an initial burst of germination is followed by a period of low germination as seedbeds dry out, and when rainfall replenishes soil moisture, a second peak of germination occurs later in the summer (110).

The proportion of sound, viable seed varies greatly among seed lots of paper birch. This proportion of viable seed can vary among seed years, localities, and specific mother trees (2). Some individuals may produce heavy seed crops frequently with consistently low (10 percent or less) germination (106). The percentage of viable seed can be estimated by examining embryo development with transmitted light under a dissecting microscope (8).

Paper birch seed may be stored for at least 2 years at room temperature if the moisture content is maintained at less than 5 percent (8). Longer storage, up to 8 years, with only slight loss of germination capacity is possible when seeds are stored at 2° to 4° C (35° to 40° F) in sealed containers and at low moisture (17,79). After long storage, viability of each seed lot should be verified by a germination test before the seeds are used, because some seed lots do lose viability (17).

Seedling Development- Germination is epigeal (8). Because of the small size of paper birch seed, newly germinated seedlings are very fragile. They are sensitive to moisture, temperature, light, and seedbed condition (46). Best germination occurs on mineral soil; germination on humus is reduced by about 50 percent, and germination on undisturbed litter is only 10 percent of that obtained on mineral soil. Shaded sites produce about twice as many germinants as full-sun sites. In a partially wind-thrown conifer forest, paper birch seedlings colonized windthrow pit and mound microsites, but most established seedlings were on rotting logs, stumps, and tree boles (100). Early survival of seedlings follows similar patterns, but initial height growth is better on humus than on undisturbed sites, probably because of greater nutrient availability. At the end of the first growing season, birch seedlings growing in full sunlight on mineral soil averaged 5 cm (2.0 in) tall compared with 12 cm (4.7 in) for those on humus. Maximum heights on the same seedbeds were 42 cm (16.5 in) for seedlings on humus and 20 cm (7.9 in) for those on mineral soil. Heights of seedlings in shaded locations on those same seedbeds were about one-half the maximum values (61,62). However, paper birch may grow well in about 50 percent of full sunlight. In a study of response to shading, paper birch seedlings grew taller under 45 percent sunlight than when grown in 100, 25, or 13 percent of sunlight. Total dry weight was equal for seedlings grown under 45 percent and 100 percent full sunlight (59).

In Alaska, 3 years following clear cutting, scarified sites were 100 percent stocked, with an average of 1.7 million birch seedlings per hectare (0.7 million/acre). Unscarified seedbeds were only 30 percent stocked with an average of 50,000 seedlings per hectare (20,000/acre) (109). Paper birch seedlings averaged 28 cm (11 in) in height on the scarified plots and 5 cm (2 in) on the unscarified plots after 2 years (112). This difference in results from those in the Northeast is probably caused by severe competition from herbaceous and other vegetation that became established on the unscarified plots. On an upland black spruce site subjected to burning treatments, best germination, survival, and 3-year growth occurred on heavily burned microsites (111).

After 5 years, in a Maine site-preparation study, there were more paper birch seedlings on disked sites than on burned or logged-only sites. But, after 10 years, the total number of birch seedlings, as well as the number of potential crop trees, was greater on the burned treatment than on either the disked or logged-only treatments (3,5):

Treatment	Thousands of Seedlings		Potential Crop Trees	
	5 - Years	10–Years	10-Years per ha	Height in 10-Years (meters)
Burn	47	12	1191	2.1
Disk	124	8	232	1.5
Log Only	25	4	497	2.1
			10-Years per Acre	Height in 10-Years (feet)
Burn	19	5	482	7
Disk	50	3	94	5
Log Only	10	2	201	7

Following clear cutting or other disturbances, the bulk of paper birch regeneration becomes established during the first growing season from seeds that fell the previous fall and winter. Data for Alaska indicate that 88 percent of seedlings present at age 5 germinated during the first growing season following clear cutting and scarification, 8 percent during year 2, and 4 percent during year 3. About 20 percent of the first-year germinants were still alive after 5 years; 7.4 million/ha (3 million/acre) the first year and 1.7 million/ha (0.7 million/acre) the fifth year (110). Some birch seed may lie dormant in the forest floor for a year or more, especially following heavy seed crops and dry years when conditions for germination are poor *(31,34,38,112).* This dormant seed may be an important source of germinants in poor seed years *(74).*

Seedlings of the variety *cordifolia* are slower growing than typical paper birch. When planted together under similar conditions in Quebec, typical paper birch grew to a height of 3.0 m (9.8 ft) in 5 years against 1.2 m (3.9 ft) for variety *cordifolia (13,39).*

In the Northeast, clear cutting stands younger than 100 years to regenerate paper birch often results in severe competition from large numbers of seedlings of *Rubus spp.* and pin cherry *(Prunus pensylvanica),* so that weeding or cleaning is needed to ensure satisfactory birch stocking *(61).* Large numbers of seeds of these species are stored in the forest floor in stands younger than 100 to 120 years old *(36).* Longer rotations are recommended to diminish the population of stored seeds and the consequent competition following disturbance.

Even though natural regeneration of paper birch is obtained readily, planting of seedlings may sometimes be desired *(45).* In planting old fields, site preparation to remove sod is required for satisfactory survival and growth. Protection from girdling by rodents and browsing by deer may be required in some locations *(6).* Planting stock can be either conventional bareroot stock or container-grown seedlings *(35).*

Seasonal height growth often begins while minimum temperatures are below freezing, rises gradually to a peak of maximum growth in mid-June, and then drops off gradually. Compared to other species, paper birch has a long period of height growth. Seedling height growth may be prolonged indefinitely under long-day conditions, whereas short days cause terminal growth to stop *(27,40.*

Diameter growth starts after maximum temperatures reach 21° C (70° F) or more and minimum temperatures are above freezing. Temporary abrupt increases and decreases in diameter growth in the spring and fall are correlated with a sudden rise and fall of temperature but not with rainfall. Diameter growth ceases well before either moisture or temperature becomes limiting. In general, paper birch begins and ceases diameter growth later than most of its associates *(46).*

Vegetative Reproduction- Paper birch can regenerate from sprouts following cutting or fire. Prolific sprouting usually occurs when young, vigorous trees have been cut in the spring to stump heights of

15 to 30 cm (6 to 12 in) *(46).* Whereas sprouts are seldom abundant enough to reproduce mature stands, they can be valuable supplements to seedlings, particularly on droughty or other difficult sites *(63).* In an early study of mature stands in Maine, 77 percent of the stumps sprouted, but only 27 percent had live sprouts after 2 years. Heavy browsing by deer was an important factor in sprout mortality *(46).* In Alaska, 85 to 99 percent of the paper birch stumps sprouted in stands as old as 55 years of age. Sprouting decreased to less than 50 percent in stands greater than 125 years old *(106).* Ten years after clear cutting and site preparation in a 70-year-old stand in Maine, sprouts were 34 percent of the potential crop trees on logged-only sites. Severe site preparation treatments of disking and burning reduced the number of sprouts as potential crop trees from 299/ha (121/acre) in the winter-logged treatment to 67/ha (27/acre) on burned plots and 32/ha (13/acre) on disked plots (5). Sprouting also may occur at the base of standing live trees that have been subjected to increased exposure by removal of nearby trees *(46).* Sprouts tend to mature earlier (age 50 to 60 years) and deteriorate sooner (age 70 to 90 years) than trees of seedling origin. Final quality is usually lower for sprouts *(63).*

Paper birch can be propagated by grafting, air-layering *(18),* rooting of cuttings, or tissue culture techniques. Cuttings from seedlings root sooner and at higher percentages than cuttings from mature trees. Eighty percent of stem and branch cuttings from 8- to 10-week-old paper birch seedlings rooted within 45 days when placed in 10 percent Hoagland's solution (no. 2) under a 16-hour photoperiod (44). Apical cuttings collected in July from 18-year-old paper birch and treated with indolebutyric acid (IBA) rooted better than cuttings collected on earlier or later dates with or without IBA treatment. Some individual trees consistently rooted better (over 40 percent), others consistently poorer (less than 20 percent), regardless of date of collection or hormone treatment of the cuttings (73). Stem segments and axillary buds from new germinants or 1- to 2-year-old seedlings proliferate into callus and multiple plantlets on a medium containing zeatin and adenine sulphate. These plantlets can be successfully transplanted to pots in a greenhouse and subsequently into the field (65). High rooting percentages in mature birch can be restored by establishing young plants through tissue culture techniques for a source of cuttings (92).

Sapling and Pole Stages to Maturity

Growth and Yield- Young paper birch grows rapidly. Individual trees often have a diameter of *20* cm (8 in) after 30 years. With age, the growth rate declines, and in old age it becomes almost negligible (46). Trees in mature stands average *25* to 30 cm (10 to *12* in) in d.b.h. and *21* m *(70* ft) in height. On the best sites, an occasional tree in old stands may exceed *76* cm *(30* in) in d.b.h. and *30* m (100 ft) in height. Trees of the variety *cordifolia* are as large as *102* cm *(40* in) in d.b.h. (46,99).

Yields at maturity on good sites are similar for Alaska, Ontario, or New England at *230* to *270* m^3/ha *(3,286* to *3,857* ft^3/acre) (table 1). On poor sites, yields range from about 100 to *185* m^3/ha *(1,429* to *2,643* ft^3/acre). New England stands produce the greatest Yields for all age classes and site qualities. Yields in Ontario are greater than those in Alaska for the first few decades, but growth rate of Ontario stands near maturity declines more rapidly than that of Alaskan stands. Thus, by age *80,* Alaskan yields surpass those from Ontario on all sites (table 1) (40,63,72). The range of site index is

similar for New England, New York, and the Lake States, *12* to *24* m *(40* to *80* ft) at base age *50* years (22,23); and somewhat lower for Alaska, 11 to *20* m *(35* to *65* ft) (40), indicating a lower growth potential, probably because permafrost and cold soils limit the growth of birch on many sites.

Table 1-Yield of fully stocked stands of paper birch in Alaska (40),

Ontario (72), and New England (63) by site index

SITE INDEX AND LOCATION		STAND AGE IN YEARS					
		30	40	50	60	70	80
		m3/ha					
13.7 m							
	Alaska			16	46	76	103
	Ontario	11	40	65	84	96	101
	New England	51	88	122	148	167	185
16.8 m							
	Alaska		23	62	107	147	177
	Ontario	35	72	105	133	152	165
	New England	63	108	150	180	205	226
19.8 m							
	Alaska	10	54	118	180	231	267
	Ontario	59	104	145	180	209	230
	New England	74	128	177	213	242	267
		ft³/acre					
45 ft.							
	Alaska			229	657	1,086	1,471
	Ontario	157	571	929	1,200	1,371	1,443
	New England	729	1,257	1,743	2,114	2,386	2,643
		ft³/acre					
55 ft.							
	Alaska		329	886	1,529	2,100	2,529
	Ontario	500	1,029	1,500	1,900	2,171	2,357
	New England	900	1,542	2,143	2,571	2,929	3,229
65 ft.							
	Alaska	143	771	1,686	2,571	3,300	3,814
	Ontario	843	1,486	2,071	2,571	2,986	3,286
	New England	1,057	1,829	2,529	3,043	3,457	3,814

Paper birch is considered a short-lived species. Trees mature in *60* to *70* years, and few live longer than *140* to *200* years (46). The variety *cordifolia* apparently has a longer life span. Several trees on Mt. Washington in New Hampshire were more than *200* years old; the oldest was *225* (37). Stands appear to last longer in Alaska than in more southerly regions (40).

Mortality is heavy throughout the life of a paper birch stand. Individual trees express dominance early in life. Unless suppressed trees are released early, they soon die. Intermediate trees survive

longer but gradually succumb after struggling for years at a low rate of growth (46). Initial stem diameter at the seedling and small sapling stage can be used to predict relative growth potential of trees selected for release. Trees that averaged only *0.8* cm *(0.3* in) in diameter when released grew to *5.3* cm *(2.1* in) in diameter after *24* years; trees in the same stand that were larger than *2.0* cm *(0.8* in) in d.b.h. when released grew to *13.7* cm *(5.4* in) in the same time (53).

Rooting Habit- Paper birch is generally a shallow-rooted species. The bulk of the roots are found in the top *60* cm *(24* in) of soil; taproots do not form. Rooting depth depends on soil depth and varies among forest stands and from tree to tree within stands (75). High wind will break the bole of paper birch more often than it will uproot the tree. Broken stems generally sprout (100). Rootlets with a primary xylem diameter greater than *25* percent of total diameter tend to become part of the permanent woody root system. Rootlets with a smaller diameter primary xylem are ephemeral (43,102).

Reaction to Competition- Paper birch is classed as a shade-intolerant tree. Among its common associates in the Northeast, only aspen, pin cherry, and gray birch *(Betula populifolia)* are more intolerant. In the natural succession of species, paper birch usually lasts only one generation and then is replaced by more tolerant species (46). When growing in mixture with spruce or spruce-fir, birch often retains a position in the stand, and the stands do not go toward pure spruce climax (22,67,76). Birch persists in some Alaskan spruce stands because of a physical smothering of spruce seedlings by birch foliage, or in other instances, chemical properties of the ashes of birch following fires may inhibit spruce development (67).

In declining old-growth stands of white spruce *(Picea glauca)* growing on flood plains in Alaska, paper birch invades openings created by death and uprooting of the spruce. Mineral soil exposed by the uprooting, and the rotting wood of the fallen trees, provide suitable seedbeds (28,52,106).

In a study of drought response, paper birch saplings had lower leaf conductance values and higher water potential than white oak *(Quercus alba)* growing under the same soil moisture conditions. The birch trees reached water stress conditions sooner than the oak. The birch trees responded to stress by losing leaves, whereas the white oak was not severely stressed by conditions of the study (30).

In a greenhouse study, paper birch seedlings were less tolerant of flooding than river birch (B. *nigra).* Once flooding treatments ended, paper birch seedlings grew faster and were as large as unflooded controls at the end of the experiment. Flooded river birch seedlings formed adventitious roots; paper birch did not (68).

Because of its intolerance, paper birch often requires release from faster growing species such as aspen or pin cherry that overtop it in the early stages of regeneration (53). Response depends on degree of release. Generally, the greater the release, the greater the growth response of paper birch. Thinnings in sapling and pole stands also yield increased diameter growth of paper birch crop trees

in proportion to the degree of release (79). Stands approaching maturity-more than 60 years-seldom respond to thinning (33,46).

Paper birch is a nutrient-sensitive species. Seedling, sapling, pole, and sawtimber-size trees have all responded to fertilizer treatments in recent studies (15,24,78,80,94,96). In a mixed stand, paper birch responded more than quaking aspen but less than bigtooth aspen *(Populus grandidentata)* to additions of nitrogen, phosphorus, and lime (24,81). Response indicated increased stem wood and bark, branches, and foliage (84,85).

Damaging Agents- In the eastern part of its range, large percentages of paper birch were killed or damaged by a condition called birch dieback during the late 1930's and 1940's. Symptoms include dying back of twigs and branches in the crown, loss of vigor, and eventual death over a period of 5 to 6 years. Trees most often damaged were shallow rooted and showed root mortality before crown symptoms. The root mortality was attributed to environmental conditions (75). Many trees sprouted epicormic branches in the lower crown and bole and eventually recovered. The dieback condition has subsided and currently is not considered an important threat to paper birch (46,63).

Postlogging decadence-a condition resembling birch dieback-sometimes develops in residual trees following partial cutting. The older the stand and the heavier the cutting, the more likely this condition. For example, trees left as seed trees in regeneration cuttings are almost certain to decline and die within a few years. The best way to avoid these problems in managed stands of birch is to maintain vitality of trees through periodic thinnings begun at an early age. Also, heavy partial cuttings in mature previously untreated stands should be avoided (63).

The bronze birch borer *(Agrilus anxius)* is the most serious insect pest of the paper birch. Usually it attacks overmature trees or trees in weakened condition. The borer played a secondary role in the dieback outbreak and undoubtedly caused the death of some trees that otherwise might have recovered. To prevent buildup of this insect, weakened and mature trees should be removed from the stand, and injury to residual trees should be avoided (21).

The most serious defoliators of birch are the forest tent caterpillar *(Malacosoma disstria),* the birch skeletonizer *(Bucculatrix canadensisella),* the birch leafminer *(Fenusa pusilla),* birch leaf-mining sawflies *(Heterarthrus nemoratus* and *Profenusa thomsoni),* the birch casebearer *(Coleophora serratella), as well as* the general forest defoliators-the saddled prominent *(Heterocampa guttivitta),* and the gypsy moth *(Lymantria dispar),* and in Alaska, the spearmarked black moth *(Rheumaptera hastata) (101).* Defoliation alone seldom causes mortality of otherwise healthy trees. Rather, growth rate is reduced and trees become susceptible to other damaging agents, particularly the bronze birch borer, which attacks and causes death of substantial numbers of trees (21). Cambium miners, such as *Phytobia pruinosa,* and ambrosia beetles, such as *Trypodendron betulae* or *Xyloterinus politus,* make injuries that cause defects in paper birch timber but seldom cause the death of trees (63,88). The variety *cordifolia* may be less susceptible to severe insect attacks than the typical paper birches (39).

Micro-organisms that enter the bole of the tree through wounds or branch stubs cause discoloration and decay in paper birch wood. A condition known as red heart is a very common defect in some areas. The wood is darkened in color but may be sound enough for some uses. Principal decay-causing fungi include *Inonotus obliqua, Phellinus igniarius,* and *Pholiota* spp. (63). Stem cankers that ruin the tree for timber purposes and make it unsightly are often caused by *Inonotus obliqua* and L *glomeratus* (87) and *Nectria galligena.* The rootrotting fungus *Armillaria mellea* infects birch trees, causing cracks at the base of the stem ("collar crack"). Attack by root-rotting fungi can also result in uprooting by the wind (88).

Animals that damage paper birch stands include white-tailed deer, porcupines, moose, and hares. The most serious threat from deer and moose is over-browsing at the seedling stage, which reduces the amount of dominant birch in regenerating stands or impairs the quality of survivors (46,51). Porcupines damage larger trees by feeding on the inner bark and girdling large branches in the cr6wn and upper trunk. The yellow-bellied sapsucker pecks rows of holes through the bark; these are the source of entry for discoloration and decay organisms and may cause ring shake (88). If a dense band of holes girdles the stem, all or a major portion of the crown will die, leading to a weakened state that can invite attack by the bronze birch borer or decay organisms. In a Maine study, 51 percent of the paper birch trees damaged by sapsuckers died. Damage by hares and other small mammals is of critical importance to the development of planted seedlings (6). Hares clip or gnaw bark on small birch seedlings causing reduction in birch stocking (51). Red squirrels may girdle stems by stripping off the bark (46) or wound the tree by biting it to obtain sap (88).

Fire, which is responsible for the establishment of many paper birch stands, is also one of the most serious enemies of established stands. Because the bark of paper birch is thin and highly flammable, even large trees may be killed by moderate fires (46). However, in Alaska, pure birch stands have little fuel available, so fires are not common. Hot crown fires in spruce become slow-burning ground fires when they enter birch stands; the fire may even go out. In extreme drying of deep organic horizons in some birch stands, a hot, slow-moving fire will consume all of the organic matter, leaving the shallow-rooted birch without support. The otherwise undamaged trees soon fall over (106). Paper birch is very susceptible to logging damage during partial harvest treatments using mechanical techniques. Up to 53 percent of designated crop trees sustained injuries to root systems, boles, or both during a careful thinning (69).

Near Sudbury, Ontario, air pollution with heavy metals from mining and smelting operations has created a coppice woodland dominated by paper birch and red maple. Seedlings are repeatedly killed back and sprout from the base, creating multi-stemmed stools. On an *exposed* ridge, 18-year-old paper birch sprouts averaged 3.3 in (10.8 ft) in height and 5.8 cm (2.3 in) d.b.h. On a more protected site, 21-year-old paper birch sprouts averaged 5.9 in (19.4 ft) in height and 7.8 cm (3.7 in) d.b.h. (48). In the greenhouse study previously mentioned, fumigation with S02 caused partial stomatal closure, visible foliar injury, and reduced growth rate of both river and paper birch. Stomatal conductance and S02 uptake of flooded seedlings were lower than controls, but S02 effects were the same whether flooded or not (68).

People vandalize trees along roadsides and in parks and picnic areas by peeling off strips of the outer papery bark. The trees are seldom killed but always carry unsightly scars. In areas of great scenic value, the exposed inner bark can be painted white to disguise the wound.

Special Uses

Young regenerating stands of paper birch and associated species provide prime browse and cover for deer and moose (86,91). Although pin cherry is preferred over birch as a browse species, birch is more important because it is more abundant (70). In Alaska, birch stands produce less browse than aspen but more than willow and alder. Willows are a preferred browse species by Alaskan moose, but birch is preferred to aspen, balsam poplar, or alder. It takes 3 to 5 years following logging, a fire, or other disturbance for production of young trees to begin providing sufficient buds and twigs for browsing animals. Peak browse production occurs from 10 to 16 years after the disturbance. Mature stands have essentially no available browse (103). The browse index for yellow and paper birch in the four northeastern National Forests indicates that birch is preferred 2.5 to almost 5 times more than its abundance would suggest (86). Paper birch is also an important source of food for birds. The redpoll, pine siskin, and chickadee feed on seeds; the ruffed grouse eats male catkins and buds (86).

The graceful form and attractive white bark of paper birch make it a prized species for ornamental planting and landscaping around homes and public buildings. The main drawback is that bark on young paper birch remains golden or brown in color until about age 10 to 12. For that reason, European birches and some other introduced species that have white bark at earlier ages are more frequently chosen as ornamentals.

Its status as a pioneer species and its adaptability to disturbed sites indicates that paper birch is a prime hardwood species for use in revegetating spoils and other drastically disturbed sites. Paper birch has been planted successfully on acid coal mine spoils. Survival of 2-0 planting stock ranged from 58 to 98 percent on spoils with a pH ranging from 3.0 to 4.0 (25).

Paper birch can be tapped in the spring to obtain sap from which syrup, wine, beer, or medicinal tonics can be made. The carbohydrate content of about 0.9 percent consists of glucose, fructose, and sucrose. This contrasts with the 2 to 3 percent sugar found in the sap of sugar maple. Currently only a few small-scale sugaring operations are in Alaska (32). Sap flow season for birch begins and ends later than for maples. Birch syrup contains lower sugar concentrations than maple (302 and 711 g/l) and is more acidic (pH 5.2 and 6.6) (50).

Paper birch has moderately dense wood. Full tree chips can be used in pulp and paper manufacture, other reconstituted uses, and fuel. Branches contain fewer fibers and more vessels than bole-wood. Branch fibers and vessels are 30 to 50 percent shorter and smaller in diameter than those from boles. Pulp from branch-wood is weaker in mechanical strength than pulp from bole-wood but is

suitable for paper making (54,55). Equations for estimating biomass of full trees and various components from tree diameter, height, or both, are available (49,83,89,105). As a fuel, caloric values for paper birch did not differ significantly between samples with and without bark, or between bole and branch components when data for samples with and without bark were pooled (66). Paper birch bark has a high fuel value. Of 24 species tested, it had the highest caloric value per unit weight-5740 cal/g (10,331 Btu/lb)-and the third highest per unit volume 3209 cal/cm^3 (360,569 Btu/ft^3) (42).

Genetics

Population Differences

Paper birch consists of a large, very plastic gene pool. There are six recognized varieties: typical paper birch (var. *papyrifera),* western paper birch (var. *commutata),* mountain paper birch (var. *cordifolia),* Kenai birch (var. *kenaica),* Alaska paper birch (var. *neoalaskana),* and northwestern paper birch (var. *subcordata)* (58). On the basis of morphological characteristics, seedling growth habits, and chromosome numbers, some authors have suggested that var. *cordifolia* be reinstated to specific rank as *B. cordifolia* (13). Chromosome number varies considerably within the species. The somatic chromosome number for typical paper birch can be either 70 or 84, rarely 56. The chromosome number for var. *cordifolia* is consistently 28, and other varieties may be 42, 56, 70, or 84. Seedlings from the same mother tree typically have two or more chromosome counts (9 through 14, 39). In a comparison of morphological and cytological characteristics of the varieties *commutata* and *subcordata,* only bark color was consistently different between the two, suggesting that separate variety names were not justified (11).

Within typical paper birch, selections of superior trees have been made on the basis of growth rate, stem form, and other characteristics. In a greenhouse study, seedlings with a plus-tree mother grew significantly taller and larger in basal diameter than trees with "average" mothers. Also, sources from New Hampshire were superior to sources from Michigan, Vermont, Maine, or Eastern Canada, in that order (77).

Hybrids

Hybridization in the birches is common. Paper birch hybridizes naturally with almost every other native species in the genus (1,16,58,98). The hybrid crosses with yellow *(B. alleghaniensis),* sweet *(B. lenta),* and river (B. *nigra)* birch have not been named. Blue birch *(B. x caerulea* or x *caerulea-grandis) is* thought to be a hybrid between grey birch and var. *cordifolia* (12,39). The variety *cordifolia is* thought to be a hybrid of paper and yellow birch (58). The named hybrids are crosses between paper birch and shrub or small tree species, as follows: Yukon birch *(B. x eastwoodiae* Sarg. or B.x *commixta* Sarg.) with resin birch *(B. glandulosa);* horne birch *(B. x hornei* Butler or *B. x beeniana* A. Nels.) with dwarf arctic birch *(B. nana);* Sandberg birch (B. x *sandbergii* Britton or *B. x uliginosa* Dugle) with bog birch *(B. pumila* var. *glandulifera);* and Andrews birch *(B. x andrewsii* A. Nels. or *B. x piperi* Britton or *B. x utahensis* Britton) with water birch *(B. occidentalis).*

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Appendix K

Forest Type Descriptions and Classifications

TIMBER SIZE DESCRIPTION

The following is a description of timber sizes for spruce and hardwoods, mainly birch, that make up the majority of timber in the Matanuska-Susitna Borough. Diameters are measured at the Diameter Breast Height (DBH) or about 4.5 feet up from the uphill side of the forest floor:

- Saplings, all species = less than five (5) inches diameter
- Poletimber, spruce species = five (5) to nine (9) inch diameter
- Poletimber, hardwood species = five (5) to eleven (11) inch diameter
- Sawtimber, spruce species, = greater than nine (9) inches diameter
- Sawtimber, hardwood species = greater than eleven (11) inches diameter

FOREST TYPE CLASSIFICATIONS

The 2006 and 2009 MSB timber inventories required the identification of commercial timber acreage on a stand-level basis (similar timber types were grouped together). This activity created six forest types, called stratums. All commercial forest land acres were placed into these six stratums and then inventoried. The stratums were sampled (took plot measurements) to compile data that could predict information about the species, acreage, and volumes that are statistically accurate within an acceptable range that is commonly used within the scientific community.

The inventory included 1,221 field sample plots that were distributed throughout the six stratums and the units that were sampled to determine timber volumes on a per acre basis by species, size class, quality, and product. Data was also recoded that was used to evaluate forest health and condition.

These stratums are important where the information is available in helping the reviewer better understand the “make-up” and “look” of the Borough’s Forest Resources.

The following is a picture and a description of each of these stratums. All photos are courtesy of Sanders Forestry Consulting, 2006.

Kashwitna

Stratum #1 Poletimber, All Species Closed Density (tree crowns nearly touching or touching). Timber stands are relatively even-aged, younger-growth forests that originated from large-scale disturbance (wildfire, flooding, clearing/harvest). Most have a high percentage of hardwood, primarily birch and aspen. Although young, this timber type contains a relatively high timber volume of approximately 1,727 net cubic feet of wood per acre, with an average tree count of 332 trees per acre.

Chijuk Creek

Stratum #2 Poletimber, All Species, Open Density (spaces between tree crowns). Timber stands are predominantly the result of recent partial-cut timber harvesting. However, naturally occurring stands are scattered throughout the area. This stratum has a low timber volume per acre with 1,030 net cubic feet per acre and an average tree count of 195 trees per acre.

Kashwitna

Stratum #3 Hardwood Sawtimber, Closed Density. Timber stands are predominantly old-growth stands that contain all age classes and are comprised of over 90 percent hardwoods (mostly birch and cottonwood with a small component of aspen) varying in age class. This timber type includes a high volume of cottonwood stands along river flood plains. The volume per acre of all species in this stratum averages to 2,247 net cubic feet per acre.

Chijuk Creek

Stratum #4 Hardwood Sawtimber, Open Density. Timber stands are predominantly old-growth stands with varying age classes in the understory. This stratum is generally composed of highly defective (over 27% visible defect), old-growth, open-density birch stands on rolling hills with a dense understory of grass and alder brush. This timber stand has a volume of 1,510 net cubic feet per acre.

Whiskers Creek South

Stratum #5 Mixed Sawtimber, Closed Density. Timber stands are the most common stratum within the borough's commercial forest representing nearly 60% of the forest acreage. It is comprised of predominantly old-growth stands with varying age classes in the understory. Hardwood timber represents 75% of the stand. This stratum is found on the better drained growing sites and has the highest birch volume per acre of 1,169 cubic feet per acre. The white spruce component is 529 cubic feet per acre. A total cubic feet per acre for all species is 1,775 net cubic feet per acre.

Chijuk Creek

Stratum #6 Mixed Sawtimber, Open Density. Timber stands are predominantly old-growth stands within varying age classes in the understory that contain all age classes. This timber type is similar to Stratum #5 except it has open crown density. Mainly this timber stand is found on poorly drained sites with wide spaces between trees and an understory containing alder and devil's club. Where this timber type is found on rolling hills it contains a higher percentage of spruce trees that are often larger than when found in denser forest stands like Stratum #5. This stratum has a medium volume per acre of 1,469 net cubic feet per acre. This stratum is considered an old-growth forest.

Appendix L

United States Department of Agriculture

Natural Resource Conservation Service

Soil Survey Type Categories

And

Use and Management of the Soils

The information contained in this appendix is only a portion of what is available for the Matanuska-Susitna and Yentna Soil Surveys. For more detailed information or to view and/or print the entire reports go to: http://websoilsurvey.nrcs.usda.gov/app/

Matanuska-Susitna Valley Area Soil Types

146—Kalambach-Disappoint complex, 0 to 10 percent slopes

147—Kashwitna silt loam, 0 to 3 percent slopes

148—Kashwitna silt loam, sloping and moderately steep

149—Kashwitna silt loam, undulating

150—Keba silt loam, undulating

151—Kichatna silt loam, 0 to 3 percent slopes

152—Kichatna silt loam, sloping and moderately steep

153—Kichatna silt loam, steep and sloping

154—Kichatna silt loam, undulating

155—Kichatna-Deception complex, sloping and moderately steep

156—Kichatna-Deception complex, steep and sloping

157—Kichatna-Delyndia complex, moderately steep and gently sloping

158—Kichatna-Delyndia silt loams, 0 to 4 percent slopes

159—Kidazqeni, cool and Niklason, cool soils, 4 to 12 percent slopes

160—Kidazqeni silt loam, rarely flooded, 0 to 2 percent slopes

161—Kidazqeni soils, 0 to 2 percent slopes

162—Kidazqeni-Niklason complex, 0 to 2 percent slopes

163—Killey and Moose River soils, 0 to 2 percent slopes

164—Knik silt loam, 0 to 3 percent slopes

165—Knik silt loam, gently sloping and moderately steep

166—Knik silt loam, steep and sloping

167—Knik silt loam, undulating

168—Knik-Cryaquepts complex, 0 to 25 percent slopes

169—Liten silt loam, hilly

170—Mine spoils

171—Nancy silt loam, 0 to 3 percent slopes

172—Nancy silt loam, sloping and moderately steep

173—Nancy silt loam, steep and sloping

174—Nancy silt loam, undulating

175—Nancy-Cryaquepts complex, 0 to 5 percent slopes

176—Nancy-Tokositna complex, sloping and moderately steep

177—Nancy-Tokositna complex, steep and sloping

178—Nancy-Tokositna complex, undulating

179—Pits, gravel

180—Psuyaah-Snowdance complex, 5 to 20 percent slopes

181—Qeni, cool-Niklavar, cool-Cryods, cold complex, 0 to 25 percent slopes

182—Riverwash and Niklavar soils, 0 to 2 percent slopes

183—Rock outcrop-Cryumbrepts association, extremely steep

184—Siwash-Talkeetna, cool-Snowdance association, 0 to 30 percent slopes

185—Susitna silt loam, 0 to 2 percent slopes

186—Susivar-Moose River complex, 0 to 2 percent slopes

187—Susivar and Niklavar fine sandy loams

188—Talkeetna very fine sandy loam, warm, 15 to 35 percent slopes

189—Talkeetna-Talkeetna, thick surface complex, 15 to 35 percent slopes

190—Talkeetna, warm-Talkeetna, thick surface complex, hilly

191—Talkeetna, warm and Talkeetna, thick surface soils, 15 to 45 percent slopes

192—Talkeetna, low elevation-Deneka, low elevation association, steep and moderately steep

193—Talkeetna, warm-Talkeetna, thick surface-Deneka complex, hilly

194—Talkeetna, cool-Snowdance complex, 5 to 25 percent slopes

195—Talkeetna, cool-Tsadaka-Chunilna, cool complex, 10 to 35 percent slopes

196—Tidal Flats

197—Tokositna silt loam, sloping and moderately steep

198—Tokositna silt loam, steep and sloping

199—Tokositna silt loam, undulating

200—Tokositna, hilly-Chunilna complex

201—Tokositna, undulating-Chunilna complex

202—Tsadaka-Talkeetna, cool complex, 5 to 25 percent slopes

203—Typic Cryaquents, 0 to 2 percent slopes

204—Typic Cryaquents, coastal, 0 to 2 percent slopes

205—Whitsol silt loam, 0 to 2 percent slopes

206—Whitsol silt loam, cool, sloping and moderately steep

207—Whitsol silt loam, cool, steep and sloping

208—Whitsol silt loam, silty substratum, 0 to 7 percent slopes

209—Whitsol silt loam, silty substratum, sloping and moderately steep

210—Whitsol silt loam, till substratum, sloping and moderately steep

211—Whitsol silt loam, till substratum, undulating

212—Yensus silt loam, 0 to 2 percent slopes

213—Yensus silt loam, sloping and moderately steep

214—Yensus silt loam, undulating

215—Yohn silt loam, 0 to 5 percent slopes

216—Yohn silt loam, rolling

217—Yohn-Deception complex, rolling

218—Yohn-Delyndia complex, hilly

219—Yohn-Flat Horn complex, rolling

W—Water

Yentna Area Soil Types

201—Beaches

202—Chedatna silt loam, 0 to 2 percent slopes

203—Chichantna peat, 0 to 8 percent slopes

204—Chuit-Nakochna-Chichantna complex, 2 to 7 percent slopes

205—Chuit-Nakochna-Rubble land complex, 7 to 45 percent slopes

206—Chuit and Nakochna silt loams, 3 to 30 percent slopes

207—Clunie peat, 0 to 2 percent slopes

208—Doroshin peat, 0 to 5 percent slopes

209—Cryaquents, tidal

210—Glaciers

211—Hewitt peat, 0 to 2 percent slopes

212—Histic Pergelic Cryaquepts-Starichkof complex, 0 to 7 percent slopes

213—Homestead silt loam, 0 to 2 percent slopes

214—Killey and Hiline silt loams, 0 to 2 percent slopes

215—Kliskon silt loam, 2 to 12 percent slopes

216—Kroto-Strandline-Cryorthents complex, 30 to 45 percent slopes

217—Lucile silt loam, 0 to 2 percent slopes

218—Nancy-Kashwitna complex, 0 to 2 percent slopes

219—Nancy-Kashwitna complex, 2 to 7 percent slopes

220—Nancy-Kashwitna complex, 7 to 12 percent slopes

221—Nancy-Kashwitna complex, 12 to 20 percent slopes

222—Nancy-Kashwitna complex, 20 to 30 percent slopes

223—Nancy-Kashwitna complex, 30 to 45 percent slopes

224—Nancy-Kashwitna complex, cool, 0 to 7 percent slopes

225—Niklason silt loam, 0 to 2 percent slopes

226—Puntilla silt loam, 7 to 20 percent slopes

227—Puntilla silt loam, 20 to 30 percent slopes

228—Puntilla silt loam, 30 to 45 percent slopes

229—Riverwash

230—Rubble Land

231—Salamatof peat, 0 to 2 percent slopes

232—Schrock silt loam, 0 to 2 percent slopes

233—Slikok muck, 0 to 5 percent slopes

234—Slikok-Starichkof-Strandline complex, 0 to 7 percent slopes

235—Spenard silt loam, 0 to 7 percent slopes

236—Starichkof peat, 0 to 7 percent slopes

237—Strandline-Kroto complex, 20 to 45 percent slopes

238—Strandline-Kroto-Chichantna complex, 1 to 20 percent slopes

239—Strandline-Kroto-Slikok complex, 1 to 12 percent slopes

240—Strandline-Spenard-Kroto complex, 2 to 30 percent slopes

241—Suntrana silt loam, 2 to 7 percent slopes

242—Susitna-Niklason silt loams, 0 to 2 percent slopes

243—Susitna and Niklason silt loams, 0 to 2 percent slopes

244—Tyonek peat, 0 to 2 percent slopes

245—Wasilla silt loam, 0 to 2 percent slopes

Use and Management of the Soils[7]

This soil survey is an inventory and evaluation of the soils in the survey area. It can be used to adjust land uses to the limitations and potentials of natural resources and the environment. Also, it can help avoid soil-related failures in land uses.

In preparing a soil survey, soil scientists, conservationists, engineers, and others collect extensive field data about the nature and behavior characteristics of the soils. They collect data on erosion, droughtiness, flooding, and other factors that affect various soil uses and management. Field experience and collected data on soil properties and performance are used as a basis in predicting soil behavior.

Information in this section can be used to plan the use and management of soils for crops and pasture; as woodland; as sites for buildings, sanitary facilities, highways and other transportation systems, and parks and other recreation facilities; and for wildlife habitat. It can be used to identify the potentials and limitations of each soil for specific land uses and to help prevent construction failures caused by unfavorable soil properties.

Planners and others using soil survey information can evaluate the effect of specific land uses on productivity and on the environment in all or part of the survey area. The survey can help planners to maintain or create a land use pattern in harmony with the natural soil.

Contractors can use this survey to locate sources of sand and gravel, roadfill, and topsoil. They can use it to identify areas where bedrock, wetness, or very firm soil layers can cause difficulty in excavation.

Health officials, highway officials, engineers, and others may also find this survey useful. The survey can help them plan the safe disposal of wastes and locate sites for ampgrounds and playgrounds.

[7] This is a copy of the *Use and Management of the Soils* from the USDA, Natural Resources Conservation Service publication; *Soil Survey of Yentna Area, Alaska*, 1998. The same type of information is available for the Matanuska-Susitna Valley.

Crops and Pasture

Prepared by Allen Koester, former District Conservationist,
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General management needed for crops and for hay and pasture is suggested in this section. The system of land capability classification used by the Natural Resources Conservation Service is explained.

Planners of management systems for individual fields or farms should consider the detailed information given in the description of each soil under “Detailed Soil Map Units” (page 6). Specific information can be obtained from the local office of the Natural Resources Conservation Service or the Alaska Cooperative Extension.

Crops and Soils

In 1984, the Yentna Area had only minimal development of land into cropland or pasture. This was on a few homesites and old homesteads. Only small acreages were cleared for home gardens or perhaps pasture for livestock. A hindrance to developing the area at the present time is the lack of access. The limited surface access is by "ice roads" across the Susitna River in the winter or from the north on the "Oil Well Road" in the summer. The other access is by river boat or airplane. Because of the complex pattern of many of the soils in the survey, all surface routes must cross extensive areas of muskegs and other wet soils to get to potential agricultural areas.

The soils and climate of the Yentna Area are best suited to hay and cool season vegetables and potatoes. Because the weather is often rainy at harvest time, hay crops would be best suited for use as silage. There are several areas in the Yentna Area with a potential for agricultural development. Soils with a potential for agricultural production make up about 125,000 acres. The best soils to be cleared for cropland are Nancy-Kashwitna, Susitna-Niklason and Schrock soils. Large blocks of Nancy-Kashwitna soils occur in the Parker Lake and Whitsol Lake areas. A smaller block occurs near Shulin Lake. Other small areas occur along major streams. Nancy-Kashwitna and Schrock soils are upland soils and occur on higher stream terraces. Susitna-Niklason soils occur on floodplains along streams.

Strandline-Spenard-Kroto complex (Figure 8) is an extensive unit found throughout the survey area. The Strandline and Kroto soils are upland soils often occurring on steep slopes, and Spenard soils are upland soils on less sloping areas that have a wetness limitation for agricultural uses. These soils occur in a complex pattern in the unit. On flatter slopes, Strandline and Kroto soils are suitable for farming. However, these soils are often found in small acreages. Extensive on-site investigation is necessary to identify the usable soils in this complex.

Fertilizer requirements will be high for all crops on all soils. Newly cleared land requires large amounts of nitrogen to help bacteria decompose the woody residues left after clearing. Most of the soils are acid with the pH ranging from 4.5 to 5.5. Crops on these soils would benefit from the

application of agricultural lime to raise the pH. However, it is usually not economically feasible to apply lime. It is recommended that fertilizer and lime be applied according to soil tests. Crop residues should be returned to the soil to help improve water holding capacity and soil tilth.

All of the soils have a high erosion potential by wind and water. Thus, adequate conservation practices must be used to protect the land as it is cleared, developed and farmed. Windbreaks, crop rotations and permanent grass cover should all be used as needed. Contouring or planting across the slope is recommended for vegetables and potatoes. Conservation tillage practices, which leave residues on the surface, also protect the soil from erosion by wind and water. Because of the water erosion hazard, it is recommended that vegetables be kept on slopes of less than 4 percent; hay or pasture (permanent grass) on slopes of less than 12 percent. Slopes over 12 percent usually should not be cleared and developed because of the very high erosion hazard of the silt loam soils.

The flatter slopes of the survey area may have a surface drainage problem in the spring due to run-off water collecting in depressions. Field operations, tillage and planting may be delayed while these areas drain and dry out.

Several methods can be used to clear land. On large acreages, the vegetation can be knocked down by "chaining" with a heavy chain pulled between two bulldozers. The material is then stacked into berm rows and burned. On smaller acreages, the vegetation may be walked down with a bulldozer, stacked into berm rows and burned, or may simply be bulldozed into berm rows and burned. If economically feasible, saw logs and firewood may be salvaged prior to stacking. Clearing operations should usually be done after freeze up in the fall or in early spring. Summer clearing can be done if extra caution is used so that an excess amount of topsoil is not removed from the field and stacked into the berm. Initial tillage or "breaking" of the newly cleared land is usually done with a heavy disc or plow. A root rake may then be used to windrow the roots and sticks or they may be picked up by hand.

Further information on adapted crop varieties, crop production and fertilizer recommendations are available from the Alaska Cooperative Extension or Natural Resources Conservation Service.

Forest Productivity and Management

Lyn R. Townsend, Forester, Natural Resources Conservation Service, helped to prepare this section.

Soil surveys are becoming increasingly more important to forest managers as they seek ways of improving the productivity of the lands they manage. Certain soils have a higher potential productivity; some are more susceptible to compaction and erosion during and after harvesting; and others will require special efforts to reforest. Nancy, Kashwitna and Schrock soils (Figure 9) are examples of soils with a higher potential productivity. Detailed descriptions of the soil map units of the soil survey area list important forestry interpretations.

Each map unit suitable for producing wood crops has information in its description concerning forest vegetation and productivity, limitations for harvesting timber, and suitable forest growth and management practices. The methods and procedures used by foresters and soil scientists to develop the information are contained in the Natural Resources Conservation Service National Forestry Manual (United States Department of Agriculture, 1980).

Table 5 summarizes forestry information given in the soil map unit and can serve as a quick reference for the more important forestry interpretations. Map unit symbols are listed, and the ordination (woodland suitability) symbol for each is given. All soils having the same ordination symbol require the same general kinds of woodland management and have about the same potential productivity.

The ordination symbol is based on a uniform system of labeling individual soils to determine the productivity potential and the principal soil properties in relation to any hazards of limitations of that soil. The first element of the ordination symbol is a number that denotes potential productivity in terms of cubic meters of wood per hectare per year for the indicator tree species (the principal species listed in the soil map unit having the highest productivity). Potential productivity is based on site index and the corresponding culmination of mean annual increment. For example, a number 1 would mean 1 cubic meter of wood per hectare per year (14.3 cubic feet per acre per year) and 10 would mean the soil has potential for producing 10 cubic meters of wood per hectare per year (143 cubic feet per acre per year). The second element of the symbol, a letter, indicates the major kind of soil limitation for tree growth and management. The letter W, indicates excessive water in or on the soil; X, indicates restrictions because of rocks or stones; and R, restrictions due to steep slopes. The letter A indicates little or no limitations or restrictions.

In Table 5, the soils are also rated for a number of factors to be considered in management. Slight, moderate and severe are used to indicate the degree of major soil limitations. For each moderate or severe rating, a sentence in the applicable soil map unit explains the soil factor or factors that are the basis of that rating.

Equipment limitations ratings refer to the limits on the use of equipment, year-round or seasonally, as a result of soil characteristics. A rating of slight indicates that equipment use is not normally restricted in kind or time of year because of soil factors; moderate indicates a short seasonal limitation due to soil wetness, a fluctuating water table, or some other factor; and severe indicates a seasonal limitation, a need for special equipment, or a hazard in the use of equipment. Steepness of slopes and soil wetness are the main factors that cause equipment limitations. As slope gradient and length increase, it becomes more difficult to use wheeled equipment. Soil wetness, especially in combination with moderate texture, can severely limit the use of equipment during break-up and freezing.

Seedling mortality ratings refer to the probability of death of naturally occurring or planted tree seedlings as influenced by kinds of soil or topographic conditions. Plant competition is not

considered in the ratings. The ratings apply to healthy, dormant seedlings from good stock that are properly planted during a period of sufficient soil moisture. Slight indicates no problem is expected under usual conditions; moderate indicates some problems of mortality can be expected, extra precautions are advisable; and severe indicates that mortality will be rough with extra precautions being essential for successful reforestation. Soil wetness, droughtiness of the surface layer, or ridge top locations account for seedling mortality problems. To offset these, larger than usual planting stock, special site preparation, surface drainage, or reinforcement planting may be needed.

Ratings of windthrow hazard consider the soil characteristics that affect the development of tree roots and the ability of the soil to hold trees firmly. A rating of slight indicates that trees are not normally blown down by wind (strong winds may break trees but not uproot them); moderate, an occasional tree may blow down during periods of excessive wetness combined with moderate or strong winds; and severe, many trees may be expected to blow down during periods of soil wetness with moderate or strong winds. Restricted rooting depth due to a high water table, an impervious layer, or a coarse textured layer are the typical causes of windthrow or tree tipover. Moderate and severe ratings indicate the need for more care in thinning the edges of woodland stands, a plan calling for periodic salvage of windthrown trees, and an adequate road and trail system to allow for salvage operations.

Plant competition ratings refer to the likelihood of the invasion or growth of undesirable brushy plants when openings are made in the tree canopy. A slight rating indicates that unwanted brushy plants are not likely to delay the development of natural reforestation, and planted seedlings have good prospects for development without undue commotion. Moderate indicates that competition will delay natural or planted reforestation. Severe indicates competition can be expected to prevent natural or planted reforestation. Favorable climate and soil characteristics account for plant competition problems. In many cases, the key to predicting brush competition problems is the quantity and proximity of seed sources of undesirable plants or the quantity of unwanted brush rootstocks that will resprout after harvest activities. Moderate and severe ratings indicate the need for careful and thorough post-harvest clean-up in preparation for reforestation, and the possibility of mechanically or chemically treating brush to retard its growth and allow seedlings to develop.

The potential productivity of important trees on a soil is expressed as a site index. This index is determined by taking height and age measurements on selected trees within stands of a given species. The procedure and technique determining site index is given in the publications used for indicator species of the soil survey area (Barnes, 1962; Meyer, 1937; Taylor, 1934; and British Columbia Forest Service, 1977). The site index applies to fully stocked, even aged, unmanaged stands found on a particular soil map unit. Greatest timber yields, usually expressed in board-feet or cubic feet per acre, can be expected from soil map units with the highest site indexes. Site index values can be converted into estimated yields at various ages by carefully using the appropriate "yield" tables (Barnes, 1962; Meyer, 1937; Taylor, 1934; and British Columbia Forest Service, 1977). Important trees are listed in the same order as that of their general occurrence observed on the soil map unit. Usually, only one or two tree species will predominate.

Trees to plant are those that are planted for reforestation or, if suitable conditions exist, allowed to naturally regenerate themselves. Species listed are suited to the soils and will produce a commercial wood crop. Desired product, topographic position (such as a ridgetop), and personal preference are three factors of many that can influence the choice of adapted trees to use for reforestation.

Recreation

The soils of the survey area are rated in Table 6 according to limitations that affect their suitability for recreation. The ratings are based on restrictive soil features, such as wetness, slope, and texture of the surface layer. Susceptibility to flooding is considered. Not considered in the ratings, but important in evaluating a site, are the location and accessibility of the area, the size and shape of the area and its scenic quality, the ability of the soil to support vegetation, access to water, and potential water impoundment sites. Soils subject to flooding are limited, in varying degrees, for recreational uses by the duration of flooding and the season when it occurs. Onsite assessment of the height, duration, intensity, and frequency of flooding is essential in planning recreational facilities.

In Table 6, the degree of soil limitation is expressed as slight, moderate, or severe. Slight means that soil properties are generally favorable and that limitations are minor and easily overcome. Moderate means that limitations can be overcome or alleviated by planning, design, or special maintenance. Severe means that soil properties are unfavorable and that limitations can be offset only by costly soil reclamation, special design, intensive maintenance, limited use, or by a combination of these measures.

The information in Table 6 can be supplemented by other information in this survey, for example, interpretations for dwellings without basements and for local roads and streets, in Table 7.

Camp areas are tracts of land used intensively as sites for tents, trailers, and campers and for outdoor activities that accompany such sites. These areas require site preparation, such as shaping and leveling the tent and parking areas, stabilizing roads and intensively used areas, and installing sanitary facilities and utility lines. Camp areas are subject to heavy foot traffic and some vehicular traffic. The soils are rated on the basis of soil properties that influence the ease of developing camp areas and performance of the areas after development. Also considered are the soil properties that influence trafficability and promote the growth of vegetation after heavy use.

Paths and trails are areas used for hiking and horseback riding. The areas should require little or no cutting and filling during site preparation. The soils are rated on the basis of soil properties that influence trafficability and erodibility. Paths and trails should remain firm under foot traffic and not be dusty when dry.

Wildlife Habitat

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Soil-forming factors work together to produce different soils, each with a particular slope, depth, drainage, texture, color, chemical makeup, etc. In the same way, different soils and environments interact and support particular plant communities. In turn, these plant communities support characteristic wildlife communities, composed of animals best adapted to local habitats. These relationships come full circle as plants and animals interact with and affect both one another and the soils on (or in) which they are found.

A varied wildlife fauna is found in the Yentna Area, reflecting the variety of habitats present. Area birds, mammals and fish provide food, fur and recreation to local residents, other Alaskans and visitors. For discussing area wildlife, seven generalized types of plant and aquatic communities are listed:

1. upland forests
2. muskegs and bogs
3. riparian forests and shrublands
4. treeline grasslands, alder shrublands
5. alpine communities
6. saltwater wetlands
7. freshwater aquatic habitats

Upland Forests

Well drained upland soils, including Strandline, Kroto and Nancy soils, generally support three forest types. The three forest types are: 1) deciduous forests dominated by birch and/or aspen; 2) mixed coniferous-deciduous forests, dominated by birch, aspen and white spruce; and 3) coniferous forests dominated by white spruce. Overlap among these types is common because all represent stages in upland forest succession. This successional sequence generally proceeds from stands of young deciduous seedlings and saplings, through dense deciduous pole timber, through mixed stands with invading white spruce, to white spruce stands. White spruce forests then remain until a disturbance, such as fire, again sets the sequence in motion. With each upland forest stage, different wildlife species appear.

Early successional deciduous stands provide abundant food for insects, birds and mammals. During summer, moose, black and brown bear, porcupine and snowshoe hare eat leaves and buds of young

birch, aspen, willow, alder, rose and other shrubs, as well as grasses and forbs. In winter, twigs and bark become more important. Grasses and forbs provide food for small rodents such as voles and lemmings. Insect-eating shrews are common, as are both seed- and insect-eating birds such as ptarmigan, flycatchers, chickadees, thrushes, warblers and sparrows. Such stands also provide excellent habitats for muskrat and beaver when located near streams, lakes or ponds.

Predators occur wherever their prey are found, so coyote, ermine, least weasel, red fox, lynx, and sometimes wolverine and wolf may use young deciduous stands. Great-horned owls, great gray owls and sharp-shinned hawks may occur; but many raptors do not use these stands because shrubby understories make aerial pursuit difficult and suitable nesting trees are rare.

Deciduous stands decline in food value as tree limbs grow beyond reach of many mammals and as an increasingly dense canopy shades out many understory plants. Eventually, spruce trees invade the forest canopy as aging or weakened trees fall and understory plants begin to increase. Some browsers, grazers and predators return. In addition, animals generally dependent on conifers appear, including red and northern flying squirrels, spruce grouse, some woodpeckers and marten.

Finally, maturing white spruce come to dominate upland forests. Mosses deepen in shaded areas, but shrubs can remain vigorous in sunny openings. Some wildlife species become less abundant as deciduous trees decline, but others remain, among them, voles, shrews, squirrels, porcupine, hare, black bear, weasels, marten, red fox, lynx, coyote, woodpeckers, many songbirds and a variety of raptors. Near rivers, riparian fur bearers such as beaver, muskrat, mink and river otter will also be common and bald eagles and moose may occur.

Muskegs and Bogs

Muskegs, bogs and stunted black spruce forests are characterized by thick moss groundcover and poor soil drainage. Soils occurring in these areas include the very poorly drained Starichkof, Salamatof, Chichantna and Doroshin soils. Willow shrubs, bog blueberry, bog cranberry, grasses, sedges and other forbs may occur, providing food for moose, snowshoe hare, bog and brown lemmings, voles, black and brown bears and sparrows. Some insect-eating birds may be abundant, including thrushes, kinglets and warblers. Red fox, coyote, lynx, ermine, least weasel and occasionally wolverine may hunt in these communities. Cow moose frequently calve on or near muskegs in May and June. A number of waterfowl and shorebirds nest on or near muskeg lakes and ponds, including loons, grebes, ducks, geese and swans.

Although muskeg and bog communities may support abundant wildlife, they generally are not as productive as young deciduous forests or mature uneven-aged coniferous stands. Absence of large trees and impaired soil drainage often restrict the kinds and numbers of wildlife species present. Muskegs and bogs located close to other plant communities or to open water will usually support more varied wildlife than those occurring in large unbroken tracts.

Riparian Forests and Shrublands

Riparian areas tend to provide very diverse and productive habitats, both in relatively pure plant communities and in mosaic-like community mixtures caused by fires, windthrow, flooding and shifts in river channels. Habitat diversity means that many kinds of food and cover are available, and proximity to open water makes riparian habitats particularly valuable to many wildlife species. Two common riparian plant communities in the Yentna Area are cottonwood forests and riparian shrublands. The soils found in these areas include the well drained Susitna and Nikalson soils.

Cottonwood forests support a fauna comparable to that found in other deciduous riparian forests. Where forbs, grasses and berries (e.g., cranberry, wild currant, crowberry, salmon berry) are abundant, species such as black and brown bears, snowshoe hare, voles, lemmings, meadow jumping mouse, muskrat and porcupine may occur, along with predators such as red fox, weasels, mink, river otter, coyote, lynx and some raptors. Seed- and insecteating birds will also be common. Where shrubs (particularly willows) and young deciduous cottonwoods dominate, moose, beaver, hare and their predators will be most numerous. Where groundcover consists mostly of Equisetum spp., bears and some snowshoe hare may occur, but many shrub- and seed-eating animals will be absent. Open forests with productive forb-grass groundcover can support large numbers of rodents, and hence, the fur bearers and raptors that feed on them.

Riparian shrublands support most of the wildlife species found in streamside forests, although tree dwelling birds will generally be absent, as will mammals requiring mature trees for food and cover. The soils found in these areas include the very poorly and poorly drained Killey, Hiline, Hewitt and Wasilla soils (Figure 10). Riparian willows and alders are essential to moose, providing them with food and cover during winter. Other species particularly common in streamside shrublands include snowshoe hare, beaver, river otter, mink and lynx. Many of the bird species listed in young deciduous forests are also present.

Treeline Grasslands and Alder Shrublands

Grasslands and alder shrublands are common at treeline, above forests and below tundra communities. Puntilla and Kliskon soils are found on these areas. Alder shrublands may provide cover and some food to herbivores (e.g., moose, porcupine) and predators (e.g., bears, coyote, wolf, wolverine), but these dense shrublands generally have sparse understories and hence provide little food to many birds and mammals. Bird species common in alder shrublands include alder flycatcher and hermit and varied thrush.

Grasslands, on the other hand, although often providing little cover, offer nutrient-rich seeds and seasonally high primary productivity. They provide important foods to voles, lemmings, some seed eating birds, bears seeking early emerging vegetation in spring and to predators feeding on grass-eating rodents. Moose often bed down in tall stands of grass.

Alpine Communities

Above alder shrublands and grasslands, alpine plant communities appear, consisting mostly of mosses, lichens, bunchgrasses, forbs and dwarf shrubs adapted to winds, cold temperatures, shallow soils and short growing seasons. The dominant soils in these areas are the well drained Chuit and Nakochna soils (Figure 11) with areas of barren rubble land. These plants provide valuable summer forage for moose, arctic ground squirrel, some voles and lemmings and brown bear. In the fall, as salmon runs end, ripening berries attract black and brown bears from lowland streams up to alpine areas. Talus slopes near herbaceous or dwarf shrub communities often support collared pika and hoary marmot. Wolverine, wolf, coyote, brown bear, ermine, red fox and least weasel can be found in alpine areas hunting shrews, rodents, birds and insects.

Birds that nest or rear young in alpine habitats include rock and white-tailed ptarmigan, lesser golden plover, rosy crowned finch, water pipit, snow bunting, Savannah sparrow, horned lark and Lapland larkspur. Golden eagle, rough-legged hawk, gyrfalcon, northern harrier, long-tailed jaeger, snowy owl and common raven hunt tundra rodents and/or nesting birds. Although in fall many alpine wildlife species hibernate or leave tundra communities to avoid harsh winter conditions, during the summer these communities support a productive and unique fauna.

Saltwater Wetlands

Three general kinds of saltwater wetlands occur along Cook Inlet in the Yentna Area: sedge dominated tidal marshes, Elymus-dominated grasslands and Myrica-dominated low shrublands. These areas are dominated by the very poorly drained Clunie soils and areas of Tidal Marsh. These productive environments are linked to adjacent estuaries, near shore coastal areas, and freshwater wetlands by freshwater runoff, tidal currents and movements of animals.

Low shrublands are farthest inland and may receive tidal influence only seasonally or during storms. Coastal shrublands generally support many wildlife species found in other low shrublands, including moose, hare, a variety of voles and lemmings, wide-ranging predators such as red fox, coyote and lynx and shrubland birds, particularly sparrows.

Elymus grasslands and tidal marshes provide succulent aquatic vegetation for moose and muskrat, but perhaps their greatest value is as staging and nesting areas for waterfowl. A variety of ducks and geese gather on Susitna Flats and along Rading Bay during migration. These environments provide high energy foods when waterfowl may need them most; and accumulated seeds in the fall to fuel southward migration and tender new growth in spring as birds travel north behind melting snows to breeding grounds. Migratory species found in these wetlands include trumpeter swan, snow goose, Canada goose (including cackling Canada goose), the rare tule white-fronted goose and a variety of ducks and shorebirds. Pintail, mallard, widgeon, shoveler, green-winged teal and other waterfowl species may nest in these habitats. Thousands of waterfowl are harvested from Trading Bay and Susitna Flats annually. Fur bearers such as muskrat, mink and otter can also be found. In addition,

these communities add detritus to estuarine and marine environments, thus contributing to aquatic food chains on which many invertebrates and fishes, including salmon, are dependent.

Freshwater Aquatic Habitats

Freshwater habitats such as streams, rivers, ponds and lakes are directly influenced by vegetation on shores and adjacent uplands. These aquatic habitats are important to a variety of fishes, both anadromous species (e.g., chinook, sockeye, coho, pink and chum salmon, steelhead trout, and Dolly Varden) and freshwater species (e.g., rainbow trout, non-anadromous Dolly Varden, lake trout, grayling, northern pike, burbot, and whitefish). Nearly every clearwater stream in the study area provides important salmon spawning habitat. Most streams, including glacial waters, provide migration routes for adults and juveniles of both anadromous and non-anadromous species. Most area lakes support one or more species of non-anadromous fish. Sport and subsistence fisheries in the area support thousands of days of fishing.

Aquatic habitats also support a variety of birds and some mammals. Bird species commonly breeding in or around lakes and ponds include common and red-throated loon, horned and rednecked grebe, gulls, Arctic tern, scoters, trumpeter swan and a variety of ducks. Common breeding birds along streams and rivers include bald eagle, belted kingfisher, dipper, spotted sandpiper and harlequin duck. Moose, beaver, muskrat, river otter, mink and other mammals hunt to feed in aquatic habitats seasonally or year-round.

Engineering

This section provides information for planning land uses related to urban development and water management. Soils are rated for various uses, and the most limiting features are identified. Ratings are given for building site development, sanitary facilities, and construction materials. The ratings are based on observed performance of the soils and on the estimated data and test data in the “Soil Properties” section (page 73).

Information in this section is intended for land use planning, for evaluating land use alternatives, and for planning site investigations prior to design and construction. The information, however, has limitations. For example, estimates and other data generally apply only to that part of the soil within a depth of 5 or 6 feet. Because of the map scale, small areas of different soils may be included within the mapped areas of a specific soil.

The information is not site specific and does not eliminate the need for onsite investigation of the soils or for testing and analysis by personnel experienced in the design and construction of engineering works.

Government ordinances and regulations that restrict certain land uses or impose specific design criteria were not considered in preparing the information in this section. Local ordinances and regulations should be considered in planning, site selection, and design.

Soil properties, site features, and observed performance were considered in determining the ratings in this section. During the fieldwork for this soil survey, determinations were made about grain size distribution, liquid limit, plasticity index, soil reaction, depth to bedrock, hardness of bedrock within 5 or 6 feet of the surface, soil wetness, depth to a seasonal high water table, slope, likelihood of flooding, natural soil structure aggregation, and soil density. Data was collected about mineralogy of the sand and silt fractions and the kind of adsorbed cations. Estimates were made for erodibility, permeability, corrosivity, shrink-swell potential, available water capacity, and other behavioral characteristics affecting engineering uses.

This information can be used to evaluate the potential of areas for residential, commercial, industrial, and recreational uses; make preliminary estimates of construction conditions; evaluate alternative routes for roads, streets, pipelines, and underground cables; evaluate alternative sites for sanitary landfills; plan detailed onsite investigations of soils and geology; locate potential sources of gravel, sand, earthfill, and topsoil; and predict performance of proposed small structures and pavements by comparing the performance of existing similar structures on the same or similar soils.

Some of the terms used in this soil survey have a special meaning in soil science and are defined in the glossary (page 111).

Building Site Development

Table 7 shows the degree and kind of soil limitations that affect shallow excavations, dwellings without basements, small commercial buildings, and local roads and streets. The limitations are considered slight if soil properties and site features generally are favorable for the indicated use and limitations are minor and easily overcome; moderate if soil properties or site features are not favorable for the indicated use and special planning, design, or maintenance is needed to overcome or minimize the limitations; and severe if soil properties or site features are so unfavorable or so difficult to overcome that special design, significant increases in construction costs, and possibly increased maintenance are required. Special feasibility studies may be required where the soil limitations are severe.

Shallow excavations are trenches or holes dug to a maximum depth of 5 or 6 feet for basements, graves, utility lines, open ditches, and other purposes. The ratings are based on soil properties, site features, and observed performance of the soils. The ease of digging, filling, and compacting is affected by the depth to bedrock, a cemented pan, a very firm dense layer, stone content, soil texture, and slope. The time of the year that excavations can be made is affected by the depth to a seasonal high water table and the susceptibility of the soil to flooding. The resistance of the excavation walls or banks to sloughing or caving is affected by soil texture and depth to the water table.

Dwellings and small commercial buildings are structures built on shallow foundations on undisturbed soil. The load limit is the same as that for single-family dwellings no higher than three stories. Ratings are made for small commercial buildings without basements, and for dwellings without basements. The ratings are based on soil properties, site features, and observed performance of the soils. A high water table, flooding, shrinking and swelling, and organic layers can cause the movement of footings. A high water table, depth to bedrock or to a cemented pan, large stones, and flooding affect the ease of excavation and construction. Landscaping and grading that require cuts and fills of more than 5 or 6 feet are not considered.

Local roads and streets have an all-weather surface and carry automobile and light truck traffic all year. They have a subgrade of cut or fill soil material; a base of gravel, crushed rock, or stabilized soil material; and a flexible or rigid surface. Cuts and fills generally are limited to less than 6 feet. The ratings are based on soil properties, site features, and observed performance of the soils. Depth to bedrock, a high water table, flooding, large stones, and slope affect the ease of excavating and grading. Soil strength (as inferred from the engineering classification of the soil), shrink-swell potential, potential for frost action, and depth to a high water table affect the traffic-supporting capacity.

Sanitary Facilities

Table 7 shows the degree and the kind of soil limitations that affect sanitary landfills. It also shows the suitability of the soils for use as a daily cover for landfill. The limitations are considered slight if soil properties and site features are generally favorable for the indicated use and limitations are minor and easily overcome; moderate if soil properties or site features are not favorable for the indicated use and special planning, design, or maintenance is needed to overcome or minimize the limitations; and severe if soil properties or site features are so unfavorable or so difficult to overcome that special design, significant increases in construction costs, and possibly increased maintenance are required.

Sanitary landfills are areas where solid waste is disposed of by burying it in soil. There are two types of landfill—trench and area. In a trench landfill, the waste is placed in a trench. It is spread, compacted, and covered daily with a thin layer of soil excavated at the site. In an area landfill, the waste is placed in successive layers on the surface of the soil. The waste is spread, compacted, and covered daily with a thin layer of soil from a source away from the site.

Both types of landfill must be able to bear heavy vehicular traffic. Both types involve a risk of groundwater pollution. Ease of excavation and revegetation should be considered.

The ratings in Table 7 are based on soil properties, site features, and observed performance of the soils. Permeability, depth to bedrock, a high water table, slope, and flooding affect both types of landfill. Texture, stones and boulders, highly organic layers, and soil reaction affect trench type landfills. Unless otherwise stated, the ratings apply only to that part of the soil within a depth of

about 6 feet. For deeper trenches, a limitation rated slight or moderate may not be valid. Onsite investigation is needed.

Construction Materials

Table 8 gives information about the soils as a source of roadfill, sand, gravel, and topsoil. The soils are rated good, fair, or poor as a source of roadfill and topsoil. They are rated as a probable or improbable source of sand and gravel. The ratings are based on soil properties and site features that affect the removal of the soil and its use as construction material. Normal compaction, minor processing, and other standard construction practices are assumed. Each soil is excavated to a depth of 5 or 6 feet.

Roadfill is soil material that is excavated in one place and used in road embankments in another place. In this table, the soils are rated as a source of roadfill for low embankments, generally less than 6 feet high and less exacting in design than higher embankments.

The ratings are for the soil material below the surface layer to a depth of 5 or 6 feet. It is assumed that soil layers will be mixed during excavating and spreading. Many soils have layers of contrasting suitability within their profile. The table showing engineering index properties provides detailed information about each soil layer. This information can help to determine the suitability of each layer for use as roadfill. The performance of soil after it is stabilized with lime or cement is not considered in the ratings.

The ratings are based on soil properties, site features, and observed performance of the soils. The thickness of suitable material is a major consideration. The ease of excavation is affected by large stones, a high water table, and slope. How well the soil performs in place after it has been compacted and drained is determined by its strength (as inferred from the engineering classification of the soil) and shrink-swell potential.

Soils rated *good* contain significant amounts of sand or gravel, or both. They have at least 5 feet of suitable material, a low shrink-swell potential, few cobbles and stones, and slopes of 15 percent or less. Depth to the water table is more than 3 feet. Soils rated fair are more than 35 percent silt- and clay-sized particles and have a plasticity index of less than 10. They have a moderate shrink-swell potential, slopes of 15 to 25 percent, or many stones. Depth to the water table is 1 to 3 feet. Soils rated poor have one or more of the following characteristics: a plasticity index of more than 10, many stones, slopes of more than 25 percent, or a water table at a depth of less than 1 foot. They may have layers of suitable material, but the material is less than 3 feet thick.

Sand and gravel are natural aggregates suitable for commercial use with a minimum of processing. They are used in many kinds of construction. Specifications for each use vary widely. In Table 8, only the probability of finding material in suitable quantity in or below the soil is evaluated. The suitability

of the material for specific purposes is not evaluated, nor are factors that affect excavation of the material.

The properties used to evaluate the soil as a source of sand or gravel are gradation of grain sizes (as indicated by the engineering classification of the soil), the thickness of suitable material, and the content of rock fragments. Kinds of rock, acidity, and stratification are given in the soil series descriptions. Gradation of grain sizes is given in the table on engineering index properties.

A soil rated as a probable source has a layer of clean sand or gravel or a layer of sand or gravel that is as much as 12 percent silty fines. This material must be at least 3 feet thick and less than 50 percent, by weight, large stones. All other soils are rated as an improbable source.

Topsoil is used to cover an area so that vegetation can be established and maintained. The upper 40 inches of a soil is evaluated for use as topsoil. Also evaluated is the reclamation potential of the borrow area.

Plant growth is affected by toxic material and by such properties as soil reaction, available water capacity, and fertility. The ease of excavating, loading, and spreading is affected by rock fragments, slope, a water table, soil texture, and thickness of suitable material. Reclamation of the borrow area is affected by slope, a water table, rock fragments and bedrock.

Soils rated *good* have friable, loamy material to a depth of at least 40 inches. They are free of stones and cobbles, have little or no gravel, and have slopes of less than 8 percent. They are naturally fertile or respond well to fertilizer, and are not so wet that excavation is difficult.

Soils rated *fair* are sandy soils, soils that have only 20 to 40 inches of suitable material, soils that have an appreciable amount of gravel or stones, or soils that have slopes of 8 to 15 percent. The soils are not so wet that excavation is difficult.

Soils rated *poor* are very sandy, have less than 20 inches of suitable material, have a large amount of gravel or stones, have slopes of more than 15 percent, or have a seasonal high water table at or near the surface. The surface layer of most soils generally is preferred for topsoil because of its organic matter content. Organic matter greatly increases the absorption and retention of moisture and nutrients for plant growth.

Appendix M

State of Alaska

Department of Natural Resources

Division of Forestry

DETAILED PLAN OF OPERATIONS

STATE OF ALASKA
DEPARTMENT OF NATURAL RESOURCES
DIVISION OF FORESTRY

NOTICE OF OPERATIONS
DETAILED PLAN OF OPERATIONS SUMMARY

Notice is given to the commissioner that an operation will be conducted on the lands described below and the completed maps attached, (AS 41.17.090). (Print or type)

Operator: _____
(Entity Responsible for Field Operations)

Operator's authorized representative: _____
(Contact Person)

Operator's authorized representative signature: _____
(DATE)

Operator's representative address:

_____

_____
City State Zip Code

LEGAL DESCRIPTION OF OPERATING AREA

Township: _____ Range: _____ Meridian: _____

Section(s): _____

NEAREST TOWN/ VILLAGE: _____

ESTIMATED STARTING DATE: _____

ESTIMATED COMPLETION DATE: _____

VOLUME TO BE HARVESTED: _____ MBF

TYPE OF ACTIVITY: _____

_____

_____

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Form 10-41-34 (Rev. 06/01/06)

Date Received: _____
DPO # _____

STATE OF ALASKA
DEPARTMENT OF NATURAL RESOURCES
DIVISION OF FORESTRY

NOTICE OF OPERATIONS
DETAILED PLAN OF OPERATIONS

Operation name: _____
Name of nearest USGS named geographical landmark: _____
Previously assigned DPO #: _____

Operator: _____
(Entity Responsible for Field Operations)
Print authorized representative's name: _____
Authorized representative's signature: _____
Address: _____
Telephone: _____ Fax: _____
E-mail: _____

Timber owner: _____
Print authorized representative's name: _____
Authorized representative's signature: _____
Address: _____
Telephone: _____ Fax: _____
E-mail: _____

Landowner: _____
Print authorized representative's name: _____
Authorized representative's signature: _____
Address: _____
Telephone: _____ Fax: _____
E-mail: _____

INFORMATION ON CORPORATION, LIMITED PARTNERSHIPS, GENERAL PARTNERSHIPS, OR JOINT VENTURES

Information has been previously submitted to the Division of Forestry and there have been no changes in any of the business relationships or key personnel.
Is this statement true? [ ] Yes [ ] No
If "no", complete and submit Page(s) 1 and 2 of Supplemental Information Form "A".

Official Use Only

REGION/AREA:	30 DAY ENDING DATE:	RECEIVED BY:

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Date Received: _____
DPO # _____

NOTICE OF OPERATIONS
DETAILED PLAN OF OPERATIONS

MAP SPECIFICATIONS

Attach a USGS quadrangle or similar **Vicinity Map**, at a 1:63,360 scale (1 inch =1 mile) suitable for black and white duplication on 8 ½"x11" paper which clearly shows the area of operations, a north arrow and if available, the legal subdivisions defining the area.

In addition to the above Vicinity Map, the items listed below are required to be identified on a **Detailed Plan of Operations Map** (11 AAC 95.220(a)(3)). The plan map should have the following areas identified or estimated if conditions exist that might influence their final location. If any of the items are missing without adequate explanation, this notification will be considered incomplete. The 30-day review period will not begin until this DPO is submitted in a complete form. The detailed map of operations should be readily reproducible in black and white in a standard size format. However, large formats or colored maps are acceptable if needed for clarity. If more than one sheet is required to adequately show operations, provide matchlines or reference each as a set of drawings i.e. Sheet 1of 4, etc. Submit four (4) copies of your operation plan map.

Adequately label notable topographic features on each map (i.e. water bodies, etc.).

Does your **operation map** identify the following items? If "no" explain why.

	Yes	No	Explanation /notes
Road Types			
Permanent	[ ]	[ ]	_____
Temporary	[ ]	[ ]	_____
Winter road	[ ]	[ ]	_____
Roads to be closed	[ ]	[ ]	_____
Inactive roads	[ ]	[ ]	_____
Material extraction sites	[ ]	[ ]	_____
End-haul sites and spoil deposit areas	[ ]	[ ]	_____
Areas of unstable soil conditions	[ ]	[ ]	_____
Unit boundaries	[ ]	[ ]	_____
Yarding methods and landing areas	[ ]	[ ]	_____
Classified surface water locations	[ ]	[ ]	_____
Stream crossings and drainage structures	[ ]	[ ]	_____
Proposed activities in riparian areas	[ ]	[ ]	_____
Sort yard and solid waste sites	[ ]	[ ]	_____
Log transfer or barge facility	[ ]	[ ]	_____
Housing facilities, fuel storage	[ ]	[ ]	_____
Section, township and meridian lines	[ ]	[ ]	_____
North arrow, scale bar, plan date	[ ]	[ ]	_____

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DPO # _____

DETAILED PLAN OF OPERATIONS
HARVEST & SILVICULTURAL ACTIVITY
SUMMARY SHEET

Complete the following summary of harvest units and silvicultural actions for all submitted areas.

Unit Label	Acres	Type of Activity*	Sec	TWP	RG	Actual Layout? **Y or N**

TOTAL ACRES: _____ (If more than one kind of activity, list totals by activity.)

* i.e. harvest, thinning, planting, etc.

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NOTICE OF OPERATIONS
DETAILED PLAN OF OPERATIONS
HARVEST & SILVICULTURAL CHARACTERISTICS

If the silvicultural activities in multiple units share a similar location, topographic characteristics and management treatments, list them on this page as a group. If the characteristics of the units are different, list each unit on a separate page. Attach additional detail pages as necessary to describe the activity. The following information should adequately describe the activity's potential to effect resources deemed important to the State in the Alaska Forest Resources and Practices Act and Regulations.

UNIT IDENTIFICATION(S): _____

_____

Which of the following best describes the unit's topography?
[ ] Relatively Flat [ ] Uniform Hillside [ ] Irregular or Complex Slopes

What percent of the unit occupies slopes greater than 67%? _____

TYPE OF ACTIVITY:
[ ] Clearcut [ ] Partial Cut [ ] Salvage [ ] Other (Specify) _____
[ ] Precommercial Thinning [ ] Chemical Application [ ] Commercial Thinning

CUTTING METHODS:
[ ] Chainsaw [ ] Feller-Buncher [ ] Whole Tree Processor [ ] Other _____

YARDING METHODS:
[ ] Cable Yarding
Type: [ ] High Lead [ ] Skyline [ ] Other _____

[ ] Ground Skidding
Type: [ ] Crawler Tractor [ ] Rubber Tired Skidder [ ] Shovel
Will forwarders or other off-road methods be used? [ ]YES [ ] NO

[ ] Helicopter [ ] Other (Specify) _____

Will the activity be done by the: [ ] operator [ ] operator's contractor
If "contractor", has the contractor been copied this plan of operations? [ ]YES [ ] NO

Name of contractor: _____

List the roads or other means required for the access and removal of this timber from the landowner's property. _____

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Date Received: _____
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DETAILED PLAN OF OPERATIONS
ROAD ACTIVITY
SUMMARY SHEET

Complete the following summary of road actions for all submitted areas.

Road Label	Road Miles	Type of Activity*	Units Along Road	Sec	TWP	RG	Actual Layout? **Y or N**

TOTAL MILES OF NEW CONSTRUCTION: _____

* i.e. new construction, closure, reconstruction, etc.

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NOTICE OF OPERATIONS
DETAILED PLAN OF OPERATIONS
ROAD CHARACTERISTICS

If the road activities share a similar location and topographic characteristics, list them on this page as a group. If the characteristics of the roads are different, list each road on a separate page. Attach additional detail pages as necessary to describe the activity. The following information should adequately describe the activity's potential to effect resources deemed important to the State in the Alaska Forest Resources and Practices Act and Regulations.

ROAD IDENTIFICATION(S): _____

_____

[ ] New Construction [ ] Reconstruction [ ] Closure

ROAD CONSTRUCTION DETAILS:

METHOD:
[ ] Modified natural sub-grade with rock fill overlay.
[ ] Modified natural sub-grade with mineral soil overlay.
[ ] Modified natural sub-grade with winter/ice road construction:
__ One winter only __ More than one winter
[ ] Unmodified natural sub-grade, natural running surface.
[ ] Reconstruction of one of the above methods (check one).
[ ] Other _____

This road is: [ ] Permanent [ ] Temporary

What percent of the road occupies side slopes in the following categories:
____ 0-30% ____ 30-67% ____ >67%

Are you removing or replacing drainage structures? [ ] YES [ ] NO

Will the road building be done by the: [ ] operator [ ] operator's contractor

If "contractor", has the contractor been copied this plan of operations? [ ] YES [ ] NO

Name of road contractor: _____

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NOTICE OF OPERATIONS
DETAILED PLAN OF OPERATIONS
WATER AND SOIL QUALITY CHARACTERISTICS

Is there evidence of previous mass soil movement or surface erosion on the proposed road route or in the unit? If so, where and what methods will you employ to minimize additional soil movement in the future due to your activity?

_____
_____
_____
_____
_____

List each known or suspected classified stream (11AAC 95.265) that will be crossed with a road:

Stream Label	Stream Type	Road Label and Location Description	Type of Structure Proposed	Site visit Request? Yes/ No

(Show the location(s) on the operation map and label them appropriately.)

List each unit that abuts or encompasses known or suspected classified waters:

Unit Label	Stream Type	Stream Label	Variation Requests			Site visit Request? Yes/ No
			None	Attached	Later	

(Show the location(s) on operation map and label them appropriately.)

Detail operational activities that you plan to perform within the riparian areas of classified waters (11 AAC 95.265), such as stream crossings, road ROW, skyline corridors, tail-holds, yarding, etc. Show the location(s) on the operation map.

_____
_____
_____
_____
_____
_____

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NOTICE OF OPERATIONS
DETAILED PLAN OF OPERATIONS
INSECT INFESTATION OR DISEASE
CONTROL METHODS

In Regions II & III (and Region I, if notified by the DOF) slash management for spruce trees or limbs greater than five (5) inches in diameter will be accomplished by:

[ ] Manufacture into cants, lumber, house logs, chips, or firewood.
[ ] Burning, subject to applicable regulations (anticipated date of burn: _____).
[ ] Leaving limbs only, dried by uniform scattering in areas open to sunshine.
[ ] Chemically treated, subject to applicable regulations;
[ ] Stored in an appropiate manner, as specified (attach correspondence);
[ ] Other methods (attach correspondence to be approved by the Division).

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NOTICE OF OPERATIONS
DETAILED PLAN OF OPERATIONS
REFORESTATION COMMITMENT

Regeneration of forested land is required within a specified time frame for each Region by the Alaska Forest Resources and Practices Regulations. See Sections 11 AAC 95.375, .380 and .385 for information on landowner's responsibilities. **Operators in Regions II and III must fill out Supplemental Sheet "C"** unless a land use conversion or exemption from reforestation is requested.

An exemption from the reforestation standards may be given if the landowner can demonstrate to the satisfaction of the Area Forester that:

1. The stand is significantly composed of insect and disease-killed, wind thrown, fire killed, or fatally damaged trees;
2. The land will be converted to another use in accordance with 11 AAC 95.200;
3. The stand will have a residual amount of trees that meet the minimum standards set out in 11 AAC 95.375(b) (3) and (4).

[ ] Land owner requests an exemption from reforestation under 11AAC 95.375(g). Submit supporting documentation as per the Alaska Forest Resources and Practices Regulations or as directed by the Division of Forestry.

[ ] Land use conversion (include a letter to the Division of Forestry stating the nature of the conversion, i.e. commercial, residential, agriculture or recreational land use).

REGENERATION METHOD

[ ] Landowner will rely on natural regeneration of the site.

[ ] Landowner will be artificially regenerating the site.

Species and source of seedlings or seed: _____

Date of proposed artificial planting: _____

What method of site preparation will be used? If different types of preparation methods are to be used in the notification area, attach adequate detail to define their location.

_____

_____

When will site preparation be accomplished? _____

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Date Received: _____
DPO # _____

NOTICE OF OPERATIONS
DETAILED PLAN OF OPERATIONS
SUPPLEMENTAL INFORMATION FORM "A"
CORPORATION, LIMITED PARTNERSHIP, GENERAL PARTNERSHIP, OR JOINT VENTURE INFORMATION

INSTRUCTIONS:

Corporation, partnership or joint venture information is required by 11 AAC 95.220(b). After the initial submittal of this information, subsequent Detailed Plan of Operations need only make reference to the previously submitted materials.

If any of the business relationships or key personnel change during the notification period, this form must be resubmitted as appropriate to maintain compliance with 11 AAC 95.220(b).

The following information applies to the: [ ] Operator [ ] Timber Owner [ ] Land Owner

In accordance with 11 AAC 95.220(b),

CORPORATION: *"a corporation must be identified by a copy of the corporation's certificate of incorporation and articles of incorporation showing the corporation's name and articles of incorporation,"* [ ] Copy attached

Also disclose "The identities of the registered agent, president, vice president, secretary, and treasurer" below:

Registered Agent _____

President _____

Vice President _____

Secretary _____

Treasurer _____

LIMITED PARTNERSHIP: "must be identified by a copy of the limited partnership agreement, evidence of filing of the limited partnership in the real property records as required by AS 32.11, and by the names and addresses of all general partners.

[ ] Copy attached (including names and addresses of all parties)

[ ] Evidence of filing in Recorder's Office, attached

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NOTICE OF OPERATIONS
DETAILED PLAN OF OPERATIONS
SUPPLEMENTAL INFORMATION FORM "A"
CORPORATION, LIMITED PARTNERSHIP, GENERAL PARTNERSHIP, OR JOINT VENTURE INFORMATION

GENERAL PARTNERSHIP or JOINT VENTURE: 11 ACC 95.220(b) states that a general partnership or joint venture must be identified by documentation showing the:

(1) Proper name of the partnership or joint venture.

_____

(2) Date that the partnership or joint venture was formed. _____

(3) Mailing address of the partnership or joint venture.

_____

_____

(4) Physical address of the partnership or joint venture.

_____

_____

(5) Names and titles of persons authorized to act for the partnership or joint venture.

_____

_____

(6) Names and addresses of all partners or all parties to a joint venture (use additional sheets as necessary.

_____

_____

NOTE: If any of the above information changes (including key individuals), resubmit Pages 1 and 2 of Supplemental Form "A".

Form 10-41-34 (Rev. 06/01/06)

Date Received: _____
DPO # _____

NOTICE OF OPERATIONS
DETAILED PLAN OF OPERATIONS
SUPPLEMENTAL INFORMATION FORM "B"
MINING RECLAMATION ACT CERTIFICATION

This page of the Operations Plan need only be filed once a year for a particular operation area if all statements on this form are applicable to subsequent notifications during the current calendar year. Silvicultural operations according to Sec 27.19.050 of the Mining Reclamation Act are exempted from bonding and annual reclamation plan filing where less than five acres and less than 50,000 cubic yards of gravel or other materials are disturbed or removed at one location in any year and there is a cumulative disturbed area of less than five acres at one location.

Pursuant to 11 AAC 97.250, _____ certifies that:
[Company Name]

1. With respect to any material site to be established or operated in the current operating year that lies within the operating area covered by operations titled _____, DPO _____.

   a. the total acreage and volume of the material to be mined from each material site are within the limits set out in AS 27.19.050(a)(2);

   b. _____ will reclaim all acreage required to be
   [Company Name]
   rehabilitated under 11 AAC 95.325; and

   c. _____ in compliance with the rehabilitation
   [Company Name]
   measures required under 11 AAC 95.325 will constitute the reclamation measures to be used to reclaim the total area mined; and

2. With respect to any material site established or operated in any prior year that lies within the operating area covered by this plan of operations:

   a. the area and volume mined from each material site are within the limits set out in AS 27.19.050(a)(2); and
   b. each material site is in compliance with 11 ACC 95.325

Dated: _____

_____
[Company Name]

By: _____

Title: _____

1

Form 10-41-34 (Rev. 06/01/06)

Date Received: _____
DPO # _____

NOTICE OF OPERATIONS
DETAILED PLAN OF OPERATIONS
SUPPLEMENTAL INFORMATION FORM "C"
REFORESTATION PLAN EXAMPLE AND WORKSHEET

NOTE: This supplemental sheet must be completed for operations in Regions II and III unless the Area Forester gives a written reforestation exemption or the operator is making a land use conversion.

Regulations promulgated under the Alaska Forest Resources and Practices Act (AFRPA) requires harvested land in AFRPA Regions II and III to be reforested within seven years of harvest. The number of vigorous, well distributed residual commercial trees free from significant damage or combination of trees and seedlings approved by the division, must average a minimum of 450 trees per acre and must have survived on site a minimum of two years. Tree species considered by the Division for stocking purposes include Sitka spruce, white spruce, Lutz spruce, aspen, balsam poplar, western black cottonwood and paper birch.

DETERMINATION OF RESIDUAL STOCKING LEVELS
To use this worksheet for reforestation planning, first estimate the number of residual commercial trees that will be left after timber harvest in each size class. Then divide, by the size class, the number of stems per acre needed to meet the minimum stocking standard found in 11 AAC 95.375(b)(4) into the estimated number of trees per acre left after harvest and multiplying by 100 to determine the stocking percentage. Percentages from each size class are then added to determine overall residual stocking levels. An Example is provided as follows:

RESIDUAL STOCKING TABLE EXAMPLE

Average DBH (Diameter at breast height)	Residual Trees (Trees / acre)	Minimum Stocking Standard (Trees / acre)	Stocking %
> 9"	20	120	17%
6" to 8"	30	170	18%
1" to 5"	60	200	30%
Total	110		65%

DETERMINATION OF MINIMUM SEEDLING REQUIREMENTS
In the example given above with 65% residual stocking, 158 additional tree seedlings per acre will be needed to satisfy the minimum stocking requirement. This is determined by multiplying the minimum 450 trees/ acre times the balance of the stocking percentage (35%) to achieve the minimum stocking level. The required number of seedlings may be achieved through natural regeneration, planting or artificial seedling. The new trees must survive on the site for a minimum of two years with in seven years of harvest.

RESIDUAL STOCKING CALCULATION TABLE

Average DBH (Diameter at breast height)	Residual Trees (Trees / acre)	Minimum Stocking Standard (Trees/ acre)	Stocking %
> 9"		120	%
6" to 8"		170	%
1" to 5"		200	%
Total Residual Stocking			%

SEEDLINGS REQUIRED

Percentage Under stocked = 100 – Total Residual Stocking %
Percentage Under stocked = 100 – _____ % = _____%

Seedlings/ Acre Required = Percentage Understocked/100 x 450
Seedlings/ Acre Required = _____% /100 x 450 = _____

1

Form 10-41-34 (Rev. 06/01/06)

Date Received: _____
DPO # _____

Appendix N

Executive Summary

MATANUSKA-SUSITNA BOROUGH:

FOREST INVENTORY REPORT

PHASE II

Amended: June 2009

Prepared by:

Sanders Forestry Consulting and Alaska Map Company

Phase I

In the spring of 2006, Sanders Forestry Consulting (Sanders), based in Sutton, Alaska, was contracted by the Matanuska-Susitna Borough (MSB) to conduct a timber inventory of designated, MSB Commercial Forest Lands (CFL) and use the inventory data and results to complete an Operational Plan, Market Analysis and Timber Appraisal and determination of the Annual Allowable Cut (AAC). The 2006 Matanuska-Susitna Borough: Forest Inventory Report was completed in December 2006 and the Operable Forest Land Analysis Report was completed February 2007. These combined reports are referred to as Phase I in this report.

Phase I of the timber Inventory required developing timber type maps and completing a statistically based timber cruise of CFL located within the designated MSB Forest Management Units (FMU) and a single Management Unit (Fish Creek). 1,221 field sample plots were recorded. The 2006 Timber Inventory Report provided: background, methodology, cruise results and analysis of the timber inventoried during 2006.

Phase II

RWS Consulting (RWS) based in Eagle River, Alaska was contracted by the MSB to complete a Forest Management Plan for the MSB. This process was divided into two parts. Part I was completed in April 2008 and Part II will be completed by May 2010.

During Phase II, Part I, additional areas were identified to be included, and in some cases areas excluded, from the timber base acreage. Part II includes some of the 2006 Forest Management Units and the new areas identified in Part I of the Forest Management Plan. Combined, these areas will be included in plans for Natural Resource Management Units (NRMU) which will replace the former Forest Management Units. This new plan will also include the Forest Management Plan.

In order for RWS to complete Part II, the 2006 Forest Inventory required revising to reflect the changes in area, acres, and timber volumes. (See: Phase II, Vicinity Map 2009) Final results from the Phase I and II inventory and operable area analysis will be used by RWS to complete a plan for these Natural Resource Management Unit's and a Forest Management Plan

RWS subcontracted Sanders and Alaska Map Company located in Kenai, Alaska to prepare timber inventory maps for the new areas using the same methodology that was used in the 2006 Inventory and compute new acres and summaries. The 2006 Inventory field data was applied to the revised acreages. The following Phase II 2009 Timber Inventory Report reflects these revisions where noted.

Table 1, on the following page, summarizes inventory results for acres and total net, timber volume by Natural Resource Management Unit.

Table 1. Phase II, Matanuska-Susitna Borough, Timber Inventory, Summary Results, Total Acres and Net Timber Volumes by Natural Resource Management Unit.

Natural Resource Management Unit	Non-Forest Acres	Non-Comm. Acres	CFL Acres	Net Bd. Ft. MBF	Net Cu. Ft. Cunit	Green Tons Cunit
Bartlett Hills	388	195	4,255	18,879	73,434	187,257
Chijuk Creek	4,324	2,922	17,413	72,796	284,656	886,700
Chulitna River	1,140	440	3,505	14,528	57,343	179,493
Deception Creek	1,146	945	1,027	4,678	17,848	53,721
Fish Creek	3,332	2,775	11,946	56,942	219,201	687,423
Kashwitna	3,031	1,297	5,038	22,599	86,728	260,711
Matanuska River North	58	57	331	1,556	5,834	19,043
Mile 233	292	116	3,738	16,769	65,449	204,439
Moose Creek	185	53	991	4,520	17,612	54,969
Parks Highway	4,503	2,405	3,159	12,875	50,682	159,418
Point Mackenzie	1,205	819	3,174	13,968	54,098	168,000
Rabideux Creek	1,136	649	2,692	11,724	45,521	140,249
Rogers Creek	1,862	2,983	2,193	10,289	39,176	116,883
Sheep Creek	1,670	3,109	4,924	21,459	83,856	262,961
Susitna River Corridor	1,425	577	4,737	17,948	70,153	219,076
Whiskers Creek South	2,960	763	10,241	44,710	174,896	547,980
TOTALS	28,658	20,107	79,364	346,240	1,346,487	4,148,323

Note. A cunit equals 100 cubic feet of solid wood. There are slight differences due to rounding.

Phase I. 2006 Inventory

Background

The timber inventory began on April 21, 2006.

The initial MSB request for proposals identified 13 Forest Management Units (FMUs) encompassing approximately 138,000 total acres with an estimated 84,691 acres of CFL. MSB chose to modify the inventory by deleting and altering the boundaries of several FMUs and adding the Fish Creek Management Unit. For the purpose of this report, the 10 FMUs and the Fish Creek Management Unit will be collectively referred to as Management Units (MU). Bunco Hills and Moose Creek FMUs were deleted from the inventory in the fall of 2006 after review of their isolated location and commercial timber volumes present. Project scope was not appreciably changed by these modifications.

The MSB specified several key parameters in their Timber Inventory Survey request for services that influenced project approach, methodology and cost.

- Existing low-level aerial photography would be used to perform the interpretation of forest lands and timber types. The added cost of procuring new, and comprehensive aerial photography was not part of the project.
- Similarly, existing digital imagery would serve for GIS base map preparation.

- Field sampling in remote areas was not required, if helicopter transport was the only reasonable access.

Objectives

Future Forest Management Plan updates depend on reliable inventory data for commercial forest lands. The validity of the timber appraisal, market analysis, operational plan, annual allowable cut (AAC), and associated maps is based on the accuracy of the timber inventory and site-specific field knowledge gained through accomplishing project tasks. There are five key elements to the timber inventory:

- Accurate and consistent mapping of MUs (aerial photo interpretation, map production and field verification).
- Accurate acreage determination of forest cover types (timber stand transfer to GIS base and creation of associated shapefiles).
- Comprehensive and statistically valid sampling design and procedures (office and field methods).
- Accurate timber measurement and timber volume/value/condition computation (professional experience and computer software programs).
- Clear and usable presentation of results.

Approach

The approach to meeting the objectives of the Timber Inventory, Phase I was as follows:

1. Identify CFL acreage on a stand-level basis (timber types) through stereo-interpretation of existing low-level aerial photography.
2. Prepare GIS timber Inventory maps and shapefiles of timber types (timber stands), non-commercial forest and non-forest acres using ESRI software compatible with MSB, GIS Department software.
3. Conduct a statistically-based timber inventory on identified CFL strata to achieve a sampling error of estimated mean total net volume, plus or minus 10%, at the 95% confidence level (CL).
4. Prepare a Timber Inventory Report that summarizes commercial timber volume in each MU by stratum, species, gross and net volume by log grade and domestic log sort on a per acre and total volume basis.
5. Prepare a summary report of Forest Health Conditions.

Methodology

Determination of Commercial Forest Land Cover Types:

Initial land cover designations for each MU were made by stereo-interpretation of existing low-level color aerial photography of varying scales and dates. See Appendix I - Photo Catalog, for photo title, scale and date by MU.

Prior to photo interpretation, a field reconnaissance of accessible MU timber types was conducted. Forest, non-forest and commercial forest land cover type calls for the original 13 FMUs were all made with the following classifications and codes. Final editing of forest cover timber type maps was performed after completion of the field cruise.

Table 2. Inventory Vegetation Classification, Coding and Description

Classification	Code	Description
Non-Forest	NFAg-G	Agricultural Lands – Grass
	NFB	Brush Fields, Alder, Willow other shrubs
	NFG	Native grass fields
	NFM	Muskegs/wetlands
	NFR	Riparian, streams and rivers
	NFR-Br	Riparian brush covered floodplains
	NFR-G	Riparian grass covered floodplains
	NFU	Urban development, including roads and borrow pits
	NFW	Lakes and ponds, standing water
Non-Commercial Forest	Bs- species	All Black spruce dominant stands
	W- density	Woodland forest types, less than 15% crown cover

Commercial Forest Lands were classified and coded according to species composition, size class, and crown density as shown below.

Table 3. Inventory Mapping Species, Code and Description

Species	Code	Description
White spruce	Ws	Greater than 80% Ws by gross volume
Hardwoods	Hd	Greater than 80% Hd by gross volume; includes Aspen, Birch, Cottonwood
White spruce/Hardwood	WsHd	Ws greater than 50%, Hd less than 50%
Hardwood/White spruce	HdWs	Hd greater than 50%, Ws less than 50%

Table 4. Inventory Timber Size Class, Code and Description

Size Class	Code	Description
Seedlings/Saplings	1	Average tree DBH less than 5 inches
Poletimber	2	Average DBH 5-9 inches Ws, Bs
		Average DBH 5-11 inches Hd
Sawtimber	3	Average DBH greater than 9 inches Ws
		Average DBH greater than 11 inches Hd

Table 5. Inventory Crown Density, Code and Description

Crown Density	Code	Description
Woodlands	1	Less than 15% crown cover, all trees
Open Forest	2	15 to 50% crown cover, all trees
Closed Forest	3	Greater than 50% crown cover

Commercial Forest Timber Type (timber stands) examples include the following:

- Hd3Ws3C Hardwood dominant stand, White spruce less than 50% by volume, sawtimber size class, with greater than 50% crown closer.
- Hd3C Hardwood dominant stands, White spruce less than 20% by volume, sawtimber size class, with greater than 50% crown closure.
- Ws2Hd2O Ws dominant stand, Hardwood less than 50% by volume, poletimber size class, with crown closer between 15 and 50%.

Recent timber harvest boundaries were often not depicted on dated photography or digital base maps. Timber harvest depletion maps were provided by the MSB Community Development Department and transferred to timber type base maps.

Map Preparation and Acreage Determination

Timber type maps were prepared by completing the following steps:

1. Scanning - Low-level imagery and photo-interpreted timber type lines and codes were scanned into Tagged Image Format Files (TIFF).
2. Geo-referencing – This is the procedure of registering non-spatial data to a known spatial coordinate system in order to enable the accurate calculation of areas and true world geometry. Digital scans were added to an ArcMap session along with one of the geometrically corrected “Control Layers” provided by the MSB. The designated coordinate system was set to North American Datum 1927, Alaska State Plane, Zone 4.
3. Digitizing – Timber type line information was digitally traced using a “heads up” digitizing process in ArcMap GIS software. A project geo-database was constructed along with a feature dataset using the MSB specified coordinate system. Additional data layers were created for:
    a. plot locations
    b. roads
    c. streams
    d. photo center locations
4. Ownership – To determine the accuracy of the Management Unit boundaries, MSB parcel data was overlaid on the Timber Survey Area Boundaries.

5. Quality Control – The following measures were performed to ensure accuracy of maps and datasets.
    a. A geo-database topology was constructed to enforce geographic relationship rules.
    b. Cartographic smoothing was set at tolerances that would maintain spatial integrity of timber type polygons.
    c. An adjacency tool was used to insure adjacent polygons did not have the same value.
    d. A tabular base was edited to ensure no typos or null data existed.
    e. Initial field maps were edited at the end of field sampling to ensure accurate timber type calls.
    f. A final Inspection was made. Often, the older (1980's) low-level imagery did not conform to the more current digital imagery, particularly along stream channels. Type lines were reshaped to match the most current geometry.

Sampling

Sampling Intensity

The number of field sample plots is based on the formula: [((t^2)*(CV^2))/SE^2] where t is Student's t-test, CV is coefficient of variation (of net cubic volume), and

SE is the desired standard error of the mean estimate (net cubic feet per acre). Cruises completed by Sanders in Southcentral Alaska have resulted in coefficients of variation of 70%. A CV of 70% results in a minimum of 196 (200, rounded) plots per stratum to estimate a plus or minus 10% accuracy at the 95% confidence level for each stratum.

Allocation of Sample Plots by Strata

Preliminary plot allocation was proposed for distribution of sample points (plots) by stratum (each stratum is a combination of similar timber types) based on species, size class and density class or "stratified random sampling". From *Forest Mensuration, Husch, Miller, Beers, 1972* stratified random sampling has the following advantages over simple random sampling:

1. Separate sampling estimates of the means and variances can be made for each of the forest subdivisions.
2. For a given sampling intensity, stratification often yields more precise estimates of the forest parameters.

This is a common sampling method in large forest inventories and was used by Sanders Forestry Consulting to meet the innovative approach required by this inventory project: estimate volumes in remote, inaccessible areas within MU boundaries.

Timber types were consolidated into six strata:

Stratum #1	Poletimber Stands (All species) Closed Density
Stratum #2	Poletimber Stands (All species) Open Density

Stratum #3	Hardwood Sawtimber Stands Closed Density
Stratum #4	Hardwood Sawtimber Stands Open Density
Stratum #5	Mixed Forest Sawtimber Stands Closed Density
Stratum #6	Mixed Forest Sawtimber Stands Open Density

A more detailed description of these six strata is contained in the report section titled "Description of Strata."

Stocked, seedling and sapling, commercial forest stands were not field sampled.

Sample Plot Distribution

A total of 200 sample points per stratum was planned for distribution throughout the eleven Management Units on a weighted acreage basis. Final allocation of plots was influenced by accessibility of strata, stand size and post-field, timber type edits. A total of 1,221 sample plots were measured in the field. See Appendix "G" Distribution of Sample Points by Strata and MU.

Sample Plot Location

Cruise instructions required that there should be no more than 15 sample points per stand to assure representative sample distribution. The inventory services agreement limited plot location to within 2 miles of four-wheel drive roads to reduce the cost of charter transport. In actuality, project foresters utilized ATVs, river boats and an available MSB helicopter charter to inventory more remote stands.

Timber Cruise Sampling Procedures

Field sampling of CFL was conducted using variable radius sample plot methods. Appendix "H" outlines pre-field cruise instructions and data recording procedures.

Grade and Sort Specifications

See Appendix "H" Timber Cruise Instructions.

Cruise Compilation

The Atterbury "SUPER" Accurate Cruise Extension (SUPER ACE), Version 6.0-94.06.03 software was used to process field data for the 2006 Timber Inventory. Sanders used a newer version "Super Ace 2004" to generate results for the revised tables and appendices in the 2009 Timber Inventory. Because of minor variations in the software formulas there are slight differences found in the computed results. These variations are within the defined sampling accuracy limits. The original sample plots and cruise cards were a part of project deliverables.

<u>Phase II.</u>

Background

Phase II of the Forest Inventory contains 16 Natural Resource Management Units (NRMU) that included many of the FMUs from the 2006 Inventory plus new areas identified. See Vicinity Map. Total acres for Phase II equals 128,127 acres.

Methodology

Sanders and Alaska Map Company used the same methodology to determine land cover types, prepare maps and determine acreages for new areas in Phase II. No additional field sampling was performed.

Cruise Compilation

Timber cruise data (Phase I, 2006) was used to compute volume for the revised acreage in Phase II.

Sanders used the updated, “Super Ace 2004”, software version to generate results for the revised tables and appendices in the 2009 Phase II, Timber Inventory. Because of minor variations due to number “rounding” in the software formulas there are slight differences found in the computed results between the two versions.

Description of Strata

This report section concerning summary strata descriptions for the entire project area is not included in this Executive Summary. A complete copy of this section can be found in Appendix L of the “Natural Resource Management Plan..

Appendices “A”, “D” and “E” of the “Forest Inventory Report” contains information that is more detailed.

Results

GIS Data file Acreage Summary

A complete listing of acres by Stratum and MU for non-forest, non-commercial forest and commercial forest were computed from GIS base map, shape files in Appendix ”A”, Land Cover Acres by Management Unit.

Table 6 summarizes Commercial Forest Land (CFL) Acres by NRMU and Strata

Table 6. Phase II. Matanuska-Susitna Borough, Commercial Forest Land, by, NRMU, Strata, in Acres.

Natural Resource Management Unit	Stratum						Total
	#1	#2	#3	#4	#5	#6	
Bartlett Hills	926	29	14	154	2,370	749	4242
Chijuk Creek	1,356	2,170		1,208	9,457	3,214	17404
Chulitna River	95	127		8	1,802	1,458	3491
Deception Creek	639		47	95	160	68	1008
Fish Creek	840	36	1,449	417	8,931	230	11903
Kashwitna	2,597	383	232	101	1,210	501	5023
Matanuska River North	38		95	197			331
Mile 233	305	2		71	2,820	539	3738
Moose Creek	74		8		816	93	991
Parks Highway	196	28	89	219	1,023	1,555	3110
Point Mackenzie	746	93	30	397	1,523	372	3160
Rabideux Creek	735	95	22	173	1,135	520	2681
Rogers Creek	1,498	32	128	73	393	61	2186
Sheep Creek	244	128	232	172	2,707	1,441	4924
Susitna River Corridor	496	128	63	278	2,020	1,198	4185
Whiskers Creek South	546	164		399	7,059	2,014	10182
TOTAL	**11,330**	**3,415**	**2,410**	**3,962**	**43,427**	**14,015**	**78559**

Commercial Forest Land (CFL) Timber Volume Totals

Gross and net timber volume by species, species, sort, grade on a per acre and total volume basis in cubic feet, board feet and green tons are represented in the following Super "ACE", Appendices B, C, D.

Green Tons

Computation of Green tons was derived from the following ratios applied for the individual species on a pounds/cunit ratio, using field results on Kenai Peninsula projects within similar timber types. Table 7 shows inventory tree species and weights per cunit that were used for this calculation.

Table 7. Inventory Species and Weight, in Pounds per Cunit

Species	Pounds/Cunit
Aspen	5,000
Birch	5,500
Black Spruce	4,500
Cottonwood	5,000
White Spruce	3,300

Inventory Timber Volume Totals

Table 8 is a summary of detailed total inventory results for all NRMUs contained in Appendix B.

Table 8, Phase II. Total Volumes by Species

Species	Net BDFT per Acre	Total Net MBF	Net CUFT per Acre	Total Net Cunits	Green Tons per Acre	Total Green Tons*
Aspen	208	16,337	77	60,333	2.85	224,046
Birch	2,625	206,225	1,063	834,948	39.10	3,071,602
Black Spruce	37	1,899	13	10,005	0.35	27,832
Cottonwood	223	17,528	73	57,191	2.22	174,429
White Spruce	1,314	103,263	489	384,060	8.79	690,491
TOTALS	**4,408**	**346,252**	**1,714**	**1,346,538**	**53.32**	**4,188,400**

Defect Percent

Visible defect can be determined by dividing the net volume by gross volume estimates. Gross volumes include utility (chip) volume and sawlog volume. Defect does not include hidden defect or logging breakage.

The average visible defect, by species, for the inventory areas is represented in Table 9

Table 9, Phase II. Average Visible Defect, Cubic Basis, by Species.

Species	Gross Volume/acre	Net Volume/acre	Percent Defect
Aspen	114.00	77.00	32.70
Birch	1,422.00	1,063.00	25.20
Black Spruce	16.00	13.00	19.10
Cottonwood	89.00	73.00	18.00
White Spruce	533.00	489.00	8.20
All Species, weighted	**2,173.00**	**1,714.00**	**21.10**

Strata Timber Volume Totals

Table 10 illustrates timber inventory volumes by stratum and species. Detailed results are contained in Appendix C.

Table 10, Phase II. MSB Timber Inventory, Volumes Summarized by Stratum and Species

Species	Net BDFT per Acre	Total Net MBF	Net CUFT per Acre	Total Net Cunits	Green Tons per Acre, Gross	Total Green Tons, Gross
STRATUM #1 — Poletimber Closed 11,330 acres						
Aspen	770	8,720	298	33,793	8.37	94,876
Birch	2,920	33,082	1,101	124,789	35.47	401,923
Black Spruce	117	1,320	40	4,523	1.28	14,478
Cottonwood	172	1,944	60	6,808	1.56	17,672
White Spruce	742	8,408	291	32,927	5.22	59,103
TOTALS	**4,720**	**54,357**	**1,790**	**202,840**	**51.90**	**588,056**
STRATUM #2 — Poletimber Open 3,415 acres						
Aspen	326	1,112	132	4,509	1.34	15,415
Birch	1,329	4,537	559	19,081	5.64	65,000
Black Spruce	123	422	46	1,587	0.36	4,091
Cottonwood	6	20	3	118	0.04	433
White Spruce	969	3,310	349	11,928	1.92	22,119
TOTALS	**2,752**	**9,400**	**1,090**	**37,224**	**9.30**	**107,057**
STRATUM #3 — Hardwood Sawtimber Closed 2,410 acres						
Aspen	519	1,250	163	3,937	1.84	21,247
Birch	2,496	6,015	974	23,477	7.38	85,024
Black Spruce	17	42	6	147	0.03	330
Cottonwood	2,638	6,358	931	22,426	5.10	58,743
White Spruce	542	1,305	191	4,607	0.75	8,674
TOTALS	**6,212**	**14,970**	**55,795**	**54,594**	**15.11**	**174,019**
STRATUM #4 — Hardwood Sawtimber Open 3,962 acres						
Aspen	24	96	6	248	0.09	1,009
Birch	2,285	9,052	937	37,136	12.69	146,149
Black Spruce	13	51	5	205	0.04	461
Cottonwood	728	2,886	221	8,762	2.82	32,485
White Spruce	942	3,733	354	14,011	2.17	24,996
TOTALS	**3,993**	**15,819**	**1,524**	**60,362**	**17.83**	**205,370**
STRATUM #5 — Mixed Sawtimber Closed 43,427 acres						
Aspen	83	3,598	27	11,689	6.39	73,602
Birch	2,888	125,422	1,179	512,046	163.49	1,882,872
Black Spruce	24	1,041	8	3,461	0.72	8,284
Cottonwood	140	6,084	42	18,441	5.44	62,645
White Spruce	1,497	65,011	548	238,116	37.47	431,589
TOTALS	**4,632**	**201,156**	**1,805**	**783,753**	**213.51**	**2,458,993**
STRATUM #6 — Mixed Sawtimber Open 14,015 acres						
Aspen	111	1,562	44	6,157	1.55	17,897
Birch	2,006	28,117	845	118,419	42.58	490,362
Black Spruce	2	24	1	83	0.02	188
Cottonwood	17	236	5	635	0.21	2,451
White Spruce	1,534	21,495	588	82,470	12.50	144,007
TOTALS	**3,670**	**51,434**	**1,482**	**207,765**	**56.86**	**654,904**

Note: *Total Green Tons = Super ACE Total Green Tons minus Cull Tons

Natural Resource Management Unit Timber Volume Totals

Table 11 contains total acres and net timber volumes for the 16 NMRUs. Appendix D contains more details.

Table 11, Phase II. Total Inventory Acres and Timber Volumes, by Unit

Natural Resource Management Unit	Non-Forest Acres	Non-Comm. Acres	CFL Acres	Net Bd. Ft. MBF	Net Cu. Ft. Cunit	Green Tons Cunit
Bartlett Hills	388	195	4,255	18,879	73,434	187,257
Chijuk Creek	4,324	2,922	17,413	72,796	284,656	886,700
Chulitna River	1,140	440	3,505	14,528	57,343	179,493
Deception Creek	1,146	945	1,027	4,678	17,848	53,721
Fish Creek	3,332	2,775	11,946	56,942	219,201	687,423
Kashwitna	3,031	1,297	5,038	22,599	86,728	260,711
Matanuska River North	58	57	331	1,556	5,834	19,043
Mile 233	292	116	3,738	16,769	65,449	204,439
Moose Creek	185	53	991	4,520	17,612	54,969
Parks Highway	4,503	2,405	3,159	12,875	50,682	159,418
Point Mckenzie	1,205	819	3,174	13,968	54,098	168,000
Rabideux Creek	1,136	649	2,692	11,724	45,521	140,249
Rogers Creek	1,862	2,983	2,193	10,289	39,176	116,883
Sheep Creek	1,670	3,109	4,924	21,459	83,856	262,961
Susitna River Corridor	1,425	577	4,737	17,948	70,153	219,076
Whiskers Creek South	2,960	763	10,241	44,710	174,896	547,980
TOTALS	28,658	20,107	79,364	346,240	1,346,487	4,148,323

Note. A cunit equals 100 cubic feet of solid wood. There are slight differences due to rounding.

Statistical Summary

Appendix “F” contains a detailed statistical summary of the timber inventory by strata. Table 12 displays summary results.

Table 12, Phase II. Timber Inventory Statistics, Weighted by Stratum

Stratum	SE%	Acres	Weighted	Weight SE
1	4.2	11,330	0.143	0.602
2	6.8	3,415	0.043	0.294
3	6.7	2,410	0.031	0.204
4	5.1	3,962	0.050	0.256
5	3.2	42,427	0.537	1.719
6	4.7	14,015	0.177	0.834
		77,559	0.982	3.909
				7.818[1]

Note 1: 7.818 % is a weighted-average Standard Error (of the mean estimate) at the 95% confidence level.

Forest Health Summary (Phase I, 2006 Inventory)

During Phase II (2009 inventory) the datum on the forest health was not changed. The information and conclusions on forest health from the 2006 inventory are still valid for the areas added to the inventory in Phase II. For the purposes of this report, the original information (2006 inventory) is included in this section.

Project foresters recorded tree health data at each field sample plot for each tree, all species. Timber cruisers evaluated tree condition and tree health using external indicators. Downed trees were not recorded. In this manner, project foresters compiled data on overall forest health by stratum.

The SUPER "ACE" timber cruise software allows the user to record sample tree condition in two fields of entry (columns T1 and T2 on field sample cards).

Detailed field procedures are listed in Appendix "H", TIMBER CRUISE FIELD INSTRUCTIONS.

Tree condition class was recorded in column T1 and the principal defect was recorded in T2. The three tree condition classes used are:

Growing Stock Tree

To rate as a condition class "1" the tree had to be a commercial species, contain merchantable product(s), have no damage/defect or have minor damage/defect that will not affect growth or survival; tree is healthy as evidenced by visible growth rate, bark appearance and crown condition. Mature trees were included that were still accruing annual net volume and expected to survive at least the next 10 years.

High Risk Tree

Trees in this condition class are a commercial species, contain merchantable product(s), but has defect/damage that reduces merchantable volume and affects the tree's ability to continue growing, and/or tree is not accruing annual net volume. Defect and damage are expected to cause increasing volume losses, below mean annual increment, or result in tree mortality within the next 10 years.

Cull / Mortality Tree

A cull tree is a live cull (expected to yield less than 50% chips and will not produce a forest product) due to rot (rotten cull) or rough form (sound cull). Mortality trees represent recent dead standing trees. White spruce mortality trees recently killed by the spruce bark beetle infestation had volumes recorded if the tree still contained utility volume (chips).

There are a significant number of principal defect codes that are listed in Appendix H, with further discussion.

Detailed forest health statistics and results by the six project strata are contained in Appendix "E", FOREST HEALTH. Table 13 summarizes Forest Health on a basal area/acre (square feet) and CUFT/acre (tree volume) basis by stratum for individual tree

species. Trees were categorized by the three condition classes: Growing Stock, High Risk, Cull and Mortality.

Table 13, Phase I. MSB Forest Inventory, Summary of Forest Health by Strata

Species	*Growing Stock BA/ac (sq. ft)*	*CUFT/ac*	*High Risk BA/ac (sq. ft.)*	*CUFT/ac*	*Cull/Mortality BA/ac (sq. ft.)*	*CUFT/ac*	*Total BA/acre*
Stratum #1 Poletimber Closed							
Aspen	7.5	144	8.0	145	1.0		16.5
Birch	51.2	720	23.6	340	7.0		81.8
Black Spruce	3.3	30	0.5	6	0.7		4.5
Cottonwood	1.7	41	0.8	19	0.2		2.7
White Spruce	11.8	222	2.3	54	1.2	4	15.3
Total	75.5	1157	35.2	564	10.1	4	120.8
Stratum #2 Poletimber Open							
Aspen	2.1	35	7.0	91	1.3		10.4
Birch	21.0	325	16.2	213	3.7		40.9
Black Spruce	2.9	33	0.5	6	0.5		3.9
Cottonwood	0.2	3	0.0	0	0.2		0.4
White Spruce	13.0	237	4.2	71	3.3	5	20.5
Total	**39.2**	**633**	**27.9**	**381**	**9.0**	**5**	**76.1**
Stratum #3 Hardwoods Sawtimber Closed							
Aspen	1.5	57	5.3	106	4.3		11.1
Birch	20.0	421	31.1	549	10.8		61.9
Black Spruce	0.3	2	0.1	2	0.0		0.4
Cottonwood	19.0	540	12.2	390	1.0		32.2
White Spruce	8.3	112	3.0	58	1.5	12	12.8
Total	**49.1**	**1132**	**51.7**	**1105**	**17.6**	**12**	**118.4**
Stratum #4 Hardwoods Sawtimber Open							
Aspen	0.0	0	0.3	7	0.2		0.5
Birch	20.3	376	36.3	554	13.3		69.9
Black Spruce	0.2	5	0.0	0	0.0		0.2
Cottonwood	3.6	103	5.1	117	2.8		11.5
White Spruce	7.1	147	7.1	181	1.6	19	15.8
Total	**31.2**	**631**	**48.8**	**859**	**17.9**	**19**	**97.9**
Stratum #5 Mixed Forest Sawtimber Closed							
Aspen	0.2	6	1.2	21	1.0		2.4
Birch	28.7	538	40.0	637	11.7		80.4
Black Spruce	0.3	6	0.2	2	0.1		0.6
Cottonwood	0.2	7	1.6	36	0.2		2.0
White Spruce	17.6	361	7.2	163	2.7	5	27.5
Total	**47.0**	**918**	**50.2**	**859**	**15.7**	**5**	**112.9**
Stratum #6 Mixed Forest Sawtimber Open							
Aspen	0.7	15	1.8	29	0.0		2.5
Birch	16.6	300	35.7	534	16.0		68.3
Black Spruce	0.0	0	0.0	0	0.0		0.0
Cottonwood	0.0	0	0.2	5	0.0		0.2
White Spruce	12.8	272	11.9	298	1.9	13	26.6
Total	30.1	587	49.6	866	17.9	13	97.6

Forest Health and Condition by Stratum

Below is a general summary of forest health and condition by strata for all CFL forest types. All percentages and comparisons are made based on basal area/acre.

Stratum #1

Timber stands are predominantly even-aged, young-growth stands that originated from large-scale disturbance (e.g., wildfire, flooding, clearing/harvest) within the last 100 years. Stratum #1 has the greatest amount of basal area/acre of the six separate strata, and birch timber represents 67% of total basal area.

In Stratum 1, 62% of total basal area represents growing stock trees, and only 29% of the basal area represents high risk trees. Further, 5% of stratum basal area represents cull trees and 4% represents mortality trees.

Samples indicate 43% of the basal area represents trees with no damage, and 29% represents trees with rough form and estimated 18% of the basal area represents live trees with disease as the most damaging agent, including cull trees.

Stratum #2

Timber stands are predominantly young-growth stands that are the result of recent partial-cut timber harvesting. While most stands are predominantly even-aged, older, more mature, formerly suppressed, pole-sized trees (particularly white spruce) are included, as are occasional saw-timber size trees (residuals) that were not harvested due to rough form, or other defect.

Stratum #2 has the least amount of basal area/acre of the six separate strata, and birch timber represents 53% of total basal area, while 52% of the basal area represents growing stock trees, and 37% of the basal area represents high risk trees. Cull trees represent 3% of basal area and 8% are mortality trees.

Trees with no damage comprise 45% of stand basal area and 18% represents trees with rough form. Live trees with disease constitute 22% of stand basal area, including cull trees.

Stratum 2 stands have the highest recorded mortality of all strata: 61% insect (mostly spruce bark beetle), 29% disease, 5% weather, and 5% natural breakage. The rate of mortality (largely due to the spruce bark beetle) is nearly double mortality found in other strata, and is the highest mortality due to insects. One possible explanation for the high mortality rate is that following partial cut harvesting residual trees were under various stresses and were more susceptible to spruce bark beetle attack. Also, birch timber was possibly more susceptible to breakage because of opened tree canopies following harvest.

Stratum #3

Stratum 3 timber stands are predominantly old-growth stands that contain all age classes. Stratum #3 has the second greatest amount of basal area/acre of the six separate strata. Hardwood timber represents 90% of total stand basal area. .

High risk trees are 44% of total basal area while growing stock trees are 41% of the stand. Cull trees are 12% of basal area and 3% represents mortality trees.

Trees with no damage are 33% of total stand basal area and 28% are trees with rough form. Diseased live trees are 29% of stratum basal area, including cull trees.

Stratum #4

Timber stands are predominantly old-growth stands that contain all age classes. Hardwood timber represents 84% of the stand by basal area.

High risk trees comprise 50% of stand basal area while 32% are growing stock trees. Cull trees are 15% of basal area and 3% are mortality trees.

Trees with no damage are 21% of stand basal area and 28% are trees with rough form. Live trees with disease (including cull trees) constitute 39% of total stand basal area.

Stratum #5

Stratum 5 timber stands are predominantly old-growth stands that contain all age classes. Hardwood timber represents 75% of stand basal area.

High risk trees are 44% of stand basal area and 42% are growing stock trees. Cull trees are 10% of basal area and 4% are mortality trees.

Trees with no damage constitute 30% of stand basal area and 28% are trees with rough form. Diseased live trees total 32% of stand basal area, including cull trees.

Stratum #6

Timber stands are predominantly old-growth stands that contain all age classes. Hardwood timber represents 72% of total stand basal area.

High-risk trees are 51% of stand basal area while 31% are growing stock trees. Cull trees are 15% of stand basal area and 3% are mortality trees.

Trees with no damage are 27% of stand basal area and 27% are trees with rough form. Live trees with disease are 33% of stand basal area, including cull trees.

Forest Health and Condition Summary

Analysis of data suggests there are strong forest health and condition correlations between strata #1and #2, strata #3 and #5, and strata #4 and #6, as described below:

- Strata #1 and #2 (mixed species pole-timber, closed and open density, respectively) comprise mostly productive, relatively even-aged, growing stock trees. Stands in these strata have the lowest incidence of disease, (disease incidence for both strata combined averages 20%), and for management purposes can be considered young-growth forests. Stands in these strata represent 17% of the total CFL acreage.
- Strata #3 and #5 (closed hardwood saw-timber and closed mixed saw-timber, respectively) comprise mostly stagnated or declining high risk trees representing all age classes. Stands in these strata have moderate, but significant incidence of disease, (disease incidence for both strata combined averages 30%), and for management purposes can be considered old-growth forest. Stands in these strata represent 61% of the total CFL acreage.

- Strata #4 and #6 (open hardwood saw-timber and open mixed saw-timber, respectively) comprise mostly stagnated or declining high risk trees representing all age classes. Stands in these strata have the highest incidence of disease, (disease incidence for both strata combined averages 36%), and for management purposes can be considered old-growth forest. Stands in these strata represent 22% of the total CFL acreage.

The majority of MSB, CFL is over-mature, birch/white spruce sawtimber stands.

Forest Health by Species

Aspen

Young-growth aspen found in dense poletimber stands were relatively free of defect and decay. In the older stands, they were highly defective with indicators of rot (conks) extending throughout the bole. Trees infested with the aspen leaf miner were noted in small, localized areas in Fish Creek and Whiskers Creek.

Birch

From Appendix "E" Forest Health, birch trees inventoried in Stratum #5, have the following average BA/acre for three condition classes.

Table 14, Phase I. Birch Tree Basal Area per Acre by Condition Class

Birch Tree Class	BA/ac (sq. ft.)	Percent
Growing Stock	28.7	36
High Risk	40.0	50
Cull/Mortality	11.7	14
Total	**80.4**	

An estimated 64% of the birch component in strata #5 is either not producing timber volume exceeding mean annual increment and/or is expected to die within the next ten years or is already dead.

Birch found in the old-growth sawtimber strata suffer from a variety of fungi and disease decay as evidenced by visible rot, conks, cankers and broken boles. During windy conditions, tree stems and boles were commonly heard falling to the ground. Rough form (crook) and multiple boles also limit the trees' ability to yield timber products and increase the occurrence of breakage due to snow, ice and wind.

Black Spruce

This is a minor species in the commercial forest. Trees recorded were relatively free of decay with root rot the principal disease noted.

Cottonwood

Cottonwood trees found in dense, young-growth, pole and small sawtimber stands along the river floodplains were thrifty and relatively free of defect and decay. However, this forest type does not comprise significant forest acreage within the boundaries of the

MSB forest inventory. Large, old-growth trees found in the older, open stands were highly defective with visible rot, hollow boles and broken tops.

White Spruce

White spruce trees within the inventory area generally appeared healthy and had few visible indicators of decay. On the poorly drained sites, hidden defect due to root rot is indicated by the presence of past, downed mortality trees and swollen tree butts.

Dominant and co-dominant, white spruce crown classes recorded in the sawtimber strata were generally old-growth but commonly classified as growing stock if they were healthy and producing minimal annual growth as evidenced by tree appearance, crown condition, tree form and leader growth.

Spruce bark beetle presence was noted and recorded. At present, bark beetle activity appears to be on the decline with less than 3% of the basal area in stratum #5 showing indications of attack by the presence of bore holes. The infestation appears to have diminished with limited sign of recent attacks. Most of the mortality trees were not recent and appeared to have been infested and killed over 3 years ago.

From the inventory results for stratum #5, the current degree of beetle infestation can be evaluated on a BA/acre basis.

Table 15, Phase I. White Spruce Beetle Infestation by Condition Class

White Spruce Tree Class	BA/ac. (sq. ft.)	Percent
Growing Stock	17.6	64
High Risk (other factors)	6.5	23
High Risk (insect)	0.7	3
Cull/Mortality (insect)	2.7	10
Total	**27.5**	**100**

Appendix O

Executive Summary

MATANUSKA-SUSITNA BOROUGH:

OPERABLE FOREST LAND ANALYSIS REPORT

PHASE II

Amended: June 2009

Prepared by:

Sanders Forestry Consulting and Alaska Map Company

Executive Summary

Phase I

Sanders Forestry Consulting (Sanders) based in Sutton, Alaska was contracted by the Matanuska-Susitna Borough (MSB) under Professional Services Agreement #06-087 to conduct a Forest Inventory, Operational Analysis and Market Analysis of eleven (11) designated Management Units (MU). This was completed in February 2007.

Phase II

RWS Consulting (RWS) based in Eagle River, Alaska was contracted by the MSB to complete a Forest Management Plan for the MSB. This process was broken into two parts. Part I was completed in April 2008 and Part II will be completed by May 2010.

During Phase II, Part I, additional areas were identified to be included, and in some cases excluded, from the timber base acreage. Part II will include some of the old Forest Management Units and the new areas identified in Part I. Combined these areas will be included in plans for Natural Resource Management Units (NRMU) which will replace the former Forest Management Units. This new plan will also include the Forest Management Plan.

In order for RWS to complete Part II, the 2006 Forest Inventory required revising to reflect the changes in area, acres and timber volumes. Final results from the Phase I and II inventory and operable area analysis will be used by RWS to complete a plan for these Natural Resource Management Unit's and a Forest Management Plan

RWS subcontracted Sanders and Alaska Map Company located in Kenai, Alaska to prepare timber inventory maps and operational analysis maps for the new areas using the same methodology that was used in the 2006 Inventory and compute new acres and summaries. The 2006 Inventory field data was applied to the revised acreages. The following Phase II 2009 Operable Forest Land Analysis Report reflects these revisions where noted.

This Operational Analysis Report summarizes Operable Forest Lands (OFL) identified within the Phase II CFL boundaries and presented on 16 NRMU Operational Analysis Maps prepared by Sanders and AKMapCo (attached). In addition, this report contains Annual Allowable Cut calculations based on CFL and operable CFL timber volumes, acreages, and estimated average site productivity. Also included is a section on Silvicultural Considerations (regeneration).

OFL was determined by applying regional timber harvest practices and systems to determine currently operable timber volumes. See: Regional Harvest Practices / Systems and Methodology sections of the following Report. Operable acres were classified as to winter or all-season access. Inoperable acres were classified by codes that limited their operability, i.e. volume, access, regulatory buffers, etc.

Table 16 summarizes results for OFL acres and net volumes by Forest Management Unit (FMU) and the Fish Creek Management Unit (MU).

Table 16, Phase II. Operational Forest Lands Summary Results, Total Acres and Net Timber Volumes by Natural Resource Management Unit.

Management Unit	Total Acres	CFL Acres	OFL Acres	Operable Net Bd. Ft. MBF	Operable Net Cu. Ft. Cunit	Operable Green Tons
Bartlett Hills	4838	4,255	2,785	12,733	49,259	151,969
Chijuk Creek	24659	17,413	14,867	62,194	243,342	758,337
Chulitna River	5085	3,505	2,845	11,834	46,736	146,430
Deception Creek	3118	1,027	676	3,055	11,727	35,472
Fish Creek	18053	11,946	9,025	42,529	164,390	516,252
Kashwitna	9366	5,038	3,429	15,370	59,132	178,028
Matanuska River North	445	331	264	1,251	4,686	15,356
Mile 233	4146	3,738	3,079	13,783	53,837	168,478
Moose Creek	1228	991	732	3,335	13,019	40,684
Parks Hwy	10067	3,159	1,534	6,674	26,042	82,039
Point Mackenzie	5198	3,174	2,631	11,558	44,825	139,867
Rabideux Creek	4477	2,692	1,585	7,038	27,264	83,417
Rogers Creek	7039	2,193	1,024	4,860	18,478	54,720
Sheep Creek	9703	4,924	1,548	7,094	27,561	86,470
Susitna River Corridor	6739	4,737	3,032	12,986	50,867	159,500
Whiskers Creek South	13965	10,241	7,518	33,482	130,969	410,903
Total	**128,127**	**79,363**	**56,575**	**249,776**	**972,134**	**3,027,922**

Introduction Phase II

The following Operable Forest Land (OFL) Report summarizes data contained on Operable Forest Analysis Maps prepared by Sanders Forestry Consulting for the 16 NRMUs. OFL is defined as commercial forest land (CFL) capable of supporting access and timber harvest systems commonly used in the region.

The following individuals participated in production of this report:

- Richard Sanders-field reconnaissance, aerial photo interpretation and mapping, report preparation.
- Gary Greenberg-GIS mapping and data compilation.

Purpose Phase II

Determine OFL, summarize acres, and volumes for the revised NRMU areas. The OFL report and associated maps will serve as the basis for economic analysis and annual cut calculations.

The decision to conduct timber harvest and designation of actual timber harvest roads and harvest unit boundaries are outside the scope and authority of this project.

Regional Timber Harvest Practices and Systems

Following is a description of practices pertaining to timber harvest and related operations currently used in the region.

Road Construction

Two types of timber access roads are currently used in the region, all-season roads and winter roads. For the purposes of this report, the principal access routes to the individual MU boundaries have been considered unencumbered and feasible.

All-season Roads

In areas having supportive timber values and suitable soil conditions, all-season roads are considered feasible for construction. All-season roads have a developed sub-grade, roadside ditches, a cross-section conducive to shaping (crowning), and a running surface of pit-run gravel excavated either from road-side slit trenches or other truck haul, borrow pits. To comply with Forest Practices and other laws and regulations, these roads typically require the use of culverts (cross drainage) and/or manufactured bridges at stream crossings. Compliance with Forest Practices requires these roads to be actively maintained or closed-out: water crossing structures removed, erosion controls installed, and access blocked to prevent access by conventional highway vehicles. Current operations indicate that CFL densities of 2400 feet in width are required to support all-season road construction costs.

Winter Roads

Winter roads are used to access areas of remote timber, lower value timber, saturated or otherwise unsuitable soils, and areas isolated by large wetlands or water bodies. Winter roads are cleared of timber and brush, but have no developed sub-grade, except in segments requiring cuts, such as on side-slopes and through-cuts to maintain grades. Typically water crossings utilize ice-bridges. Winter road construction and use depends on frozen ground conditions. Current operations indicate that CFL densities of 1200 feet in width are required to support winter road construction costs.

Harvest Systems

Cutting

Timber cutting is accomplished mostly by means of mechanical cutting on large-scale harvests (feller-buncher machinery). Manual falling is common on small timber harvests, steep slopes and large diameter trees.

Yarding

To date, only ground-based harvest methods have been used effectively in the region. On small sales a variety of methods have been used to harvest, load and haul timber products. On the larger sales the machinery used to skid trees or logs includes rubber tired skidders, dozers, logging shovels, and forwarders. Economical ground based skidding (maximum yarding) distances range from 500 ft. with a dozer to about a mile with forwarders. Field review of current timber harvest operations (ground-based logging methods) suggests an average maximum yarding distance of 1200 feet for

planning purposes. Ground-based harvest systems are feasible on ground slopes up to 30 percent.

Landings

Designated landings or continuous roadside landings are used to land, sort, deck, and load log trucks, chip vans and rail cars. Designated landings may also serve as a processing point for: limbing, bucking and/or de-barking and chipping. Designated landings need to be large enough to accommodate planned harvest activities: log skidding, decking, sorting, processing and loading (generally a clearing of 200X200 feet).

Processing

Cut timber is processed either in the woods or at the landing to produce logs or chips. Processing timber into logs is accomplished manually or with a mechanized tree processor, which limbs the tree and bucks it into one or more logs. Mobile processors are used to de-bark and process logs into chips that are conveyed into chip vans for hauling.

Hauling

Logs or wood chips have been transported from the woods to market by log truck, chip van and rail car.

Methodology

Given the regional harvest practices, described above, the eleven (11) individual MUs were evaluated for harvest potential (OFL) using the MU Timber Type Maps (Phase I) as a base for determining harvest chance. The low-level aerial photos (stereo pairs), that were used to interpret forest types, were also used in combination with project foresters' field reconnaissance to identify OFL boundaries, road locations, saturated soil conditions, terrain features, stream locations and other site-specific harvest conditions and constraints.

Operable Timber

1. Operable areas containing timber volumes and values that have been historically or currently harvested under commercial timber sale agreements. This requires timber stands to contain commercial timber products not less than 800 CUFT/acre and capable of producing 20 CUFT/acre/year of wood products[8].
2. Areas currently or potentially accessible by all-season or winter road construction.
3. Capable of harvest using ground based, mechanized timber harvest systems currently used in the region.
4. Timber stand volume and values that currently support road construction and harvest costs in the region.
5. Available for harvest under law, regulation, ordinance or policy.

[8] Timber Resource and Statistics for the Beluga Block, Susitna River Basin Multiresource Inventory Unit, Alaska, 1980, Carroll, Setzer, Mead

Inoperable Timber

1. Non-commercial forestland identified by the Timber Inventory.
2. Isolated timber volumes/values within a MU that have not historically supported all-season or winter road construction (access) are considered inoperable at this time.

Mandatory No Cut Buffers:

1. 100 ft. no cut buffer on streams that are anadromous and streams that connect to anadromous streams without documentation of a physical blockage and stream gradient less than 8 percent. Alaska Forest Resources and Practices Act (AFR&PA) Regulations.
2. 100 ft., no-cut buffer surrounding Class I and II wetlands. Willow Sub-Basin Plan and MSB, Land Management Department (LMD) policy.
3. 100 ft., no-cut buffer surrounding lakes. Willow Sub-Basin Plan, Southeast Susitna Area Plan, Alaska Forest Resources and Practices Act (AFR&PA) Regulations, and MSB, LMD policy.
4. 100 ft., no-cut buffer along adjacent ownership lines. MSB 23.20.070.
5. 150 ft., no-cut buffer along scenic highways.

Road Location

Road locations were based on construction techniques commonly used in the region and the following criteria:

1. Locate roads to promote downhill skidding.
2. Keep the length of roads to a minimum.
3. Designing road type (all-season or winter), length, and density to reflect timber volumes, and maximum yarding distances for ground-based harvest methods: 1200 ft. for all-season harvest areas and 600-1200 ft. for winter harvest areas.
4. Locate roads in the commercial forest.
5. Avoid unnecessary intersections.
6. Avoid unstable and saturated soils wherever possible.
7. Keep stream crossings to a minimum.
8. Minimize the need for construction of cut and fill side-slopes and through-cuts.
9. Maximum grades are designed to be less than 15% favorable haul, and 10% adverse haul.
10. Landings were not identified and are considered to be an operator's choice and part of road construction cost.
11. Follow "Best Management Practices" for road construction as described in Alaska Forest Resources and Practices Regulations.

Harvest System

Potential harvest areas were based on current timber harvest systems and the following limitations:

1. The maximum average ground based, yarding distance was planned to be between 600 and 1200 ft.
2. Small pockets of commercial timber, “long corners”, exceeding the 1200-foot yarding distance were considered operable and often included.
3. Areas exceeding 30% ground slope were judged to be inoperable for ground-based logging methods.

Silvicultural Considerations

Cutting Prescriptions

For the purpose of OFL Mapping and Report, silvicultural harvest systems, even-aged (clear-cut) or multi-aged (selective harvest), have not been specified. Silvicultural prescriptions: including the decision to harvest, cutting prescriptions, site preparation and regeneration methods are best accomplished as part of site-specific timber sale planning efforts.

Summer vs. Winter Harvest

Summer harvest is dependent on existing access and sufficient timber values that will support all-season, road construction. Timber stands harvested during the summer months will experience seedbed preparation in conjunction with skidding activities. If required, all-season road construction provides access for additional post-harvest silvicultural treatment such as site preparation (scarification). Winter harvested units will receive little site scarification resulting from skidding activities and if isolated by wetlands or water bodies, may not be accessible to post-harvest treatment requiring summer access.

Regeneration

The primary silvicultural consideration is commercial timber stand establishment following harvest. Alaska Forest Practices Regulations require that within 7 years following harvest, harvested areas must contain an average of 450 seedlings per acre or a combination of residual trees and seedlings approved by the Division of Forestry. Post-harvest stocking of commercial trees and/or seedlings is the responsibility of the landowner.

Obstacles to adequate post-harvest stocking exist in the region. Currently, timber values do not support intensive reforestation methods such as hand planting of seedlings. Establishment of blue-joint reed grass (Calamagrostis spp.) following harvest commonly inhibits seedling establishment on many sites and may limit or preclude adequate stocking within required time frames. Post-harvest, scarification and exposure of mineral soil is commonly prescribed to promote seedling establishment. Hardwood regeneration is susceptible to damage by moose.

Based on review of harvested areas in the region, a combination of scarification, residual stocking and natural regeneration (both coppice and seedlings) following

partial-cut (selective) timber harvest may fulfill post-harvest AFR&PA stocking requirements. Winter harvested timber, isolated during the summer months by wetlands or water bodies, will need to be analyzed on a site-specific basis and may require selective harvest (adequate residual stocking) or hand planting to meet AFR&PA requirements.

Mapping Codes and Operability Descriptions

Operable commercial timber stands, and inoperable timber stands and areas were identified, categorized and mapped as shown in Table 17.

Table 17, Inventory Vegetation Classification, Coding and Description

Forest Condition, Class	Code	Operability Class
Operable Commercial Forest Lands		
All-Season	OA	Operable All-season access and harvest
Winter	OWA	Operable Winter Access Required
	OWA-V	Operable Winter Access and Volume limitations
	OWV	Operable Winter Volume limitations
Inoperable Commercial Forest Lands		
Logging		Inoperable due to logging constraints
	IOLGA	Inoperable Logging due to Access constraints, i.e. major stream crossings, canyons, large wetlands
	IOLGA-V	Inoperable due to Access and timber Volume limitations
	IOLGT	Inoperable due to Terrain, slopes exceeding 30%
	IOLGT-AV	Inoperable due to Terrain plus Access and Volume limitations
	IOLGV	Inoperable due to limited Volume concentrations to support winter road construction
	IOLGV-A	Inoperable due to limited Volume plus Access limitations
	IOLGV-T	Inoperable due primarily to Volume with Terrain limitations in the area
Regulations	IORGA	Inoperable areas surrounding braided anadromous stream crossings (outside of mandatory buffers)
	IORGA_B	Inoperable areas within 100 feet of anadromous streams required by AFR&PA regulations
	IORGV_B	Inoperable scenic buffer areas within 150 feet of designated scenic highways
	IORGW_B	Inoperable buffers surrounding lakes and Class I and II wetlands

Results

The following tables summarize OFL results by Project (All Management Units), Strata (six), and by the individual Management Units (sixteen).

Acres

Management unit acres are summarized by forest type and operability in Table 18.

Table 18, Phase II. Summary of Project Acres (All NRMU)

Management Unit	Total Acres	Non-Forest	Non-Commercial Forest	Commercial Forest	Inoperable Forest	Operable Forest
Barlett Hills	4,838	388	195	4,255	1,470	2,785
Chijuk Creek	24,659	4,324	2,922	17,413	2,546	14,867
Chulitna River	5,085	1,140	440	3,505	660	2,845
Deception Creek	3,118	1,146	945	1,027	350	676
Fish Creek	18,053	3,332	2,775	11,946	2,921	9,025
Kashwitna	9,366	3,031	1,297	5,038	1,609	3,429
Matanuska River North	445	58	57	331	66	264
Mile 233	4,146	292	116	3,738	658	3,079
Moose Creek	1,228	185	53	991	259	732
Parks Hwy	10,067	4,503	2,405	3,159	1,624	1,534
Point Mackenzie	5,198	1,205	819	3,174	543	2,631
Rabideux Creek	4,477	1,136	649	2,692	1,108	1,585
Rogers Creek	7,039	1,862	2,983	2,193	1,170	1,024
Sheep Creek	9,703	1,670	3,109	4,924	3,376	1,548
Susitna River Corridor	6,739	1,425	577	4,737	1,705	3,032
Whiskers Creek South	13,965	2,960	763	10,241	2,723	7,518
Total	128,127	28,658	20,107	79,363	22,787	56,575

Operable forest land acres are listed by management unit and forest stratum in Table 19.

Table 19, Phase II. OFL Acres by NRMU and Stratum

Unit	Strata 1: (Pole Timber - Closed)	Strata 2: (Pole Timber - Open)	Strata 3: (Hardwood Sawtimber - Closed)	Strata 4: (Hardwood Sawtimber - Open)	Strata 5: (Mixforest Sawtimber - Closed)	Strata 6: (Mixforest Sawtimber - Open)	Total
Bartlett Hills	761		10	154	1,703	157	2,785
Chijuk Creek	898	1,923		890	8,485	2,672	14,867
Chulitna River	59	87		8	1,468	1,222	2,845
Deception Creek	383			74	154	65	676
Fish Creek	428		713	361	7,307	216	9,025
Kashwitna	1,711	203	130	32	868	485	3,429
Matanuska River North	21		82	161			264
Mile 233	190			68	2,347	475	3,079
Moose Creek	1		6		657	68	732
Parks Hwy	104		81	143	710	496	1,534
Point Mackenzie	507	73	30	369	1,291	361	2,631
Rabideux Creek	509	69	10	47	741	208	1,585
Rogers Creek	788	2	67	6	105	57	1,024
Sheep Creek	54	11	109	21	1,121	233	1,548
Susitna River Corridor	258	43	7	230	1,596	898	3,032
Whiskers Creek South	134	84		137	6,008	1,156	7,518
Total	6,807	2,494	1,246	2,701	34,560	8,767	56,575

Acres by operability classification, season and forest stratum are shown in Table 20.

Table 20, Phase II. OFL Acres by Stratum and Operating Season

	all-season	**winter**					
Strata	**OA**	**OWA**	**OWA-V**	**OWS**	**OWV**	**OWV-A**	**Total**
Strata 1: (Pole Timber - Closed)	1,751	765	3,470		695	126	6,807
Strata 2: (Pole Timber - Open)	2,122	31	262		69	10	2,494
Strata 3: (Hardwood Sawtimber - Closed)	176	32	999		40		1,246
Strata 4: (Hardwood Sawtimber - Open)	1,208	194	1,137	6	121	35	2,701
Strata 5: (Mixforest Sawtimber - Closed)	11,366	1,113	18,650		2,783	648	34,560
Strata 6: (Mixforest Sawtimber - Open)	3,246	1,072	3,545		811	93	8,767
Total	**19,868**	**3,206**	**28,063**	**6**	**4,520**	**912**	**56,575**

Table 21 is a more detailed listing of inoperable commercial forest acres by NRMU and classification.

Table 21, Phase II. Summary of Project Inoperable Commercial Forest Acres by NRMU and IO Code

	Natural Resource Management Unit																
IO Code	Bartlett Hills	Chijuk Creek	Chulitna River	Deception Creek	Fish Creek	Kashwitna	Mat. River North	Mile 233	Moose Creek	Parks Hwy	Point Mackenzie	Rabideux Creek	Rogers Creek	Sheep Creek	Susitna River Corridor	Whiskers Creek South	Total
IOAO_B	7	12	6		55	68		119	2	9	72	21	4	5	41	3	425
IOLGA		3	47	4		161		56	32	8	24	3	5		34	223	601
IOLGA-V	69	1,227	106		308	914		51		1,285	112	785	999	13	167	217	6,253
IOLGT	1,121		76	7	50	84	41	116	46		131	65	29	101		111	1,977
IOLGT-AV														3,167			3,167
IOLGV	18	327	89	111	393	61		49	7	135	40	71	12	6	292	738	2,348
IOLGV-A	19	337	20	190	19	13			131						15	355	1,100
IOLGV-T											16						16
IONCF	13	9	14	19	43	15				49	14	11	8	0	552	59	805
IORGA		17			7	7						46			120	224	420
IORGA_B	62	164	86		164	45		104	23	34	3	7	8	15	190	386	1,291
IORGA-V																20	20
IORGTR												18					18
IORGTR_B	98	305	106	16	124	128	25	132	16	5	31		74	28	73		1,162
IORGV_B			12							25		3			48		88
IORGW_B	63	145	98	5	266	113		32	3	74	99	78	31	41	171	388	1,607
IOWLB					1,490												1,490
Total	1,470	2,546	660	350	2,921	1,609	66	658	259	1,624	543	1,108	1,170	3,376	1,705	2,723	22,787

Note: IO Codes are listed in Table 17.

Operable Forest (Project) Timber Volumes

Table 22 summarizes OFL timber volumes by management unit, and Table 23 shows volume in several types of units by strata and species. Additional project timber volume results can be found in Appendix A: Operable Project Timber Volumes

Table 22, Phase II. Operable Volume Summary Totals by NRMU

Management Unit	OFL Acres	Net Bd. Ft. MBF	Net Cu. Ft. Cunit	Green Tons Net *
Bartlett Hills	2785	12,733	49,259	183,612
Chijuk Creek	14867	62,194	243,342	711,674
Chulitna River	2845	11,834	46,736	143,390
Deception Creek	676	3,055	11,727	44,577
Fish Creek	9025	42,529	164,390	548,087
Kashwitna	3429	15,370	59,132	216,768
Matanuska River North	264	1,251	4,686	14,618
Mile 233	3079	13,783	53,837	163,675
Moose Creek	732	3,335	13,019	44,020
Parks Highway	1534	6,674	26,042	126,687
Point Mckenzie	2631	11,558	44,825	135,228
Rabideux Creek	1585	7,038	27,264	113,861
Rogers Creek	1024	4,860	18,478	97,966
Sheep Creek	1548	7,094	27,561	209,660
Susitna River Corridor	3032	12,986	50,867	175,462
Whiskers Creek South	7518	33,482	130,969	437,276
Totals**	**56,575**	**249,773**	**972,117**	**3,366,560**

* Calculated by Net Tons/acre for strata acres/NRMU, Table 8.

** Slight differences in Totals due to rounding in Super ACE software

Table 23, Phase II. Operable Volume Summary by Strata and Species

Species	Net BDFT per Acre	Total Net MBF	Net CUFT per Acre	Total Net Cunits	Green Tons per Acre	Total Green Tons
STRATA #1 — Poletimber Closed 6,807acres						
Aspen	770	5,239	298	20,302	8.37	59,438
Birch	2,920	19,875	1,101	74,972	35.47	251,796
Black Spruce	117	793	40	2,717	1.28	9,070
Cottonwood	172	1,168	60	4,090	1.56	11,071
White Spruce	742	5,052	291	19,783	5.22	37,028
TOTALS	**4,720**	**32,127**	**1,790**	**121,865**	**51.90**	**368,405**
STRATA #2 — Poletimber Open 2,598 acres						
Aspen	326	812	132	3,293	4.51	11,727
Birch	1,329	3,313	559	13,935	19.03	49,450
Black Spruce	123	308	46	1159	1.2	3112
Cottonwood	6	14	3	86	0.13	329
White Spruce	969	2,417	349	8,711	6.48	16,827
TOTALS	**2,752**	**6,865**	**1,090**	**27,185**	**31.35**	**81,445**
STRATA #3 — Hardwood Sawtimber Closed 1,938 acres						
Aspen	519	646	163	2,036	8.82	17,086
Birch	2,496	3,110	974	12,138	35.28	68,372
Black Spruce	17	22	6	76	0.14	266
Cottonwood	2,638	3,287	931	11,595	24.37	47,238
White Spruce	542	675	191	2,382	3.60	6,975
TOTALS	**6,212**	**7,740**	**2,265**	**28,226**	**72.21**	**139,938**
STRATA #4 — Hardwood Sawtimber Open 2,750 acres						
Aspen	24	66	6	169	0.25	700
Birch	2,285	6,171	937	25,316	36.96	101,629
Black Spruce	13	35	5	140	0.12	320
Cottonwood	728	1,967	221	5,973	8.20	22,547
White Spruce	942	2,545	354	9,552	6.31	17,350
TOTALS	**3,993**	**10,784**	**1,524**	**41,150**	**51.83**	**142,546**
STRATA #5 — Mixed Sawtimber Closed 35,971 acres						
Aspen	83	2863	27	9302	1.69	60,966
Birch	2,888	99813	1,179	407496	43.36	1,559,601
Black Spruce	24	828	8	2754	0.19	6,862
Cottonwood	140	4842	42	14676	1.44	51,890
White Spruce	1,497	51737	548	189497	9.94	357,489
TOTALS	**4,632**	**160083**	**1,805**	**623725**	**56.62**	**2,036,807**
STRATA #6 — Mixed Sawtimber Open 8,814 acres						
Aspen	111	977	44	3,852	1.28	11,255
Birch	2,006	17,589	845	74,076	34.99	308,388
Black Spruce	2	15	1	52	0.01	118
Cottonwood	17	148	5	397	0.17	1,541
White Spruce	1,534	13,446	588	51,589	10.28	90,566
TOTALS	3,670	32,174	1,482	129,966	46.73	411,868

* Calculated by tons per cunit for species multiplied by net cubic volume

Road Construction

Total projected miles of road construction are displayed in Table 24 by Management Unit, season, and type of road (i.e., existing, planned, reconstruction, etc.).

Table 24, Phase II. Road Construction Total Miles by NMRU

		All Season		
Unit	**Winter Roads - Planned**	**Existing**	**Planned**	**Reconstruction**
Bartlett Hills	9.98		7.61	
Chijuk Creek	37.35	8.01	24.82	
Chulitna River	6.57		8.79	
Deception Creek	5.04	1.02		
Fish Creek	56.80			
Kashwitna	23.02		0.24	1.60
Matanuska River North	2.56		0.26	1.82
Mile 233	0.88		11.50	
Moose Creek	0.85		1.94	
Parks Hwy	6.38		2.29	
Point Mackenzie	4.66	0.22	7.02	0.61
Rabideux Creek	9.24		0.93	0.46
Rogers Creek	10.77		0.75	
Sheep Creek	10.23			
Susitna River Corridor	15.13	0.94	2.57	0.87
Whiskers Creek South	35.26			
Grand Total	**234.73**	**10.19**	**68.71**	**5.35**

Annual Allowable Cut Calculations Phase II

The basis for the Annual Allowable Cut analysis is commercial forest acreage, operable forest acreage (Phase II revisions) and timber volume estimates resulting from the MSB Timber Inventory, 2006, (Phase I) completed by Sanders Forestry Consulting (Sanders). An estimate of average site productivity for MSB forest lands derived from USDA/NRCS Soil Survey data was also used.

Estimation of Annual Allowable Cut (AAC) generally requires analysis of forest resource data, and in-depth consideration of various forest management options, goals and objectives. Because specific forest management decisions are outside the scope and authority of Sanders role in the AAC determination process, this Report presents a range of potential AAC estimates based only on existing data and information as the best strategy to assist the MSB in selecting an AAC to be consistent with policy, goals and objectives of its revised Forest Management Plan.

The most recent MSB Forest Management Plan allows commercial harvest of MSB timber on lands classified as “Forest Management Lands” and other designated lands (with Borough Assembly approval), on a sustained yield basis.

Forest Management Lands "are those lands which are important for a variety of existing and potential forest-dependent economic and non-economic values and uses. These values and uses include timber, commercial and personal recreation, tourism, fish and wildlife habitat, watershed and wilderness. These lands shall be managed to ensure, to the extent feasible, the protection or enhancement of these values and uses."

For purposes of this Report, the definition of sustained yield is the same as found in the Susitna Forestry Guidelines, and the Alaska Forest Resources and Practices Act (AS 41.17): "sustained yield means the achievement and maintenance in perpetuity of a high level annual or regular periodic output of the various renewable resources of forest land and water without significant impairment of the productivity of the land and water, but does not require that timber be harvested in a non-declining yield basis over a rotation period."

AAC estimates provided are based on the following recognized and accepted AAC determination methods: Area Control Method, Volume Control Method, and Hanzlik's Formula. AAC estimates are provided for both CFL and Operable CFL (OpCFL) MSB timber bases. Individual AAC estimates provided in the tables below are expressed as the amount of net timber volume (CUFT), or as the total acreage, available for harvest each year within a given rotation period.

FOREST RESOURCE VARIABLES AFFECTING AAC

Timber base acreage, timber volume, and estimated site productivity were analyzed to provide a range of AAC estimates using various rotation lengths for both the CFL and OpCFL timber bases. Although not strictly a resource variable, rotation length must be specified to estimate AAC using these methods.

Timber Base Acreage

AAC estimates contained in this Report are based on estimates of CFL and OpCFL acreage contained in the 16 NRMUs. Stocked seedling and sapling stands and past harvested tracts were included in the CFL acreage total below but were not included in volume per acre calculations or considered OpCFL at this time.

The area (total acreage) of standing commercial timber volume (MSB commercial timber base) forming the basis of the AAC estimation is:

CFL = 79,363 Acres

OpCFL = 56,575 Acres

Timber Volume

AAC estimates contained in this Report are based on estimates of CFL standing timber volume and OpCFL standing timber volume contained in the 16 NRMUs.. Volume figures are derived from the 2006 Timber Inventory and expressed as net CUFT timber volume.

Total Net CFL Standing Timber Volume = 134,653,800 CUFT

Total Net OpCFL Standing Timber Volume = 97,211,700CUFT

Site Productivity/Growth and Yield

Historically, the Mat-Su valley has not been intensively managed for commercial timber production. The vast majority of MSB commercial timber stands presently exist in an un-even aged, over-mature condition approximating old-growth. Consequently, reliable growth and yield data resulting from managed, second-growth stands representing all growing sites does not exist. The best available site productivity data are the estimates of site index supplied with interpretations of soil types found in the region. Review of data included in the USDA/NRCS Soil Survey Matanuska-Susitna Valley Area, indicates average timber yields from soils underlying MSB commercial forest lands is approximately 25 CUFT per acre, per year.

The average growth increment value used in this Report to estimate AAC with Hanzlik's Formula is 25 CUFT/AC/YR.

Rotation Length

Rotation length is a forest management decision, but must be specified to calculate AAC. Rotation length is the age (in years) of a timber stand at final harvest. A 70 year rotation means that a timber stand will be harvested once it reaches an age of 70 years. Without recommending specific forest management decisions, including rotation lengths, this Report presents a range of AAC estimates based on rotations ranging from 50 to 100 years in ten year increments, using three separate AAC determination methods.

AAC ESTIMATES FOR MSB FOREST LAND

AAC estimates provided below were derived using the Area Control Method, Volume Control Method, and Hanzlik's Formula. All three methods result in AAC estimates that are compatible with sustained yield timber management and harvest. Without regard to which method or rotation length is used, actual achievement of the AAC each year of a chosen rotation would result in a perfectly regulated forest at the end of one complete rotation. Simply put, the entire commercial timber base would be converted from unmanaged Old-growth to managed Second-growth in one rotation on a sustained yield basis.

Area Control Method

AAC estimates in the Area Control Method Table below are derived by dividing total acreage (CFL and OpCFL MSB timber bases) by various rotation lengths ranging from 50 to 100 years. AAC estimates are expressed as the acreage available for harvest each year of the rotation, on a sustained yield basis.

Table 25, Phase II. Annual Allowable Cut, by Forest Type and Rotation Length.

	AAC—Area Control Method			
Forest Type	**Acres**	**Rotation Length**		**Est. AAC Ac./Yr.**
CFL	79363	50	Years	1587
		60	Years	1323
		70	Years	1134
		80	Years	992
		90	Years	882
		100	Years	794
OpCFL	56575	50	Years	1132
		60	Years	943
		70	Years	808
		80	Years	707
		90	Years	629
		100	Years	566

Volume Control Method

AAC estimates in the Volume Control Method shown below in Table 26 are derived by dividing total net cubic foot timber volume (CFL and OpCFL MSB timber bases) by various rotation lengths ranging from 50 to 100 years. AAC estimates are expressed as the total net cubic foot timber volume available for harvest each year of the rotation on a sustained yield basis.

Table 26, Phase II. Annual Allowable Cut, by Forest Type, Net Cubic Feet, and Rotation Length.

	AAC--Volume Control Method			
Forest Type	**Volume Cu. ft. Net**	**Rotation Length**		**Est. AAC Cu. ft./Yr.**
CFL	134,653,800	50	Years	2,693,076
		60	Years	2,244,230
		70	Years	1,923,626
		80	Years	1,683,173
		90	Years	1,496,153
		100	Years	1,346,538
OpCFL	97,211,700	50	Years	1,944,234
		60	Years	1,620,195
		70	Years	1,388,739
		80	Years	1,215,146
		90	Years	1,080,130
		100	Years	972,117

Hanzlik Formula

The Hanzlik Formula is applicable to forests which are predominantly over-mature. The Hanzlik Formula is a variation of the volume control method and accounts for timber volume produced annually by productive, young-growth timber stands. This annual increase in growth of commercial timber is added to the volume available for harvest each year. AAC estimates for CFL and OpCFL timber bases shown in the Hanzlik Formula Table below were derived using three steps:

The amount of timber available for harvest each year was derived by dividing the total standing timber volume by various rotation ages.

The annual growth volume increase in growing stock (productive, Young-growth stands) was estimated by multiplying the acres of seedling and sapling stands plus Stratum #1 and Stratum #2 by the estimated average site productivity value of 25 CUFT/ACRE/YEAR.

The volume figures derived in steps 1 and 2 were added together to yield AAC estimates for various rotation lengths.

AAC estimates are expressed as the total net cubic foot volume (including annual growth) available for harvest each year of the rotation, on a sustained yield basis.

Table 27, Phase II. Annual Allowable Cut, by Forest Type, Net Cubic Feet, and Rotation Length, using Hanzlik's Formula.

	Aac--Hanzlik Formula					
Forest Type	Volume Cu. Ft. Net	Rotation Length		Cu. Ft. Per Year	Annual Growth	Est. AAC Cu. Ft./Yr
CFL	111,399,400	50	Years	2,693,076	388,750	3,081,826
		60	Years	2,244,230	388,750	2,632,980
		70	Years	1,923,626	388,750	2,312,376
		80	Years	1,683,173	388,750	2,071,923
		90	Years	1,496,153	388,750	1,884,903
		100	Years	1,346,538	388,750	1,735,288
OpCFL	84,899,300	50	Years	1,944,234	252,650	2,196,884
		60	Years	1,620,195	252,650	1,872,845
		70	Years	1,388,739	252,650	1,641,389
		80	Years	1,215,146	252,650	1,467,796
		90	Years	1,080,130	252,650	1,332,780
		100	Years	972,117	252,650	1,224,767

Summary/Conclusion

Currently, MSB forest lands are in a predominantly Old-growth condition; annual volume gains are offset by volume losses due to damage and disease, and some stands may be actually declining in usable net volume. Because intensive forest management for

commercial timber production has not been undertaken, reliable growth and yield tables for commercial timber species, and the range of growing sites is not currently available.

Due to the relative reliability of input data (acres, timber volume, site productivity), the AAC estimates derived using the Area Control Method are considered to be the most valid; AAC estimates derived using Hanzlik's Formula, are considered the least valid.

The AAC will need to be periodically evaluated, and revised in response to: harvest decisions, regeneration success following harvest, changes to the timber base, conversion of unmanaged stands to managed stands, forest product markets, and the availability of reliable growth and yield data.

Appendix P

MSB 23.20: Forest Management

Chapter 23.20: FOREST MANAGEMENT

Section

23.20.010 Purpose and Intent
23.20.020 Forest Inventory
23.20.030 Sustained Yield
23.20.040 Annual Allowable Cut
23.20.050 Forest Management Units
23.20.060 Forest Management Plan
23.20.070 Buffers
23.20.080 Timber Sale Nominations
23.20.090 Five-year Sale Schedule
23.20.100 Contents of Five-Year Sale Schedule
23.20.110 Sale Implementation Schedule
23.20.120 Multiple Sales Within the Same Sale Area
23.20.130 Methods and Authorization for the Sale, Lease or Permitting of Forest Products
23.20.140 General Contract provisions for Timber, Salvage or Non-Timber Forest Products sales, Leases, or Permits
23.20.150 Fair Market Value Determination
23.20.160 Plan of Operations
23.20.170 Non-Commercial Personal Use of Timber Resources
23.20.180 Real Property Asset Management Board Review
23.20.190 Conformance with Local, State, and Federal Law

23.20.010 Purpose and Intent.

(A) Short- and long-term management of the Borough-owned forest resources shall be based on the principles of multiple-use and sustained yield to promote a healthy forest, provide forest products, create economic opportunities, and enhance multiple-use opportunities. At a minimum, this shall be accomplished through consideration of:

(1) silvicultural characteristics of tree species; and

(2) physical, economic, social, and environmental factors affecting the area; and

(3) timber and non-timber current and future resources and uses.

(B) Prudent forest management techniques are necessary to enhance and maintain the health of forests and forest resources on borough-owned land.

(C) In addition to timber, borough forests also provide non-timber forest uses including such things as fish and wildlife habitat and viewing, outdoor recreation opportunities, natural view sheds, and protection of soil, water, and air quality.

(D) The Borough recognizes that non-timber forest products such as sap, mushrooms, bark, conks, and other forest products meet social and economic needs and will be considered in management processes.

(E) Borough management of its forest resources shall incorporate the best available data from applicable disciplines and use appropriate management techniques and regulatory measures.

23.20.020 Forest Inventory

(A) The borough shall maintain an inventory of all forest land suitable for commercial timber or forest product uses that include:

(1) an inventory of commercial forest land and operable commercial forest land including an analysis of existing Forest Management Units that is statistically defensible and field verified to produce a gross timber volume and an average volume per acre by timber type;

(2) an inventory of land that is suitable for other non-timber forest product uses;

(3) an evaluation of the forest health to include age and quality of the wood for various markets and uses; and

(4) an evaluation of markets for borough-owned forest resources.

23.20.030 Sustained Yield

(A) All commercial and non-commercial borough-owned forest land will be managed on a sustained yield basis to provide forest timber and forest products based on the rotation period for the dominant timber type.

(B) The standard rotation period to be used is:

(1) white spruce – 100 years;

(2) paper birch – 80 years;

(3) cottonwood – 75 years; and

(4) aspen – 60 years

(C) The standard rotation rate for any species not listed in subsection (B) of this section shall meet or exceed accepted scientific standards for that timber type.

(D) The standard rotation rate for each species in subsection (B) of this section may be adjusted through the forest management plan process under MSB 23.20.060 based on but not limited to location, slope, growth potential, and condition of trees.

23.20.040 Annual Allowable Cut

(A) The allowable cut on borough land is the amount of acreage or volume of commercial forest land that may be harvested periodically.

(B) Annual allowable cut equals the total amount of operable forest land acreage in all borough forest management units divided by the rotation period of the dominant timber stand type established in MSB 23.20.020.

(C) The total commercial and operable forest land acreage in all borough forest management units will be determined by the forest inventory in MSB 23.20.020.

(D) An annual allowable cut on borough commercial forest land within all forest management units shall be managed on a decadal (10-year) basis. Harvest volumes in an individual forest management unit may be above or below the annual allowable cut to allow for efficient management and responsiveness to market fluctuations.

(E) Timber harvest volumes sold, leased, or permitted under Personal Use of timber Resources (MSB 23.20.170) shall not count against annual allowable cut limitations established in this section.

23.20.050 Forest Management Units

(A) Land classified as Forest Management Lands shall be placed into Forest Management Units and be subject to a Forest Management Plan.

(B) Unclassified land and land classified for another purpose may also be placed in Forest Management Units in order to facilitate overall management of all land and resources within the Forest Management Unit.

23.20.060 Forest Management Plan

(A) The Borough shall maintain a Forest Management Plan that provides for the planning and management of land and resources within and among the forest management units.

(B) A Forest Management Plan may cover more than one Forest Management Unit, and conversely, more than one Forest Management Plan may be adopted to cover the various Forest Management Units.

(C) Forest Management Plans shall be consistent with borough adopted land use and management plans.

(D) The plans shall contain, at a minimum, the following elements:

(1) an analysis and determination of commercial forest land, operable commercial forest land, potential timber harvests, access, and market demand;

(2) commercial timber sales for forest products that include such things as firewood (cordwood), fence posts (posts), house logs and saw logs (logs), or wood fiber (chips);

(3) permits, leases, and sales for the harvest of non-timber forest products;

(4) forest management guidelines for non- extractive uses shall address:

(a) important areas for fish and wildlife habitat;
(b) local business enterprises;
(c) scenic quality;
(d) substantial areas important to tourism and recreation;
(e) environmentally sensitive areas;
(f) water quality; and
(g) soils.

(E) Forest Management Plans shall be reviewed on a regular basis, undergo full public review and comment under MSB 23.05.025, and shall be approved by the Assembly.

23.20.070 Buffers

(A) In addition to the buffers on public land required by the Forest Resources and Practices Act, there shall be an additional no-harvest buffer along all borough property boundaries of one hundred (100) feet between the boundary of the operations area and the immediately adjacent property boundary.

(B) Adjustments to the requirements of subsection (A) of this section may be made, if during the public notice process leading to a sale, the specific terms and conditions of the adjustments are addressed. Examples of conditions where adjustments may be made include but are not limited to:

(1) where an adjacent property owner does not object; or

(2) adjacent to rights-of-way on public roads where other management goals and objectives, such as wildfire prevention and other public safety hazards, disease control, or wildlife habitat enhancement, are to be achieved; or

(3) adjacent to trails where other management goals and objectives, such as wildfire prevention and other public safety hazards, disease control, or wildlife habitat enhancement, are to be achieved; or

(4) parking areas and trailheads where other management goals and objectives, such as wildfire prevention and other public safety hazards, disease control, or wildlife habitat enhancement, are to be achieved.

(C) Limited select harvest within the buffer may occur if:

(1) the adjacent property owner does not object; or

(2) the concerns of the property owner have been adequately addressed; or

(3) the harvest is for a specific species of tree, size, and quality for a specific value-added product.

(D) In the case of a conflict between the Forest Resources and Practices Act requirement for buffers and this chapter, the widest buffer width shall apply.

23.20.080 Timber Sale Nominations

(A) Nominations for areas for timber sales may be submitted. The nomination must, at a minimum specify the areas and species of timber being nominated.

(B) Nominations shall not guarantee that the areas nominated will be included in a sale schedule.

23.20.090 Five-year Sale Schedule

(A) Only land that is classified as “Forest Management Lands,” located within a Forest Management Unit, and has an adopted Forest Management Plan may be included in the five-year sale schedule.

(B) Land that is not classified as “Forest Management Land” may be sold, leased, or permitted for firewood sales, salvage sales, personal use, or for non-forest products. This land does not have to be located within a Forest Management Unit; does not need to be subject to an adopted Forest Management Plan; and does not need to be included in the five-year sale schedule.

(C) At least every two years, the director shall prepare a five-year schedule of timber sales planned on forest land owned by the borough.

(D) The amount proposed for sale per year must be within the requirements of MSB 23.20.040.

(E) To the extent possible, the five-year sale process should be coordinated with the Alaska, State Department of Natural Resources, Division of Forestry's five-year timber sale process.

(F) The five-year sale schedule shall be subject to public review and comment as provided by MSB 23.05.025.

(G) The Assembly shall approve the five-year sale schedule.

23.20.100 Contents of Five-Year Sale Schedule

(A) Timber sales should be offered in a range of volumes, timber types, products, and duration to accommodate different sectors of the forest products industry.

(B) Proposed sale offerings shall consider:

(1) location and access;
(2) markets;
(3) volumes;
(4) limits of the annual allowable cut;
(5) other forest uses; and
(6) public comments.

(C) For each proposed sale at least the following information shall be included in order to provide the public and the forest products industry with a basis on which to comment on the proposed sale:

(1) acreage of the total area and operable area;
(2) timber species, volume, and size category (sapling, pole timber, saw timber);
(3) current land/resource uses;
(4) existing infrastructure;
(5) existing land use plans;
(6) development patterns and surrounding land use;
(7) zoning, or other land use restrictions;
(8) public health, safety, welfare concerns;
(9) public water bodies (including buffers);
(10) soils and terrain;
(11) cost/revenue analysis of the proposed sale;
(12) estimated minimum price based on current market value as determined by MSB 23.20.150; and
(13) contract performance requirements.

23.20.110 Sale Implementation Schedule

(A) For those areas covered under an approved five-year sale schedule, the director shall prepare a schedule to implement approved timber sales.

(B) The schedule may not propose more sale volume than that allowed under MSB 23.20.040.

(C) The sale implementation schedule shall be subject to public review and comment as provided by MSB 23.05.025. Review and comments shall be limited to the sale schedule and terms and conditions of the sale.

23.10.120 Multiple Sales Within the Same Sale Unit.

(A) Multiple sales for different forest products within the same site or cutting area are encouraged (i.e., a select cut sale for a specific value-added product followed by, or in conjunction with, another select cut sale for a different value-added product or a sale for wood fiber products).

(B) Multiple sales on the same site or cutting area shall only be counted one time against the annual allowable cut as determined by MSB 23.20.040 even though the successive sale may occur in a different year.

23.20.130 Methods and Authorization for the Sale, Lease or Permitting of Forest Products

(A) Commercial timber or non-timber forest product sales shall first be offered by competitive bid. Any proposed competitive timber or non-timber product sales that do not receive a competitive bid or that the bid is not accepted shall be made available to the next available qualified bidder. If no acceptable bids are received or accepted, the timber or non-timber products sale may be made available through an over-the-counter sale for a period of time not to exceed two (2) years under the same terms and conditions as the competitive sale offering.

(B) Forest resource sales in excess of $25,000 per transaction shall be approved by the assembly prior to contract execution.

(C) Forest resource sales for under $25,000 per transaction may be approved by the manager.

(D) Firewood sales, salvage sales, and non-timber forest product sales, leases, or permits between one (1) year and five (5) years in duration and less than $25,000 may, after public notice pursuant to MSB 23.05.025, be negotiated by the manager without competitive bid.

(E) Firewood sales, salvage sales, and non-timber product sales, leases or permits for less than one (1) year may be negotiated by the director without competitive bid.

23.20.140 General Contract Provisions for Timber, Salvage or Non-Timber Forest Product Sales, Leases, or Permits

(A) All sale contracts shall include the following:

(1) contract performance conditions and requirements;

(2) liability, vehicle, and workers compensation and employers' liability insurance, if applicable;

(3) performance period;

(4) performance bond;

(5) reforestation or scarification bond;

(6) plan of operations requirements; and

(7) timber harvesting permit (MSB 28.60) requirements, if applicable.

(B) All sales or leases of timber and non-timber forest products shall be reviewed by the Real Property Asset Management Board. Prior to the sale, lease, or

permit the Board may make recommendations concerning the terms and conditions to the director.

23.20.150 Fair Market Value Determination.

(A) The Borough shall determine the fair market value of timber resources based on one or more of the following:

(1) appraisal by an approved independent third-party forestry professional utilizing standard timber appraisal techniques, following appraisal instructions provided by the Borough;

(2) an analysis of State, Borough, or other public timber sales, with similar timber types, within the Matanuska-Susitna Borough during the preceding three-year period; or

(3) an analysis of other competitive timber sales with similar timber types and comparable attributes.

(B) The fair market value of Borough timber resources shall not be determined by using only a cost approach analysis.

(C) The Borough shall reserve the right to withhold a timber sale if the fair market value is determined to be less than the reasonable foreseen cost associated with preparing and administering the sale.

23.20.160 Plan of Operations

(A) A plan of operations shall be completed by the operator and approved by the director prior to the execution of the sale contract. At a minimum the detailed plan of operations shall include the following:

(1) a copy of the State of Alaska, Division of Forestry, Detailed Plan of Operations as required by 11 AAC 95.220; and

(2) evidence of Compliance with MSB 28.60 – Forest Harvest.

23.20.170 Non-commercial Personal Use of Forest Products.

(A) Firewood, salvage, timber, and other non-commercial forest products may be sold through the use of non-competitive permits, or use allowed by permit for free from areas designated by the manager.

(B) Firewood, salvage, timber, and other non-commercial timber resource areas shall be identified and marked on the ground.

(C) The manager may designate additional non-commercial personal use areas outside of Forest Management Units in remote locations upon the request by local property owners.

(D) Quantities for personal use shall be limited to:

(1) 10 cords per year for firewood; and

(2) six-hundred (600) lineal feet for saw or house logs.

23.20.180 Real Property Asset Management Board Review.

(A) The board shall review sustained yield and harvest goals and levels, forest management plans, five-year sale plans, and schedules of sales and leases, and permits and make recommendations to the director, manager, and assembly for:

(1) adherence to borough code;

(2) forest plan recommendations and requirements; and

(3) to ensure public and forest land needs are being met.

23.20.190 Conformance with Local, State, and Federal Law

(A) Failure to comply with local, state, and federal laws and regulations for any authorization issued under the authority of this chapter shall be terms for contract, permit or lease revocation, termination, or other action as deemed appropriate.

Appendix Q

MSB 28.60: Timber Harvest

Section
28.60.010: Purpose and Intent
28.60.020: Applicability
28.60.030: Noise
28.60.040: Artificial Lighting
28.60.050: Buffers
28.60.060: General Public Safety
28.60.070: Traffic Safety Plan
28.60.080: Timber Transport Permit
28.60.090: Traffic Signs
28.60.100: Road Maintenance

28.60.010 Purpose and Intent.

(A) This chapter is to ensure that the Matanuska-Susitna Borough implements safeguards so that timber harvesting practices protect public health, safety, and welfare.

28.60.020 Applicability.

(A) The Alaska Forest Resources and Practices Act (FRPA) governs how timber harvesting, reforestation, and timber access occur on state, private, and municipal land. Forest management standards on federal land must also meet or exceed the standards established by the FRPA for state land.

(B) All land within the borough is included under the requirements of Region II (southcentral) of the Act.

(C) This chapter applies to all state, private, and municipal land subject to the FRPA for commercial operations larger than forty (40) acres in size, except:

(1) if this chapter is in conflict with the conditions of a Special Use District established under MSB 17, the more restrictive conditions shall apply; or

(2) if otherwise preempted by federal or state law.

(D) Timber harvest operations where a FRPA Detailed Plan of Operations has been approved by the state, Division of Forestry prior to the effective date of this chapter, are permitted to continue without a Timber Transport Permit, provided that an application for pre-existing status is submitted within two months from the date of adoption of this ordinance.

28.60.030 Noise.

(A) The following shall be followed in all cases except when there are no improvements, borough, state, or federal campgrounds, or other places where the

public assembles or meets on a regular basis within one-half mile of the operations area.

(B) Except as provided in paragraph (A) of this section, no sound resulting from allowable activities shall exceed limits set forth in Table 1 when measured at the property boundary between the land being utilized and the adjacent land.

Table 1.
Permitted Sound Levels

Adjacent Land Use Category	Time Period	Sound Level Limit {dBA}
Area with Improvements	7 a.m. – 10 p.m. 10 p.m. – 7 a.m.	70 50
Commercial Area	At all times	70
Industrial and Timber Harvest Area	At all times	100

(C) For any sound that is of short duration, between the hours of 7 a.m. – l0 p.m., the levels established in Table 1 may be increased by:

(1) five dBA for a total of 15 minutes in any one hour; or

(2) 10 dBA for a total of five minutes in any one hour; or

(3) 15 dBA for a total of one and one-half minutes in any one-hour period.

(D) Noise reduction measures must be taken by a person to mitigate or lessen noise impact to surrounding properties in order to meet or exceed the standards under A and B of this section. Such measures may include, but are not be limited to, restricting hours of operation to meet noise level requirements; erecting noise barriers (e.g., berms a minimum of 10 feet in height) between location of noise-producing equipment and adjacent properties; strategic location of noise-producing equipment (e.g., below grade in excavated pit area); or measures to utilize equipment with noise reduction features.

28.60.040 Artificial Lighting.

(A) The following shall be followed in all cases except when there are no improvements, public campgrounds, or other areas where the public assembles or meets on a regular basis within one-quarter mile of the operations area.

(B) Exterior lighting fixtures of 150 total watts or more mounted more than twenty 20 feet high shall be located and shielded to direct the light towards the ground to minimize light spilling from the timber harvest operations area or upward into the night sky.

28.60.050 Buffers

(A) Buffers are not required on private land. However, a person on private land is encouraged to screen timber harvesting activities from road traffic, public areas and other private property where possible and prudent, and to provide buffers to protect adjacent private or public property from damage.

(B) The need for visual buffers on public land, beyond that required by the Alaska Forest Resources and Practices Act, shall be considered and specifically addressed by the public land owner or manager, and if appropriate included in the terms and conditions of a timber sale. Areas where buffers may be appropriate include but are not limited to:

(1) outside rights-of-way on public roads;
(2) along public trails;
(3) adjacent to parking areas and trailheads; and
(4) adjacent to private property.

(C) It is preferred that screening should be accomplished, whenever possible, by leaving a vegetative buffer of native species.

28.60.060 General Public Safety.

(A) To minimize the potential for injury to cross-country travelers (hikers, skiers, off-road vehicles, or other means), the person shall post the operations area with suitable weather resistant signs and plastic flagging at:

(1) all road and trail intersections where they leave or enter the operations area; and

(2) along the perimeter of the operations area where signs or plastic flagging is clearly visible between marking points or areas unless otherwise prohibited by state or federal law.

28.60.070 Traffic Safety Plan

(A) The state of Alaska has primary responsibility for regulating and enforcing commercial vehicle enforcement, traffic control, and equipment standards on all highways.

(B) If not otherwise required by the state, this section shall apply to a person who will be operating on borough or state roads for their timber harvest activities in excess of two (2) cargo carrying vehicles per day or ten (10) cargo carrying vehicles in a one calendar week period, whichever is more.

(C) If applicable the person shall prepare a traffic safety plan prior to beginning timber harvest transportation operations.

(D) The purpose of a traffic safety plan is to identify road or traffic conditions potentially adverse to safe cargo carrying vehicle operations and public health, safety, and welfare, and to identify specific actions to be taken by the operator to mitigate such conditions.

(E) The traffic safety plan shall apply to the most likely used road routes from the point of leaving the operations area to its initial intersection with any state or borough road classified as a major collector, arterial, or highway under the functional classification system.

(F) The person shall provide the borough Public Works Department a map showing the route(s) to be used described in (E) of this section.

(G) The borough Public Works Department shall provide the person with a description and a map at a sufficient scale that clearly shows, but not limited to, the following general road conditions:

(1) width of drivable surface;
(2) existence and width of shoulders;

(3) curves subject to off-tracking at posted speed;

(4) steep grades requiring sustained braking;

(5) presence of school bus routes, times that buses are picking up or dropping off students along the route, specific stops where line of sight to a bus is limited (e.g., the state Department of Transportation and Public Facilities considers less than 700 feet at 35 MPH and less than 1,000 feet at 55 MPH to be a reason for closer analysis); and

(6) presence of known "walk to school" or "pedestrian" crossing areas, trails, or other uses on or adjacent to the road surface.

(H) Using the information from Section (G) the person shall prepare a traffic safety plan prior to beginning timber harvest transportation operations. At a minimum the Traffic Safety Plan will address:

(1) time(s) of day cargo carrying vehicle use will occur;

(2) type, gross vehicle weight and overall length of cargo carrying vehicles that will be utilized; and

(3) number of trips by cargo carrying vehicles that will occur per day or week.

(I) The plan shall serve as the basis for determining the requirements to be included in the Timber Transportation Permit, and by the person to:

(1) identify topics and issues to be discussed at regular truck driver safety meetings;

(2) identify hauling time-period limitations that may be necessary for traffic safety or noise abatement;

(3) identify vehicle operator actions such as reduced speed where road conditions or other uses warrant; and

(4) identify the means of public information to be taken by the person to notify the public about timber harvest plan of operations and mitigating actions that will be taken in the traffic safety plan.

28.60.080 Timber Transport Permit

(A) A Timber Transport Permit (TTP) is required when the person will be utilizing roads outside of the timber harvest area for the transportation of harvested timber or timber harvest products in excess of two cargo carrying vehicles per day, or 10 cargo carrying vehicles in a one calendar week period, whichever is more.

(B) A complete application shall include a proposed traffic safety plan that meets the criteria set forth in MSB 28.10.070, and a copy of the summary page of the FRPA Detailed Plan of Operations as submitted to the state Division of Forestry, or the Forest Land Use Plan (FLUP).

(C) Public Notice

(1) Public Notice shall be provided within five working days of receipt of the information required in B of this section.

(2) Public notice required under this chapter shall be given in accordance with MSB 23.05.025, Public Notice.

(3) The public notice shall contain the provisions of the Traffic Safety Plan; and the Detailed Plan of Operations as filed with the state Division of Forestry or the Forest Land Use Plan (FLUP). The FLUP or the Detailed Plan of Operations shall

not be subject to comment under this notice, but shall be provided for the reviewers' information.

(4) The borough shall prepare and be responsible for the distribution and publication of the legal notice.

(5) The person shall be responsible for costs of distribution and publication of the legal notice.

(D) The director shall consider the information supplied by the person and the comments received from the public notice in making their decision.

(E) The Timber transport permit shall be issued by the director if the traffic safety plan effectively addresses the following objectives and standards:

(1) the adequacy of access to and from the operations area and the effect on pedestrian and vehicular circulation and safety;

(2) adequacy of the proposed transportation plan to deal with intersections, road conditions, site distances, traffic volumes, types of equipment, existing road use, and may include, under certain circumstances, dust control and snow removal;

(3) the effect of the proposed transportation on recreational uses, and tourism related activities; and

(4) the effect the proposed transportation will have on general public health, safety, and welfare.

(F) The permit will contain:

(1) time(s) of day cargo carrying vehicle use is permitted to occur;

(2) type, gross vehicle weight and overall length of cargo carrying vehicles that may be utilized

(3) maximum number of trips by cargo carrying vehicles that shall occur per day or per week;

(4) presence of school bus routes, times that buses are picking up or dropping off students along the route, specific stops where line of sight to a bus is limited;

(5) presence of known "walk-to-school" or "pedestrian" crossing areas, trails, or other uses on or adjacent to the road surface; and

(6) identify vehicle operator actions such as reduced speed where road conditions or other uses warrant;

(7) identify the means of public information to be taken by the person to notify the public about timber harvest operations and actions that will be taken to implement a traffic safety plan;

(8) traffic signs or warning signs that shall be posted during timber hauling operations; and

(9) any road maintenance that shall be required during and after timber hauling operations.

(G) An application for a TTP shall be issued or rejected by the director within five working days following completion of the public notice as required under this section.

(H) The time period for issuance or denial of the permit may be extended by either the director or the person for a period of time mutually decided by the director and the person, but not to exceed thirty (30) days.

(I) A TTP may be amended, suspended or revoked by the director based on significant changes to the:

(1) volume of timber, timing of harvest, or size of area being harvested; or

(2) changes in volume of traffic or other conditions that require changes to the traffic safety plan; or

(3) changes, damages, or wear to borough roads.

(J) If a change is determined to be significant by the director, or a permit is to be suspended or revoked, a new public notice shall be required.

(K) If a proposed change is determined to be significant by the director, the original terms and conditions of the TTP shall be followed until the proposed terms and conditions of the TTP are accepted, amended or denied.

(L) Administrative Appeal

(1) A decision by the director including amendment, suspension or revocation of a timber transport permit may be appealed in writing to the manager within ten (10) working days of being approved or denied in writing by the director. A copy of the written decision shall be mailed to the applicant and to any person who meaningfully participated during the public notice and comment period.

(2) The 10 working days begins on the date the decision is postmarked or personally delivered.

(3) An appeal must be postmarked or received by the Manager within the 10 day period. The appeal must specifically state the reasons for the appeal and a proposed resolution.

(M) The manager may uphold, amend, or overturn the decision by the director. The decision of the manager is the final decision of the borough.

28.60.090 Traffic Safety Signs

(A) When conditions warrant the director, as part of the timber transport permit, may require warning signs for traffic safety beyond that normally required by state law.

(B) Signs posted by the person shall meet state and borough standards for traffic safety.

28.60.100 Road Maintenance

(A) If borough-owned or managed roads utilized by the person are deemed not to be safe, are damaged, or are at risk to damage beyond that associated with regular Road Service Area maintenance because of the additional surface traffic associated with the persons activities, the borough may require that the person perform maintenance or construction work as necessary to meet or exceed the conditions of the road when forest harvest operations began. Any such provision may be part of the timber transport permit and may include dust control, grading, or plowing for safety.

(B) The borough may require that a bond or other form of security be provided to ensure performance with this section.

Matanuska-Susitna Borough

Asset Management Plan:
Natural Resource Management Units

Volume IV – Public and Agency Participation

Chapter 1: Introduction
Chapter 2: Phase I – Scoping
Chapter 3: Phase II – Public Involvement Plans
Chapter 4: Phase II – Plan Development
Chapter 5: Draft Plan Public Review
Chapter 6: Advisory Boards; Review and Recommendations
Chapter 7: Planning Commission; Review and Recommendations
Chapter 8: Assembly; Review and Adoption

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Adopted: September 21, 2010

Asset Management Plan:

Natural Resource Management Units

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Chapter 1
Introduction

This section contains a summary of public and agency participation in developing the Asset Management Plan for Natural Resource Management Units. A general summary of these processes is located in Volume I, Chapter I; *How the Plan Was Developed*.

The information in this volume is separated into eight chapters:

Chapter I – Overview
Chapter 2 – Phase I Scoping
Chapter 3 – Phase II Public Involvement Plans
Chapter 4 – Phase II Plan Development
Chapter 5 – Draft Plan Public Review
Chapter 6 – Advisory Boards; Review and Recommendations
Chapter 7 - Planning Commission; Review and Recommendations
Chapter 8 - Assembly; Review and Adoption

The public was invited to participate in the entire Plans scoping and development. From October 2007 through June 2008, the Scoping, or Phase I process occurred.

Following completion of the first phase, a break in time occurred before beginning Phase II or the actual plan development process. This began in December 2008.

Prior to beginning the actual Phase II, or plan development, a Public Involvement Plan was prepared and was amended two times to reflect changes in the plan development and review processes.

Notices of the availability of documents for the public to review throughout the entire Phase I and Phase II process were advertised in *The Frontiersman* and posted on the borough's web site.

Copies of written comments received during the various public comment and input periods, except as noted in the detailed sections on each part of the plan process below, have been retained by the borough (Community Development Department) where they are available for viewing.

Chapter 2
Phase I – Scoping

From January 18, 2008 through March 21, 2008, a document was made available to the public to review that contained two parts.

Part I contained background and general information describing what had been completed so far; forest inventory, revision to public notice requirements (23.05.025), new chapters in borough code for Forest Management (23.20), and (timber harvest (28.60). See Volume I, Chapter 1; *How the Plan Was Developed*, for details on this information.

The document also had explanations and definitions so that the reviewer could provide meaningful thoughts, comments and suggestions on recommendations on various proposed policies, and to comment on proposed goals and management guidelines for borough land within various proposed Natural Resource Management Units. The areas included in the 1990 Forest Management Units that were still owned by the borough were included in this review.

Public Notice was provided according to MSB 23.05.025. Approximately 3,350 notices were mailed to property owners, community councils, service districts, various affected industries, interest groups, and community councils. The review document was made available on the Borough's web site and at all public libraries. Public open houses were also held at the Upper Susitna Senior Center, Willow Area Community Association building, and at the Central Emergency Services facility in Wasilla.

At the conclusion of the public comment period, 78 individuals and groups submitted hundred's of comments, suggestions, edits, and other topics they thought needed to be addressed in developing this Plan and the eventual designation, classification and management of the various management units. All these comments were summarized and were considered in the development of this Plan.

The letter that follows on the next page was attached to the scoping public review document. The entire document has not been included because of its length (130 pages), but is available for reviewing at the borough offices in Palmer.

A summary of the comments received and how the comments would be addressed in the plan follows the letter.

Dear Reviewer,

The Matanuska-Susitna Borough owns approximately 365,000 acres of land that it has received as part of its Municipal Land Grant and through varies land exchanges. Over the last decade, the Borough has taken steps to adopt Asset Management Plans for these lands. These Asset Management Plans, once adopted by the Borough Assembly, become part of the Borough's Comprehensive Plan.

Adoption of Asset Management Plans involves a series of steps that includes a thorough scientific and technical inventory, reviewing past and present uses of the land including surrounding land, and soliciting public input on how these lands should be managed.

One of the Asset Management Plans for Borough-owned land is to develop new comprehensive policies and procedures for identifying, planning, and managing the forest resources owned by the Borough. Several steps have already been taken towards this goal including an inventory of the forest resources, adoption of new ordinances specifying how Forest Management Units shall be identified and established, adopting policy for Annual Allowable Cut, what needs to be included in the Multiple-Use Forest Management Plan, and how timber sales shall be conducted.

For forested land, the last steps in this process is to identify Multiple-Use Forest Management Units, and then to adopt a Multiple-Use Forest Management Plan for these units. The purpose of this document is to solicit public input on the make-up of the potential units and general information on how these units should be managed.

The following document contains two-parts. The first part contains general information describing what has been completed thus far. It also has explanations and definitions so that the reviewer can provide meaningful comments and suggestions on four of the topics that will be included in the Multiple-Use Forest Management Plan.

The second part is where we are asking you, the reviewer, to review the information we have collected so far and to provide comments and recommendations on this information. We are also seeking your thoughts and recommendations on proposed policy, goals, and management guidelines.

Comments must be submitted by no later than Friday, March 21, 2008. Comment sheets are provided in Part 2 of this document along with an explanation on the various ways you may submit your comments.

We will also be holding public open houses or forums in various communities and locations throughout the Borough in early March to discuss the information in this document and to solicit your input. More information on these meetings will be available in February, 2008.

Thank you for your time in reviewing this information and providing your thoughts on how the Borough's land and resources should be managed.

FOREST MANAGEMENT PLAN – PHASE I
PUBLIC COMMENTS

From January 18. 2008 through March 21, 2008 the Matanuska-Susitna Borough requested comments on topics and issues related to establishing Multiple-Use Forest Management Units and how these units should be managed. The Borough also requested comments on related issues dealing with; forest research and study areas, sustained yield and annual allowable cut, and proposed goals and general management intent.

At the conclusion of the public comment period, 78 individuals and groups submitted hundred's of comments, suggestions, edits and other topics they thought needed to be addressed in developing the new Multiple-Use Forest Management Plan for the Borough.

The table below is a general summary of the comments that were received. This summary does not include the details of everyone's comments; it generalizes the comments and concerns expressed into categories or topics. The specific comments that were received will be considered and used, where appropriate, in the Plan.

TOPIC	COMMENTER'S NAME	COMMENT/ISSUE	RESPONSE
Management Units			
Anderson Creek	Lewis Bratcher	Supports Recommendation	No response needed
Bartlett Hills	Lewis Bratcher Billy FitzGerald Brian Okonek	Supports some local value added harvest.	This will be addressed in the plan.
	Judy Price Becky Long Jok Bondurant Jeffrey Robinson Deborah Brocke Kathleen Fleeming Jim & Carolyn Hruby Richard Leo	Area should not be a Forest Management Unit and no commercial timber harvest should occur. Local resident use only. Primary classification should be Public Recreation and watershed, not Forest Management of Land Bank.	This unit, along with all the other units, is a public resource owned by all borough residents. Local residents may not receive preferential uses, however, their concerns will be considered in the planning process.

TOPIC	COMMENTER'S NAME	COMMENT/ISSUE	RESPONSE
	Brian Okonek Denis Ransy Ellen Wolf Ruth Wood		Not all land within a unit will be subject to or available for timber harvest. Classifications and management intent for the unit will be evaluated and established in the plan to include sale and harvest sizes. Actual sale size, harvest methods, etc. will be determined later during the sale process and in the Plan of Operations which will be subject to further public review.
	Judy Price	Area is hilly and erosion is a concern.	Protection from erosion is a requirement of the Alaska Forest Practices Act. Timber harvest areas will be designed and stipulations added to contracts to prevent erosion.
	Becky Long	Recreational activities are not compatible with timber harvest in this unit.	Recognition and protection of existing multiple-uses will be addressed in the plan.
	Becky Long Brian Okonek Sheryl Salasky John Strasenburgh Ruth Wood	Talkeetna River Trail is really the Larson Creek Trail and is not located correctly. Trail must be protected and not used as a road.	Trail status will be researched and trail protected.
	Becky Long Brian Okonek Sheryl Salasky John Strasenburgh Ruth Wood	Unit does not have direct access from Mastadon Rd. This is an easement only and local residents oppose building a road on the easement.	Access will be further researched and noted appropriately.

TOPIC	COMMENTER'S NAME	COMMENT/ISSUE	RESPONSE
	Becky Long Denis Ransy Sheryl Salasky Roberta Sheldon	Trumpeter Swans are in the unit and must be protected. Other wildlife also exists in significant numbers.	All important habitat areas will be managed in coordination with ADF&G recommendations.
	Becky Long Denis Ransy	Not all local residents support using fuel wood for wood-fired boilers in public buildings.	This issue is outside of this plan process. It was mentioned during Phase I for information purposes on potential uses.
	Becky Long	Portion of Talkeetna River within unit should be added to Recreational River Corridor.	Recommendations contained in the Susitna Recreational Rivers Management Plan will be considered.
	Roger Robinson Mark Stahl Roberta Sheldon Susitna Community Council (Cari Sayre) Ellen Wolf Mike Wood Arthur Mannix	Area should be managed by the Susitna Forestry Council.	The plan will not decide if anyone but the Borough will manage public resources. However, local input on how any unit will be managed is being actively sought and will be considered.
	Mark Stahl	Some level of road construction and timber harvest will improve recreation and habitat values.	This will be considered when developing the plan for this and other units.
Bunco Hills	Becky Long Billy FitzGerald Richard Leo Brian Okonek John Strasenburgh Ruth Wood	Dual classification should not be used. Primary classification should be public recreation, watershed and wetland bank.	These recommendations will be considered during development of the plan.

TOPIC	COMMENTER'S NAME	COMMENT/ISSUE	RESPONSE
	Dulce Ben-East John Strasenburgh	Settlement areas exist in this unit and should be documented.	Land status will be verified.
	Lewis Bratcher	Supports recommendation.	No response.
	John Strasenburgh	Listing of wildlife and fish species needs to be expanded.	Agree species of concern will be identified in consultation with ADF&G.
	John Strasenburgh	Trail information is incorrect and not properly mapped.	Corrections will be made.
Chijuk Creek	Dulce Ben-East	Access conflicts between residential/ recreational users and timber harvest operations will result that should be addressed prior to timber harvest.	General access issues in all the units where any timber harvest may occur will be addressed. Details will be addressed prior to any sale which includes a public notice/review period.
	Lewis Bratcher	Supports recommendation.	No response.

TOPIC	COMMENTER'S NAME	COMMENT/ISSUE	RESPONSE
Chulitna River	Rick Ernst Lewis Bratcher Jean Hartman	No large scale harvest in this unit. Small personal use areas, such as for firewood or select cut OK if properly managed.	Agree, will be addressed in the plan.
	Brian Okonek FOMS (Mimi Peabody) Sheryl Salasky John Strasenburgh Ruth Wood	Unit should be Public Recreation and Watershed Protection.	That will be the primary purpose of this unit. However some small scale personal use timber harvest may be included in the Plan.
	Ruth Wood John Strasenburgh	There are lands in the NW portion of the unit, west of the Parks Highway that are important waterfowl habitat.	This will be researched and verified with ADF&G.
	John Strasenburgh	Trail Information is incorrect.	Agree, corrections will be made.
Deception Creek	James Carter Vern Halter WACO (Linda Okley)	Need to include input from Willow Comprehensive Plan as it is developed.	All comprehensive plans will be followed, where applicable.
	Lewis Bratcher	Supports recommendation.	No response.
	Vern Halter	Classify entire unit as Public Recreation.	With proper management, activities on a large unit with multiple values can co-exist.
	Vern Halter	Protect Haessler-Norris Trail System.	Trail system will be protected and any timber harvest areas will consider integrity of the system and other recreational concerns.

TOPIC	COMMENTER'S NAME	COMMENT/ISSUE	RESPONSE
Kashwitna	James Carter Vern Halter WACO (Linda Oxley) Lewis Bratcher	Need to include input from Willow Comprehensive Plan as it is developed. Supports recommendation.	All comprehensive plans and other land-use plans will be followed, where applicable. No response.
Matanuska River	Gene Agnew Chickaloon Village (Gary Harrison) Jessica Dryden Sutton Community Council (George Rauscher) Brian Winnestaffer (ADF&G)	Wildlife information is not accurate. Reference should be made to the adjacent Mat Valley Moose Range and Important Moose Crossings of the Glenn Highway	Coordination with ADF&G will occur during development of the Plan. Moose Range Plan and Moose Crossings of the Glenn Highway will be referenced.
	Gene Agnew Chickaloon Village (Gary Harrison) Brian Winnestaffer (ADF&G)	Elks Lake Trail crosses private property. One commenter suggested another existing route off the Glenn Highway.	Alternative access will be researched.
	Gene Agnew Jessica Dryden	Concerned about noise and visual impacts.	Site specific buffers will be evaluated.
	Chickaloon Village (Gary Harrison)	Impacts to cultural sites need to be investigated.	Agreed. It is a legal requirement to obtain an archeological clearance before conducting field operations.
	Chickaloon Village (Gary Harrison) Sutton Community	Scenic Values of the Glen Highway need to be protected.	Agreed, buffers will be provided.

TOPIC	COMMENTER'S NAME	COMMENT/ISSUE	RESPONSE
	Council (George Rauscher) Brian Winnestaffer (ADF&G)		
	Chickaloon Village (Gary Harrison)	The traditional council should be added to the list of those provided information.	The council will be added to the list of reviewers.
	FoMS (Mimi Peabody) Brian Winnestaffer (ADF&G)	Supports recommendation on southern parcel.	No response.
	Lewis Bratcher	Supports recommendation.	No response.
Mile 233	Judy Price Becky Long William Barstow Don Billington Sarah Birdsall Jeffrey Robinson Deborah Brocke James Cline Trust Dave Deaver Johathan Durr Robert Durr Steve Durr Billy FitzGerald Kathleen Fleeming Sue McCullough Beth Pike & Jerry Boutte	Area should be left "as is" for use by local residents and their lifestyle with no large commercial timber harvests. Area should be classified Public Recreation.	This unit, along with all the other units, is a public resource owned by all borough residents. Local residents may not receive preferential uses, however, their concerns will be considered in the planning process. Not all land within a unit will be subject to or available for timber harvest. Land-use classifications, goals, and management intent for the unit will be evaluated and established in the plan, to include harvest and sale sizes. Actual sale size, harvest methods, etc. will be determined later during the sale process and in the Plan of Operations which will be subject to further public review.

TOPIC	COMMENTER'S NAME	COMMENT/ISSUE	RESPONSE
	Charles & Linda Rutledge Talkeetna Community Council (Ellen Wolf) Nicole South Cathy Teich Ruth Wood		
	Don Billington	Inbound tourists flights fly over this unit and timber harvest would be a negative factor.	Viewsheds, size, shape and type of harvest areas will be a addressed in the Forest Management Plan.
	James Cline Trust	Clear Creek Road is a muddy trail at best and needs maintenance	So noted.
	Lewis Bratcher	Supports recommendation.	No response.
	Cathy Teich Don Billington	There are springs from Mile 233 to Mile 236 that would be affected by runoff.	Areas affected by runoff will be avoided and protected from any negative use.
Moose Creek	Becky Long	No commercial harvest should occur within this unit.	It is premature to determine the long-term management for this unit until a resource inventory has been completed.
	Lewis Bratcher Richard Leo	Supports small sales in this unit that protects high recreational use.	Unit may be considered for personal use and small select cut timber and gravel sales. Protection of recreational uses will be primary consideration.
Olson Creek	Lewis Bratcher	Supports recommendation.	No response.
Parks Highway	Lewis Bratcher	Supports recommendation, especially for small sustainable sales.	No response.

TOPIC	COMMENTER'S NAME	COMMENT/ISSUE	RESPONSE
	Brian Okonek	Limit timber harvest to personal use (firewood, cabin logs, etc.) and small select cut sales. Winter operations only.	Agree. The plan will recommend limited timber harvests and methods.
Point MacKenzie	Garvin Bucaria	Does not support splitting the area into 2 sub-units.	The split was recommended to aid the public and the land manager as significantly different uses occur, and where different management regimes will be required. Overall watershed management will still be a primary consideration.
	Garvin Bucaria	Recommended 5 areas for corridors and specific land-use classifications.	Recommendations will be considered in the Plan.
	Lewis Bratcher	Supports recommendation.	No response.
	Mtn. Village LLC (Dan Kennedy)	Add area north west of Port District.	No map or description was provided. Generally all borough land NW of the Port District is within this unit or the Fish Creek Plan area.

TOPIC	COMMENTER'S NAME	COMMENT/ISSUE	RESPONSE
Rabideux	Lewis Bratcher	Supports recommendation, wants to see additional small area inventoried.	Small area with competing uses, access issues and buffers will leave little operable area, if any.
	David & Judith Lund Glenda & Marty Sanders	Concern that the access road to their property may be damaged from logging activities and who will be responsible.	Stipulations will be put in timber sales that require the contractor to maintain road(s) and fix any damage. Seasonal restrictions can also be made. Borough code (MSB 28.60) has requirements for road maintenance and traffic safety.
	David & Judith Lund Glenda & Marty Sanders	Concerned about access across private property.	Private property rights must be respected. Property owners may grant permission for access that may include reasonable stipulations and conditions.
	Glenda & Marty Sanders	Concerned about provisions to prevent and mitigate wild fire danger.	Stipulations will be put in sale contracts to address these concerns. Harvest time (winter) and methods are also utilized to address concerns at the time of the sale.
Rogers Creek	James Carter	Land Status needs to be verified as state and borough mapping conflicts exist.	Land status will be verified.
	James Carter Vern Halter WACO (Linda Oxley)	Need to include input from Willow Comprehensive Plan as it is developed.	All comprehensive plans will be followed, where applicable.
	Lewis Bratcher	Supports recommendation.	No response.

TOPIC	COMMENTER'S NAME	COMMENT/ISSUE	RESPONSE
	Vern Halter Vern Halter	Unit should be classified as Public Recreation. Protect Emil Stancec Trail System.	Activities on a large unit with multiple values can co-exist with proper management. Trail system will be protected and timber harvest areas will consider integrity of the system and other recreational concerns.
Sheep Creek	Lewis Bratcher Tami Hamler	Supports recommendation. Manage for public recreation and habitat protection as recommended in the Susitna Forest Guidelines	No response. Timber sales will be designed and managed so that all values will be managed in a coordinated way
Susitna River Corridor	Lewis Bratcher Jean Hartman Brian Okonek Jean Hartman Trapper Creek Glen Homeowners Assoc. (Nancy Schommer) Trapper Creek Glen Homeowners Assoc. (Nancy Schommer)	Supports recommendation. Would like to see the area managed for birch, protect recreational and habitat values with small value added and personal use sales. Adequate buffers need to be provided for the property in Trapper Creek Glen Subdivision and for all trails. Existing dedicated trails and parking areas are not mapped.	Small timber harvest areas with appropriate guidelines will be included in the Plan. Any timber harvesting activities will have buffers from all private property and trails. Also, see response under buffers. Maps will be corrected.
Whiskers Creek	Judy Price Jok Bondurant Jeffrey Robinson Deborah Brocke Roger Robinson	No large scale timber harvest should occur in this unit because of its natural values and area should be managed for these values. Recommend classification for Public Recreation and Watershed.	Primary classification will be public recreation for the entire unit. In the southern unit, only small select cuts or personal use sales, winter harvest only with no new road construction. No timber

TOPIC	COMMENTER'S NAME	COMMENT/ISSUE	RESPONSE
	Pam Robinson Billy FitzGerald Kathleen Fleming Richard Leo Brian Okonek Sheryl Salasky Jean Hartman John Strasenburgh Ellen Wolf Mike Wood Ruth Wood Dave Johnston	Several commenter's suggested the area should be added to Denali State Park.	harvest in the northern unit will be allowed in the plan. There has been no indication by DNR that they are interested in pursuing a land exchange to add the area to Denali State Park.
	Lewis Bratcher	Supports recommendation.	No response.
Willow	Unknown James Carter FoMS (Mimi Peabody)	Good Recommendation.	No response.
	Veronica Cavanaugh Theodore & Melitta White Vern Halter WACO (Linda Oxley)	Classify Public Recreation with no secondary classifications.	This will be considered. Portions of the unit are also suitable for community expansion. Final classifications will be made in conjunction with the Willow Comprehensive Plan recommendations when it is completed.
	Lewis Bratcher	Supports recommendation, but if development occurs wants to see salvage or thinning sales.	No response.

TOPIC	COMMENTER'S NAME	COMMENT/ISSUE	RESPONSE
Forest Research and Study Areas			
Forest Research and Study Areas	Dulce Ben-East Mark Stahl Cliff Eames FOMS (Mimi Peabody) Jean Hartman Richard Leo Brian Okonek Roberta Sheldon James Carter Brian Okonek Rick Shear John Strasenburgh Talkeetna Community Council (Ellen Wolf) Ellen Wolf Mike Wood Ruth Wood Arthur Mannix	Need more information on regeneration and growth rates of natural species, especially paper birch and white spruce. More information on the research sites, including dates, and citations would be useful. Study sites and research areas need to be located throughout the borough.	Plan will acknowledge existing research and study areas. Citations will be provided, if available. Language will be clarified as to length of studies, locations, etc. and identify research needs. Federal, State agencies along with the University of Alaska are primary researchers. Borough research activities will continue to be in support of their projects.
	Arthur Mannix	Research and study sites should be protected and used for further (secondary) research even if the original purpose of the study at a particular site has been completed.	Generally agree. This will be addressed in the Plan.
	Arthur Mannix	Funding and implementation needs to be ensured to maintain long-term viability. Suggests adding a percentage to stumpage fees to address this.	This is a same concern as contract management. While needed, the Plan can only recommend solutions. The ultimate decision is left to the Assembly.

TOPIC	COMMENTER'S NAME	COMMENT/ISSUE	RESPONSE
	James Carter	1989 Moose Habitat Project shown on Copper Timber Sale map should be included.	This will be added, if applicable.
	Chickaloon Village (Gary Harrison) James Carter	Habitat projects done and on-going by ADF&G should be included.	These will be researched and added where applicable and where on-going research related to forest management is being conducted.
	James Carter	Reforestation research needs stated in the Susitna Forest Guidelines should be included.	These will be researched and added, where applicable.
	NPI, LLC (Dane Crowley)	Does not want to see the Borough replicate or synthesize new information and research already completed or being studied.	The purpose of identifying existing research and studies was to show current efforts. Federal, State agencies along with the University of Alaska are primary researchers. Borough research activities will continue to be in support of their projects.
Sustained Yield & Annual Allowable Cut			
Sustained Yield & Annual Allowable Cut	Becky Long James Carter Brian Okonek Doug Smith	Data provided does not support statement that commercial forest land has exceeded rotation age. Resource bulletin that was used as a source does not apply to Mat-Su Forests.	The stratum data shows the age of various forest stands. Stratum's 4 through 6, by definition, are composed of mature and defective trees. This data has been field verified. The resource bulletin that was cited will be checked for applicability.
	Becky Long Roger Robinson	Do not support using a shorter rotation period for timber harvest for a wide	Rotation periods be re-evaluated during development of the Forest Management

TOPIC	COMMENTER'S NAME	COMMENT/ISSUE	RESPONSE
	Pam Robinson James Carter FOMS (Mimi Peabody) Jean Hartman Brian Okonek Sheryl Salasky John Strasenburgh Talkeetna Community Council (Ellen Wolf) Rudy Wittshirk Mike Wood Ruth Wood Dave Johnston Arthur Mannix	variety of reasons. One recurring concern is that inadequate information is available on growth rates and successful regeneration.	Plan and may be applied differently to specific units.
	Dulce Ben-East	Stands should provide increased resources available for non-timber forest products, such as birch sap, conks, and bark.	Plan will recognize the need for these non-timber resources.
	Mark Stahl NPI, LLC (Dane Crowley)	Supports shortened rotation to convert some areas to new growth which provides more broad benefits and a healthy forest.	Rotation periods be re-evaluated during development of the Forest Management Plan and may be applied differently to specific units.
	Brian Winnestaffer (ADF&G)	Sustained yield definition/explanation needs to be clarified. Example, if after xx years of harvesting paper birch, the re-growth does not equal the board feet produced during the previous harvest,	Agree, clarification will be made.

TOPIC	COMMENTER'S NAME	COMMENT/ISSUE	RESPONSE
		then one cannot maintain a sustained yield.	
General Management Goals			
Fish & Wildlife Protection	Judy Price Becky Long Jeffrey Robinson Deborah Brocke	Important wildlife, plant species, endangered species not identified, information too vague.	Information provided by ADF&G will be considered in the Plan.
	Billy FitzGerald Judy Price Becky Long Jeffrey Robinson Deborah Brocke James Carter Roger Robinson Pam Robinson Garvin Bucaria Kathleen Fleming Jay Hudson Ron McDowell Brian Okonek Point MacKenzie Community Council (Gordon Attaliades) Denis Ransy Sheryl Salasky John Strasenburgh Doug Smith Talkeetna Community Council (Ellen Wolf) Cathy Teich	Not all anadromous or resident fish streams were identified and must be protected.	Agreed, language will be in the plan to insure that all anadromous and resident fish streams will be protected. In addition, the Alaska Forest Resources and Practices Act must be followed, whose primary goal is to protect fish and fish habitat.

TOPIC	COMMENTER'S NAME	COMMENT/ISSUE	RESPONSE
	Mike Wood Ruth Wood Dave Johnston		
	Cliff Eames Judy Price Becky Long Kathleen Fleeming Brian Okonek Sheryl Salasky Talkeetna Community Council (Ellen Wolf) Rudy Wittshirk Mike Wood Ruth Wood Arthur Mannix	More coordination with ADF&G for evaluating impacts is needed during this plan process, during sale layout, and post sale monitoring and enforcement.	Agree. Goals and guidelines for this consultation will be in the plan. Evaluating specific impacts will be required to be done on a case-by-case basis at the time of a timber sale or some other on-the-ground activity occurs.
	Judy Price	Protection of fur-bearing animal habitat is not addressed.	Information provided from ADF&G will be considered in the plan.
	Becky Long	Fish and wildlife habitat should not be enhanced to produce moose farms.	This issue will be addressed in the Forest Management Plan and done in coordination with Fish and Game recommendations.
	Dane Crowley (NPI, LLC)	Forest Lands should be managed for both forest health and enhanced hunting opportunities. Timber harvest areas and wildlife habitat are not mutually exclusive goals.	This issue will be addressed in the Forest Management Plan and done in coordination with Fish and Game recommendations.

TOPIC	COMMENTER'S NAME	COMMENT/ISSUE	RESPONSE
	Garvin Bucaria Billy FitzGerald Tami Hamler	Provide for wildlife migration corridors.	Agree and will be coordinated with ADF&G.
	FOMS (Mimi Peabody)	Providing harvests for moose winter habitat away from the road corridor is an excellent goal.	Agree and will be coordinated with ADF&G.
Forest Resources	Judy Price Becky Long James Carter Billy FitzGerald Brian Okonek Mark & Marie Richter John Strasenburgh WACO (Linda Oxley) Ruth Wood Vern Halter Arthur Mannix	More information on the impacts of timber harvest needs to be included to include direct and indirect costs (recreation, tourism, etc.).	Both direct and indirect benefits will be considered when developing the Plan. Agree. The Plan will examine this issue in more detail once the final units are determined.
	Judy Price Jok Bondurant Doug Smith	No discussion on non-commercial harvest being important for local residents. Person use (firewood, house logs, etc.) should be made available close to communities and settlement areas.	It is recognized that local harvest does occur and must be a consideration for timber harvest and forest management. Personal use timber harvest areas will be provided as appropriate.
	Becky Long Jay Hudson Brian Okonek Talkeetna Community Council (Ellen Wolf)	Regeneration by scarification is not successful. Manual planting and other regeneration methods should be examined and utilized. More knowledge of this subject is needed.	Regeneration will be addressed in the Plan in conjunction with silvicultural needs.

TOPIC	COMMENTER'S NAME	COMMENT/ISSUE	RESPONSE
	John Strasenburgh Dave Johnston Arthur Mannix		
	Becky Long Mark Stahl Kathleen Fleeming Brian Okonek Rick Shear Susitna Community Council (Cari Sayre) Doug Smith Talkeetna Community Council (Ellen Wolf) Ellen Wolf Mike Wood Dave Johnston Arthur Mannix	Does not support cutting all of one year's AAC within one unit.	Agree. The Plan will examine this issue in more detail once the final units are determined.
	Jeffrey Robinson Deborah Brocke Billy FitzGerald Richard Leo Brian Okonek Sheryl Salasky Susitna Community Council (Cari Sayre) Doug Smith Talkeetna Community Council (Ellen Wolf)	Value added, small-scale industries are the best use of the borough's forest land.	These uses, and others, will be addressed in the Plan.

TOPIC	COMMENTER'S NAME	COMMENT/ISSUE	RESPONSE
	Dave Johnston Arthur Mannix		
	Jeffrey Robinson Deborah Brocke Cliff Eames Kathleen Fleming Brian Okonek Sheryl Salasky Rick Shear Susitna Community Council (Cari Sayre) Talkeetna Community Council (Ellen Wolf) Mike Wood Ruth Wood Dave Johnston Arthur Mannix	Follow Susitna Forest Guidelines.	Applicable portions of the Guidelines will be included in the Plan. This will be done in consultation with the States', Division of Forestry.
	Jeffrey Robinson Deborah Brocke Peg Foster Brian Okonek Sheryl Salasky John Strasenburgh Talkeetna Community Council (Ellen Wolf) Dave Johnston Arthur Mannix	No large scale timber harvest should occur.	Units will be managed consistent with the Plan. Sale plans will assure sale contributes to healthy ecosystem needs, not necessarily to meet only industry needs..

TOPIC	COMMENTER'S NAME	COMMENT/ISSUE	RESPONSE
	Garvin Bucaria	Uneven age forests should be maintained to provide for a variety of uses and habitats.	Agree. The plan will provide both even and uneven aged forest. Application of silvicultural techniques will be required.
	Jessica Dryden Billy FitzGerald Brian Okonek Susitna Community Council (Cari Sayre) Ellen Wolf	Each unit should have its own management plan.	Agree. There will be a chapter on area wide goals and management objectives. A specific chapter or section for each unit will provided with specifics on how the goals and management objectives shall be applied to that unit.
	Lewis Reese Ellen Wolf John Strasenburgh	Strong safeguards need to be put in place for access, limiting timber harvest to winter months and during normal working hours, eliminating slash piles, size and type of equipment, bonding, and enforcement	All these issues will be addressed in the Plan or already exist in Borough Code or State Law.
	Ruth Wood	Add goal that the process of managing the forest, and harvesting its resources, the overall health of the ecosystem of which the forest unit is a part shall not be impaired.	Agree, this goal will be added as it is one of the intents of the plan.
	John Strasenburgh	Clarify natural regeneration and human assisted regeneration as to what techniques apply to each.	This will be clarified. .

TOPIC	COMMENTER'S NAME	COMMENT/ISSUE	RESPONSE
	John Strasenburgh Ruth Wood	Numerous suggestions and clarifications for goals which are too long to list and explain in this document.	These are all very well thought out and will be individually addressed in the plan.
	Mike Wood John Strasenburgh Ruth Wood Dave Johnston Arthur Mannix	Accepted, proven and effective silvicultural practices must be adopted.	Silvicultural practices will be addressed in the plan.
	Arthur Mannix	Uses that will occur (recreation, fish and wildlife habitat enhancement, etc.) need to be addressed and planned for prior to any sale and during the sale layout.	Agree, that is what multiple-use management entails and will be addressed in the Plan.
Buffers	Dulce Ben-East	Clarify buffer language on streams (too technical).	Language will be clarified and illustrations included where appropriate.
	Jeffrey Robinson Deborah Brocke Billy FitzGerald FOMS (Mimi Peabody) Jean Hartman Lewis Reese Sheryl Salasky John Strasenburgh Talkeetna Community Council (Ellen Wolf) Brian Winnestaffer (ADF&G) Rudy Wittshirk	Need flexibility on size of water body, riparian, wetlands, road, trail, viewsheds and ridge line buffers. Some areas need to be wider for a variety of reasons.	This issue will be addressed in the Forest Management Plan and done in consultation with ADF&G, DNR and other agencies. Plan will make it clear that public input will also be considered during the timber sale process. Guidelines (checklist) will also be provided for adjusting buffer size. Different land-use classifications may also be used in some cases.

TOPIC	COMMENTER'S NAME	COMMENT/ISSUE	RESPONSE
	Ellen Wolf Mike Wood Dave Johnston NPI, LLC (Dane Crowley) Sheryl Salasky	 Viewsheds and private property can be adequately protected using existing required buffers and land-use classifications.	 Generally agree. This issue will be addressed in the Forest Management Plan and done considering agency and public recommendations on a unit specific and case-by-case basis.
Recreation	Numerous Numerous Becky Long James Carter John Strasenburgh Ruth Wood FOMS (Mimi Peabody) Floyd Heimbuch Sheryl Salasky John Strasenburgh Cathy Teich Ruth Wood Brian Okonek	Transportation impacts on recreation. Impacts on recreation and tourism. Trails and trailheads should not be developed unless the local residents support them and the Borough has adequate resources to manage the negative impacts. Encourage minimum impact recreational activities. A recreational plan for each unit must be developed prior to any timber harvest.	See Transportation section. See Forest Resources section. These concerns will be addressed in the Plan. All Borough owned land is a public resource owned by all borough residents. Local residents may not receive preferential use, however, their concerns will be considered in the planning process. Will be considered on a unit-by-unit basis. Recreational uses will be addressed in the plan with management goals and guidelines. The Borough's Parks, Recreation, and Open

TOPIC	COMMENTER'S NAME	COMMENT/ISSUE	RESPONSE
			Space Plan and the Recreational Trails Plan will also be referenced. Specific recreational concerns will be addressed at the time of a timber sale or other on-the-ground activity occurs. A public notice and review period will be provided at that time.
Transportation	Judy Price Jean Hartman John Strasenburgh Trapper Creek Glen Homeowners Assoc. (Nancy Schommer) Ruth Wood Willow Trails Committee (Steve Charles) WACO	Trails not accurately mapped and not all trails are shown. All legally established and dedicated trails, easements, or rights-of-way should be recognized.	Will be researched. Many local trails can only be indentified at the time of a planned action. Language will be in the plan to identify and protect regionally and locally significant trails prior to any timber harvest.
	Becky Long Cliff Eames Kathleen Fleming Brian Okonek John Strasenburgh Talkeetna Community Council (Ellen Wolf) Ruth Wood	Do not agree that a goal should be to expand the existing road system.	This goal will be clarified. Recommending new permanent roads will only be done through a public process that should also address future funding and management.
	Jeffrey Robinson Deborah Brocke Kathleen Fleming Brian Okonek	Winter harvest only with no new permanent roads.	This issue will be addressed in the plan for each individual unit.

TOPIC	COMMENTER'S NAME	COMMENT/ISSUE	RESPONSE
	Talkeetna Community Council (Ellen Wolf) Mike Wood		
	Cliff Eames Jeffrey Robinson Deborah Brocke Brian Okonek Sheryl Salasky John Strasenburgh	Summer ATV use needs to be controlled/managed.	Goals and management intent issue will be addressed in the plan in general and for each specific unit.
	James Carter Mark & Marie Richter	The negative effect of damage to roads from timber harvest operations should be addressed.	Borough code (MSB 28.60) has requirements for road maintenance and traffic safety.
	FOMS (Mimi Peabody) Brian Okonek John Strasenburgh	Provide clear policy and guidelines for "putting roads to bed" or obliterating them so that unmanaged uses do not occur.	Goals and management guidelines will be provided in the plan.
	Jean Hartman Sheryl Salasky	No tax money should be spent building roads used primarily for timber harvest.	That is a decision that is not part of this plan. If authorized, building logging roads are the responsibility of the timber harvest contractor to standards set forth in a sale contract.
Water Quality, Wetlands, Riparian Areas	Numerous	All streams, riparian, and wetland need buffers, not just those in the Anadromous Catalog.	Agree, this will be addressed in the plan. Also see Fish & Wildlife Protection.

TOPIC	COMMENTER'S NAME	COMMENT/ISSUE	RESPONSE
	FoMS (Mimi Peabody) Ruth Wood	Avoid all impacts to water quality, wet lands and riparian areas.	Agree, that is the goal. However, experience has shown that this goal cannot always be achieved. Guidelines will be provided in the Plan to improve, maintain or cause minimal impact, if an activity cannot be prevented.
Other			
Subsistence Areas	Judy Price	Important local areas Subsistence areas are not identified.	This is not a Borough issue. Information provided by ADF&G will be considered.
Climate Change	Becky Long James Carter Jay Hudson Cathy Teich Mike Wood	A new category should be added to address carbon and climate change.	This is not a subject of this plan. The amount of timber that could be harvested is so minimal in comparison to the size of remaining forests that it does not warrant further studies as part of this plan process. However, as other studies are done the plan may be amended, if needed.
Classifications	Becky Long Ellen Wolf	Borough needs a wildlife habitat classification.	The Municipal Land Act does not allow conveyance of Wildlife Habitat Land to municipalities. Before DNR conveys land to any municipality they work with ADF&G to determine these areas. The Borough has identified additional areas with habitat values and classifies them as public recreation, wetland, or watershed lands.
	Rick Jandreau (DOF)	Classifications should be limited to one as co-classification leads to ambiguity and conflict. Use goals and management intent to protect other resources and uses.	Valid point and will be considered during development of the Plan. This may require a change in Borough code to implement as currently the Borough uses a tiered hierarchy classification system

TOPIC	COMMENTER'S NAME	COMMENT/ISSUE	RESPONSE
Public Hearings	Becky Long Linda Oxley (WACO)	Public hearing instead of open houses should have been held to solicit additional comments. Process for gathering input needs serious review and revision.	Two months was provided for the public to provide comments. It was made clear that the open houses were being held to provide members of the public with information and to answer questions to aid them in providing comments. We did receive 78 written responses with hundreds of comments, edits, and recommendations during this phase. This indicates that the public comment process that was used provided ample opportunity for the public to participate. This is just the first phase of developing this Plan with many more opportunities available for review and comment as development of the Plan continues over the next several months. The Borough welcomes suggestions on how to improve the public input and review process.
	Ruth Wood	As the Plan is developed, separate meetings should be held on specific topics and areas so that people knowledgeable about topics and areas can provide meaningful input.	This will be considered as time and budget restraints allow. Additional opportunities will be provided for public review and input at the time of a timber sale, or other on-the-ground activity occurs.
Invasive Plant Species	Becky Long Judy Price James Carter	Specific provisions must be provided to prevent invasion of non-native plant species during logging operations.	Agree. We will consult with ADF&G & DOF on this issue.
Plan and plan amendments	James Carter	Provide section in Plan on the timing and how the Plan can be amended.	Agree, this will be included in the Plan.

TOPIC	COMMENTER'S NAME	COMMENT/ISSUE	RESPONSE
	William Haag Mtn. Village LLC (Dan Kennedy)	Supports Plan that provides economic benefits and enhances resource values.	No response.
	Vern Halter	More time needed for the public to provide comments.	This is the first of many opportunities for the public to review and comment on the Plan as it is developed.
	Jean Hartman	Information provided seems to justify commercial timber harvests.	That was not the intent. As stated, the intent is to manage borough forests on a sustained and healthy basis along with other activities and uses.
	WACO	Request that Plan process stops until Willow Comprehensive Plan process can be completed.	The Willow Comprehensive Plan process covers a very large geographic area. It is recognized that the area has been "assaulted" with demands from a number of sources which all demand time to address. However, we cannot stop our Plan process because of other multiple on-going efforts. The Plan will recognize that these efforts are on-going and may recommend delaying adoption of certain portions of the Plan or that Plan amendments may be needed when these other efforts are completed.
	Norlene Wolbert	Whatever you are up to, don't, government does not help in any way.	Publicly owned resources belong to everyone and must be managed accordingly.
Contract Administration	Mark Stahl Becky Long Judy Price	Timber contracts and recreational uses need more on-the-ground administration and active enforcement. Possibly use	Agree. This is recognized as a deficiency. Although not a direct product of the Plan, a recommendation will be made for more

TOPIC	COMMENTER'S NAME	COMMENT/ISSUE	RESPONSE
	Cliff Eames Billy FitzGerald Susitna Community Council (Cari Sayre) Doug Smith John Strasenburgh Talkeetna Community Council (Ellen Wolf) Dave Johnston Arthur Mannix	third-party administrators. Past experience with large scale timber harvests is dreadful.	field presence for all natural resource and land management functions.
	Mike Wood	All users, including locals, should pay for the use of public resources.	Agree.
General Management Goals	Lewis Bratcher	Neutral or generally support goals as they are compatible with the Great Alaska Bowl Company's harvest needs	Local business (value added) timber needs will be addressed in the Plan.
	Dane Crowley (NPI,LLC)	Enough forested land is already set aside to be left natural (state parks, game refuges) and other areas should be managed for other uses.	The intent of the plan is to provide for healthy and sustainable forests, while recognizing the importance of other uses and users.
	Sheryl Salasky John Strasenburgh	Add a goal to find a regeneration method that is "proven and effective."	Agree. It must be recognized by everyone that not all goals are achievable 100% of the time. "Proven and effective" can be evaluated by different people in different ways. Guidelines will be provided in the Plan to achieve this goal through appropriate silvicultural methods.

TOPIC	COMMENTER'S NAME	COMMENT/ISSUE	RESPONSE
	Sheryl Salasky Rudy Wittshirk Ellen Wolf Rick Jandreau (DOF)	Add a goal to protect viewsheds and important recreation areas. Several suggested edits and clarifications on General Management Goals	Viewsheds and recreation areas will be addressed under classifications, buffers and timber sale layouts. These will be incorporated where appropriate in the Plan
AK Railroad Corridor	Mtn. Village LLC (Dan Kennedy)	Add new railroad corridor as a new unit.	Most of the areas around the proposed corridors is already included in existing plans or plans in progress. Any timber within the corridor where tracks would be located would be harvested as a "salvage sale."
Definitions	Ed Strabel John Strasenburgh Brian Winnestaffer (ADF&G) Ruth Wood	Define "hardwoods", "softwoods", "operable timber" and "inoperable timber." Define "wildlife" to include at least animals and birds. Clarification on AAC; when it does and does not apply to personal use harvest. Define/explain "area control basis" for determining annual allowable cut.	Definitions were included in Part I, pages 17 and 18. A clear definition will be provided. Clarification will be made. Definition/explanation will be added.
Watershed Management	Rudy Wittshirk Ruth Wood	Coordinate with the state and other agencies to harvest timber and conduct other activities in a coordinated manner.	Agree. Steps have already been taken to coordinate timber sales, land use, and management activities on a regular and on-going basis.
Community Council Areas	Ruth Wood John Strasenburgh	Recognize that some units are outside of Community Council/Comprehensive	The Plan will acknowledge that some areas outside of community council boundaries

TOPIC	COMMENTER'S NAME	COMMENT/ISSUE	RESPONSE
	Talkeetna Community Council (Ellen Wolf) Susitna Community Council (Cari Sayre)	Plan boundaries, but important to residents of those and other areas.	are important to local residents. The plan will also acknowledge that all the Borough owned land is a public resource belonging to all residents of the Borough.

Chapter 3
Phase II – Public Involvement Plans

Following the scoping phase of this project, it became a requirement that a Public Participation Plan be submitted for all planning projects. A Public Participation Plan was prepared and submitted on December 22, 2008.

The original plan was later amended two times (April 27, 2009, and August 26, 2009).

The amendments were necessary because of time delays in getting Phase II of the project started. In addition, as a result of the time delay additional public participation opportunities became available and were utilized.

The following is the original Public Participation Plan followed by the two amendments.

MATANUSKA-SUSITNA BOROUGH

FOREST MANAGEMENT PLAN
NATURAL RESOURCE MANAGEMENT UNITS

MSB Contract 2009-00001715

PUBLIC INVOLVEMENT PLAN
December 22, 2008

Prepared by:
RWS Consulting

Background

The Community Development Department, Division of Land and Resource Management is in the second of three final steps in the process to establish on Borough owned land, viable Natural Resource Management Units[1] (NRMU's) and to complete a Forest Management Plan (FMP). This second step takes all the information gathered in Phase I (proposed Multiple Use Forest Management Units and gathered information on a variety of forest management and timber harvest issues, which includes hundreds of public comments) and proceeds down two separate, but related paths.

When completed, the Forest Management Plan (in a format similar to the Trails Plan or Parks, Recreation and Open Space Plan) and the Natural Resource Management Unit Plan (NRMU's) will be completed for about 148,000 acres. These documents will cover about 40% of all Borough-owned land, of which approximately 38,000 acres may have a timber harvest component. When completed, all the land will have land use classifications, management intent and management guidelines in place.

The first document will be the FMP as required by MSB 23.20.060. The second document will be a Natural Resource Management Plan that identifies the multiple-uses for each the 19 management units identified during Phase I (both those with and without a forest management/harvest component).

Somewhat by coincidence, the Department of Natural Resources is just beginning to update two of their plans that overlap polices and geographic areas as the MSB project. The Division of Forestry is updating the Susitna Forest Guidelines, and the Division of Mining, Land and Water is updating the Susitna Area Plan.

The Susitna Forest Guidelines will deal with many of the same subjects as the Borough's Forest Management Plan. Hopefully, many of the policies developed in the Borough and State Plan will be consistent with each other.

The Susitna Area Plan update will update general management guidelines and land use designations. Many of the areas will be adjacent to or in close proximity to the Borough's NRMU's. By working collaboratively, inconsistent or conflicting land use designations can be avoided.

The schedule for these plan updates is roughly on the same time line as the Borough's for the FMP and the NRMU's review and adoption process. This will provide an excellent opportunity for the agencies to have all the plans reviewed by the public at the same time, and for policies, guidelines, and land use designation efforts to be coordinated and consistent with each other where possible.

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[1] Multiple Use Forest Management Units (MUFMU) from Phase I, are being renamed Natural Resource Management Units (NRMU) to encompass the full breadth of multiple uses of assets found in each unit. NRMU will be used consistently through the end of this plan wherever MUFMU was used previously.

Purpose of the Public Involvement Plan

The Public Involvement Plan (PIP) sets forth the means and methods for obtaining public input and communicating with stakeholders and affected interests. It defines the strategies, tools, and timing to incorporate public and stakeholder knowledge, viewpoints and preferences into the FMP and the identification and management of NRMU's.

Stakeholders and Potentially Affected Interests

The stakeholders for the FMP and NRMU's are many. This public involvement plan identifies strategies and tools to reach as many as practical during the 18-month duration of this contract/project.

This project affects all residents of the Borough, especially those that use and rely on the use of Borough owned land for a variety of uses. This includes a variety of recreational users (hiking, hunting, fishing, etc.), tourism, various commercial wood products, personal use wood products (firewood, etc.), watershed management, grazing and agricultural uses, etc.

Besides local residents and visitors, the FMP and the land use designations resulting from the NRMU processes will also directly affect those individuals and companies directly and indirectly involved in the forest products industry. This includes non-extractive users (birch sap tappers, conk gathers, etc.), specialty product producers (bowls, flooring, cabinets, etc.), small mills and wood pulp suppliers.

Community Coordination

The contractor (RWS Consulting) and Borough staff will meet with members of Community Councils where Borough owned land, which is subject to this contract/project, is located within their boundaries. Meetings will also be held with local groups and non-profit organizations (Susitna Forestry Council, Friends of Nat-Su, etc.) that could be affected by the management and land use designations that are the subject of this contract/project.

During Phase I of this project (completed May 2007), 34 people attended three open houses and 78 individuals and groups commented on possible land use designations and forest management issues. These have been included in a database for future public notices and email notifications.

Agency Coordination

The contractor and Borough staff will also meet with individual state and local agency representatives to ensure accuracy of technical information and to coordinate similar activities and planning efforts (see background section).

Website

The schedule, descriptions, status and all documents related to the project will be located on the Borough's Web site. All documents will be in low resolution, small file format to the extent possible for ease of access.

Document Repositories

Documents will also be available at the Borough offices in Palmer and at all Borough libraries. Community Councils will be provided extra copies as well for review by local residents.

Meetings and Public Notices

There will be two separate opportunities for members of the public to participate in this process.

A draft of the FMP will be posted on the Borough's Web site, mailed to all residents within 1-mile of any land affected by the Plan, and all persons and organizations on the projects mailing list in July 2009. Public Notice will meet the requirements of MSB 23.05.025; with notice to the local community councils, assembly members, posted at libraries and published twice during the notice period in a newspaper of local circulation. Comments will be accepted during August and September (60 day response period). During this same time period meetings will be held with the Borough's Real Property Asset Management Board and Parks, Recreation and Trails Advisory Board. Following this review period, comments will be summarized and appropriate changes will be made to the FMP.

From mid-November 2009 through the end of January 2010, another public notice will take place for the proposed NRMU areas. Again, the requirements of MSB 23.05.025 will be met including notification to all persons and organizations on the projects mailing list. In January 2010, three public meetings will be held in the Talkeetna/Susitna/Trapper Creek Community Council areas, Willow, and Wasilla.

Following this public comment period, the comments will be summarized and appropriate changes to the two plans will be made. During February and March 2010, the plans will be reviewed by the two advisory boards, further changes made if appropriate before forwarding the Plans to the Planning Commission for their recommendation and to the Assembly for their consideration. All the board, the Planning Commission and Assembly are open to the public and where public comments will be accepted.

Record of Agency and Public Comments and Public Involvement Deliverables

All comments and recommendations by agency staff, the public and organizations, and the two Borough Boards will be summarized; action taken will be noted and made part of the legislative package that will move forward to the Planning Commission. The Planning Commission recommendations will be added to the legislative package that will be submitted to the Assembly for their consideration. Copies of all comments received will be kept as part of the public record.

MATANUSKA-SUSITNA BOROUGH

AMENDED
PUBLIC INVOLVEMENT PLAN

FOR THE
NATURAL RESOURCE MANAGEMENT UNITS PLAN
Including a
FOREST MANAGEMENT PLAN

Original: December 22, 2008
Amended: April 27, 2009

MSB Contract 2009-00001715

Prepared by:
RWS Consulting

The following information supplements and amends the Public Involvement Plan that was originally submitted on December 22, 2008.

Background

Changes have been made in this section to reflect that one plan will be written that will address all natural resources and uses found in a Natural Resource Management Unit instead of having a separate plan for forest management. During development of the plan for the Natural Resource Management Units, it became clear to RWS Consulting that separating the Forest Management Plan from other natural resources that co-exist in Natural Resource Management Units is confusing and puts forest management out of context with the management of other natural resources

Change this section to read:

The Community Development Department, Division of Land and Resources is in the second of three final steps in the process to establish on MSB owned land viable Natural Resource (multiple-use) Management Units (NRMU's) and to complete a Forest Management Plan (FMP). The second step takes all the information gathered in Step I (proposed Natural Resource Management Units, and gathering information on a variety of forest and timber harvest issues), including hundreds of public comments and to write a plan for management of 19 NRMU's which will include chapters for the management of a variety of natural resources and uses.

When completed an asset management plan (polices and management guidelines similar to the Recreational Trails Plan or Parks, Recreation and Open Space Plan) will be completed for Natural Resource Management Units that total about 148,000 acres, about 40% of all MSB owned land. A separate chapter of this plan will deal with Forest Management which comprises approximately 38,000 acres of the 148,000 acres. When completed, all the land will have recommended land use classifications, land use designations, management intent and management guidelines in place.

Somewhat by coincidence, the Department of Natural Resources is just beginning to update two of their plans that overlap polices and geographic areas as the MSB project. The Division of Forestry is updating the Susitna Forest Guidelines (likely to be renamed), and the Division of Mining Land and Water is rewriting the Susitna Area Plan (now called the Susitna-Matanuska Area Plan).

The Susitna Forest Guidelines will deal with many of the same subjects as the Borough's plan for Forest Management. Hopefully, many polices developed in the borough and state plan's will be consistent and/or complement each other.

The Susitna-Matanuska Area Plan will update land use designations and general management guidelines from the 1985 Susitna Area Plan. Many of the areas will be adjacent to or in close proximity to the Borough's NRMU's. By working together, inconsistent and conflicting land use designations can be avoided.

The schedule for these plan updates is roughly on the same time line as the Borough's for the NRMU adoption process. This will provide an excellent opportunity for the agencies to have all the plans reviewed by the public at the same time, and for polices, guidelines and land use designation efforts to be coordinated and consistent with each other where possible.

Purpose of the Public Involvement Plan

No change from the December 22, 2008 plan.

Stakeholders and Potentially Affected Interests

No change from the December 22, 2008 plan.

Community Coordination

No change from the December 22, 2008 plan.

Agency Coordination

No change from the December 22, 2008 plan.

Website

No change from the December 22, 2008 plan.

Document Repositories

No change from the December 22, 2008 plan.

Meetings and Public Notices

Since the December 22, 2008 Public Involvement Plan was submitted, a series of seven public open houses have been held jointly with the borough and state Department of Natural Resources. A copy of a summary of these meetings is attached to this amendment.

The concept of having two separate plans (NRMU's and a Forest Management Plan) that closely interrelate but reviewed separately has been changed to have one plan as described in the background section.

Accordingly, amend this section to read:

There will be at least two separate opportunities for members of the public to participate in this process.

During April 2009 the borough, in coordination with the Department of Natural Resources, conducted a series of 7 open houses in various locations throughout the Borough. These open

houses provided the public an opportunity to participate and learn about the Borough's Natural Resource Management Unit Plans, the Susitna-Matanuska Area Plan update, and the Susitna Forest Management Plan update.

Public notice was provided at all post offices, libraries, and published in the "Anchorage Daily News", the "Frontiersman" and in the "Talkeetna Good Times" newspapers. Public service announcements were also provided to KTNA and KNBQ radio stations.

At these meetings the public were specifically asked to comment on the proposed land use management designations for each of the proposed Natural Resource Management Units. Based on the input received, the management unit designations will be changed; general borough-wide policies and guidelines for various natural resources will be written which will include a specific chapter on forest management.

A handout was provided for the public to specifically comment on. This same information was also sent to everyone on the borough's project mailing list and was posted on the borough's web site. The public comment period began on April 14 and will remain open until May 15th, although public comments will still be accepted and considered throughout the summer while the plan is being written.

During the summer of 2009, a draft of the entire plan will be completed and sent to various borough departments and state agencies to review and comment on. During this same period meetings have been and will continue to be held with the Borough's Real Property Asset Management Board, and the Parks, Recreation, and Trails Advisory Board.

In the fall (approximately October) revisions will be made to the entire plan based on the internal, agency and advisory board input.

From approximately mid-November 2009 through the end of January 2010, public notice will take place for the entire plan. This public notice will be provided to meet the requirements of MSB 23.05.025. This will include notification to all residents within 1-mile of any land affected by the Plan and to all persons and organizations on the projects mailing list. In January 2010, at least three public meetings will be held in the Susitna/Talkeetna/Trapper Creek Community Council areas, Willow and Wasilla.

Following this public comment period, the comments will be summarized, and appropriate changes to the plan will be made. During February and March 2010, the plans will be reviewed by the two advisory boards, further changes made if appropriate before forwarding the Plan to the Assembly for their consideration, including sending the Plan to the Planning Commission for their recommendations. All the advisory boards, the Planning Commission and Assembly are open to the public and where public comments will be accepted.

Record of Agency and Public Comments and Public Involvement Deliverables

This section has been changed to reflect the Plan will be submitted to the Assembly for possible action and recommendations by the Planning Commission as recently changed in Borough Code.

All comments and recommendations by agency staff, the public and organizations, and the two Borough Advisory Boards will be summarized; action taken noted and made part of the legislative package that will be sent to the Assembly. This same information will be provided to the Planning Commission if the Assembly sends the plan to them for a recommendation. If reviewed by the Planning Commission, their recommendations will be added to the legislative package that will be submitted to the Assembly for their consideration.

Copies of all comments received will be kept as part of the public record.

MATANUSKA-SUSITNA BOROUGH

PUBLIC INVOLVEMENT PLAN

FOR THE
NATURAL RESOURCE MANAGEMENT UNITS PLAN
Including a
FOREST MANAGEMENT PLAN

Original Plan: December 22, 2008
Amended: April 27, 2009
Amended: August 26, 2009

MSB Contract 2009-00001715

Prepared by:
RWS Consulting

The following information supplements and amends the Public Involvement Plan that was originally submitted on December 22, 2008, and amended on April 27, 2009.

Background

Changes have been made in this section to reflect that one plan will be written that will address all natural resources and uses found in a Natural Resource Management Unit instead of having a separate plan for forest management. During development of the plan for the Natural Resource Management Units, it became clear to RWS Consulting and Borough staff that separating the Forest Management Plan from other natural resources that coexist in Natural Resource Management Units is confusing and puts forest management out of context with the management of other natural resources.

Change this section to read:

The Community Development Department, Division of Land and Resources is in the second of three final steps in the process to establish on MSB owned land viable Natural Resource (multiple-use) Management Units (NRMU's) and to complete a Forest Management Plan (FMP). The second step takes all the information gathered in Step I (proposed Natural Resource Management Units, and gathering information on a variety of forest and timber harvest issues), including hundreds of public comments and to write a plan for management of 21 NRMU's which will include separate chapters for the management of a variety of natural resources and uses.

When completed an asset management plan (similar to the Recreational Trails Plan or Parks, Recreation and Open Space Plan) will be completed for Natural Resource Management Units that total about 161,000 acres, about 45% of all MSB owned land. A separate chapter of this plan will deal with Forest Management which comprises approximately 56,000 acres of the 161,000 acres. When completed, all the land will have recommended policies, management intent, land use designations, management guidelines and land use classifications in place.

Somewhat by coincidence, the Department of Natural Resources is updating two of their plans that overlap polices and geographic areas as the MSB project. The Division of Forestry is revising/updating the Susitna Forest Guidelines (likely to be renamed), and the Division of Mining, Land and Water is rewriting the Susitna Area Plan (now called the Susitna-Matanuska Area Plan).

The Susitna Forest Guidelines will deal with many of the same subjects as the Borough's plan for Forest Management. Hopefully, many of the polices and management guidelines developed in the borough and state plan's will be consistent and/or complement each other.

The Susitna-Matanuska Area Plan will update land use designations and general management guidelines from the 1985 Susitna Area Plan. Many of the areas will be adjacent to or in close proximity to the Borough's NRMU's. By working together, inconsistent or conflicting land use designations can be avoided.

The schedule for these plan updates is roughly on the same time line as the Borough's for the NRMU adoption process. This will provide an excellent opportunity for the agencies to have all the plans reviewed by the public at the same time, and for polices, guidelines and land use designation efforts to be coordinated and consistent with each other where possible.

Purpose of the Public Involvement Plan

No change from the December 22, 2008 plan.

Stakeholders and Potentially Affected Interests

No change from the December 22, 2008 plan.

Community Coordination

No change in purpose from the December 22, 2008 plan. Time line has been amended (see attached GANTT chart).

Agency Coordination

No change in purpose from the December 22, 2008 plan. Time line has been amended (see attached GANTT chart).

Website

No change from the December 22, 2008 plan.

Document Repositories

No change from the December 22, 2008 plan.

Meetings and Public Notices

Since the December 22, 2008 Public Involvement Plan was submitted and amended in April 2009, the concept of having two separate plans (NRMU's and a Forest Management Plan) that closely interrelate, but reviewed separately, has been changed to have one plan as described in the background section.

Accordingly, amend this section to read:

During April 2009 the borough, in coordination with the Department of Natural Resources, conducted a series of 7 open houses in various locations throughout the Borough. These open houses provided the public an opportunity to participate and learn about the Borough's Natural Resource Management Unit Plans, the Susitna-Matanuska Area Plan revision, and the Susitna Forest Management Plan update.

Public notice was provided at all post offices, libraries, and published in the "Anchorage Daily News", the "Frontiersman" and in the "Talkeetna Good Times" newspapers. Public service announcements were also provided to KTNA and KNBQ radio stations.

At these meetings the public were specifically asked to comment on the proposed land use management designations for each of the proposed Natural Resource Management Units. A handout was provided for the public to specifically comment on. This same information was also sent to everyone on the borough's project mailing list and was posted on the borough's web site. The public comment period ran from April 14 to May 15, 2009.

Based on the input received, the management unit designations will be changed, general borough-wide policies and guidelines for various natural resources have been drafted which includes a specific chapter on forest management.

Beginning in the summer of 2009, a draft of the individual chapters of the plan (Introduction (Chapter 1), Natural Resource Management Unit Goals and Guidelines by Resource or Activity (Chapter 2), Forest Management (Chapter 3), Implementation and Recommendations (Chapter 4), and the Appendices) have been reviewed by the Real Property Asset Management Board. Revisions have been made to the chapters based on their comments. Chapters 2 and 3 are currently out for agency review.

In July letters were sent to affected state agencies, borough departments and community councils where NRMU's lie within their boundaries asking for detailed resource information on each of the 21 management units. They have been asked to submit comments by August 28, 2009.

Presently individual plans are being written for each of the management units. They will be reviewed by the Real Property Asset Management Board and the Parks, Recreation and Trails Advisory Board as they are completed over the next few months. Their comments will be incorporated into the individual unit plans before sending out the unit plans for agency review from mid-November through the end of December. Revisions to the unit plans based on the agency comments will again be made.

From approximately mid-January 2010 through the beginning of April 2010, public notice will take place for the entire plan. This public notice will be provided to meet the requirements of MSB 23.05.025. This will include notification to all residents within 1-mile of any land affected by the Plan and to all persons and organizations on the projects mailing list. In early March 2010, at least three open houses/public meetings will be held in the Susitna/Talkeetna/Trapper Creek Community Council areas, Willow and Wasilla.

Following this public comment period, the comments will be summarized, and appropriate changes to the plan will be made. During mid-April through mid-May will again be reviewed by the two advisory boards. Further changes will be made where appropriate before forwarding the Plan to the Assembly for their consideration, hopefully by the end of May.

It is expected that the Assembly will send the Plan to the Planning Commission for further review. All advisory boards, the Planning Commission and Assembly meetings are open to the public and where public comments will be accepted.

Record of Agency and Public Comments and Public Involvement Deliverables

This section has been changed to reflect the Plan will be submitted to the Assembly for possible action and recommendations by the Planning Commission as recently changed in Borough Code.

Before sending the Plan to the Assembly the entire public input and review process will be documented and included as an appendix in the Plan. If reviewed by the Planning Commission, their recommendations will be added to the Plan as a supplement that will be submitted to the Assembly for their final consideration.

Copies of all comments received will be kept as part of the public record.

Chapter 4
Phase II – Plan Development

Working on the draft Plan began in early 2009. In April 2009 project staff participated in 7 public open houses (86 individuals signed in) with Alaska Department of Natural Resources staff who are working on a revision of the Susitna Area Plan (now called Susitna-Matanuska Area Plan), and the Susitna Forest Guidelines.

Meetings were held at Glacier View, Sutton, Wasilla, Willow, Talkeetna, Trapper Creek and Anchorage. 86 individuals signed in at these meetings. Sign in sheets from the meetings are on file. A meeting summary is included later in this section.

Using the results of the Phase I Scoping process, an informational paper was prepared which included proposed management intent and land use designations for the former Forest Management Units, which as a result of the scoping process; the names were changed to Natural Resource Management Units. Also, as a result of the earlier scoping process some additional areas of borough land were added, and some areas were deleted. Copies of the information were also sent to all affected community councils with an invitation to submit comments.

Beginning on page 52 is a copy of the materials that were distributed for review and available at the open houses.

Written comments were received from 37 individuals and groups. A summary of these comments follows the materials that were distributed. This summary does not include every conversation held with individuals or work sessions held with the borough's Real Property Asset Management Board during this stage of the Plans development that eventually lead to the development of the Public Review Draft of the plan.

The Plan was broken into three volumes (four including this volume on Public and Agency Participation).

<u>Volume I</u>
Chapter 1 included a summary and purpose of the plan, how and why the plan was developed, what the plan covers, and a summary of plan actions.

Chapter 2 included resource goals and guidelines for all borough land within natural resource management units. The goals and guidelines for all borough land within Natural Resource Management Units. The goals and guidelines were drafted by resource, management program and land use category. A new management tool, Special Management Zones, was included in this chapter.

Chapter 3 presented the specific forest management policy for all borough lands that were proposed to be designated and classified in a category that allows for active forest management and timber harvest. This chapter is the revised Forest Management Plan, required by borough code. The chapter includes forest inventory, silvicultural techniques,

commercial and operable forest analysis, sustained yield, annual allowable cut, invasive species, cutting unit sizes, timber sale processes including contract requirements, and monitoring and enforcement. The concept of Forest Improvement Study Area(s) was introduced in this chapter as a new tool to bridge the gap between large experimental forests and small test plots.

Chapter 4 discusses specific actions necessary to implement the plan, how amendments to the plan could be made, research needs and management recommendations. During drafting of this Plan, it also became clear that some changes to existing borough code were needed to make implementation of this Plan possible. These legislative recommendations were added to this chapter.

Volume II

This volume contains the Natural Resource Management Unit plans for 21 of the 22 Natural Resource Management units. The *Fish Creek Management Plan* is not included in this volume because a management plan was adopted separately from this plan. All the units, including Fish Creek, will be managed for multiple-use purposes. All the units have active management or contain land and resources that are described in Volume I, Chapters 2 and 3.

Volume III

This volume contains a definitions/glossary, bibliography and informational literature, and an appendices. The appendices include a variety of background and educational information.

As the volumes, and their chapters or sections were being drafted, the Real Property Asset Management Board spent considerable time at each of their meetings reviewing the drafts and recommending changes, deletions and additions.

Beginning in July and continuing through September 2009 review drafts were sent to knowledgeable, and possibly effected agencies asking for their review and input as well. Community councils that potential Natural Resource Management Units within their boundaries were asked to comment as well on the resources and land uses.

Beginning on page 70 are samples of the letters that were sent out. Following the letters is a summary of those that commented and the information they provided.

MATANUSKA-SUSITNA BOROUGH
Asset Management Plan for Natural Resource Management Units

Background

The Matanuska-Susitna Borough owns approximately 365,000 acres of land that it received as part of its Municipal Land Act entitlement and through various land exchanges. Over the past decade, the borough has taken steps to adopt Asset Management Plans for these lands. These Asset Management Plans, once adopted by the Borough Assembly, become part of the Borough's Comprehensive Plan.

Adoption of Asset Management Plans involve a series of steps that include a thorough scientific and technical inventory, reviewing past and present uses of the land including surrounding land, and soliciting public input on how these lands should be managed.

The updated plan is based on the conclusion that much has changed since the original plan was adopted almost 20 years ago. The borough is the fastest growing region of Alaska, and has one of the fastest growing populations in the country. Some of the existing Forest Management Units are located in areas that have seen an increased population growth and, in some cases, primary uses of the units have changed as the result of changes in attitudes, economics, and use patterns by local residents and visitors to these areas.

During the course of developing this new plan a wide variety of ideas were explored, including extensive public input during "Scoping" which occurred in 2008 on how best to use and protect the multiple-use values of various natural resources of borough-owned blocks of land, which will be called Natural Resource Management Units. This plan will ensure that management of all the natural resources and the variety of uses occur in a responsible manner, reflecting interests of both the present and the future.

When adopted by the Matanuska-Susitna Borough Assembly, this plan will establish management intent (management objectives), goals (general condition desired, and guidelines (course of action to be followed). The plan becomes the official policy for the management and use of the various natural resources, including public recreation, tourism, fish & wildlife, heritage resources, trails, transportation, forest resources, and watersheds in a compatible manner. The goal is to avoid conflicts when and where possible within the various Natural Resource Management Units.

Current Review

Based on the public input received last fall, input from various agencies, and a review of scientific and technical information, we are now asking for your comments, thoughts, and suggestions on a portion of the plan for the Natural Resource Management Units. This review is not a formal public notice issued under MSB 23.05.025 which specifies how public notices are t be issued. This is an informal opportunity for you to comment on a portion of the plan, as the entire plan is being developed. This opportunity is being provided at the same time the State Department of Natural Resources is also receiving input on the Susitna-Matanuska Area Plan and the Susitna Forest Guidelines.. Combined, all three of these plans

when completed, will provide how Borough-owned and State-owned public land inside the borough, will be managed in the future.

Additional Opportunities to Review the Plan

The borough will be seeking additional public comments on this plan as it is further developed under the requirements of MSB 23.05.025. This will occur later this year. Based on the public comments, appropriate changes will be made to the plan. You will then have another opportunity to comment then the Borough's Real Property Asset Management Board (RPAMB) reviews the amended plan in early 2010. After the RPAMB, the Plan will be submitted to the Assembly for consideration in early spring of 2010. The Assembly may choose to send the Plan t the Planning commission for review and set a time for them to complete their review and submit recommendations. The borough Assembly will make the final decision on the Plan sometime in the spring or early summer of 2010.

Please feel free to comment, but be sure to send comments no later than 5:00 p.m. on Friday, May 15, 2009, to:

Matanuska-Susitna Borough
Department of Community Development
350 East Dahlia Avenue
Palmer, AK 99645

or by fax to: (907) 745-9635 or you may also email in your comments or contact us at LMB@matsugov.us

If you do not have any comments at this time, but would like to be on our mailing list so that we can send you additional information as the plan process proceeds along, please compete the following information as well.

Name: _____

Mailing Address: _____

City: _____ State: _____ Zip Code: _____

Contact Phone Number (optional): _____

Email Address (optional): _____

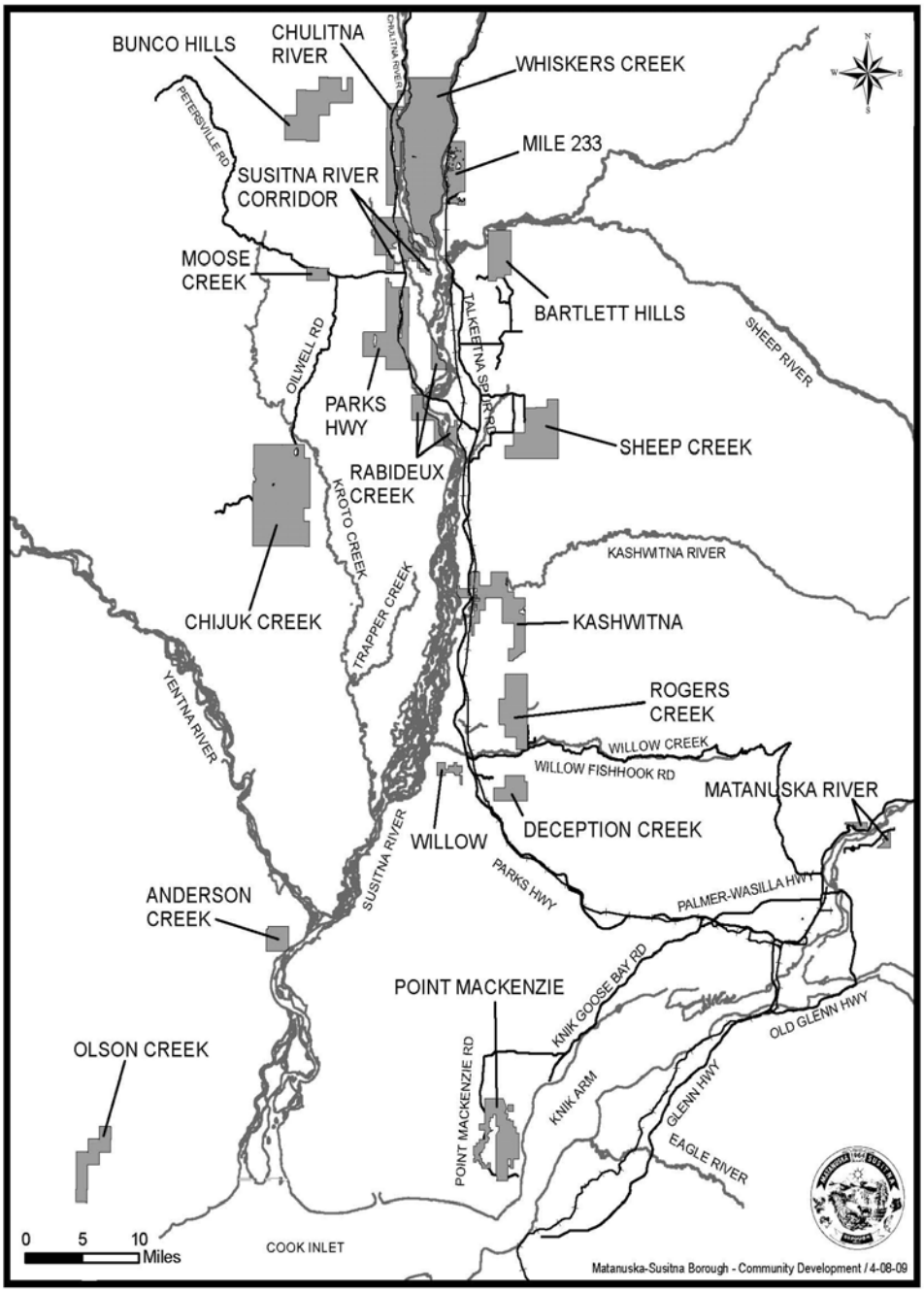
Information to help the Reviewer

The map shows where all the Natural Resource Management Units are located.

The table for each of the management units shows the proposed land use designations. These tables are a "broad brush" look at each management unit. When the actual plan is completed, it will be much more detailed as to areas within each unit. However, this review will give you a "sense" for how we are proposing to manage each unit. Management goals, intent and guidelines will be written after the individual designations are further refined for each individual unit and included in the final plan.

The following is to help you understand the terms that are used:

- **Forest Management –** Includes all activities related to attaining the goal of a healthy and sustainable forest. Activities may include management of fire and pests; harvest of timber and other forest products; and utilizing silvicultural practices necessary to enhance multiple uses of the forest.
- **Material** – Land with commercial quantities of sand and gravel.
- **Primary Designation** – The named resource or resources in a unit are the primary or of major importance. The named resource will be managed to encourage, develop or protect this use. Secondary designated activities can occur as long as they do not determinedly affect the primary use.
- **Public Recreation** - Land which, because of location, physical features, or adjacent development, are presently or potentially valuable to the public as natural or developed recreational or historic areas.
- **Resource Management** - Land which, because of surface or subsurface resources contained within the land or in connection with adjacent lands, are presently or potentially valuable for multiple values with no one resource or activity being more important than another.
- **Secondary Designation** – A designated, allowed use considered important but intended to receive less emphasis than a primary use. Management for a secondary use will recognize and protect primary uses through application of guidelines.
- **Transportation/Trails** – Existing roads and trails that have been dedicated for a public purpose or identified in the Borough's Recreational Trails Plan
- **Watershed Protection**– Land that is important for protecting water quality, some wetland areas, fish habitat, rivers, lakes, streams and adjacent riparian areas.
- **Wildlife Habitat** – Those areas identified as important for species of concern, or for things like seasonal concentration areas, bear denning areas, swan nesting areas, and bald eagle nests.



NATURAL RESOURCE MANAGEMENT UNITS

Anderson Creek	
Designation	**Notes**
Primary	
Land Bank	Remote area, with no natural resource inventory completed.
Secondary	
Public Recreation	

Bartlett Hills	
Designation	**Notes**
Primary	
Resource Management	Variety of natural resources, uses and users.
Secondary	
Forest Management	Timber harvest in operable areas spread out over a long-term and limited to selective cuts for specialty products and house logs; small Sawlog sales(support value added industries and possible fuiel wood supply for Upper-Su High School); and personal use and firewood sales using wood lots.
Public Recreation	Recognize existing recreational activities.
Watershed Protection	Water bodies with adjacent buffers.
Transportation/Trails	Buffer on Larson Creek Trail.
Wildlife Habitat	Important habitat areas (swan nesting and other species of concern as identified by ADF&G).

Bunco Hills	
Designation	**Notes**
Primary	
Resource Management	Variety of natural resources, uses and users.
Secondary	
Public Recreation	Recognize exiting recreational activities.
Transportation/Trails	Buffer along Safari Lake Trail.
Watershed Protection	Water bodies with adjacent buffers; and seasonal protection in Class I and II wetland areas.
Wildlife Habitat	Important habitat areas identified by ADF&G for species of concern.

Chijuk Creek	
Designation	**Notes**
Primary	
Forest Management	Timber harvest through selective cuts for specialty products and house logs; sawlog and wood fiber sales; and personal use and firewood sales.
Secondary	
Public Recreation	Recognize existing recreational uses.
Transportation/Trails	Buffers along Oil Well Road, Shulin Lake Trail, Parker Lake Trail, and McDougall Seismic Trail
Watershed Protection	Chijuk Creek and other water bodies with adjacent buffers; seasonal protection of Class I and II wetland areas.
Wildlife Habitat	Important habitat areas identified by ADF&G for species of concern.

Chulitna River	
Designation	**Notes**
Primary	
Resource Management	Variety of natural resources, uses and users.
Secondary	
Forest Management	Harvest limited to small selective cuts for specialty products (bowls, cabinet, flooring, house logs, etc.). Small personal use and firewood sales on a case-by-case basis.
Public Recreation	Recognize existing recreational uses.
Transportation/Trails	Minimum of 150-foot scenic buffer along Parks Highway, buffers along East-West Express and Chulitna Bluffs trails.
Watershed Protection	Minimum 150 foot buffer along Chulitna River; seasonal protection of Class I and II wetland areas.
Wildlife Habitat	Protect important habitat areas identified by ADF&G for species of concern.

Deception Creek	
Designation	**Notes**
Primary	
Resource Management	Variety of natural resources, uses and users.
Secondary	
Forest Management	Timber harvest through selective cuts for specialty products and house logs; sawlog and wood fiber sales; and personal use and firewood sales.
Public Recreation	Recognize existing recreational uses.
Transportation/Trails	Establish buffer along Hessler-Norris Sled Dog Trail
Watershed Protection	Minimum 200-foot buffer along Deception Creek; establish buffer around other waterbodies; seasonal protection in Class I and II wetland areas.
Wildlife Habitat	Protect important habitat areas identified by ADF&G for species of concern.

Kashwitna	
Designation	**Notes**
Primary	
Resource Management	Variety of natural resources, uses and users.
Secondary	
Forest Management	In the northwest portion of the unit (roughly 1-mile either side of Kashwitna River) and in southwest portion of the unit (roughly 1-mile north of Little Willow Creek), harvest limited to small selective cuts for specialty products, house logs, and personal use and firewood sales. Timber harvest through selective cuts for specialty products and house logs; sawlog and wood fiber sales; and personal use and firewood sales in remainder of unit with the goal of improving wildlife habitat.
Public Recreation	Protect existing recreational uses.
Transportation/Trails	Buffer along Talkeetna Mail (Herning) Trail.

Watershed Protection	Establish minimum 150-foot buffer along Kashwitna River and Little Willow Creek; establish buffers along other streams and riparian areas; seasonal protection of Class I and II wetland areas.
Wildlife Habitat	Protect important habitat areas identified by ADF&G for species of concern.

Matanuska River - South	
Designation	**Notes**
Primary	
Public Recreation	Combine with adjacent land in the Wolverine Lake area and manage as one unit.
Secondary	
Watershed Protection	Buffer along Wolverine Lake.

Matanuska River - North	
Designation	**Notes**
Primary	
Resource Management	Variety of natural resources, uses and users.
Secondary	
Forest Management	Timber harvest through selective cuts for specialty products and house logs. Firewood and small personal use sales for local community use on a case by case basis.
Public Recreation	Recognize existing recreational and community uses.
Transportation/Trails	Minimum 150 foot buffer along Glenn Highway. Buffers along existing access routes that traverse the unit.
Watershed Protection	Buffer along Moose Creek.
Wildlife Habitat	Protect important habitat areas identified by ADF&G for species of concern.

Mile 233	
Designation	**Notes**
Primary	
Resource Management	Variety of natural resources, uses and users.
Secondary	
Forest Management	Timber harvest through selective cuts for specialty products and house logs; and personal use and firewood sales. Create wood lots and cutting areas to support local resident needs, improve wildlife habitat and forest health. Location and layout of timber harvest areas shall minimize negative visual impact on tourist flights enroute to Denali National Park.
Public Recreation	Recognize existing recreational uses.
Transportation/Trails	Buffer along Clear Creek Road.
Watershed Protection	Buffers along waterbodies, riparian areas, seasonal protection in Class I and II wetland areas.
Wildlife Habitat	Protect important habitat areas identified by ADF&G for species of concern.

Moose Creek	
Designation	**Notes**
Primary	
Resource Management	Variety of natural resources, uses and users.
Secondary	
Forest Management	Timber harvest through selective cuts for specialty products and house logs; sawlog and wood fiber sales; and personal use and firewood sales.
Material	Sand and gravel extraction permitted with adequate buffers and hours of operation.
Public Recreation	Recognize existing recreational and community uses.
Transportation/Trails	Minimum 150-foot buffer along Petersville Road and Petersville Roadside Trail. Buffer along Trail Ridge Road.
Watershed Protection	Buffer along Moose Creek, Gate Creek and other waterbodies within the unit; seasonal protection in Class I and II wetland areas.

Olson Creek	
Designation	**Notes**
Primary	
Land Bank	Remote area with no natural resource inventory completed.
Secondary	
Public Recreation	

Parks Highway	
Designation	**Notes**
Primary	
Resource Management	Variety of natural resources, uses and users.
Secondary	
Forest Management	Timber harvest through selective cuts for specialty products and house logs; Samll sawlog sales; and personal use and firewood sales.
Public Recreation	Recognize existing recreational uses.
Transportation/Trails	Minimum 150-foot buffer along Parks Highway. Buffer along Rabideux Trail
Watershed Protection	Buffer along Rabideux Creek and other waterbodies; seasonal protection of Class I and II wetlands.
Wildlife Habitat	Protect important habitat areas identified by ADF&G for species of concern.

Pt. MacKenzie	
Designation	**Notes**
Primary	
Resource Management	Variety of natural resources, uses and users.
Secondary	
Forest Management	Area roughly one-mile either side of Pt. MacKenzie Road (Pt. Mac Road Subunit): Timber harvest through selective cuts for specialty products and house logs; sawlog sales; and personal use and firewood sales. Remainder of Unit (Mule Creek Subunit): Timber harvest through selective cuts for specialty products and house logs; sawlog and wood fiber sales; and personal use and firewood sales with a goal of improving wildlife habitat.
Material	Sand and gravel extraction permitted with appropriate buffers and hours of operation.
Public Recreation	Recognize existing recreational uses.
Transportation/Trails	Buffer along Pt. MacKenzie and Alsop Roads.
Watershed Protection	Buffer along Mule Creek and other waterbodies. Seasonal protection of Class I and II wetlands.
Wildlife Habitat	Protect important habitat areas identified by ADF&G for species of concern.

Rabideux Creek	
Designation	**Notes**
Primary	
Resource Management	Variety of natural resources, uses and users. This unit is comprised of four non-contiguous parcels.
Secondary	
Forest Management	Timber harvest through selective cuts for specialty products and house logs; sawlog and wood fiber sales; and personal use and firewood sales. Firewood and personal use sales only in smaller parcels along the Parks Highway.
Public Recreation	Recognize existing recreational and community uses.
Transportation/Trails	Minimum 150-foot buffer along Parks Highway; Buffer along Amber Lake and Trapper Lake Trails; seasonal protection of Class I and II wetalnds.
Watershed Protection	150-foot buffer along the Susitna River and sloughs. Buffer along Rabideux Creek and other waterbodies within the unit. Seasonal protection in Class I and II wetland areas.
Wildlife Habitat	Protect important habitat areas identified by ADF&G for species of concern.

Rogers Creek	
Designation	**Notes**
Primary	
Resource Management	Variety of natural resources, uses and users.
Secondary	
Forest Management	Timber harvest through selective cuts for specialty products and house logs; sawlog and wood fiber sales; and personal use and firewood sales.
Public Recreation	Recognize existing recreational and community uses.
Transportation/Trails	Buffers along Kenny Blvd., Willer-Kash and Jim Carter Roads. Buffers along Talkeetna Mail (Herning), Emil Stancec, and Central Trails.
Watershed Protection	Buffer along Willow, Rogers, Iron and Little Willow Creeks as well as other waterbodies within the unit; seasonal protection in Class I and II wetland areas.
Wildlife Habitat	Protect important habitat areas identified by ADF&G for species of concern.

Sheep Creek	
Designation	**Notes**
Primary	
Resource Management	Variety of natural resources, uses and users.
Secondary	
Forest Management	Timber harvest through selective cuts for specialty products and house logs; sawlog and wood fiber sales; and personal use and firewood sales.
Public Recreation	Recognize existing recreational and community uses.
Transportation/Trails	Buffer along Montana Creek Road. Buffers along Sunshine Creek, S. Montana Creek and Montana Creek Dog Mushers 50-Mile Trails.
Watershed Protection	Buffers along Goose and No Name Creeks as well as other waterbodies within the unit. Seasonal protection in Class I and II wetland areas.
Wildlife Habitat	Protect important habitat areas identified by ADF&G for species of concern.

Susitna Corridor	
Designation	**Notes**
Primary	
Resource Management	Variety of natural resources, uses and users. Unit is bisected by the Parks Highway.
Secondary	
Forest Management	East of Parks Highway: Timber harvest through selective cuts for specialty products and house logs; small-sized sales of sawlogs; and personal use and firewood sales. West of Parks Highway: Timber harvest through selective cuts for specialty products and house logs; medium-sized sales of sawlogs; and personal use and firewood sales.
Public Recreation	Recognize existing recreational uses.
Transportation/Trails	Minimum 150-foot buffer along Parks Highway, and along Trapper Creek Road. Buffer along Chulitna Bluffs Trail.
Watershed Protection	150-foot buffer along the Chulitna River; buffers along Trapper Creek as well as other waterbodies within the unit; seasonal protection in Class I and II wetland areas.
Wildlife Habitat	Protect important habitat areas identified by ADF&G for species of concern.

Whiskers Creek - North	
Designation	**Notes**
Primary	
Public Recreation	Area adjacent to Denali State Park and Boy Scout High Adventure Camp.
Secondary	
None	

Whiskers Creek - South	
Designation	**Notes**
Primary	
Resource Management	Variety of natural resources, uses and users.
Secondary	
Forest Management	Timber harvest through selective cuts for specialty products and house logs; small sales for sawlogs; and personal use and firewood sales. Location and layout of timber harvest areas shall minimize negative visual impact on tourist flights enroute to Denali National Park.
Public Recreation	Recognize existing recreational uses.
Watershed Protection	150-foot buffer along the Chulitna and Susitna Rivers; buffers along Whiskers Creek as well as other waterbodies within the unit; seasonal protection in Class I and II wetland areas.
Wildlife Habitat	Protect important habitat areas identified by ADF&G for species of concern.

Willow	
Designation	**Notes**
Primary	
Public Recreation	
Secondary	
Forest Management	Firewood and personal use sales for local use.
Transportation/Trails	Buffers along Willow Creek Parkway and Crystal Lake Road. Buffers along Almond Lake, windsock, Winter Carnival, and West Gateway Trails.
Watershed Protection	Buffers along the tributary of Willow Creek and other waterbodies in the unit; seasonal protection in Class I and II wetland areas.
Wildlife Habitat	Protect important habitat areas identified by ADF&G for species of concern.

RWS CONSULTING

• LAND • NATURAL RESOURCES •
• PROJECT DEVELOPMENT & MANAGEMENT •

May, 2009
To: Natural Resource Management Unit Plan File
From: Ron Swanson
Subject: Tri-Plan Public Open Houses

During the weeks of April 12th and 19th, 2009 I participated in six public open houses, along with representatives from the Alaska Department of Natural Resources (ADNR). The following is where the open houses were held:

Sutton - April 14
Willow – April 15
Wasilla – April 16
Anchorage – April 21
Talkeetna – April 22
Trapper Creek – April 23

All the meetings were held from 5 to 9 pm. There was also a meeting held at Glacier View on April 14 (1 – 4 pm) which I did not attend because there is no Borough land in that area.

The public notice that was sent out and information that was posted on the Borough and ADNR web sites is attached. Also attached are copies of the sign in sheets for all the meetings. The public notice was emailed to everyone on both ADNR's and the Borough's contact lists.

Because the Department of Natural Resources is either updating or writing new plans for the old Susitna Area Plan (now called Susitna-Matanuska Area Plan), the Susitna Forest Guidelines (may be renamed at a later date) and the Borough is developing plans for Natural Resource Management Units to include a Forest Management Plan, it seemed to make sense to go out to the public with all three plans at the same time for input.

The meetings were jointly held with myself (representing the Mat-Su Borough for the Natural Resource Management Unit and Forest Management Plan) and the Alaska Department of Natural Resources, Division of Mining, Land and Water Management (Bruce Phelps and Ray Burger for the Susitna-Matanuska Area Plan) and Division of Forestry (Jim Schwarber and either Ken Bullman, Glenn Holt or Rick Jandreau for the Susitna Forest Guidelines). Debby Broneske and Bish Buckle from the Borough also attended the Wasilla meeting.

At each of the meetings, separate tables were set up for each of the three plans where we could talk individually or to groups of people who attended the meetings. At the beginning of each meeting, a 30-minute presentation was given by Ray Burger, Jim Schwarber and myself explaining what the three plans were all about and what information we were each seeking at this time.

The attendance at the meetings varied widely from 3 in Anchorage to around 30 in Talkeetna. Because we had set aside 4 hours for each meeting, we were able to informally spend time with individuals and small groups of people discussing our individual plans, exchanging information and ideas.

Prior to this point, the Borough had completed an extensive "Scoping" process for the Forest Management Plan and plan for Natural Resource Management Units (formerly called Forest Management Units). This scoping included seeking public input on a variety of general management issues and how specific units should be managed. This process was completed, and a summary prepared in the spring of 2008.

Based on comments from the public, input from various agencies, and a review of scientific and technical information, comments were sought during these open houses on possible land use designations for primary and secondary activities within each of separate 19 management units. A handout was prepared and available at the meetings, they were also posted to the Borough's web site and all contacts were emailed telling them that the information was available. The handout encouraged people to submit written comments, if possible by May 15th.

Based on the comments received and further input from various agencies, the land use designations will be further refined, borough wide guidelines written for a variety of natural resources and uses, and specific plans written for each management unit.

July 28, 2009
{Name}
{Community Council}
{Address}
{City, State, ZIP}
RE: Natural Resource Management Unit Plans
Dear {Name}

The Matanuska-Susitna Borough is presently working with RWS Consulting to develop natural resource management plans for 21 blocks of borough-owned land located throughout the borough. The total area is approximately 145,000 acres. The blocks of land, called Natural Resource Management Units, will all be managed for various multiple uses.

During Phase I of this project, which was completed in the spring of 2008, we received lots of comments about various resources located within the Natural Resource Management Units. In most cases these comments were not detailed enough for us to be able to identify specific resources and areas. We have asked state and borough agencies to provide this information, but we also know that local residents are another valuable source of information.

We are now asking for your input in order to identify these important areas that might need special management and to ensure that uses do not occur within certain areas that could conflict with other natural resources or uses. We would like you and knowledgeable members of your community to review the enclosed maps for each of the Natural Resource Management Units in or near your community and to provide input on any resources or uses that occur within these units. Specifically we are looking for areas that have special values or need special management and/or protection.

For example, we know that general recreation, including hunting and fishing, occurs in most of the areas. Please provide additional information you are aware of where recreational uses are concentrated (camping areas, boat launches, and etc.), or have a special value. Another example, all areas have wildlife habitat, but what we want to know is which areas are most important for such things as swan and eagle nesting areas or seasonal wildlife concentration areas.

If any of the areas you mark on the maps contain sensitive information we need to know that as well. For example, we want to protect historical and cultural sites, but we don't want to make this public information in order to protect the site from vandalism or theft. This type of sensitive information will be kept confidential, but the sites or areas will be protected with special management zones.

One resource that you do not need to show on the maps is waterbodies unless it has special wildlife concerns. All flowing waterbodies and lakes over 10 acres is size will have a minimum of a 100 foot buffer from any activity that may cause a change to the natural vegetation.

Feel free to mark up the maps and provide a brief written narrative or explanation describing the activity and the use or resource that is annotated on the maps. If you would like to provide general information about resources in the entire unit, that would be useful to us as well. If you or members of your community mark up the maps, please indicate the specific area(s) as best can be done for the scale of the maps. If an actual activity does occur on the ground at a later date, the areas the exact areas will be determined and part of a public notice process prior to the actual activity taking place. It would also be helpful to provide the name(s) of the person(s) who supplied the information so we can follow-up with them if we need additional or to verify information.

If you have any questions on the mapping needs, contact RWS Consulting (Ron Swanson).

Ron Swanson, RWS Consulting
11036 Katlian Drive
Eagle River, AK 99577
Email: ronswanson@mtaonline.net
Phone: (907) 694-9564 Cell: (907) 242-9779

Please feel free to distribute copies of the maps to knowledgeable people in your community. If you need additional copies of the maps or would like to receive them in an electronic format, contact Carla Goers, MSB Land Management Technician.

Send the marked up maps and your related comments to Carla Goers directly:

Carla Goers, Land Management Technician
Matanuska-Susitna Borough, Community Development Department
350 E. Dahlia Avenue
Palmer, AK 99645-6488
Email: Carla.Goers@matsugov.us
Phone: (907) 745-9894

In order to complete this plan in a timely manner we would appreciate your input by ***August 28, 2009,*** or as soon thereafter as possible.

We appreciate your help and input. Later this year, we will send you the entire plan for further review.

Respectfully,

Linda Brenner, MS, CTRS
Director

Distribution list and maps for each Community Council

COMMUNITY COUNCIL	NATURAL RESOURCE MANAGEMENT UNIT
Lazy Mountain	Matanuska River South
Sutton	Matanuska River North
Talkeetna	Mile 233 Bartlett Hills Bunco Hills Chulitna River Whiskers Creek North Whiskers Creek South Parks Highway Rabideux Creek Susitna River Corridor
Trapper Creek	Bunco Hills Chijuk Creek Chulitna River Whiskers Creek North Whiskers Creek South Parks Highway Rabideux Creek Susitna River Corridor Moose Creek
Upper Susitna	Parks Highway Rabideux Creek Sheep Creek Susitna River Corridor
Chase	Mile 233 Bartlett Hills
WACO	Willow Kashwitna Deception Creek
Point MacKenzie	Pt. MacKenzie

July 20, 2009
{Name}
{Agency}
{Address}
{City, State, ZIP}

RE: Natural Resource Management Unit Plans

Dear {Name}

The Matanuska-Susitna Borough is presently working with RWS Consulting to develop natural resource management plans for 21 blocks of borough-owned land located throughout the borough. The total area is approximately 145,000 acres. The blocks of land, called Natural Resource Management Units, will all be managed for various multiple uses.

We are asking for your input, in order to identify important areas that might need special management and to ensure that uses do not occur within certain areas that could conflict with other natural resources or uses.

First, we would appreciate your review and comments on chapter 2 of this plan. Chapter 2 deals with "Natural Resource Management Unit Goals and Guidelines by Resource or Activity." This chapter has separate sections on a variety of natural resources and how they are to be used and managed. Goals and management guidelines have been drafted for each resource and management category. Goals and guidelines are explained in the beginning of this chapter.

We would appreciate any comments, suggestions, and edits on this chapter, especially the sections that directly affect your agency or office. The one resource that is not included deals with forestry. This will be included in the plan as a separate chapter that will be distributed for later review.

Second, we would appreciate your agency or office to review the maps for each of the Natural Resource Management Units and to provide input on any resources or uses that occur within these units. Specifically we are looking for areas that have special values or need special management and/or protection.

Feel free to mark up the maps and provide a brief written narrative or explanation describing the activity and the use or resource that is annotated on the maps. If you would like to provide general information about resources in the entire unit, that would be useful to us as well.

For example, we know that general recreation, including hunting and fishing, occurs in most of the areas. Please provide additional information you are aware of where recreational uses are concentrated or have a special value. Another example, all areas have wildlife habitat, but what we want to know is which areas are most important for such things as swan and eagle nesting areas or seasonal wildlife concentration areas.

If any of the areas you mark on the maps contain sensitive information we need to know that as well. For example, we want to protect historical and cultural sites, but we don't want to make this public information in order to protect the site from vandalism or theft. This type of sensitive information will be kept confidential, but the sites or areas will be protected with special management zones.

One resource that you do not need to show on the maps is waterbodies unless it has special wildlife concerns. All flowing waterbodies and lakes over 10 acres is size will have a 100 foot buffer from any activity that may cause a change to the natural vegetation.

If you have any questions on the contents of Chapter 2 or questions on the mapping needs, contact RWS Consulting (Ron Swanson).

Send all written comments on Chapter 2 to Ron Swanson directly:

Ron Swanson, RWS Consulting
11036 Katlian Drive
Eagle River, AK 99577
Email: ronswanson@mtaonline.net
Phone: (907) 694-9564 Cell: (907) 242-9779

If you need additional copies of the maps or would like to receive them in an electronic format, contact Carla Goers, MSB Land Management Technician.

Send the marked up maps and your related comments to Carla Goers directly:

Carla Goers, Land Management Technician
Matanuska-Susitna Borough, Community Development Department
350 E. Dahlia Avenue
Palmer, AK 99645-6488
Email: Carla.Goers@matsugov.us
Phone: (907) 745-9894

In order to complete this plan in a timely manner we would appreciate your input no later than ***August 28, 2009***.

We appreciate your help and input. Later this year, we will send you the entire plan for further review.

Respectfully,

Linda Brenner, MS, CTRS
Director

Distribution List:
Ellen Simpson, ADF&G, Sport Fish
Tony Kavalok, ADF&G, Wildlife Conservation
Mike Bethe, ADF&G, Habitat
Kevin Hanley, DEC
Fran Seager-Boss, MSB, Cultural Resources
Dan Keys, MSB, Parks and Outdoor Recreation
Wayne Biessel, DNR, DOP/OR

October 21, 2009
{Name}
{Agency}
{Address}
{City, State, ZIP}
RE: Natural Resource Management Unit Plans
Dear {Name}

Last July we asked you to review and comment on Chapter 2 of a Natural Resource Asset Management Plan that we are working on with Ron Swanson of RWS Consulting. That chapter dealt with "Natural Resource Management Unit Goals and Guidelines by Resource or Activity." Chapter 2 has separate sections on a variety of natural resources and how they are to be used and managed. Thank you to those of you that submitted comments and suggestions. They will all make that chapter better.

Last July we also asked you to review maps of the individual units and provide information on specific resources and uses that you were aware of for each of the units. These 21 blocks of borough owned land, called Natural Resource Management Units, will all be managed for various multiple uses. The total area is approximately 145,000 acres. Several reviewers asked for this review to be delayed until we could provide more information about what resource information we had available and the proposed management for each of the units.

This has now been completed. We would now appreciate your agency or office to review the maps and narratives for each of the Natural Resource Management Units and to provide input, corrections or additions on the resources and uses that occur within these units. Specifically we are looking for areas that have special values or need special management and/or protection.

For example, we know that general recreation, including hunting and fishing, occurs in most of the areas. Please provide additional information you are aware of where recreational uses are concentrated or have a special value. Another example is, all areas have wildlife habitat, but what we want to know is which areas are most important for such things as swan and eagle nesting areas or seasonal wildlife concentration areas.

Feel free to mark up the draft maps and narratives. If any of the areas you mark on the maps contain sensitive information we need to know that as well. For example, we want to protect historical and cultural sites, but we don't want to provide specific information, such as exact location in the narrative or on the maps in order to protect the site from vandalism or theft. This type of sensitive information will be kept confidential, but the sites or areas will be generally described in the narrative and protected with special management zones.

In order to complete this plan in a timely manner we would appreciate, and **must have your input by no later than November 23, 2009.** We have been asked by the Borough Assembly to have the entire plan out for public review by no later than mid-December of this year.

If it would be useful to you, Mr. Swanson would be glad to meet with you individually to discuss the narratives and maps. If you have any additional questions, or wish to meet with Mr. Swanson, you can contact him directly at:

Ron Swanson, RWS Consulting
11036 Katlian Drive
Eagle River, AK 99577
Email: ronswanson@mtaonline.net
Phone: (907) 694-9564 Cell: (907) 242-9779

We appreciate your help and input. We will send you the public review draft of entire plan when it is available in mid-December.

Respectfully,

Linda Brenner, MS, CTRS
Director

Attachments: Draft Maps and Narratives for each Natural Resource Management Unit
CD containing the Maps and Narratives for each Natural Resource Management Unit

Distribution List:
Ellen Simpson, ADF&G, Sport Fish
Tony Kavalok, ADF&G, Wildlife Conservation
Mike Bethe, ADF&G, Habitat
Kevin Hanley, DEC
Eileen Probasco, MSB, Planning
Fran Seager-Boss, MSB, Cultural Resources
Dan Keys, MSB, Parks and Outdoor Recreation
Dave Heier, MSB, Land and Resource Management

Public and Agency Comments and Input during
Natural Resource Management Unit Plan Development

NAME	SUBJECT	COMMENTS
Alaska Moose Federation (Gary Olson)	Moose Habitat Highway Safety	Supports more active timber harvest to create moose winter habitat away from transportation corridors.
Alaska, Department of Fish and Game (Tony Kavalok, Mike Bethe)	Volume I, Chapter 2	Various edits and suggestions for clarification.
Alaska, Department of Fish and Game (Ellen Simpson)	Volume II	
Alaska, Department of Natural Resources (Bruce Phellps)	Definitions/Glossary	Various edits and suggestions for clarification.
Alaska, Division of Forestry (Ken Bullman, Rick Jandreu)	Volume I, Chapters 2 and 3	Various edits and suggestions for clarification.
Alaska Quiet Rights Coalition (Susan Olson)	Natural Quiet Areas	Provide balanced allocation for both non-motorized and motorized recreation.
Alaska Survival (Becky Long, 5/1/09)	General Land Use Designations Bartlett Hills, Bunco Hills, Moose Creek and Mile 233 NRMU's	Wetlands Bank should be used for designations. Resource Management is to broad a category. Habitat definition needs to be expanded related to area covered. Recommended designations and information about units.
Alaska Survival (Becky Long, 5/3/09)	Forest Research and Study Areas Public Meetings	Find funding for research, including regeneration, scarification techniques. Don't use open house format. Let people testify.
Alaska Survival (Becky Long, 5/13/09)	Bartlett Hills Plan Issues	Size of buffers for wetlands, consistence with Susitna Basin Recreation Rivers Management Plan, Mastodon Road and Regeneration. List of 27 issues that should be addressed in the NRMU Plan.

NAME	SUBJECT	COMMENTS
Alaska Survival (Judy Price)	Endangered Species – Beluga Whale	National Marine Fisheries Service should be consulted and plan fails to conduct analysis of impacts on waters that support food resources for Beluga Whales.
Jok Boundurant	Whiskers Creek Units	Supports recreational classification in northern unit and limited logging on south unit.
Garvin Bucaria	Pt MacKenzie Unit	Identified wildlife species in area. Identified potential wildlife corridors.
Chase Community Council (Mike Wood)	Mile 233, Whiskers Creek North and South	Identified resident uses of the unit, important ecosystem and wildlife areas.
Diamond Gold Corporation (Ed Ellis)	Bunco Hills Chijuk Creek	Mining in these units should be permitted.
Dan Elliot	Volume I and II	As a member of the Parks, Recreation and Trails Advisory Board and the Real Property Asset Management Board, Mr. Elliot submitted numerous written comments, discussion items, edits, clarifications and suggestions during the plan development phase. All his comments were shared with the board members and discussed at their meetings during this time period and used to develop the plan's public review draft.
Tami Hamler	Sheep Creek NRMU Su Valley High School boiler project	Develop more trails. Likes proposed recommendation. Supports dedicated land for this use that can also be used for study.
Dave Johnston	Wood fiber sales Bunco Hills, Chulitna River, Rabideux Creek	No wood fiber sales (chips/pellets) in Chijuk Creek, Deception Creek, Kashwitna Creek, Moose Creek, Rabideux Creek, Rogers Creek and Sheep Creek NRMU's. Watershed protection should be primary designation.
KC Services Firewood & Land Clearing (Randy Chivers)	Timber Harvest	Wants to see areas opened for select harvesting to keep forests from burning due to insect infestation and promote local timber industries.
Becky Long, 8/12/09	Bartlett Hills	Information and management recommendation about unit.
Becky Long, 8/22/09	Bartlett Hills	Information and management

NAME	SUBJECT	COMMENTS
		recommendation about unit.
Becky Long, 8/24/09	Bartlett Hills	Recommended changes to physical characteristics map.
Ken Marsh	Parks Highway NRMU	Protection of historic Rabideux brother's cabins.
Arthur Mannix (string of emails)	Su Valley High School boiler and forest education	Various issues related to Su Valley High School wood-fired boiler, education program and forest study areas.
MSB, Community Development Staff	Volume's I and II	Various edits and suggestions for clarification.
MSB, Cultural Resources Division (Fran Seager-Boss)	Volume II	Various edits and additional information on specific cultural and historic sites for some of the individual units.
Brian Okonek	Bartlett Hills and Bunco Hills	Information about resources and uses for the two units.
Denis Ransy	Bartlett Hills Bunco Hills Moose Creek Mile 233	No timber harvest. Don't use area for Susitna High School wood fired boiler project. Protect wildlife habitat areas. Traditional trails need identification and protected. Area should be designated for wildlife protection and public recreation. Small winter timber harvests only. Protect trails and residential areas. Timber harvest for personal use only. Protect water bodies and trails. Primary use should be remote residential.
Real Property Asset Management Board	Plan Development	The Board spent significant time at their meetings throughout the summer and fall reviewing and discussing concepts and policies contained in drafts of volumes I, II and the definitions/glossary in Volume III
Ruffed Grouse Society (Gereth Stillman	Forest Management	Develop intense timber harvest program to encourage early successional deciduous forests to create and maintain wildlife habitat.
Cari Sayre	Resource Management Designation Wood Fiber Sales Watershed Protection	Objects to designation as being too vague. Remove wood fiber sales (wood chip harvests) wherever it occurs as a use in unit plans. Change designations in Bunco Hills,

NAME	SUBJECT	COMMENTS
		Chulitna River, Moose Creek, Parks Highway, and Rabideux Creek to Watershed Protection.
	Forest Management	Change Mile 233 and Susitna River Corridor to forest management.
	Whiskers Creek South	Change designation to public recreation.
	Sheep Creek	Change designation to wildlife habitat as area is used for hunting.
John Strasenburgh	Plan Development	Mr. Strasenburgh submitted numerous written comments, discussion items, edits, clarifications and suggestions during the plan development phase as a member of the Real Property Asset Management Board. All his comments were shared with the board members and discussed at their meetings during this time period and used to develop the plan's public review draft.
Susitna Community Council	Sheep Creek, Kashwitna River and Rabideaux Creek	Supports using units for recreation, trails, hunting, fishing and local use and/or sustainable use timber harvesting, and discourage harvesting timber for chipping operations in these areas.
Susitna Forestry Council (Arthur Mannix)	Susitna Valley High School wood fired boiler project	Suggested using Sheep Creek, Rabideux Creek Susitna River Corridor and Parks Highway NRMU's for project and not Bartlett Hills as had been suggested in the past.
Talkeetna Community Council (Doug Gualtieri), 5/8/09	Bartlett Hills	No large scale timber harvest in this unit because of the areas recreational use, wildlife and patchwork ecosystems and to maintain rural residential communities/wilderness recreation in this area.
Talkeetna Community Council (Ellen Wolf), 9/12/09	Bartlett Hills	Supports reclassification to as any or all of the following: wildlife habitat, wetlands, or recreation, with low impact, sustainable yield forestry as a secondary use.
	Whiskers Creek (general)	Five areas within the unit identified for special protection. Create a park within the Whiskers Creek.

NAME	SUBJECT	COMMENTS
		NRMU.
Cathy Teich	Mile 233	Leave the area the way it is.
Trapper Creek Community Council (Michael Zagula)	Firewood	Designate locations for local residents to cut firewood on a yar-around accessible road in one of the following units: Rabideux, Parks Highway, Moose Creek, Susitna River Corridor and Chulitna River.
Rudy Wittshirk	Global warming Pellets and Chips	Forests are becoming unhealthy due to insects and diseases influenced by climate warming and weather. Pellet and chip production is a losing proposition.
Ruth Wood	Forest Management Wildlife Habitat Resource Management Bartlett Hills, Bunco Hills, Chijuk Creek, Chulitna River, Deception Creek, Kashwitna, Mile 233, Susitna River corridor, Whiskers Creek North and South	Need more information on what utilizing silvicultural practices to enhance multiple uses of the forest means. More thought needs to be put into defining habitat. Make it clear that this designation comprises other secondary designations. Information, concerns and management recommendations for these NRMU's.

Chapter 5
Draft Plan Public Review

On December 15, 2009 the public review draft of the Asset Management Plan: Natural Resource Management Units was made available for public review. Because of the length and complexity of the plan, a 3-month public review period was provided. The review period ran from its release on December 15, 2009 through March 15, 2010.

A notice of the plans availability was issued pursuant to the requirements of MSB 23.05.025. This included notices to 4,358 individuals on the mailing list that was compiled during the development of the plan and all property owners within one-mile of any of the proposed units. Notices (122) were also sent to members of borough boards and commissions, service area members and the Borough Assembly.

A copy of the public notice follows.

Copies of the entire plan were provided to all affected community councils and to all borough and city libraries. The entire plan was also available on the boroughs web site.

MATANUSKA-SUSITNA BOROUGH
Community Development
Land Management Division
350 East Dahlia Avenue
Palmer, Alaska 99645

FIRST CLASS

PUBLIC NOTICE

Natural Resource Management Units Plan LMD File Number MSB004966

MATANUSKA-SUSITNA BOROUGH
PUBLIC NOTICE

The Matanuska-Susitna Borough, Community Development Department announces this opportunity for public review and comment on the Natural Resource Management Units Plan*.

The Matanuska-Susitna Borough (MSB) is providing this notice about release of the public review draft of the **Natural Resource Management Units Plan** (NRMU). This asset management plan for the NRMU includes a summary and purpose of the plan, resource goals and guidelines for various resources including a chapter related to forest management and timber sales for all borough land within the NRMU's, and management plans for the twenty-one NRMU's that total over 143,500 acres. A Definitions/glossary, bibliography and informational literature, a summary of public participation and an appendices are also included. A location map showing the NRMU's is on the reverse side of this notice.

Public Review and Input - Because of the size of this plan, the public review period will be 3 months long. The public review period will end on March 15, 2010. Copies of the plan are available at all borough libraries and at the borough, Community Development Office in Palmer. A copy of the plan has also been sent to the Chase, Lazy Mountain, Point MacKenzie, Sutton, Talkeetna, Trapper Creek, and Susitna Community Councils and to the Willow Area Community Organization.

The plan is also available on the borough's web site at: ww1.matsugov.us/community development/. Click on Land Management then Asset Management Plans in the left navigation menu and then click on the link, Natural Resource Management Units Plan.

Three public open house/meetings will be held the first week of February from 5:30 PM to 8:30 PM in Wasilla Tuesday February 2nd, in Talkeetna Wednesday February 3rd, and in Willow on Thursday February 4th. Meeting facilities will be noticed at a later date in the newspaper, libraries, through community councils and on the MSB web page.

The final plan is expected to be presented to the Assembly and Planning Commission for their consideration in May 2010.

Submit your comments in writing to: Matanuska-Susitna Borough, Land and Resources Management Division, 350 East Dahlia Avenue, Palmer, AK 99645. By email to: nrmucomment@matsugov.us or fax them to: (907) 745-9635. Remember, we need to receive your written comments no later than **March 15, 2010** in order to be considered when making any plan revisions. **PLEASE REFER TO PARCEL MSB004966 WHEN SUBMITTING COMMENTS**.

If you have questions about this request: call Debby at 745-9863 between 8:00-5:00. *This public notice & request for comments is in compliance with MSB Code 23.05.025.

YOUR COMMENTS:

_____

_____

_____

(If you need more space for comments please attach a separate sheet of paper.)

At the same time the plan was distributed a letter was included to all reviewers that explained how the plan was developed, summarized what the plan contained and gave information on how the reviewer could comment on the plan. A copy of this letter follows:

MATANUSKA-SUSITNA BOROUGH
Community Development Department
350 East Dahlia Avenue • Palmer, AK 99645
Phone (907) 745-9869 • Fax (907) 745-9635
E-mail: lmb@matsugov.us

December 15, 2009

Subject: Asset Management Plan, Natural Resource Management Units Plan

Dear Reviewer;

The Matanuska-Susitna Borough is developing natural resource management plans for 21 blocks of borough-owned land located throughout the borough. The total area is approximately 143,500 acres. The blocks of land, called Natural Resource Management Units, will all be managed for multiple uses.

We are now asking for your comments on this draft plan.

Adoption of Asset Management Plans involve a series of steps that include a thorough scientific and technical inventory, reviewing past and present uses of the land including surrounding land, and soliciting public input on how these lands should be managed. This plan takes those ideas and translates them into goals, management intent, land use designations, classifications, guidelines, and implementation actions for the new Natural Resource Management Units that will replace the old Forest Management Units.

This asset management plan for Natural Resource Management Units is in three volumes.

Volume I
Chapter 1 includes a summary and purpose of the plan, how and why the plan was developed, what the plan covers, and a summary of plan actions.

Chapter 2 includes resource goals and guidelines for all borough land within natural resource management units. The goals and guidelines are listed by resource and land use category. Guidelines are specific directives that apply to land and water management decisions as resource uses and development occur.

Chapter 3 presents the specific forest management policy for all borough lands that are designated and classified in a category that allows for active forest management and timber harvest. This chapter is the revised Forest Management Plan, required by borough code. This includes forest inventory, silvicultural techniques, commercial and operable forest analysis, sustained yield, annual allowable cut, buffers, invasive species, cutting unit sizes, and timber sale processes including contract requirements and monitoring and enforcement.

Chapter 4 discusses specific actions necessary to implement the plan, how amendments to the plan can be made; research needs and management recommendations. This chapter also recommends some changes to existing borough code that will make implementation of this plan possible.

Volume II

This volume has natural resource management plans for twenty-one of the twenty-two natural resource management units. The *Fish Creek Management Plan* is not included in this volume because a management plan was adopted separately from this plan. All the units, including Fish Creek, will be managed for multiple-use purposes. All the units have active management or contain land and resources that are described in Volume I, Chapters 2 and 3.

Volume III

This volume contains a definitions/glossary, bibliography and informational literature, a summary of public participation and an appendices. The appendices include a variety of background and educational information. The definitions/glossary are also included in volumes I and II to make it easier for the reader to reference commonly used technical words and terminology.

Public Review and Input

Because of the size of this plan, the public review period will be 3 months long. The public review period will end on March 15, 2010.

Copies of the plan are available at all borough libraries. A copy of the plan has also been sent to the Chase, Lazy Mountain, Point MacKenzie, Sutton, Talkeetna, Trapper Creek, and Susitna Community councils and to the Willow Area Community Organization.

The plan is also available on the borough's web site at: ww1.matsugov.us/communitydevelopment/ Click on Land Management then Asset Management Plans in the left navigation menu then click on the link Natural Resource Management Units Plan.

Three public open house/meetings will be held during the public review period. ***These meetings will be held from 5:30 pm to 8:30 pm in Wasilla on Tuesday February 23rd, Upper Susitna on Wednesday February 24th' and Willow on Thursday February 25th (revised).*** Meeting facilities (locations) will be noticed at a later date in the newspaper, libraries, through community councils and on the MSB web page.

The meetings will begin with an open house which will give people an informal opportunity to get more information and discuss the plan with the people that developed the plan. At 6:30 pm there will be a brief presentation about the plan including an opportunity to ask questions about the plan. We will also provide time for those present to make comments or discuss the plan.

While we will listen and take notes on your comments at the public open house/meetings, we encourage you to submit any comments you may have in writing. We are asking for the written comments so they become part of the public record, there can be no dispute on whether your comments were heard or not, or whether they were heard as you intended.

Comments may be submitted in one of the several ways:

- Drop them off at any of the public meetings.
- Submit them in writing to:

  Matanuska-Susitna Borough
  Land and Resources Management Division
  350 East Dahlia Avenue
  Palmer, AK 99645

- By email to: nrmucomment@matsugov.us
- Fax them to: (907) 745-9635

Following the public review period, appropriate changes to the plan will be made based on the public input. The plan will then go to the borough's Real Property Asset Management Board for their input. Following that, the plan will go to the Planning Commission and the Assembly for their consideration. The Real Property Asset Management Board, Planning Commission and Assembly will hold public hearings before taking action on the plan.

Remember, we need to receive your comments no later than March 15, 2010 in order to be considered when making any plan revisions.

Respectfully,

Linda Brenner, MS, CTRS

Linda Brenner, MS, CTRS
Community Development Director

In early February 2010 a second public notice was issued that reminded people of the due date for comments on the plan and that public meetings would be held where reviewers could get information about the plan, ask questions about the plan and provide verbal testimony about the plan if they so chose. A copy of the public notice of these meetings is on the following page.

Public meetings were scheduled to be held at Trapper Creek (Trapper Creek Community Park Building), Wasilla (Wasilla Middle School), Willow (Willow Community Center), and in the upper valley (Upper Susitna Middle/High School) in late February, 2010.

Following the public meeting notice is a summary of these public meetings that 50 people signed in as attending. It should be noted that some people who attended did not sign in.

At the end of the public comment period a total of 82 individuals and groups submitted about 370 comments on topics or concerns they had about the draft plan. A summary of these comments, along with a response to every comment follows the summary of the public meetings.

Based on the comments received, numerous changes were made to the Plan.

MATANUSKA-SUSITNA BOROUGH
Community Development
Land Management Division
350 East Dahlia Avenue
Palmer, Alaska 99645

FIRST CLASS

PUBLIC NOTICE

MATANUSKA-SUSITNA BOROUGH
PUBLIC NOTICE

Natural Resource Management Units Plan Open Houses

This is a follow up notice for dates and locations for Public Open Houses for the Natural Resource Management Units Plan.

Four public open house/meetings will be held the last week of February 2010.

The Meeting locations are as follows:
Tuesday February 23, 2010 at Wasilla Middle School, 650 Bogard Road, Wasilla from 5:30 PM to 8:30 PM

Wednesday February 24, 2010 at the Trapper Creek Park Community Center, Mile Post 115.2 Parks Highway, Trapper Creek from 1:30 PM to 3:30 PM.

Wednesday February 24, 2010 at the New Su-Valley High School, Mile Post 98 Parks Highway, from 5:30 PM to 8:30 PM

Thursday February 25, 2010 at Willow Area Community Center, Mile Post 69.7 Parks Highway, 23625 W. Willow Community Center Circle, Willow, from 5:30 PM to 8:30 PM.

The meetings will begin with an open house which will give you an informal opportunity to get more information and discuss the plan with the people that developed the plan. After about an hour there will be a brief presentation about the plan (in Trapper Creek this will begin at 2 PM) including an opportunity to ask questions about the plan. We will also provide time for those present to make comments or discuss the plan.

While we will listen and take notes on your comments at the public open house/meetings, we encourage you to submit any comments you may have in writing. We are asking for the written comments so they become part of the public record, there can be no dispute on whether your comments were heard or not, or whether they were heard as you intended.

Copies of the plan are available at all borough libraries and the Community Development Department in Palmer. A copy of the plan has also been sent to the Chase, Lazy Mountain, Point MacKenzie, Sutton, Talkeetna, Trapper Creek, and Susitna Community Councils and to the Willow Area Community Organization.

The plan is also available on the borough's web site at: ww1.matsugov.us/communitydevelopment/ Click on Land Management then Asset Management Plans in the left navigation menu then click on the link: Natural Resource Management Units Plan.

If you have questions about this information: call Debby at 745-9863 between 8:00-5:00 or you can send an e-mail to nrmucomments@matsugov.us.

March 1, 2010
TO: Files
FROM: Ron Swanson
SUBJECT: Natural Resource Management Plan, Public Review Draft Public Meetings

The public review draft of the Management Plan for Natural Resource Management Units (NRMU) was sent out for public review on December 15, 2009 with comments due by March 15, 2010. As part of the public review process 4 public meetings were held:

Wasilla: Tuesday, February 23 from 5:30 to 8:30 pm at Wasilla Middle School

Trapper Creek: Wednesday, February 24 from 1:30 to 3:30 pm at the Trapper Creek Community Center

Upper Susitna; Wednesday, February 24 from 5:30 to 8:30 pm at the Upper Susitna Middle/High School

Willow: Thursday, February 25 from 5:30 to 8:30 pm at the Willow Community Center.

Prior to the public meeting a public notice was issued that was published in the Frontiersman, located on the borough web site and was broadcast on local radio stations. The notice was also sent to all community councils, members of boards and commissions and assembly members. Copy of the notice was posted at all borough and city libraries and the Big Lake, Sutton, Talkeetna, Trapper Creek, Willow post offices.

Attendance (based on the sign-in sheets) at the four public meetings varied.

Wasilla:	5
Trapper Creek:	33
Upper Susitna:	13
Willow:	1

Sign in sheets for each meeting are attached. It should be noted that not all people who attended the Trapper Creek and Upper Susitna meetings signed in.

At each of the meetings, except Trapper Creek, either Bishop (Bish) Buckle and/or Bruce Paulsen were present and helped me with the meetings.

At each meeting a power point "handout" was provided to each participant that gave an overview about the plan. Also maps showing the various data layers for each NRMU were available. The maps were a consolidation of the mapping information contained in the plan for each unit.

The format for the meetings varied somewhat depending on number of participants and what information they wanted about the plan, the plan comment process and the plan adoption process. Generally, most of the people that attended the meetings had not read the plan. The first portion of the meetings was spent going over what the plan contained and what it did not contain. The power point handout was used to provide this overview.

The remainder of the meeting time was spent doing question and answers in order for those attending to be able to better provide comments about the plan.

At each meeting people were given an opportunity to provide public testimony. No one took advantage of this opportunity, although during the question and answer periods several people seemed to express various opinions. Sometimes it was not clear whether a statement was being made or a questions was being asked.

At each meeting I strongly encouraged people to submit written comments so that they would become a permanent part of the public record. I made it clear that I preferred written comments because unrecorded verbal testimony or comments could be subject to interpretation on whether we heard all the comments, interpreted and wrote them down correctly.

There were some items raised by multiple individuals at the various public meetings that need to be further addressed and/or clarified in the plan. These include:

1. Provide a preference first to local residents for wood for personal use (mainly for firewood) before offering commercial sales. Or, at least ensure that local needs are met at the same time. There is a large desire for local residents to meet their fuel wood needs without having to rely on commercial sales.

2. Provide a definition for what constitutes a small, medium and large scale timber harvest.

3. Clarify the process on how areas are nominated for timber harvest, both for commercial and personal use.

4. Ensure the plan provides protection for all flowing water streams and lakes/ponds no matter what the size if they have important habitat values (anadromous fish rearing) even if they are not presently identified or mapped in the plan.

5. Clearly explain how to determine "40% of remaining cover." Is it within the management unit or the operable timber area.

6. Language needs to be added so that it clear that once this plan is adopted that it supersedes all previous plans and land use designations that exist at the time the plan is adopted. It was pointed out that all existing FMU's should go away.

7. Language needs to be added to the plan that once the plan is adopted and made part of the boroughs comprehensive plan that any decisions that might be contrary to what the plan states are appealable.

8. Clearly state when the clock starts for determining sustained yield/annual allowable cut. People were not sure if the clock started immediately following the harvest or when stems were present that met FPA requirements for regeneration.

9. Make it clear in the plan that while minimal rotation periods are established in borough code and in the plan that they can be and should be longer in some locations in order to provide a mixed aged second generation forest.

10. Make it clear in the plan that Special Management Zones for wildlife protection (and other reasons as well) can be established or eliminated at any time as new information becomes available. This should be a flexible method that can respond immediately to information and not require a lengthy administrative or legislative process. The example given was a bear den is found while conducting a timber harvest. A Special Management Zone should be created immediately so as not to disturb the bear den without having to do a "stop order" until a lengthy administrative or assembly action is completed.

<u>Attachments</u>

Note: The attachments referred to in this memo are not included in this plan. The public notice can be found before this memo. Because of length of the power point handout and the desire to protect personal identity of the individuals who attended the meetings the power point presentation and sign-in sheets respectively are not included in this volume, but are on file in the Community Development offices.

NATURAL RESOURCE MANAGEMENT UNITS
PUBLIC REVIEW DRAFT

SUMMARY OF PUBLIC COMMENTS
AND
RESPONSE TO PUBLIC COMMENTS

From December 15, 2009 through March 15, 2010 the Matanuska-Susitna Borough requested the public to comment on the Public Review Draft of the Asset Management Plan for Natural Resource Management Units. This Plan also included the Forest Management Plan as required by MSB 23.20.060.

At the conclusion of the public comment period, 82 individuals and groups submitted a little less than 400 comments, suggestions, edits and suggested other topics they thought needed to be addressed in the draft Plan.

The table's that follow are a general summary of the comments that were received.

The tables and comments organized in the same order as in the Plan; by Volume and by Chapter for Volumes I and III and by Natural Resource Management Unit name for Volume II. The comments on specific resource issues and/or topics are in alphabetic order for each volume and/or chapter.

This summary does not include the details of everyone's comments. The summary generalizes the comments and concerns expressed into categories or topics. A response to all the comments and concerns is provided as well. The specific comments and suggestions that were received were all considered and used, where appropriate, in revising the Plan.

All the comments that were received have been kept and are on file in the Matanuska-Susitna Borough, Community Development Department, Division of Land and Resources offices.

Natural Resource Management Unit Plan: General Comments			
TOPIC	**COMMENTER'S NAME**	**COMMENT/ISSUE**	**RESPONSE**
	Alaska Survival (Becky Long)	Supports guidelines that minimize damage to resources, minimize conflict between users and resources, and protect the long term values of the resources, public safety and the environment.	Plan has been written to accomplish these goals.
	Alaska Survival (Becky Long) Jok Bondurant Mark Stahl Scott Holcomb Brian Okonek John Strasenburgh Talkeetna Community Council (Billy Fitzgerald) Ruth Wood	Plan has improved during its development and better reflects the desires of the public. Generally the Plan strikes a good balance between the values of wild lands and the need for high value-added commercial use of our forest resources. The Plan is of high quality, detailed and understandable.	Thank you.
	Alaska Survival (Becky Long)	Protect public forests and watersheds in land use planning.	This Plan protects important watersheds and important resource areas while at the same time providing for a variety of multiple uses utilizing professional management techniques and balancing uses to reduce or eliminate conflicts.
	John Strasenburgh	Plan has identified the many and varied uses and values of lands within the NRMU's and provides land use designations and management guidance that, if properly	Thank you. The commenter described very well the entire purpose of this Plan.

Natural Resource Management Unit Plan: General Comments			
TOPIC	**COMMENTER'S NAME**	**COMMENT/ISSUE**	**RESPONSE**
		implemented and with some modifications to the draft Plan, would maintain the health and sustainability of our forest, protect our watersheds and water quality, and maintain the habitat necessary to support healthy and diverse fish and wildlife populations. All these are central to sustaining the quality of life and lifestyles of our communities, to ensuring that a broad spectrum of outdoor recreation opportunities continue to be available, to supporting recreation and tourist based businesses, and to providing local, high value-added use of forest resources.	
	Richard Gattis	Plan is a waste of tax payer's money. Please just do the basic public services.	Borough land is a public resource that is required by state law and borough code to be planned for and managed in the public interest.
Appeals of Administrative Decisions	Alaska Survival (Becky Long) Friends of Mat-Su (Heather McCausland) John Strasenburgh Ruth Wood	There needs to be an explanation of public process, particularly appeals, following public notice under MSB 23.05.025 and resulting non-Assembly decisions.	This issue is outside this Plan process because it affects ALL public notices regardless of the topic and resulting administrative decisions. This issue has been forwarded to the borough administration and borough attorney's office.

Natural Resource Management Unit Plan: General Comments			
TOPIC	**COMMENTER'S NAME**	**COMMENT/ISSUE**	**RESPONSE**
Community Council Involvement in Decisions	Vern Halter Brian Okonek Richard Leo Shawn York Stan Stankowitz	Local community councils should have a larger and more prominent voice in this Plan and future sales. Their say/vote should be adhered to. The Plan should specifically refer to Community Council and their involvement in future sales, sale areas and personal use cutting.	A goal and guidelines have been added to Volume I, Chapter 2 ("General Goals for all Natural Resource Management Units," "General Guidelines for all Natural Resource Management Units" and Volume II, "Role of Agencies, Community Councils, and the Public in Unit Management Decisions") to ensure that agencies, community councils and the public will continue to be notified and involved with implementation and having an opportunity to comment on proposed management decisions. Also, a proposed ordinance change has been added (see Volume I, Chapter 4; "Recommended Ordinance Changes") that will require the Real Property Asset Management Board to review and provide advice on any proposed actions within the NRMU's. The proposed ordinance and the amended draft Plan do not give local community councils the final decision on how the individual Natural Resource Management

Natural Resource Management Unit Plan: General Comments			
TOPIC	**COMMENTER'S NAME**	**COMMENT/ISSUE**	**RESPONSE**
			Units will be managed. All borough land is a public resource and is to be managed for the use and benefit of all borough residents. The Plan is the result of three rounds of public meetings (14 separate meetings) and three separate opportunities to provide written input. Through open invitation, review of the draft Plan, and the changes being made as the result of the review of the draft Plan (referred throughout this summary), involved community councils, local community council recognized advisory committees, non-profit organizations, adjacent land owners and other members of the public. Where comprehensive Plans exist, they are referenced in the individual Plan for each Unit and pertinent sections of those Plans are listed in the individual Unit Plans. The individual Unit plans are consistent with local comprehensive plans, where they exist.

Natural Resource Management Unit Plan: General Comments			
TOPIC	**COMMENTER'S NAME**	**COMMENT/ISSUE**	**RESPONSE**
			The Five-Year and Periodic Timber Harvest Schedule's each require public notice under MS 23.05.025, which requires notification to all affected community councils and service districts. The ultimate decisions on timber harvests, including locations, are made by the borough Assembly which involves another forum for public input and involvement.
Endangered Species	Alaska Survival (Becky Long)	Plan needs to analyze the impact to Cook Inlet Beluga Whales. The National Marine Fisheries Service should be consulted.	No change. The National Marine Fisheries Service was provided an opportunity to review the draft Plan and did not comment. All anadromous fish waterbodies will be protected by buffers and designated/classified for watershed protection. All the Natural Resource Management Units are located well upstream of any known Beluga Whale habitat.
Enforcement & Implementation	Friends of Mat-Su (Heather McCausland) Denis Ransy (Susitna Forestry Council) Nancy Richar (sp?)	How will the Plan be implemented and enforced?	See Volume I, Chapter 3: "Monitoring and Enforcement," Volume I, Chapter 4; "Funding and Enforcement." In addition additional language has been added

Natural Resource Management Unit Plan: General Comments			
TOPIC	**COMMENTER'S NAME**	**COMMENT/ISSUE**	**RESPONSE**
			to the Plan in several locations in Volume I and II to require continued agency, community councils and the public with implementing the plan and having an opportunity to comment on proposed management decisions.
Habitat Classification	Geoffrey Parker ("representing (several) unnamed Trapper Creek residents and property owners")	Borough should have a habitat classification similar to the state.	The Municipal Land Act (AS 29.65) does not allow municipalities to select land valuable for habitat purposes. However, some locally significant habitat land has been conveyed to many municipalities as part of larger tracts of land conveyed to them under this Act. In these cases the Matanuska-Susitna Borough has recognized these locally significant habitat values and designates the land for habitat protection and classifies the land in a category to retain them in public ownership (for example, Public Recreation" or "Watershed Lands."

Natural Resource Management Unit Plan: General Comments			
TOPIC	**COMMENTER'S NAME**	**COMMENT/ISSUE**	**RESPONSE**
Information Sources	Friends of Mat-Su (Heather McCausland) John Strasenburgh Chase Community Council (Mike Wood)	Consult with adjacent land owners and credible sources to obtain additional resource and use information that may not be otherwise available from various agencies.	The Plan as drafted requires that information from credible sources be used to gather and supplement resource and use information. The draft Plan has several instances where input from non-agency people and groups was utilized.
Public Notice	Friends of Mat-Su (Heather McCausland)	Public notice under MSB 23.05.025 should be required for all permits and included in the resource goals and management guidelines for this Plan.	This section of borough code requires public notice for the "sale, lease or other disposal of borough-owned resources in excess of one-year." Requiring notice for temporary uses (such as individual personal use permits) in all cases would be a unnecessary burden on borough staff, individual financial resources (applicant pays for public notice) and preclude short term immediate responses to certain events or situations (mushroom gathering immediately following a wildfire).
Public Ownership	Vern Halter	The Units in the Plan should not be re-designated for another use in the future and to maintain these areas in public ownership.	No change. This Plan, on its own, cannot make this decision. The intent of the Plan is to retain the land in public ownership and to manage the areas for multiple-uses. The Plan does recognize that land may need to be removed from a unit

Natural Resource Management Unit Plan: General Comments			
TOPIC	**COMMENTER'S NAME**	**COMMENT/ISSUE**	**RESPONSE**
			and used for another purpose in the future. This can only happen with Assembly approval on a case-by-case basis.
Stricter Standards	Friends of Mat-Su (Heather McCausland)	In the event that the borough adopts ordinances with stricter standards in the future than in the Plan, the stricter standards apply.	The draft Plan states that if there is a conflict between the Plan and an ordinance or state law, the more restrictive shall apply. If such an event happens the Plan can be amended as a minor change. See Volume I, Chapter 4; "Procedures for Plan, Including Guidelines, Amendments."

Volume I : Chapter 1: Introduction			
TOPIC	**COMMENTER'S NAME**	**COMMENT/ISSUE**	**RESPONSE**
No comments were received.			

Volume I : Chapter 2: Natural Resource Management Unit Goals and Guidelines by Resource, Program or Management Tool			
TOPIC	**COMMENTER'S NAME**	**COMMENT/ISSUE**	**RESPONSE**
Buffers	Alaska Survival (Becky Long) Billy Fitzgerald Friends of Mat-Su (Heather McCausland) Vern Halter Brian Okonek John Strasenburgh Talkeetna Community Council (Billy Fitzgerald) Ruth Wood	Buffers on all waterbodies should be 200 feet or more.	No change. Buffers can be made larger, or a Special Management Zone added to fit an individual situation at the time of a proposed timber harvest, other resource extraction, or any other activity. At a minimum, the requirements of the *Alaska Forest Resources and Practices Act* for buffers on waterbodies shall be followed. Those buffer widths were amended and made larger in 2007 after review and input from a multi-agency technical and scientific advisory committee and separate review from a committee of agency, governmental, environmental and industry representatives.
	Alaska Survival (Becky Long) Billy Fitzgerald Friends of Mat-Su (Heather McCausland) Brian Okonek John Strasenburgh Talkeetna Community Council Ruth Wood	Lakes under 10-acres in size that support anadromous and important resident fish and/or are part of a lake and stream system that is connected and supplies nutrients to creeks, streams and rivers should also be protected.	Agree. Protection for lakes is beyond what is generally required by the *Alaska Forest Resources and Practices Act*. The 10-acres used in the draft plan was choosen to make the mapping process easier. Language in the Plan has been changed to provide buffers on all waterbodies, no matter what the

			size, that support anadromous and/or important resident fish, or are part of a lake and stream system that is connected to creeks, other streams and rivers. This includes a classification of watershed protection which will cover the waterbody and the buffered area beyond the water column.
	Ernest Bahr Francine Bennit(sp?) Howard Carbone Friends of Mat-Su (Heather McCausland) Vern Halter Talkeetna Community Council	Larger buffers around private property, roadway's, trails, riparian areas and streams.	No change. Buffers widths are established in state law and/or borough code. Buffers can be increased on a case-by-case basis as needed at the time a resource extraction or other activity is proposed.
	Denali Log & Lumber (Mark Stahl)	100' buffers on private land is appropriate, however, such buffers along public lands should not be mandated.	No change. These buffers are required in borough code (23.20.070). This same section of code provides for adjustment or elimination of buffers with concurrence of the adjacent land owner. Prior to any timber harvest, adjacent property owners will be notified and provided the opportunity to comment on the size of buffers along their property.

Volume I : Chapter 2: Natural Resource Management Unit Goals and Guidelines by Resource, Program or Management Tool			
	Alaska Survival (Becky Long)	Buffers of trails should be 200 feet to avoid human/moose conflicts.	No change to draft Plan. Buffers can be made larger, or a Special Management Zone added to fit an individual situation at the time of a proposed timber harvest, other resource extraction, or other activity.
	John Strasenburgh	The language in Buffer Exceptions (Volume I, Chapter 2, "Buffers") focuses on reasons that would tend to decrease a buffer. Legitimate reasons for increasing a buffer, such as for protection of an important habitat, should also be included.	Agree. This section in the draft plan has been changed to address this concern.
	Steven Miller John Strasenburgh	Protection of rivers, creeks, lakes and wetlands sounds good, but will need to be followed with enforcement action.	No change. The Plan, in Volume I, Chapter 4 "Funding, Education and Enforcement," states that education and enforcement action is necessary.
Goals	CIRI (Kim Cunningham)	Add an Energy Development Goal (recommended language provided).	Energy Development Goal has been added.
Materials & Minerals	Friends of Mat-Su (Heather McCausland)	Recommends that groundwater quality and quantity protection be ensured as proposed in MSB 28.30.	The "Rock, Sand and Gravel" goals and guidelines (Volume I, Chapter 2; Rock, Sand and Gravel) requires that current borough code related to materials and minerals extraction must be followed.

Volume I : Chapter 2: Natural Resource Management Unit Goals and Guidelines by Resource, Program or Management Tool			
	Friends of Mat-Su (Heather McCausland)	Recommends that all material and mineral sites be reclaimed and revegetated as proposed in MSB 28.30.	See above response.
	Friends of Mat-Su (Heather McCausland)	Recommends that all material and mineral sites be subject to public notification as proposed in MSB 28.30.	See above response.
	Ruth Wood	One of the goals under Rock, Sand, and Gravel says, "Protect the integrity of the environment and affected communities to the extent feasible when developing material resources." The term "extent feasible" should be deleted and/or additional language added to require a formal analysis of whether the standard should be relaxed to cover cases where it may not feasible to protect the integrity of the environment and affected communities.	The term "extent feasible" has been removed from all goal statements in the draft plan. As described in Volume I, Chapter 1, goals are general conditions the borough is trying to achieve and describe the ideal intentions for management. Goals between various resources and uses may conflict which requires analysis and public review on the course of action to take. Goals on their own should generally not have qualifiers, such as "extent feasible."
Private Property	CIRI (Kim Cunningham)	Add a goal stating the borough will work with adjacent private property owners needs in a cooperative manner.	Goal added to Plan.
Public Access	Ruth Wood	One of the management guidelines for "Public Recreation and Tourism" states that access shall be provided to the public. It should say "open" to the public.	Language in the draft plan has been changed to address both concerns.

Volume I : Chapter 2: Natural Resource Management Unit Goals and Guidelines by Resource, Program or Management Tool			
		If the borough does plan to provide or allow new physical access, that access should not be developed or otherwise facilitated unless the borough is able to provide management, monitoring, and enforcement.	
Settlement	Alaska Survival (Becky Long)	Support no land sales or leases unless specifically approved by Assembly.	No comment – already included in the draft Plan.
	CIRI (Kim Cunningham)	Add goal stating the sale or lease of borough land may be reasonably necessary for the achievement of energy economic development and private property goals.	Goal has been added, Guideline already exists in draft Plan that requires Assembly approval of any sale or lease.
Special Management Zones	Susitna Forestry Council (Denis Ransy)	Special Management Zone concept and language in the plan is generally good.	Thank you.
Trails	CIRI (Kim Cunningham)	Add a goal to locate or relocate trails so as to avoid trespass activities on adjacent private land(s).	Goal and guideline added to Plan.

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	Cari Sayre Ruth Woods	Only allow access in sensitive areas to winter time use only when adequate snow and frost exists to protect the vegetation.	No change. This plan only deals with those areas or portions of trails that are within an NRMU. The plan does not extend management of roads and trails outside of the units, or on land that is not borough owned outside of the Units. For those areas within NRMU's the Plan does state that there must be adequate frost and snow cover must exist before any motorized uses can occur. The plan does recognize that management of ATV's is an issue that goes beyond the scope of this plan and recommends that the issue needs to be addressed by all property owners at a regional and/or state level. (See Volume I, Chapter 4 "Other Research."
Transportation	CIRI (Kim Cunningham)	Add Utilities to the heading.	Added to the Plan.
	CIRI (Kim Cunningham)	Add an energy and economic development goal through planning and development of necessary transportation and utility rights-of-way within Natural Resource Management Units.	Goal added with modifications to suggested language to deal only with utilities, and to make it generic as to application on borough lands in general.
	Denali Log & Lumber (Mark Stahl)	Plan does not discuss the use of all-season short-term (temporary) roads.	The Plan has been changed to discuss short-term all-season roads and to require the purchaser,

			harvester, or operator to construct, maintain and to permanently remove the road following completion of the project.
	Scott Holcomb	Change MSB 28.60.100 (A) and (B) to "shall" instead of "may". This portion of code deals with requiring road maintenance and bonding.	This change would require a change in an existing ordinance and is outside the scope of this plan. When these portions of code were adopted in 2007, the word "may" was carefully decided to be used instead of "shall" because of legal issues associated with proving that an operator was the sole source on a publically used road of causing road damage or making it unsafe. In addition, the borough wanted the option of choosing who, how and when the needed maintenance would be done, rather than specifying in code who would perform the work. The intent is to get the work done correctly as soon as possible and to put the operator on notice that they may be liable for all or a portion of the expense.

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	Steven Miller	What will the borough do to minimize trespass on remote private property by off-season vehicles using access roads constructed for timber harvesting activities?	The plan in Volume I, Chapter 4 "Funding, Education and Enforcement" acknowledges that education and enforcement action is necessary. The Plan has been changed to discuss short-term all-season roads and to require the purchaser, harvester, operator to construct, maintain and to permanently remove the road following completion of the project.
	Ron Robbins	Roads to logging area(s).	We are assuming the commenter meant needing roads to harvest area(s) based on comments on other subjects made by the commenter. The issue of having to provide secondary or temporary roads to timber harvest areas is outside the scope of this plan. Access information is required to be provided as part of the Five-Year and Periodic Timber Harvest schedules.

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Wetlands	Alaska Survival (Becky Long) Friends of Mat-Su (Heather McCausland) John Strasenburgh Talkeetna Community Council (Billy Fitzgerald) Ruth Woods	Temporary roads should not be allowed to cross any wetlands.	The draft plan has been amended to make it clear that temporary roads shall not be allowed to cross important wetlands. Exceptions can be made only through a plan and/or guideline amendment, and may also require Corp of Engineers review and approval.
	Brian Okonek Alaska Survival (Becky Long) Friends of Mat-Su (Heather McCausland) John Strasenburgh Talkeetna Community Council (Billy Fitzgerald) Ruth Woods	Trails across wetlands should not be allowed with the exception of winter trails when the snow and frost is deep enough to protect the underlying vegetation.	The Plan has been amended to make it clear that trails that cross important wetlands shall not be used until there is sufficient snow and frost to protect the underlying vegetation.

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TOPIC	**COMMENTER'S NAME**	**COMMENT/ISSUE**	**RESPONSE**
General Chapter Comments	Bob & Debbie Filter Vern Halter Klaus Lerch Sylvan (Hal) Morgan Susitna Forestry Council (Denis Ransy) Billy Reynolds Nancy Richar (sp?) Shawn York Stan Stankowitz	Logging is OK, but opposes irresponsible logging practices that have eroded faith and trust local citizens have for the borough.	This Plan, along with changes to borough code has and is being made to address these concerns.
	Nayyar Malik	Do not sell timber to anyone. Natural Resources should be saved for emergencies.	The purpose of this plan is to ensure proper and responsible management of borough owned land.
	Scott Holcomb	I like the parts about "Traffic Safety Plan" and "Timber Transport Permit."	No comment.
Annual Allowable Cut	Howard Carbone Scott Holcomb Brian Okonek Cari Sayre Susitna Community Council Talkeetna Community Council (Billy Fitzgerald)	The total allowable cut for the entire inventory should not be taken from one unit.	The draft plan has been changed (See Volume I, Chapter 3, "Five-Year Harvest Schedule" and "Periodic Timber Harvest Schedule") changed to state that the total Annual Allowable Cut for any given year or decadal time period shall not be located in one Natural Resource Management Unit. Public review and Assembly approval of the Five-Year and Periodic Timber Harvest Schedules

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			and separate Assembly approval of individual harvests over 64,000 cubic feet or 500 cords of wood (equivalent to about 40 acres) will prevent this practice from happening even without the changes mentioned above. In addition, the Plan requires that reasonable local personal and community use must be met prior or during any other timber harvests. Personal Use harvest areas will likely spread out among several units so that they will be available to local communities.
Bonding & Permits	Ernest Bahr Vern Halter Klaus Lerch Billy Reynolds Ron Robbins	The cost for personal use permits and bonds for small sales should be low or non-existent so local folks can harvest firewood, and small businesses are not put out of business because of government required overhead expenses.	This was a concern expressed by many people at the public meetings. This is a subject that is outside of this plan. One fee structure does not necessarily fit all situations. There are expenses related to all timber harvests (monitoring, harvest area layout, reforestation) that need to be addressed. Options (such as a bonding and/or reforestation pool) might need to be explored.

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			A recommendation has been added to the plan (Volume I, Chapter 4; "Other Research") to research and make recommendations on this issue. The final decision on fees is made by the Assembly.
	Mark Karaffa	Opposed to bond requirement (for personal use or small harvests?). There is no definition of how long a period that would be set for re-growth requirements.	No change. Requirements are in the plan; Volume I, Chapter 3 "Reforestation" and "Monitoring and Enforcement." These requirements are to meet the standards established in the *Alaska Forest Resources and Practices Act.*
	John Strasenburgh Ruth Wood	Stronger language is needed to ensure that the borough does not end up bearing the financial burden of contract non-compliance (performance standards, reclamation or regeneration).	The draft plan has been changed to state that all bonds, or other acceptable form or surety, shall be of sufficient monetary size and time duration to ensure that the borough, as the land owner, does not end up bearing the financial burden of meeting the *Alaska Forest Resources and Practices Act* requirements or other performance requirements.
Clear Cutting	Francine Bennit(sp?) Chris Connell Travis Finkenbinder	No clear cutting	The type of harvest methods and means is a detail that is approved separately in the Five-Year and

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	Joe Griffin Vern Halter Mark Karaffa Marc Nitzkorski & Mary High John Billy Reynolds Ron Robbins		Periodic Timber Harvest Schedules, not in this plan, which are subject to public notice and must be approved by the Assembly.
	Klaus Lerch Shawn York Stan Stankowitz	Generally opposed to commercial clear cutting because of past experiences. If clear cutting must take place, keep areas small with plenty of buffer zones between them.	The purpose of this plan is to ensure proper and responsible management of borough owned land.
Commercial Logging	Richard Leo Shawn York Stan Stankowitz	The Trapper Creek community has loudly and unanimously expressed its opposition to any commercial logging in any of the NRMU's within and near the Trapper Creek Community Council area. Personal use timber harvest would satisfy forestry management goals without the potential loss of tourism benefits and lowering property values.	The draft plan, for the most part, recognizes the concerns of the commenter by restricting the size and/or types of the harvests in many units. Forest management is done for forest health and silviculture purposes. It may take more than one kind of harvest technique (i.e., personal use) to accomplish that goal.

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TOPIC	**COMMENTER'S NAME**	**COMMENT/ISSUE**	**RESPONSE**
	Jennifer Hartman	Everything you touch, you destroy. No commercial logging in my area (Trapper Creek) or around me. Tourism is our main source of income. "Stay the hell out."	The purpose of this plan is to ensure proper and responsible management of borough owned land. Tourism has been recognized throughout the various NRMU's as an important resource and economic activity.
	Mark Karaffa	Would like a definition of who can cut where. Is someone with a mill going to cut in my backyard?	Specific timber harvests will be contained in the Five-Year and Periodic Timber Harvest Schedules, not in this Plan. The exact type of harvest, methods and means, etc. is a detail that is approved separately in these schedules which are subject to public notice and must be approved by the Assembly.

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TOPIC	**COMMENTER'S NAME**	**COMMENT/ISSUE**	**RESPONSE**
	Marc Nitzdorski & Mary High John	No commercial logging in the Trapper Creek area, at least until all the Oil Well Road (Chijuk Unit) wood that was cut is utilized.	The timber that was harvested in the Chijuk Creek Unit is the subject of an on-going lawsuit whose ownership is in question. Proper forest management and silvicultural practices should be practiced on all borough-owned forest land.
	Susitna Forestry Council (Denis Ransy)	The borough has limited ability to responsibly manage commercial logging. The debacle at Chijuk Creek is the most striking example where thousands of board feet of lumber were left to rot and local were not allowed in to get firewood.	See response above.
Firewood (local) Harvest Areas	Ernest Bahr Vern Halter	Designate areas for local firewood harvest.	The Plan, as written, provides for and identifies units to provide for local firewood harvest.
Forest Health	Mark Stahl (Denali Log & Lumber)	Add goal and a guideline of converting unmanaged forest stands to a managed condition and a timeline to achieve that goal.	Volume I, Chapter 3 (Forest Management) has several goals that collectively address this management concern. Given the diversity of interests, it is impossible to totally achieve the commenter's goal in all NRMU's. The entire chapter on Forest Management is in itself a practical "guideline" towards better

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TOPIC	**COMMENTER'S NAME**	**COMMENT/ISSUE**	**RESPONSE**
			managing the borough owned forest resources.
Herbicides	Alaska Survival (Becky Long) Friends of Mat-Su (Heather McCausland) Scott Holcomb Brian Okonek Susitna Forestry Council (Denis Ransy)	No herbicides should be used.	The Plan has been changed to only allow the use of herbicides following additional research, specifically for cold weather climates. Any use must be specifically approved by DEC and the Assembly.
Personal Use	Klaus Lerch Ron Robbins	We need designated firewood cutting areas designated in our community (Trapper Creek) with a no cost permit. The property taxes we pay should cover such a permit process.	The draft plan has identified areas suitable for this purpose. Bonding expenses and permit fees are outside the scope of this plan process. Generally permit and bond fees are established after reviewing the costs associated with administering each program or activity or, in the case of bonds, the cost to the borough to correct an activity or action. A recommendation has been made in the plan (Volume I, Chapter 4; "Other Research") to examine this issue and to make a recommendation to the Assembly.

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TOPIC	**COMMENTER'S NAME**	**COMMENT/ISSUE**	**RESPONSE**
	Ron Robbins	Family's need Personal Use Permits with no limit on logs at no more than 75¢ per lineal foot and $5.00 per cord for firewood with maybe a 10 cord limit.	The limits for personal use are established in borough code (MSB 23.20.170). A recommendation has been made in the plan (Volume I, Chapter 4; "Recommended Ordinance Changes") to lower the personal use harvest limits because timber is a public resource, not a public subsidy program. Permit fees are outside the scope of this plan process. Generally permit fee costs are established after reviewing the costs associated with administering each program or activity. A recommendation has been made in the plan (Volume I, Chapter 4; "Other Research") to examine this issue and to make a recommendation to the Assembly.

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TOPIC	**COMMENTER'S NAME**	**COMMENT/ISSUE**	**RESPONSE**
Pesticides	Alaska Survival (Becky Long) Howard Carbone Friends of Mat-Su (Heather McCausland) Scott Holcomb Brian Okonek Susitna Forestry Council (Denis Ransy) John Strasenburgh Talkeetna Community Council (Billy Fitzgerald) Ruth Wood	No pesticides should be used.	The Plan has been changed to ban the use of pesticides.
Preference for Personal Use and Small Businesses	Ernest Bahr Francine Bennit(sp?) Travis Finkenbinder Vern Halter Richard Leo Cari Sayre Shawn York Stan Stankowitz	Need provisions for personal use and small saw mill operations to make sure their needs are met and/or have a preference, or first priority, over other proposed timber harvests. Small parcels (5, 10 and 15 acres) should be available over the counter for this use without having to go through the competitive sale process. The borough has done a terrible job of making this happen.	The draft Plan has been changed in several places to ensure that "reasonable" local personal use needs are met. The Plan has been amended (Volume I, Chapter 3; Methods and Authorizations for Sales) to provide for over-the-counter sales for small timber harvest sales without having to go to competitive bids. A recommended amendment to borough code (23.20.130) has been added to the draft Plan to implement this change

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			(Volume I, Chapter 4; Recommended Ordinance Changes). Small sales have been defined as less than 100 cords of firewood, or 13,000 cubic feet of timber which is equivalent the timber on about 10 acres. No bidding preference for small commercial operators has been provided in the Plan or is currently authorized in borough code.
Public Notice for Timber Harvests	Howard Carbone	Public Process should be required for timber harvests over a certain size.	The Five-Year and Periodic Timber Harvest Schedule's both require public notice. The draft Plan has been changed to require that all timber harvests, no matter what the size, must appear on both schedules. The Five-Year Timber Harvest Schedule also requires Assembly approval. Proposed legislation in the Plan recommends that Timber harvests over 64,000 cubic feet or 500 cords (roughly 40 acres) would require Assembly approval in addition to

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			the approval already required in the Five-Year Timber Harvest Schedule.
Reforestation/Regeneration	Alaska Survival (Becky Long)	Regeneration is important; scarification used in the past has not proven to be successful; other methods such as planting trees might be successful and more cost effective.	No change. Scarification has been successful when done correctly, i.e. expose mineral soils. The draft Plan recognizes that regeneration is a topic that needs further research and field experience. Besides scarification, other techniques, such as natural regeneration and tree planting are discussed in the Plan.
	Denali Log & Lumber (Mark Stahl)	The replacement stand of trees can be improved by planting seedlings rather than solely relying on scarification and natural revegetation. Given the high cost and low effectiveness of scarification and the long time lag for adequate reestablishment of the forest, the present net value of the cost of planting is likely less than scarification.	Plan has been amended; Volume I, Chapter 3, "Reforestation" and Volume I, Chapter 4, "Forest Research" to make sure reforestation options, other than scarification are investigated and researched. Also, see above response.

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	Friends of Mat-Su (Heather McCausland)	The borough should make sure it has adequate resources to address the economics of potential liability from land that is not properly regenerated.	Volume I, Chapter 4; "Monitoring and Enforcement" requires that all contracts require bonds or other acceptable form of surety be established and held to ensure reforestation conditions are met.
	Ruth Wood	The *Alaska Forest Resources and Practices Act* requirements for regeneration should be applied to harvest areas less than 40 acres in size as well.	Reforestation/regeneration should happen in all cases. The *Alaska Forest Resources and Practices Act* applies to timber harvests over 40 acres, or where a stream lies within the timber harvest area. A change has been added to the draft plan in Volume I, Chapter III, "Proposed Ordinance Changes", to require that that both the Five-Year and Periodic Timber Harvest Schedule's address regeneration methods and means for all proposed timber harvests.

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TOPIC	**COMMENTER'S NAME**	**COMMENT/ISSUE**	**RESPONSE**
	Ruth Wood	The Plan should make it clear that the responsibility for regeneration lies with the timber harvester.	The *Alaska Forest Resources and Practices Act* puts the burden of regeneration on the property owner. The Plan does have provisions for requiring bonding (see above comments and responses) and has language to require contract enforcement (see Volume I, Chapter 3 "Monitoring and Enforcement" which includes reforestation/regeneration requirements.
Research Forest	Dr. Valerie Barber (UAF) Jok Bondurant Howard Carbone F. Stuart (Terry) Chapin III (UAF) Henry Cole Janice C. Dawe (UAF) Denali Log & Lumber (Mark Stahl) Charles Krebs (US Forest Service, State & Private Forestry) Billy Fitzgerald John Fox, Jr. (UAF) Tony Gasbarro (UAF)	Establish Research Forest	The Plan provides for establishing Forest Improvement Study Area(s) that should meet the majority of research and educational needs suggested by the commenter's. Large research forest study areas are better established on state or federal land where the timber base is much larger and the possible harvests larger than can be held on borough owned operable forest land.

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TOPIC	**COMMENTER'S NAME**	**COMMENT/ISSUE**	**RESPONSE**
	Scott Holcomb Jingjing Liang (UAF) Chris Maisch (DNR/DOF) Mitch Michaud (Natural Resources Conservation Service) J. Andres Soria (UAF) Susitna Community Council Talkeetna Community Council (Billy Fitzgerald) Tanana Chief Conference (Will Putman)		
Rotation Periods	Alaska Survival (Becky Long) Scott Holcomb	Plan needs to identify when the rotation period starts.	Agree. Language has been added to the Plan to clarify when the "clock" starts for determining rotation period. The clock starts once the regeneration requirements have been met as defined in the *Alaska Forest Resources and Practices Act*.

Volume I : Chapter 3: Forest Management			
TOPIC	**COMMENTER'S NAME**	**COMMENT/ISSUE**	**RESPONSE**
	Alaska Survival (Becky Long) Scott Holcomb	Needs to be management for 100-150 year spruce rotation.	No change. The Plan is clear that land within Natural Resource Management Units shall be managed for multi-aged (including old growth) forests. The rotation period does not mean that all trees will be harvested as soon as the rotation period has been reached.
	Ruth Wood	The plan provides for harvesting mature forests sooner because older trees are rotting and will lose value. Older trees can be sound, and even if starting to rot, they provide for diversity of habitat. Some trees need to reach full maturity, die, and decay, and the plan should acknowledge and provide for that.	See above response.

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TOPIC	**COMMENTER'S NAME**	**COMMENT/ISSUE**	**RESPONSE**
Select Harvests	Martin Bee Vern Halter	Selective wood cutting would be less intrusive to local residents than commercial clear cutting.	Selective harvest is one of many methods of timber harvest and is generally less intrusive than some other methods. Various types of harvests are used depending on appropriate silvicultural practices and the ultimate forest (and other resources) management goal for a unit or harvest area. The exact type of harvest, methods and means, etc. is a detail that is approved separately in the Five-Year Timber Harvest Schedule which is subject to public notice and must be approved by the Assembly.
Specialty Timber Harvests	John Strasenburgh	Specialty timber harvests should be rotated to another area for the next selective cut harvest to ensure that the genetically strong trees in an area are not cleaned out by repeated selective cuts.	The draft Plan has been changed to say that cutting units for specialty timber should be rotated so that one unit or area is not harvested on a regular or on-going basis. The intent to ensure that the unit or area continues to have a diversity of tree species and sizes.

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TOPIC	**COMMENTER'S NAME**	**COMMENT/ISSUE**	**RESPONSE**
Su Valley Middle/High School wood fired boiler	Alaska Survival (Becky Long) Mark Karaffa	Opposes project for a variety of reasons.	The final use of any forest product(s) is outside the scope of this Plan. The Plan identifies possible areas where timber harvests could occur. The ultimate decision on whether the wood fired boiler should proceed will be made under a separate process. If approved, the wood source would be approved through the Five-Year and Timber Harvest Implementation schedules.
	Howard Carbone Jok Bondurant Billy Fitzgerald Scott Holcomb Cari Sayre	Supports wood fired boiler project for a variety of reasons.	See above response.
	Richard Leo	Timber harvest for a possible wood fired boiler must be to the east side of the Susitna River in the Rabideaux Creek Unit, if at all.	See above response.
	Lon McCullough	Opposed to any harvest of timber for the proposed boiler at Susitna Valley High School in the Trapper Creek Community Council area.	See above response.
	Brian Okonek	If there is to be a wood fired boiler, it is imperative that there are enough acres of operable timber, in close	See above response.

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TOPIC	**COMMENTER'S NAME**	**COMMENT/ISSUE**	**RESPONSE**
		proximity to the school, for sustained yield for firewood reserved for use at the school.	
	Susitna Forestry Council (Denis Ransy)	Harvesting timber for the sole purpose of feeding a wood boiler for decades would be wasteful of public resources. Virtually all wood-boilers in public buildings in both the US and Canada are located near sawmills producing large quantities of wood waste. The Su valley High School proposal has no large mills in the area. Further study is needed, including looking at other possible alternative energy wood sources.	See above response.
Timber Harvest Sizes	Howard Carbone Vern Halter Scott Holcomb Brian Okonek Susitna Community Council Talkeetna Community Council (Billy Fitzgerald)	Need to define small, medium and large timber harvest sizes	A definition has been added to the Plan in Volume III, "Definitions/Glossary" and in Volume I, Chapter 3; "Harvest Unit Management and Sizes."

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TOPIC	**COMMENTER'S NAME**	**COMMENT/ISSUE**	**RESPONSE**
Timber Sales	Billy Reynolds Ron Robbins	Logging to be in small parcels; 5 to 20 acres maximum and not to be up for bid or over the counter only.	We assume the commenter's meant timber harvests other than commercial sales. Specific timber harvests can be contained in the Five-Year and Periodic Timber Harvest Schedules, not in this Plan. The exact type of harvest, methods and means, etc. is a detail that is approved separately in this schedule's which are subject to public notice and must be approved by the Assembly. The Plan has been changed to ensure that "reasonable" personal and/or community use needs are met. In addition, legislation has been recommended in the Plan to implement this provision in the Five-Year and Periodic Timber Harvest Schedules.
Timber Harvests Values Requiring Assembly Approval	John Strasenburgh	Currently the Borough Manager may approve timber sales of up to $25,000. A $25,000 sale, using past per acre prices, could exceed 350 acres. This is a large sale with potentially significant impacts.	The draft plan has been changed, and a change to the existing ordinance has been recommended (see Volume I, Chapter 4 "Recommended Ordinance Changes") that states that

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			individual sales over 64,000 cubic feet or 500 cords of wood (equivalent to about 40 acres) would require Assembly approval. All references to monetary values have been deleted.
Volume vs. Acreage for Timber Harvests	Denali Log & Lumber (Mark Stahl)	Mr. Stahl mentioned various reasons (principally cost effectiveness) where he felt acreage instead of volume measurements should be used. If volume is to be used, scaling by an independent third-party should be utilized.	No change. The commenter makes good points on why, in some situations, acreage harvests are better than using volume measurements. This is true, in some but not all cases (i.e. small select or personal harvest vs. larger utility harvests). The Plan states that volume is the preferred measurement method, but other methods may also be used, depending on the harvest. In the majority of the units, the harvest will be small, such as for personal use or specialty products. In this case the volume method is preferred in that the borough will be reimbursed for the value of the tree that is used, rather than averaging all the tree values in an acre or cutting unit.

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TOPIC	**COMMENTER'S NAME**	**COMMENT/ISSUE**	**RESPONSE**
			The overall value of the trees in borough owned forest areas, and the amount that will be harvested (annual allowable cut) does not lend itself to using a third-party to scale the trees that are harvested. Instead actual harvest volumes can be done by measuring the cubic volume by species by the pick-up or truck load. This method will minimize administrative costs and better ensure a fair monetary return to the borough for the type and size of the trees that are harvested.
	Ron Robbins	Logs to be sold by board feet, not lineal feet.	Any volume measurement can be used as conversion tables exist. See Volume III, Appendix I; "Timber and Lumber Conversions with Examples."

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TOPIC	**COMMENTER'S NAME**	**COMMENT/ISSUE**	**RESPONSE**
	Brian Okonek	It is hard to visualize timber volume when permitting timber harvests. It is much easier to visualize the number of acres that would be cut when harvesting timber.	Agree. It is difficult, for example, to visualize the equivalent of 20 select cut trees over 10 acres versus a clear cut of 100 trees on 2 acres. In the majority of units select cut, shelterwood or group harvesting systems will be the most likely method used. In these type harvests the volume harvested is likely to be spread out over a larger geographic area which is less obtrusive to the eye immediately after a harvest. For the Five-Year and Periodic Timber Harvest Schedule's the guidelines in the plan have been changed from the draft plan to require that the approximate number of trees to be harvested per acre be given to help the reviewer better visualize the proposed harvest.

Volume I : Chapter 4: Implementation and Recommendations			
TOPIC	**COMMENTER'S NAME**	**COMMENT/ISSUE**	**RESPONSE**
Ordinance Changes	Ruth Woods	The proposed ordinance change for MSB 23.20.165 deals with timber salvage. The statement, "If feasible, all timber with a commercial value or that can be used for personal use that exists on borough land where the timber will be removed because of a conversion of land use to a non-forest use…" is pretty explicit, but not necessarily clear. For example, the borough does not always know whether the timber will be removed from the property it sells.	Agree, this statement is unclear and overly broad. The intent is to salvage timber from land that is being converted to another use that will remain in borough ownership (i.e. school, public safety facility, road, etc.). It was not intended to apply to property being conveyed into private ownership, unless the proposed use does not include the rights to the timber (agricultural properties) or the sale contract explicitly states differently. The draft language in the plan has been changed to clarify this.
Research	Susitna Community Council Ruth Wood	Supports further research to understand better what is needed to promote the sustainable use, growth and health of our boreal forest.	No change. Volume I, Chapter 3 "Forest Improvement Study Area(s)" and Volume I, Chapter 4, "Forest Research" addresses this concern.

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TOPIC	**COMMENTER'S NAME**	**COMMENT/ISSUE**	**RESPONSE**
Anderson Creek Management Unit	Loisann Reeder	Owns property and a cabin adjacent to the unit since 1970 and is in complete agreement with the proposed management intent for the unit.	No comment.
	Loisann Reeder	Under Current Land Uses, delete "Principally hunting, trapping and fishing." While these activities occur there are other uses as well such as wildlife viewing, birding, hiking, snowmobiling, cross-country skiing and snowshoeing.	Requested change made to the plan and other activities listed by the commenter have been added.
	Loisann Reeder	Under Surrounding Land Ownership and Uses, change to reflect that there is extensive private land, some with cabins, adjacent to, and in the vicinity of, the northwest quarter of the Unit.	Requested change made to the plan.
	Loisann Reeder	Under Cultural Resources and Cultural Sites, change the language in the draft Plan to reflect that extensive Native use of the land along Anderson Creek has been documented.	The supporting information provided by the commenter has been verified by the borough's Cultural Resources Division. Changes have been made to the draft plan.
	Loisann Reeder	Additional information provided by the commenter on fish and wildlife resources within the unit.	The information provided has been added to the plan.
	Loisann Reeder	With the extensive private property just outside and in the vicinity of the Unit and the Iditarod Trail, the	The plan has been changed to reflect this information.

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TOPIC	**COMMENTER'S NAME**	**COMMENT/ISSUE**	**RESPONSE**
		recreational activity is quite heavy at times, both summer and winter.	
	Loisann Reeder	The location of the Iditarod Trail is not shown correctly. It does pass through the Unit.	The location has been changed on the maps to show the surveyed "historic" route. The narrative for the unit has also been changed accordingly along with a statement that actual used trail location changes on regular (annual) basis depending on snow and other conditions.
Bartlett Hills Management Unit	Alaska Survival (Becky Long) Linda Langner Richard Leo Susitna Forestry Council (Denis Ransy)	This unit should be designated and classified as open space, preserved as roadless and undeveloped. Any timber harvest should be for personal use (firewood, house and saw logs).	See next comment response. .
	Alaska Survival (Becky Long) Susitna Forestry Council (Denis Ransy)	The classification should be public recreation, watershed, wetland bank lands, and not resource management and watershed lands. These are the only ones that will maintain the present stable and reasonable use patterns in the area.	The land use classifications and designations have been changed from the draft plan. Important habitat areas have been designated as habitat and classified either public recreation or watershed lands. All waterbodies and wetland areas (including buffers) have been designated and classified as

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			watershed lands. All remaining uplands have been designated as public recreation-dispersed and classified as public recreation lands. With these designations and classifications, there will be no timber harvests, including personal use. Wetland Bank Lands are only used for wetlands certified by the Corps of Engineers, EPA, and USF&WS to be used for wetland mitigation, which are not applicable for this unit.
	Alaska Survival (Becky Long) Jok Bondurant Howard Carbone Billy Fitzgerald Vern Halter Linda Langner Brian Okonek Denali Log & Lumber (Mark Stahl) Susitna Forestry Council	The commenter's had numerous comments about the size and type of any timber harvests, reforestation requirements and techniques, need for additional public input prior to timber harvesting, and access into the unit as it affects the operable timber area for timber harvesting.	The land use designations and classifications have been changed from the draft plan to where there will be no timber harvest of any kind in this unit. See above comment and response for land use designations and classification for this unit.

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	(Denis Ransy) Talkeetna Community Council (Billy Fitzgerald)		
	Alaska Survival (Becky Long) Billy Fitzgerald Brian Okonek	Several important wildlife, wetland and waterbody areas were identified beyond what was shown in the draft plan.	After consulting with ADF&G, the areas identified by the commenter's have been added to the narrative and maps and designated as habitat and classified appropriately.
	Susitna Forestry Council (Denis Ransy)	Trumpeter Swan and raptor areas must receive the highest level of protection.	These areas have been identified by local residents very familiar with the area and have been protected with appropriate designations and buffers.
	Susitna Forestry Council (Denis Ransy)	ADF&G should continue to study and document fish and wildlife in the unit. The fish and game protection language in the draft Plan is generally good.	No change.
	Alaska Survival (Becky Long)	Larson Lake Trail is more correctly the Larson Creek or Talkeetna Bluffs Trail.	The reference to Larson Lake Trail will be removed from the map. This trail has numerous names. The MSB Recreational Trails Plan refers to the trail as the Talkeetna Bluffs Trail.
	Susitna Forestry Council (Denis Ransy)	Talkeetna Bluffs Trail should not be improved or upgraded.	This issue is outside the scope of this plan.

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	Susitna Forestry Council (Denis Ransy)	The Iron Creek Trail is locally believed to be the Talkeetna River itself.	Noted and information passed on to those responsible for working on and maintaining the borough's Recreational Trails Plan
	Brian Okonek	The S. Mastodon Road easement should be shown as only dedicated (dotted line) all the way to the west side of the map as no road physically exists anywhere on the area shown on the map.	Map changed to show dedicated, unconstructed road.
	Susitna Forestry Council (Denis Ransy)	The "roads" shown in sections 25 and 36 of T26N, R4W., SM are in fact only trails.	These are dedicated, but unconstructed roads. The map will be changed to reflect this status.
	Alaska Survival (Becky Long) Linda Langner	Should be ¼ mile buffer on Talkeetna Bluffs Trail to keep from having moose conflicts when timber harvest activities occur.	No change. No buffers are needed at this time as there will not be any timber harvest or other resource extraction activities in the unit. Buffers, Special Management Zones and other possible protection manners may be needed in the future if use patterns change.

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TOPIC	**COMMENTER'S NAME**	**COMMENT/ISSUE**	**RESPONSE**
	Alaska Survival (Becky Long) Brian Okonek Susitna Forestry Council (Denis Ransy)	Draft Plan does not list cataloged anadromous fish streams.	The draft Plan has been changed to recognize that there are cataloged anadromous streams in the unit. In addition, the Plan identifies and protects additional anadromous streams that are not cataloged by ADF&G, but that had been identified by local knowledgeable and reliable residents.
	Susitna Forestry Council (Denis Ransy)	Group feels fish and wildlife populations to be moderate to high.	After consulting with ADF&G, language in the draft plan has been changed.
	Susitna Forestry Council (Denis Ransy)	Forest in this unit is generally healthy with birch, spruce and cottonwood in all ages and stages of growth.	No comment. Timber inventory data is available.
	Alaska Survival (Becky Long) Susitna Forestry Council (Denis Ransy)	Use in the unit occurs more than just in the winter.	Agree. The language in the draft plan has been changed to reflect that use occurs in the unit throughout the year, with the majority occurring in the winter when access is easier.

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	Jok Bondurant Howard Carbone Billy Fitzgerald	Buffers should be larger.	No change. There is no need to increase the size of the buffers because of the changes made in the land use designations and classifications. See other comments and responses for this unit.
	Brian Okonek	While it may not work to have a "forest trust" to manage an individual NRMU, it is very important for there to be a local advisory board that would study and comment on all multiple use proposals. Please keep this language in the plan.	A forest trust is not needed because the plan has been changed so that no timber harvest in this unit will occur. Language in the draft Plan has been changed to recognize local advisory boards or non-profit organizations established by, or endorsed by local community councils are an appropriate forum to gather information and to make recommendations on management of NRMU's.
	Susitna Forestry Council (Denis Ransy)	The concept of designating the unit as a "forest trust" was discussed with no conclusion reached.	See response above.
	Talkeetna Community Council (Billy Fitzgerald)	The Talkeetna Community Council supports the Susitna Forestry Council to gather information and provide a forum for local residents to gather information to make decisions about the use of our public lands.	See response above. The Talkeetna Community Council may select the Susitna Forestry Council to be their local advisory board to make recommendations for this unit, following adoption of this Plan.

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TOPIC	**COMMENTER'S NAME**	**COMMENT/ISSUE**	**RESPONSE**
	Susitna Forestry Council (Denis Ransy)	Unit should remain free of private property.	No change. The plan states that all NRMU's shall remain in public ownership unless specifically excluded by the Assembly through the plan amendment process.
Bunco Hills Management Unit	Billy Fitzgerald	Identified general grizzly and black bear denning areas.	Noted in the Plan.
	Amy Karn (Alaska Department of Natural Resources)	State land adjacent to the south and east portions are proposed for state land disposals. Requested the Plan to recognize and provide for this activity.	No change. This Plan does not directly affect land or possible future uses outside of the Unit. Comments on the proposed land designations in the draft *Susitna-Matanuska Area Plan* may be submitted separately by the borough.
	Vern Halter Cari Sayre	This Unit is a very sensitive and dense recreation area and needs protection for the future.	No change. The plan recognizes the values mentioned by the commenter's. The unit is to be managed for public recreation, important habitat values, and watershed protection.
	Brian Okonek	Eagles nest around Swan Lake but the location of these nests changes as existing nesting trees fall down. Existing and future nesting sites need to be protected. Human activities that disturb these nesting areas, particularly in the	No change. There is a 330-foot mandatory no-disturbance buffer around all Eagle nesting sites and they are protected under federal law (Endangered Species Act). Because Eagle nesting sites are protected under federal law, any

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		spring, needs to be managed.	disturbance of nesting areas should be reported to the USF&WS who has enforcement authority.
	Geoffrey Parker ("representing (several) unnamed Trapper Creek residents and property owners")	Unit should be classified as Public Recreation.	No change. The draft plan recommends the unit be classified as public recreation and watershed protection.
Chijuk Creek Management Unit	Richard Leo Sylvan (Hal) Morgan	Commercial logging should not be allowed. Only personal use and select cut for local consumption should be permitted.	The decision on the type of harvest is not the subject of this Plan. Those decisions are to be made through the Five-Year and Periodic Timber Harvest Schedule's which require additional public notice and input. Final approval for any harvest is required to be made by the Assembly.
	Geoffrey Parker ("representing (several) unnamed Trapper Creek residents and property owners")	Two provisions should be added: (1) set an acreage limit that could be offered in any one sale and that would be tailored to the maintenance of sustained yield over the long term, and sustaining recreational use and habitat; and (2) that would require monitoring of past sales to determine if regeneration is as expected.	No change. Specific timber harvests will be developed in the Five-Year and Periodic Timber Harvest Schedule processes, not in this Plan. The exact type of harvest, size of harvest, methods and means, etc. is a detail that is approved separately in these schedules which are subject to public notice and must be approved by the Assembly. The management intent and

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			guidelines for the unit recognizes the importance of the units' recreational and habitat values. Monitoring of past sales for regeneration is required under the *Alaska Forest Resources and Practices Act.* There are numerous sections in the draft plan that discusses forest health and reforestation/regeneration.
	Geoffrey Parker ("representing (several) unnamed Trapper Creek residents and property owners")	Recommends co-classifying the unit as forestry and public recreation.	No change from draft plan. Co-primary classifications can, by their nature, create unavoidable conflicts as no use has a priority over another. The classifications for Forest Management and Resource Management (separate areas) combined with the management intent make it clear that the areas shall recognize and manage for the areas recreational uses while managing the areas forest resources.

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TOPIC	**COMMENTER'S NAME**	**COMMENT/ISSUE**	**RESPONSE**
	Roger Patch	Concerned that a portion of Parker Lake has been included in the Unit.	The maps have been changed to exclude all of Parker Lake from the Unit.
Chulitna River Management Unit	Amy Karn (Alaska Department of Natural Resources)	The state has existing material extraction sites located along the Parks Highway adjacent to this unit (Jigsaw Lakes Subunit).	No change. The Plan does not affect land outside of the Unit.
	Robert Sanders	The draft Plan, specifically in the Jigsaw Subunit, fails to accommodate access to private property owners in the Swan Lake Subdivision.	The maps will not be changed as only trails that are in the *Mat-Su Borough Recreational Trails Plan* or a local comprehensive plan are shown. The existence and existing use of the trails will be added to the narrative for the unit.
	Cari Sayre	Supports draft Plan designations for the Jigsaw Puzzle Lakes subunit.	Thank you.
Deception Creek Management Unit	Dean Bunker James Bunker Terry Bunker CW Jasper	Private road to his homestead and other private property in the same area is "pictured" as part of the Hessler-Norris dog sled trail. Maps were provided to show the conflict area and James Bunker requested that private property signs be posted.	Based on the maps provided by the commenter's, it appears alternate access around the private property is available. The unit maps have been changed so that trails that cross private property without a legal easement or right-of-way are not shown.
	James Bunker	Various suggested language changes to acknowledge private property and provided some additional fish and game habitat information.	Language corrections have been made and fish and game habitat areas have also been incorporated.

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	Willow Area Community Organization (Linda Oxley)	Feels management intent for the Unit sets the right balance between recreation, natural resource protection, forestry and other uses. WACO fully supports the public review draft as written for this Unit.	Thank you.
	Willow Area Community Organization (Linda Oxley)	The Willow Area Trail Plan, adopted by WACO in 2006, was not referenced in the Plan.	Reference to the *Willow Area Trails Plan* has been added to the draft Plan. In addition, the Borough Assembly, through Ordinance 06-098, included the trails in the *Willow Area Trail Plan* into the *Mat-Su Borough Recreational Trails Plan.*
	Willow Area Community Organization (Linda Oxley)	Provided additional information about land uses and resources.	Information has been incorporated into the draft plan.
Fish Creek Management Unit	No Comments were received		The Fish Creek Management Plan has already been adopted and will be recommended to become a Natural Resource Management Unit.

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Kashwitna Management Unit	Rachel Harrison Herbert Harrison	Concern expressed about current timber 300 foot wide timber harvest along the Parks Highway without regard to riparian areas, nesting areas for Sandhill Cranes, Trumpeter Swans and Eagle nests, and anadromous streams.	Current timber harvest is related to Parks Highway construction. The commenter's concerns about anadromous streams, riparian areas and nesting areas are all addressed in the draft plan and are protected.
Matanuska River North Management Unit	No comments were received.		
Matanuska River South Management Unit	No comments were received.		
Mile 233 Management Unit	Chase Community Council (Mike Wood) Mike & Molly Wood	Public Review Draft of the Plan did a very good job of integrating the relevant information from the Chase Comprehensive Plan.	Thank you.
	Alaska Survival (Becky Long) Chase Community Council (Mike Wood) Susitna Forestry Council (Denis Ransy Mike & Molly Wood	Only timber harvest should be for personal use firewood, house and sawlogs.	No change. The forest management guidelines for this unit state that any timber harvest should be small and to not reduce the local resident's rural lifestyles and the recreational and scenic values in the unit. The exact type of harvest, methods and means, etc. is a detail that is approved separately in the Five Year Timber Harvest Schedule which is subject to public notice and must be approved by the Assembly.

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	Sarah Birdsall Chase Community Council (Mike Wood) Patricia Cox Jonathan Durr Beth Pike Mike & Molly Wood	Opposes any future commercial timber harvesting in the unit.	The forest management guidelines for this unit state that timber harvest is a permitted use when it does not significantly reduce the local resident's rural lifestyles and the recreational and scenic values in the Unit. Timber harvests shall generally be small in average volume for the amount harvested per year. Examples include selective cuts for specialty products, sawlogs, house logs, personal use and firewood sales. This level of timber harvest appears to address the commenter's concerns.

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Moose Creek (Petersville Area) Management Unit	Alaska Survival (Becky Long) Richard Leo Lon McCullough Susitna Forestry Council (Denis Ransy)	Only timber harvest should be for personal use firewood, house and sawlogs.	No change. The forest management guidelines for this unit state that any timber harvest should be small and to not reduce the local resident's rural lifestyles and the areas recreational, and scenic values. The exact type of harvest, methods and means, etc. is a detail that is approved separately in the Five-Year Timber Harvest Schedule which is subject to public notice and must be approved by the Assembly.
	Geoffrey Parker ("representing (several) unnamed Trapper Creek residents and property owners")	Unit should be classified as Public Recreation to protect the areas recreational and habitat values and recognize the local area resident's rural lifestyles while allowing limited woodlots for firewood, sawlogs, and dispersed select cut for specialty wood products including house logs.	No change. See response above. Classifying the unit as Public Recreation would not allow for any timber harvest. Timber harvests, including for personal use can only occur on land as classified as Forest Management or Resource Management with management intent and guidelines to allow timber harvest. The Trapper Creek Community Council identified this unit as an area that would like to see available for personal/community timber harvest purposes. The management intent, land use

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		Commenter also quoted an earlier response to public comments that stated "it is premature to determine the long-term management for this unit until a resource inventory has been completed.	designations, classifications and the guidelines for the unit provide for protection of the recreational values and uses the commenter is seeking. This quote was a response was to the comments received during the "Scoping" process of developing this plan. Since scoping, a timber inventory of the unit was completed in 2009. Results of that inventory can be found in volume I, Chapter 3, and volume III, Appendices "N" and "O."
	Alaska Survival (Becky Long) Richard Leo Susitna Forestry Council (Denis Ransy)	Opposes classification that allows gravel extraction.	No change. The classification does not allow gravel extraction. The classification identifies the resource and protects it for future use. Any proposed future use will require public notice.

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TOPIC	**COMMENTER'S NAME**	**COMMENT/ISSUE**	**RESPONSE**
Olson Creek Management Unit	CIRI (Kim Cunningham)	Add information or correct language in the public review draft dealing with: current land use, surrounding land, private property, and roads and trails.	Information provided by commenter was used to make corrections to the draft Plan.
	CIRI (Kim Cunningham)	Add a heading for energy development within the Unit.	This Plan does not address the development or use of non-owned borough land and sub-surface resources where the borough may be the surface owner. Any proposed use of borough owned surface lands to explore or, develop sub-surface resources must be done consistent with the Plan.
Parks Highway Management Unit	Lon McCullough	Only timber harvest should be for personal use firewood, house and sawlogs.	No change. The forest management guidelines for this unit state that any timber harvest should be small and to not reduce the local resident's rural lifestyles and the areas recreational, and scenic values. The exact type of harvest, methods and means, etc. is a detail that is approved separately in the Five-Year Timber Harvest Schedule which is subject to public notice and must be approved by the Assembly.

Volume II : Natural Resource Management Unit Plans			
TOPIC	**COMMENTER'S NAME**	**COMMENT/ISSUE**	**RESPONSE**
	Geoffrey Parker ("representing (sever) unnamed Trapper Creek residents and property owners")	Unit should be classified as public recreation because of its close proximity to the Parks Highway that should have recreation as a primary consideration.	No change. Classifying the unit as Public Recreation would not allow for any timber harvest. Timber harvests, including for personal use can only occur on land as classified as Forest Management or Resource Management with a designation and guidelines to allow timber harvest. The Trapper Creek Community Council identified this unit as an area that would like to see available for personal/community timber harvest purposes. The management intent, land use designations, classifications and the guidelines for the unit provide for protection of the recreational values and uses the commenter is seeking.
	Talkeetna Community Council (Billy Fitzgerald)	Supports Research Forest in this Unit and 3 others).	This use is recognized in the draft Plan.
Point MacKenzie Management Unit	No comments were received.		

Volume II : Natural Resource Management Unit Plans			
TOPIC	**COMMENTER'S NAME**	**COMMENT/ISSUE**	**RESPONSE**
Rabideux Creek Management Unit	Denali Log & Lumber (Mark Stahl) Vern Halter	Good unit for research forest and as a wood supply for possible Su Valley Middle/High School wood fired boiler project.	This unit has been identified as a possible location for a wood supply and as research forest/site. Unit does have year-round access and operable forest area limitations. The Trapper Creek Community Council has also requested that this unit be made available as a personal use/community firewood supply area.
	Talkeetna Community Council (Billy Fitzgerald)	Supports Research Forest in this Unit and 3 others).	This use is recognized in the draft Plan.
	Steven Miller	Generally, does not object to proposed timber harvest as stated in draft plan (small winter harvests for fire wood, saw logs and specialty products).	No further comment needed.
Rogers Creek Management Unit	Willow Area Community Organization (Linda Oxley)	Feels management intent for the Unit sets the right balance between recreation, natural resource protection, forestry and other uses. WACO fully supports the public review draft as written for this Unit.	Thank you.
	Willow Area Community Organization (Linda Oxley)	The Willow Area Trail Plan, adopted by WACO in 2006, was not referenced in the Plan.	Reference to the *Willow Area Trails Plan* has been added to the draft Plan.

Volume II : Natural Resource Management Unit Plans			
TOPIC	**COMMENTER'S NAME**	**COMMENT/ISSUE**	**RESPONSE**
			In addition, the Borough Assembly, through Ordinance 06-098, included the trails in the *Willow Area Trail Plan* into the *Mat-Su Borough Recreational Trails Plan.*
	Willow Area Community Organization (Linda Oxley)	Provided additional information about land uses and resources in the Unit.	Information provided was used to change the draft Plan.
Sheep Creek Management Unit	Denali Log & Lumber (Mark Stahl)	Not the best unit to use Unit to use for a timber supply for the possible Upper Su Middle/High School wood fired boiler project and research area because it does not have the best timber stands for that purpose and access is problematic.	Draft Plan has been changed to note possible limitations.
	Talkeetna Community Council (Billy Fitzgerald)	Supports Research Forest in this Unit and 3 others).	This use is recognized in the draft Plan.
Susitna River Corridor Management Unit	Diane Bee Martin Bee	Concern about location of sales in general, and specifically west of Kula Road Subdivision, and that border any other subdivisions in this unit.	Specific timber harvests will be contained in the Five-Year and Periodic Timber Harvest Schedules, not in this Plan. The type of harvest, methods and means, enlarged buffer, etc. is a detail that is approved separately in these schedules which are subject to public notice and must be approved by the Assembly.

Volume II : Natural Resource Management Unit Plans			
TOPIC	**COMMENTER'S NAME**	**COMMENT/ISSUE**	**RESPONSE**
	Jean Hartman John Giaclone Vern Halter Betty Hein Ralph & Nancy Lee Robert Stilwell Trapper Creek Glen Homeowners Association (Jean Hartman)	Area(s) adjacent to Trapper Creek Glenn Subdivision should be limited to select cut and homeowners need a source of wood for personal use.	Decisions on location and types of harvests are outside the scope of this Plan and will be made through the Five-Year and Periodic Timber Harvest Schedules.
	Billy Fitzgerald	Supplied information on bear denning locations and moose winter habitat just outside the unit.	Information has been added to the Plan.
	Mark Karaffa Lon McCullough	Recommend a no timber-harvest zone at least 2 to 3-miles from the intersection of the Parks and Petersville Roads because of the amount of private property in the area and the units' location to the community of Trapper Creek.	No change from draft Plan. Decisions on location and types of harvests will be made through the Five-Year and Periodic Timber Harvest Schedules. The community of Trapper Creek might want to consider such a zone through its comprehensive plan process.

Volume II : Natural Resource Management Unit Plans			
TOPIC	**COMMENTER'S NAME**	**COMMENT/ISSUE**	**RESPONSE**
	Mark Karaffa Lon McCullough	Opposes any gravel extraction without a plan for reclamation and reforestation within a specific time period.	No change from draft plan. The goals and guidelines for rock, sand and gravel (Volume I, Chapter 2) require that any rock, sand and gravel extraction must be reclaimed pursuant to state law and borough code.
	Lon McCullough	The 230 acres in the SE of the unit is located in a residential area. Material extraction in that section would be disruptive and dangerous. The water table in that area is at five-feet.	The draft plan does not identify any material sources in that area. The only possible material source identified in the Unit is along the Parks Highway in the SE ¼ of Section 6. It is shown on the "Land Use Designation" map.
	Richard Leo Lon McCullough	Commercial logging should not be allowed. Only personal use and select cut for local consumption should be permitted.	The Five-Year and Periodic Timber Harvest Schedule's require additional public notice and input. Final approval for any harvest is required to be made by the Assembly.

Volume II : Natural Resource Management Unit Plans			
TOPIC	**COMMENTER'S NAME**	**COMMENT/ISSUE**	**RESPONSE**
	Lon McCullough	Commenter stated that references were made to Trapper Creek Road and not the community of Trapper Creek.	The references to Trapper Creek Road in the draft plan were made to identify access and natural resource locations. There was no intent to ignore the community of Trapper Creek which is mentioned in other portions of the unit narrative.
	Talkeetna Community Council (Billy Fitzgerald)	Supports Research Forest in this Unit and 3 others).	No change.
	Trapper Creek Farm/Alaska (Phillip Smith)	Requested that a 40 acre parcel be excluded from the unit because the parcel has agricultural values and should be made available for sale for that purpose.	Parcel excluded from Unit. The described parcel (SE1/4SW1/4, Section 21, T.26 N., R.5 W., SM) was on the edge of the proposed unit; has no operable forest land, and has no significant habitat or recreation values. Parcel does have soils identical to adjacent land that is currently being actively used for agricultural purposes.

Volume II : Natural Resource Management Unit Plans			
TOPIC	**COMMENTER'S NAME**	**COMMENT/ISSUE**	**RESPONSE**
Whiskers Creek North Management Unit	Jok Bondurant	Supports balance Plan provides between Whiskers Creek North and Whiskers Creek South.	No comment.
	Chase Community Council (Mike Wood) Mike & Molly Wood	Public Review Draft of the Plan has integrated feedback from the community.	No comment.
	Chase Community Council (Mike Wood) Jonathon Durr Richard Leo Mike & Molly Wood	Opposed to commercial logging in this unit.	The draft Plan does not allow any timber harvesting in this unit.
	Chase Community Council (Mike Wood) Billy Fitzgerald Mike and Molly Wood	Provided additional information about animal, fish and bird habitat areas.	This information has been added to the Plan.
	Vern Halter	More local input, advice and planning needed in any logging activities are to be authorized.	No change. The draft plan does not allow any timber harvest in this unit.
	Beth Pike	Any logging in swampy areas or adjacent to the Susitna and Chulitna Rivers will cause bank erosion.	There is not timber harvesting permitted in this unit.
Whiskers Creek South Management Unit	Jok Bondurant Talkeenta Community Council (Billy Fitzgerald)	Supports balance Plan provides between Whiskers Creek North and Whiskers Creek South.	No comment.
	Chase Community Council (Mike Wood) Mike & Molly Wood	Public Review Draft of the Plan has integrated feedback from the community.	No comment.

Volume II : Natural Resource Management Unit Plans			
TOPIC	**COMMENTER'S NAME**	**COMMENT/ISSUE**	**RESPONSE**
	Chase Community Council (Mike Wood) Jonathon Durr Beth Pike Mike & Molly Wood	Stated various reasons about the operable forest areas; namely that the best trees are found in various riparian zones and is dispersed and localized on higher zones. For those reasons, the commenter's are opposed to commercial logging in this unit.	No change. Commercial logging is a broad term covering everything from a very small select cut to a large (over 40 acres) clear cut. The guidelines for timber management in this unit state that timber harvesting may occur but only when it does not significantly reduce the units' recreational, habitat, scenic, and water resource values. The guidelines further state that harvests shall be very low in annual volume which includes sporadic timber harvesting spread out over a number of years. Areas offered and harvested shall be small in size, and if possible, dispersed. Timber harvests shall be limited to firewood, and specialty wood products including house logs.
	Vern Halter	More local input, advice and planning needed if any logging activities are to be authorized.	Agree and no change needed to Plan. The Five-Year and Periodic Timber Harvest Schedule's require additional public notice and input. Final approval for any harvest is required to be made by the Assembly.

Volume II : Natural Resource Management Unit Plans			
TOPIC	**COMMENTER'S NAME**	**COMMENT/ISSUE**	**RESPONSE**
	Chase Community Council (Mike Wood) Billy Fitzgerald Mike & Molly Wood	Provided additional information about animal, fish and bird habitat areas.	This information has been added to the Plan.
	Richard Leo	Commercial logging should not be allowed. Only personal use and select cut for local consumption should be permitted.	The Five-Year and Periodic Timber Harvest Schedules require additional public notice and input. Final approval for any harvest is required to be made by the Assembly.
	Beth Pike	Any logging in swampy areas or adjacent to the Susitna and Chulitna Rivers will cause bank erosion.	Concern is noted. According to the draft plan, there is very little timber harvesting permitted. Large (330') buffers have been provided. Specific timber harvests will be contained in the Five-Year and Periodic Timber Harvest Schedules, not in this Plan. The exact type of harvest methods and means, enlarged buffer, etc. is a detail that is approved separately in these schedules which are subject to public notice and must be approved by the Assembly.

Volume II : Natural Resource Management Unit Plans			
TOPIC	**COMMENTER'S NAME**	**COMMENT/ISSUE**	**RESPONSE**
Willow Management Unit	Willow Area Community Organization (Linda Oxley)	Feels management intent for the Unit sets the right balance between recreation, natural resource protection, and other uses. WACO fully supports the public review draft as written for this Unit.	Thank you.
	Willow Area Community Organization (Linda Oxley)	The *Willow Area Trail Plan*, adopted by WACO in 2006, was not referenced in the Plan.	Reference to the *Willow Area Trail Plan* has been added to the draft Plan. The Borough Assembly, through Ordinance 06-098, included the trails in the *Willow Area Trail Plan* into the *Mat-Su Borough Recreational Trails Plan.*
	Willow Area Community Organization (Linda Oxley)	Provided additional information about land uses and resources in the Unit.	Information has been incorporated into the draft Plan.

Volume III : Definitions/Glossary, Bibliography and Informational Literature, Appendices, Public and Agency Participation			
TOPIC	**COMMENTER'S NAME**	**COMMENT/ISSUE**	**RESPONSE**
No comments were received.			

Chapter 6
Advisory Boards Review and Recommendations

Following the revisions as a result of the comments received during the public comment period the plan was again submitted to the Parks, Recreation and Trails Advisory Board and the Real Property Asset Management Board for their review and recommendations.

The Parks, Recreation, and Trails Advisory Board met on April 26, 2010. They reviewed and discussed the recreational and trail aspects of the Legislative Review Draft of the Plan and found that the Plans general goals and guidelines recognized and accommodated both present and projected future general needs. They also found that the individual unit plans for the Natural Resource Management Units provided a good overall balance of the various existing uses and possible future uses, while ensuring that recreational uses were adequately protected.

The Parks, Recreation and Trails Advisory Board approved Resolution 07-10 which recommended adoption of the Plan. A copy of their approved resolution follows.

The Real Property Asset Management Board met on May 10, 2010. This Board had spent considerable time over the past year reviewing various drafts of portions of the Plan. At this meeting the Board discussed and found that: using the term Natural Resource Management Units instead of Forest Management Units better reflected the multiple-use management concept; recommended adoption of the Plan as written; recommended that adoption of the related ordinance changes contained in the Plan should be done in order to fully implement the Plan; recommended inclusion of the Fish Creek Management Plan area as a Natural Resource Management Unit; and, found that the terms and conditions of the timber harvest moratorium will have been met because of previously adopted ordinances on public notice, timber harvest permits, and the chapter on forest management combined with this Plan satisfied the terms and conditions of the moratorium.

The Real Property Asset Management Board approved Resolution 10-07. A copy of their approved resolution follows the Parks, Recreation, and Trails Advisory Board resolution.

MATANUSKA-SUSITNA BOROUGH
PARKS, RECREATION, AND TRAILS ADVISORY BOARD
RESOLUTION NO. 10-07

A RESOLUTION OF THE MATANUSKA-SUSITNA BOROUGH PARKS, RECREATION AND TRAILS ADVISORY BOARD RECOMMENDATION ADOPTION OF THE ASSET MANAGEMENT PLAN: NATURAL RESOURCE MANAGEMENT UNITS, PLACE THE FISH CREEK MANAGEMENT PLAN AREA INTO A NATURAL RESOURCE MANAGEMENT UNIT, AND ADOPT RELATED ORDINANCE CHANGES TO IMPLEMENT THE ASSET MANAGEMENT PLAN: NATURAL RESOURCE MANAGEMENT UNITS.

WHEREAS, the Natural Resource Management Unit Plan (Plan) covers twenty-one separate management units of borough-owned land totaling about 140,000 acres; and

WHEREAS, the Natural Resource Management Units are all managed for multiple resources and uses; and

WHEREAS, the Plan contains goals and guidelines by resource, program or management tool which includes: agriculture and grazing, buffers, cultural resources and historical sites, fish and wildlife habitat, forest management, green infrastructure, private property, public recreation and tourism, materials (rock, sand and gravel), settlement, special management zones, trails, transportation, and water quality, water quantity, wetlands, and riparian resources; and

WHEREAS, the Plan has been written over two-phases that included 14 public meetings and open houses at three different times during scoping and development of the Plan, and three opportunities for the public to submit written comments; and

WHEREAS, more than 160 individuals attended the public meetings, about 200 written comments were received that contained more than 700 topics, concerns and issues about the plan; and

WHEREAS, federal, state, local government and knowledgeable individuals and groups provided natural resource and use information that was not available from other sources; and

WHEREAS, all the concerns and issues raised by the public, interest groups, and community councils were addressed in developing the plan; and

WHEREAS, the Plan recognizes and accommodates the varied recreational activities that occur on borough lands and uses appropriate management intent, land use designations and land-use classifications to ensure that these activities can continue and be managed in a way to avoid conflicts; and

WHEREAS, all trails contained in the "Matanuska-Susitna Borough Recreational Trails Plan" and from community comprehensive plans have been protected in the individual unit plans; and

WHEREAS, the Matanuska-Susitna Borough Parks, Recreation and Trails Advisory Board has been informed and involved in the Plans development.

NOW, THEREFORE, BE IT RESOLVED, that the Matanuska-Susitna Borough Parks, Recreation and Trails Advisory Board recommends

that the Asset Management Plan: Natural Resource Management Units be adopted and fully implemented.

BE IT FURTHER RESOLVED, Matanuska-Susitna Borough Parks, Recreation and Trails Advisory Board recommends that the borough-owned land covered by Fish Creek Management Plan be added as a Natural Resource Management Unit.

BE IT FURTHER RESOLVED, that the Matanuska-Susitna Borough Parks, Recreation and Trails Advisory Board recommends that the proposed ordinance changes contained in the Plan be adopted into borough code in order to implement the Plan.

ADOPTED by the Matanuska-Susitna Borough Parks, Recreation, and Trails Advisory Board this 26th day of April, 2010.

Daniel H. Elliot II

DANIEL ELLIOT, II, Chairman

ATTEST:

Maria Abada

Maria Abada, Admin Secretary

MATANUSKA-SUSITNA BOROUGH
REAL PROPERTY ASSET MANAGEMENT BOARD
RESOLUTION NO. 10-07

A RESOLUTION OF THE MATANUSKA-SUSITNA BOROUGH REAL PROPERTY ASSET MANAGEMENT BOARD RECOMMENDING ADOPTION OF THE ASSET MANAGEMENT PLAN: NATURAL RESOURCE MANAGEMENT UNITS; RECOMMENDING ELIMINATION OF ALL EXISTING FOREST MANAGEMENT UNITS; RECOMMENDING ADOPTION OF RELATED ORDINANCE CHANGES TO IMPLEMENT THE ASSET MANAGEMENT PLAN: NATURAL RESOURCE MANAGEMENT UNITS; RECOMMENDS ADDING THE FISH CREEK MANAGEMENT PLAN AREA AS A NATURAL RESOURCE MANAGEMENT UNIT; AND, FINDING THAT THE TERMS AND CONDITIONS OF THE TIMBER HARVEST MORATORIUM ESTABLISHED BY ASSEMBLY RESOLUTION SERIAL NO. 06-136(AM) HAVE BEEN MET AND THE TIMBER HARVEST MORATORIUM SHOULD BE ELIMINATED.

WHEREAS, the Natural Resource Management Unit Plan (Plan) covers twenty-one separate management units of borough-owned land totaling about 140,000 acres; and

WHEREAS, the Natural Resource Management Units are all managed for multiple resources and uses; and

WHEREAS, the Plan contains goals and guidelines for: agriculture and grazing, buffers, cultural resources and historical sites, fish and wildlife habitat, forestry, green infrastructure, private property, public recreation and tourism, materials (rock, sand and gravel), settlement, special management zones, trails, transportation, water quality and quantity, wetlands, and riparian resources; and

WHEREAS, the Plan contains a Forest Management Plan which meets the requirements of MSB 23.20.060; and

WHEREAS, the Plan has been written over two-phases that included 14 public meetings and open houses at three different

times during scoping and development of the Plan, and three opportunities for the public to submit written comments; and

WHEREAS, more than 160 individuals attended the public meetings, about 200 written comments were received that contained more than 700 topics, concerns and issues about the plan; and

WHEREAS, the Plan utilized natural resource and land-use information from federal, state, local government and knowledgeable individuals; and

WHEREAS, the concerns and issues raised by the public, interest groups, and community councils were addressed in developing the plan; and

WHEREAS, the Real Property Asset Management Board has been actively and intensively involved in reviewing, suggesting changes and clarifications during the Plans development; and

WHEREAS, The Forest Management Plan contains a balanced approach to address the requirements of MSB 23.20.060 that will manage borough forests in a way that provides for a level of timber harvest that will meet reasonable local and industry needs while maintaining or enhancing the overall health of the borough-owned forests; and

WHEREAS; the Plan identifies the many and varied uses and values of lands within Natural Resource Management Units, and provides land-use designations and management guidance that, if

properly implemented, will maintain the health and sustainability of our forests while providing local and high value-added use of forest resources, protect our watersheds and water quality, maintain the habitat necessary to support healthy and diverse fish and wildlife populations; all of which are central to sustaining the quality of life and lifestyles of the boroughs communities, ensuring that a broad spectrum of outdoor recreation opportunities continue to be available, and supporting recreation and tourist based businesses.

NOW, THEREFORE, BE IT RESOLVED, that the Matanuska-Susitna Borough Real Property Asset Management Board recommends that the Asset Management Plan: Natural Resource Management Units be adopted and implemented.

BE IT FURTHER RESOLVED, that the Matanuska-Susitna Borough Real Property Asset Management Board recommends that the proposed ordinance changes contained in the Plan be adopted into borough code in order to fully implement the Plan.

BE IT FURTHER RESOLVED, that the Asset Management Plan: Natural Resource Management Units should replace all existing Forest Management Units and related plans that were created by, but not limited to, Ordinance Serial No. 90-020 (AM) and AM 90-071 and that all existing Forest Management Units should be revoked, and

BE IT FURTHER RESOLVED, because the borough-owned land within the Fish Creek Management Plan area is to be managed for multiple-uses similar to the Natural Resource Management Units covered by this Plan, the Matanuska-Susitna Borough Real Property Asset Management Board recommends that the borough-owned land covered by Fish Creek Management Plan be added as a Natural Resource Management Unit to ensure management consistency.

BE IT FURTHER RESOLVED, that the Matanuska-Susitna Borough Real Property Asset Management Board has found that the conditions and requirements of the timber harvest moratorium put in place by Assembly Resolution 06-136(AM) for a transparent public process has been met and the moratorium on sales and harvests of timber should be lifted upon adoption of this Plan.

ADOPTED by the Matanuska-Susitna Real Property Asset Management Board this 10th day of May, 2010.

BISHOP T. BUCKLE, Chairman

ATTEST:

Elizabeth Weiant, Secretary

Chapter 7
Planning Commission Review and Recommendations

The Planning Commission held a public hearing on the Plan on July 19, 2010. They recommended adoption of the Plan as written. A copy of their resolution, 10-26 follows.

MATANUSKA-SUSITNA BOROUGH
PLANNING COMMISSION RESOLUTION NO. 10-26

A RESOLUTION OF THE MATANUSKA-SUSITNA BOROUGH PLANNING COMMISSION RECOMMENDING THE MATANUSKA-SUSITNA BOROUGH ASSEMBLY ADOPT THE ASSET MANAGEMENT PLAN: NATURAL RESOURCES MANAGEMENT UNITS, ITS LAND USE DESIGNATIONS AND CLASSIFICATIONS; AND, AMENDING THE MSB 15.24.030, COMPREHENSIVE PLAN TO INCLUDE THE ASSET MANAGEMENT PLAN: NATURAL RESOURCES MANAGEMENT UNITS.

WHEREAS, in 2006 the Matanuska-Susitna Borough Assembly requested the Community Development Department prepare a new forest management plan; and

WHEREAS, the Plan was re-titled the Asset Management Plan: Natural Resource Management Units Plan to encompass the full breadth of natural resources and land use activities that are covered by the Plan; and

WHEREAS, the Plan will adopt a definition for Natural Resource Management Units as: "An Assembly designated geographic area of borough-owned land that has and is managed for multiple-use values. This includes, land classified or with management intent for: important fish and wildlife habitat, forest management, material, mineral, public recreation, watershed, and important wetlands. These units shall not include non-borough owned land, or land classified for agricultural, commercial, industrial, private recreation, or residential purposes;" and

WHEREAS, the Plan when adopted will establish new multiple-use management plans on about 140,000 acres of borough-owned land; and

WHEREAS, the Plan also incorporates the existing Fish Creek Management Plan (Ordinance Serial No. 09-130) (27,000 acres) as a Natural Resource Management Unit, for a total of over 167,000 acres; and

WHEREAS, the Plan when adopted will amend MSB 15.24.030, Comprehensive Plan to include the Asset Management Plan: Natural Resources Management Units; and

WHEREAS, the Plan provides management goals, guidelines, land use designations, and classifications for the Natural Resource Management Units; and

WHEREAS, the Plan has been written over two-phases that included 14 public meetings and open houses at three different times during scoping and development of the Plan, and three opportunities for the public to submit written comments; and

WHEREAS, more than 160 individuals attended the public meetings, and approximately 200 written comments were received that contained more than 700 topics, concerns, and issues about the plan; and

WHEREAS, the Plan utilized natural resource and land-use information from federal, state, local government, and knowledgeable individuals; and

WHEREAS, the concerns and issues raised by the public, interest groups, and community councils were addressed in developing the plan; and

WHEREAS, the Plan contains a balanced approach to address the requirements of MSB 23.20.060 that will manage borough forests in a way that provides for a level of timber harvest that will meet reasonable local and industry needs while maintaining or enhancing the overall health of the borough-owned forests; and

WHEREAS, the Parks, Recreation and Tails Advisory Board and the Real Property Asset Management Board have been actively and intensively involved in reviewing, suggesting changes, and requesting clarifications during the Plans development, and both boards have passed resolutions supporting adoption of the Asset Management Plan: Natural Resource Management Units.

WHEREAS, the Parks, Recreation and Tails Advisory Board adopted Resolution 10-07 on April 26, 2010; and

WHEREAS, the Real Property Asset Management Board adopted Resolution 10-07 on May 10, 2010.

NOW, THEREFORE, BE IT RESOLVED, that the Matanuska-Susitna Borough Planning Commission supports the management intent, land use designations, and land use classifications for the borough-owned land covered by the Asset Management Plan: Natural Resource Management Units.

BE IT FURTHER RESOLVED, the Matanuska-Susitna Borough Planning Commission supports the adoption of the Asset Management Plan: Natural Resource Management Units.

BE IT FURTHER RESOLVED, the Matanuska-Susitna Borough Planning Commission supports adding the Asset Management Plan; Natural Resource Management Units into the Borough's Comprehensive Plan (MSB 15.24.030).

ADOPTED by the Matanuska-Susitna Borough Planning Commission this 19th day of July, 2010.

Patrick Johnson, Acting Chair

ATTEST:

JUDY E. THOMPSON, Planning Clerk

(SEAL)

Chapter 8
Borough Assembly Review and Adoption

The Plan was set for public hearing before the Assembly on September 7, 2010. The public hearing was held September 21, 2010.

Before the Assembly was Ordinance Serial Number 10-083 which adopted the Asset Management Plan: Natural Resource Management Units, and added the Plan to the Borough's Comprehensive Plan. The same ordinance added the Fish Creek Management Plan area as a Natural Resource Management Unit and adopted all the land-use classifications and land-use designations as contained in the Plan. The ordinance also found that the Plan met the requirements for a Forest Management Plan and confirmed that the timber harvest moratorium was no longer in place.

Adopted at the same meeting was Ordinance Serial Number 10-084 (AM). This ordinance adopted all the changes to borough code as recommended in Volume I, Chapter 4 of this Plan. In addition, several amendments to this ordinance were made and adopted that specified that local residents should have a preference for any timber that is sold or harvested, that personal use harvest opportunities must be provided for, and that areas for utility timber be made available if the wood-fired boiler for the Su Valley Junior/Senior High School, if that project proceeds. These same provisions are already identified in the Plan as well.

A copy of the adopted ordinance 10-083 is on the following pages.

CODE ORDINANCE

By: Borough Manager
Introduced: 09/07/10
Public Hearing: 09/21/10
Adopted: 09/21/10

MATANUSKA-SUSITNA BOROUGH
ORDINANCE SERIAL NO. 10-083

AN ORDINANCE OF THE MATANUSKA-SUSITNA BOROUGH ASSEMBLY ADOPTING THE ASSET MANAGEMENT PLAN: NATURAL RESOURCE MANAGEMENT UNITS; AND, AMENDING MSB 15.24.030, COMPREHENSIVE PLAN AND PURPOSES.

WHEREAS, the Natural Resource Management Unit Plan (Plan) covers twenty-one separate management units of Borough-owned land totaling about 140,000 acres; and

WHEREAS, the Natural Resource Management Units are all managed for multiple resources and uses; and

WHEREAS, the Plan contains goals and guidelines for: agriculture and grazing, buffers, cultural resources and historical sites, fish and wildlife habitat, forestry, green infrastructure, private property, public recreation and tourism, materials (rock, sand, and gravel), settlement, special management zones, trails, transportation, water quality and quantity, wetlands, and riparian resources; and

WHEREAS, the Plan contains a Forest Management Plan which meets the requirements of MSB 23.20.060; and

WHEREAS, the Plan has been written over two-phases that included 14 public meetings and open houses at three different

times during scoping and development of the Plan, and three opportunities for the public to submit written comments; and

WHEREAS, more than 160 individuals attended the public meetings, about 200 written comments were received that contained more than 700 topics, concerns, and issues about the Plan; and

WHEREAS, the Plan utilized natural resource and land-use information from federal, state, local government, and knowledgeable individuals; and

WHEREAS, the concerns and issues raised by the public, interest groups, and community councils were addressed in developing the Plan; and

WHEREAS, the Forest Management Plan contains a balanced approach to address the requirements of MSB 23.20.060 that will manage Borough forests in a way that provides for a level of timber harvest that will meet reasonable local and industry needs while maintaining or enhancing the overall health of the Borough-owned forests; and

WHEREAS; the Plan identifies the many and varied uses and values of lands within Natural Resource Management Units, and provides land-use designations and management guidance that, if properly implemented, will maintain the health and sustainability of our forests while providing local and high

value-added use of forest resources, protect our watersheds and water quality, maintain the habitat necessary to support healthy and diverse fish and wildlife populations; all of which are central to sustaining the quality of life and lifestyles of the borough's communities, ensuring that a broad spectrum of outdoor recreational opportunities continue to be available, and supporting recreation and tourist based businesses;

WHEREAS, the Parks, Recreation and Tails Advisory Board and the Real Property Asset Management Board have been actively and intensively involved in reviewing, suggesting changes and clarifications during the Plan's development, and both boards have passed resolutions supporting adoption of the Asset Management Plan: Natural Resource Management Units; and

WHEREAS, the Planning Commission held a public hearing and passed Resolution Serial No. 10-26 without recommending any changes to the proposed Plan and recommended adoption of the Asset Management Plan; Natural Resource Management Units as written.

BE IT ENACTED:

Section 1. Classification. Sections 2 through 7, of this ordinance are non-code, Section 8 is of a general and permanent nature and shall become a part of the Borough code.

Section 2. Approval of Plan. The Matanuska-Susitna Borough Assembly does hereby adopt the Matanuska-Susitna Borough Asset Management Plan: Natural Resource Management Units.

Section 3. Forest Management Units, related land-use Plans and land-use classifications. The Matanuska-Susitna Borough Assembly hereby finds that all existing Forest Management Units, related land-use Plans and classifications that were created by, but not limited to, Ordinance Serial No. 90-020 (AM) and AM 90-071 are hereby revoked. The management intent, land-use classifications and designations in the Asset Management Plan: Natural Resource Management Units shall replace any and all existing management intent, land-use classifications and designations for the lands covered by the Asset Management Plan: Natural Resource Management Units.

Section 4. Creation of Natural Resource Management Units. The Matanuska-Susitna Borough Assembly does hereby create the Natural Resource Management Units as contained in the Asset Management Plan: Natural Resource Management Units.

Section 5. Fish Creek Management Plan area. The Matanuska-Susitna Borough Assembly does hereby include the Borough-owned land covered by the Fish Creek Management Plan as a Natural Resource Management Unit to be managed consistent with the Fish Creek Management Plan. The management intent, land-use

classifications and designations as specified in the Fish Creek Management Plan shall remain as stated in the Fish Creek Management Plan.

Section 6. Forest Management Plan. The Matanuska-Susitna Borough Assembly does hereby find that the Asset Management Plan: Natural Resource Management Units meets the requirements of MSB 23.20.060 for a Forest Management Plan on Borough-owned lands.

Section 7. Timber Moratorium. The Matanuska-Susitna Borough Assembly finds that the conditions and requirements of the timber harvest moratorium put in place by Resolution Serial No. 06-136(AM) for a transparent public process and permit application has been met and the moratorium on sales and harvests of timber on borough-owned land is hereby lifted.

Section 8. Adoption of subparagraph. MSB 15.24.030(B)(26) is hereby adopted to read as follows:

(26) Matanuska-Susitna Borough Asset Management Plan: Natural Resource Management Units, adopted 2010.

Section 9. Effective date. This ordinance shall take effect upon adoption by the Matanuska-Susitna Borough Assembly.

ADOPTED by the Matanuska-Susitna Borough Assembly this 21 day of -, 2010.

TALIS J. COLBERG, Borough Mayor

ATTEST:

LONNIE R. McKECHNIE, CMC, Borough Clerk

(SEAL)

PASSED UNANIMOUSLY: Woods, Houston, Arvin, Ewing, Bettine, Colver and Halter